



Relations between alcohol, violence and victimization in adolescence

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Abstract

Background: Compared to links between alcohol and aggression, links between alcohol and vulnerability are poorly understood.

Objectives: To determine whether there is a significant relationship between vulnerability to physical violence and alcohol consumption in adolescence independent of a relationship between alcohol consumption and violent behaviour.

Design, setting, participants: Cross-sectional study of 4187 adolescents aged 11–16 in a stratified sample of 13 English schools.

Results: Fighting decreased with age whereas hitting others and being hit increased. Relationships between fighting, hitting others and vulnerability to being hit and frequency of drinking and drunkenness were all highly significant ($p < 0.0001$), and were evident at all ages. The outcome most strongly related to frequency of drunkenness was hitting others (odds ratio (OR) 6.62), followed by being hit (OR 4.01) and fighting (OR 2.10). Alcohol consumption and drunkenness remained significantly and independently associated with vulnerability to being hit after adjusting for violent behaviour as well as age and sex.

Conclusions: These findings indicate an association between alcohol and victimization independent of associations of both with physical aggression. Reducing intoxication may reduce victimisation without necessarily affecting violent behaviour. Violence reduction should focus as much on preventing alcohol misuse among victims or potential victims as among offenders.

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Introduction

Adolescent aggression and violence are causing widespread public and political concern in many Western countries. Much of the blame for violence is attributed to alcohol consumption, in particular heavy “binge drinking” (Shepherd & Brickley, 1996). There has been less work on the relationship between violence and underage drinking, but Fergusson, Lynskey, and Horwood (1996), as part of a longitudinal study in New Zealand, concluded that a significant association existed between adolescent drinking and violence and that adolescents who abused alcohol were three times more likely to commit violent offences than those who did not drink to excess. However, it is acknowledged that the nature of the relationship between alcohol and violence needs to be explored further (Touhig, 1998). For example, Harrington (2000), reporting findings from the 1998–99 Youth Lifestyles Survey (UK) that a higher proportion of offenders between the ages of 12 and 17 were frequent drinkers (36%) than non-offenders (20%), comments that no causal link can be inferred from these data. Importantly, many studies have utilized aggregate data and have demonstrated an association between alcohol and violence but few have applied more rigorous case–control and dose–effect approaches. However, some findings support a more direct, dose-related, link between alcohol and violent behaviour (e.g. Brismar & Bergman, 1998).

From a victimization standpoint, two UK case–control studies focusing on risk of assault injury and alcohol consumption found positive, dose-related effects, but no links with dependence in adults aged under 40 years (Shepherd & Brickley, 1996; Shepherd et al., 1989). Cherpitel (1997) studying data from two US emergency departments (EDs) found a positive relationship between blood alcohol concentration and violence-related injuries. At both EDs, victims treated were more likely to have been drinking in the 6 h preceding injury than control patients with non-violent injuries. Cherpitel et al. (2003) in a cross-national meta-analysis, found a robust association between blood alcohol concentration and ED injury admission.

Mechanisms to explain a causal link between binge drinking and injury sustained in violence have been identified (Shepherd, 1998) and include reduced physical competence and poor decision making in intimidating, threatening or violent situations, isolation late at night in high risk urban settings and signals of immunity from prosecution since drunkenness substantially reduces the chances of assailant identification.

The study reported here was designed to examine concurrently the relationship between adolescent drinking and both violence and vulnerability to injury. The hypotheses underpinning this research were that fighting is associated more strongly with drunkenness (reflecting the effects of intoxication) than with frequency of alcohol consumption (reflecting contextual factors such as increased exposure to risky environments), and that drinking frequency and drunkenness predispose to vulnerability to be hit, an effect independent of violent behaviour.

Method

Participants

Nineteen comprehensive school headteachers were asked to facilitate this study by four Local Education Authorities in the North of England, the South of England, the Midlands and London,

13 of which consented. Schools were selected on the basis of geographical location, and include schools in deprived inner-London boroughs, schools in deprived areas of other southern English cities, and schools in affluent and deprived areas of the Midlands and northern England. However, the sample is not assumed to be representative of schools or adolescents in England and Wales. However, the principal hypotheses relate not to prevalence of violence and victimization, but to relationships between alcohol consumption and violence/victimization. The analyses presented here relate to 4187 respondents (out of a total of 7022 students: Table 1) stratified by region (see above), age and gender who all returned complete data relating to the five questions listed below which were designed to test the study hypotheses. Although it was planned to utilize the entire student population, this was not possible owing to examination commitments, absenteeism and school outings (Sutherland and Shepherd, 2002). Information about non-attendance was obtained from two schools—one in London and one in the southeast: this was estimated to range from 7% to 14% on any given day in the month when the survey took place (March).

Questionnaire

The data presented in this study were abstracted from responses to a longer questionnaire (the Adolescent Substance Abuse Questionnaire, ASAQ; Sutherland & Shepherd, 2001) which are not reported here in full. ASAQ is a 46-item questionnaire relating to self-esteem, anxiety, hostility, depression, hypochondria, fantasy, household substance use, smoking and drinking, family influence, religious practice and belief, peer influence, academic attainment and aspirations, and offending in addition to the questions listed here. Validation has been extensive, including factor analyses (Sutherland, 2001). The data reported were derived from answers to the following questions:

- If you drink alcohol, how often do you do this? (*I don't, yearly, monthly, weekly, 2–3 times a week, daily*).
- If you get in fights, how often does this happen? (*I don't, yearly, monthly, weekly, 2–3 times a week, daily*).
- In the past year how many times have you been drunk? (*never, 1–2 times, 3–5 times, 6–10 times, 11–20 times, 21+*).
- In the past year how many times have you hit someone? (*never, 1–2 times, 3–5 times, 6–10 times, 11–20 times, 21+*).
- In the past year how many times have you been hit by someone? (*never, 1–2 times, 3–5 times, 6–10 times, 11–20 times, 21+*).

The ASAQ was piloted, which suggested that questions on violence-elicited responses relating to violence predominantly outside the home and not involving family members such as parents and siblings or to verbal assaults. It was decided not to include definitions and footnotes in the ASAQ, mainly to elicit respondents' own perspectives, but also to reduce complexity.

Because responses to questions about getting into fights, hitting others and being hit might not represent independent variables, cross-tabulations were examined using χ^2 and Spearman

rank correlation tests. All these tests rejected the null hypothesis that variables concerned are independent, though confidence intervals are narrow, reflecting the very large sample size.

Variables	Rank correlation	95% confidence interval
Alcohol frequency and drunkenness frequency	0.484	0.451–0.507
Alcohol frequency and frequency of hitting others	0.261	0.232–0.289
Alcohol frequency and frequency of being hit	0.171	0.142–0.200

Although this is a disadvantageous feature of the data, it does not disqualify the variables in question from further analysis as separate outcome variables particularly since the objective was to study adolescents' own perceptions.

Procedure

Completion of this questionnaire was carried out in year groups. Year tutors were asked to ensure that pupils understood that the questionnaire was not an examination and that there were no right or wrong answers, and that pupils did not have to participate if they did not want to, and could withdraw from the survey at any time. Teachers were also asked to stress that the survey was completely confidential and that identification of individuals was impossible. They were instructed to clarify that answers to the alcohol consumption questions should refer to regular use only and should not include experimentation or occasional use on special occasions. The items relating to violence included reference to events both at school and elsewhere.

Schools were asked to ensure that completion of the questionnaire was carried out on the same day across year groups. Confidentiality was ensured by supplying each pupil with an envelope in which to return the questionnaire. Completed questionnaires were collected by a named teacher at each school and returned by post to one of the authors (IS). The questionnaires were then scored using a National Computer Systems OpSCAN 3 optical mark reader. To confirm the reliability of the scoring, 50 randomly selected questionnaires were manually scored; the scores were identical.

Statistical analysis

For each of the five questions, the two lowest responses, "never" and "yearly" or "1–2 times yearly" were combined for purposes of analysis to produce 5-category ordinal variables. Corresponding binary variables were also produced, in which "never" combined with "yearly" or "1–2 times yearly" was taken as a negative response and all others positive. All χ^2 values quoted are 1df tests for linear-by-linear association, based on the five-category ordinal variables. Logistic regression analyses were carried out in order to assess the relationship of being hit (binary as above) to alcohol consumption, adjusting for violent behaviour as well as age and gender.

Odds ratios (ORs) were calculated for associations between fighting, hitting others and being hit and alcohol consumption and drunkenness, each expressed as a binary variable, adjusted for age (six categories) and gender by logistic regression, for the whole sample and for age groups.

Results

Table 1 presents the distribution of gender and age last birthday of the 4187 respondents. Over 60% of respondents were male. The age distribution was very similar in the two genders: mean recorded age was 13.26 years for boys, 13.31 for girls.

Table 2 summarizes boys' and girls' responses to the five questions about frequency of alcohol consumption and violence. There was no difference between boys and girls in overall frequency of habitual alcohol consumption ($\chi^2 = 1.46$, $df = 1$, $p = 0.23$) and in frequency of being hit during the past year ($\chi^2 = 0.44$, $p = 0.51$). Drunkenness was reported slightly more often by girls, fighting and hitting others more frequently by boys. Though these gender differences were statistically significant (p approximately 0.01 in each case) in this large sample, they were small, and relatively unimportant compared to the major age differences shown below. Accordingly males and females were combined in subsequent tables, though gender was included as a factor in the logistic regression analyses.

Table 3 shows the percentages of respondents reporting alcohol consumption and drunkenness at each age. Both increase markedly with age ($\chi^2 = 354$ and 244 , $p < 0.0001$).

Table 4 shows the percentages of respondents reporting fighting, hitting others and being hit at each age. The frequency of habitual fighting declined significantly with increasing age ($\chi^2 = 127$, $p < 0.0001$). Conversely, the proportion of respondents who claimed to have hit others during the preceding year increased somewhat with increasing age ($\chi^2 = 25$, $p < 0.0001$). The proportion of respondents who reported having being hit increased slightly with age ($\chi^2 = 4.8$, $p = 0.03$).

Table 5 shows the strong relationships between frequent fighting and alcohol consumption frequency ($\chi^2 = 165$, $p < 0.001$) and frequency of drunkenness in the past year ($\chi^2 = 89$, $p < 0.0001$). Confounding with age cannot explain these relationships, because the alcohol variables increase with age, whereas reported fighting decreases.

Table 1
Number of respondents by age and gender

	Age last birthday						Total
	11	12	13	14	15	16	
Boys	326	443	711	572	382	146	2580
Girls	174	263	454	408	228	80	1607
Total	500	706	1165	980	610	226	4187

Table 2

Responses to five questions on frequency of alcohol consumption, drunkenness, fighting, hitting others and being hit, by gender

Gender	Number of respondents	Percentage of respondents reporting frequency of alcohol consumption				
		None/yearly	Monthly	Weekly	2–3 times weekly	Daily
Boys	2580	32.7	34.0	24.1	5.9	3.3
Girls	1607	30.6	34.0	25.8	7.5	2.1
		Percentage of respondents reporting frequency of drunkenness in past year				
		Never/1–2 times	3–5 times	6–10 times	11–20 times	21 times +
Boys	2580	59.4	16.1	8.6	5.9	10.0
Girls	1607	55.0	17.9	9.4	6.4	11.3
		Percentage of respondents reporting frequency of fighting				
		None/yearly	Monthly	Weekly	2–3 times weekly	Daily
Boys	2580	57.6	26.8	7.8	4.1	3.7
Girls	1607	61.4	25.0	7.6	2.7	3.3
		Percentage of respondents reporting frequency of hitting others in past year				
		Never/1–2 times	3–5 times	6–10 times	11–20 times	21 times +
Boys	2580	84.9	7.8	2.6	1.6	3.1
Girls	1607	86.9	7.7	2.6	1.3	1.6
		Percentage of respondents reporting frequency of being hit in past year				
		Never/1–2 times	3–5 times	6–10 times	11–20 times	21 times +
Boys	2580	90.6	5.3	1.6	0.9	1.6
Girls	1607	90.9	5.6	1.5	0.5	1.5

Table 6 shows the strong relationships between frequency of having hit others during the preceding year and alcohol consumption frequency ($\chi^2 = 512$, $p < 0.0001$) and frequency of drunkenness in the past year ($\chi^2 = 591$, $p < 0.0001$). These relationships are clearly only slightly accounted for by the confounding effect of age, being much stronger than the age gradient in hitting others. Because the percentage in the lowest category for hitting others only ranges from 89.4% at age 11 to 74.3% at age 16, this variable cannot account for these much larger differences.

Table 7 shows the strong relationships between frequency of having been hit during the preceding year and alcohol consumption frequency ($\chi^2 = 185$, $p < 0.0001$) and frequency of drunkenness in the past year ($\chi^2 = 206$, $p < 0.0001$).

Table 8 shows the proportion of respondents who had been hit three or more times during the preceding year, in relation to alcohol consumption frequency and frequency of drunkenness in the

Table 3
Percentages of respondents reporting alcohol consumption and drunkenness by age

Age last birthday	Total respondents	Percentage of respondents reporting alcohol consumption				
		None/yearly	Monthly	Weekly	2–3 times weekly	Daily
11	500	55.6	25.4	10.8	4.6	3.6
12	706	47.2	31.0	14.2	4.2	3.4
13	1165	33.8	34.7	22.6	6.4	2.5
14	980	23.7	38.4	29.5	6.4	2.0
15	610	13.3	35.9	39	9.3	2.5
16	226	8.0	34.5	40.7	10.6	6.2
		Percentage of respondents reporting drunkenness in past year				
		Never/1–2 times	3–5 times	6–10 times	11–20 times	21 + times
11	500	76.2	12.8	4.0	2.4	4.6
12	706	70.4	12.7	7.1	3.3	6.5
13	1165	59.1	17.5	8.8	6.4	8.2
14	980	50.1	20.5	10.3	8.1	11.0
15	610	44.3	17.0	12.0	7.7	19.0
16	226	39.4	17.7	11.5	8.8	22.6

past year, restricted to the 2284 respondents who responded negatively to both questions about fighting and hitting others. Because restriction in this way reduces the number hit from 389 to 93, the response variable, frequency of having been hit, was dichotomized for these analyses. Here χ^2 was 15.7 for the relationship with alcohol consumption and 19.0 for the relationship with drunkenness ($p < 0.0001$ for both).

Many of those who had been hit also reported violent behaviour. Table 9 summarizes the results of logistic regression models examining the influence of alcohol and drunkenness (each kept as a five-level factor) on the proportion reporting being hit. In the first row, age (treated as continuous) and sex are adjusted for. In the second row, binary variables representing fighting and hitting others are also adjusted for. In the final row, respondents reporting ever fighting or having hit others three times or more in the past year are excluded, as in Table 8. In each case the OR for the association is shown, with a 95% confidence interval. From this, there is a direct relationship between alcohol consumption and drunkenness and vulnerability to being hit, which remains after allowing for the confounding effect of being violent.

In Table 9, the ORs relate to the three dichotomized variables *beenhit2*, *alcohol2* and *drunk2*. Each is dichotomized into the lowest value and others. Thus the variable *beenhit2* identifies those who reported having been hit three or more times in the past year—as the legend to Table 9 makes clear. The variable *alcohol2* identifies those who reported drinking monthly or more often. The variable *drunk2* identifies those who reported drunkenness three or more times in the past year. So, the OR of 2.94 for the relationship between alcohol and being hit means that the odds of being hit three or more times in the year are greater by a factor of 2.94 in those who report drinking

Table 4
Percentages of respondents reporting fighting, hitting others and being hit, by age

Age last birthday	Total respondents	Percentage of respondents reporting habitual fighting frequency				
		None/Yearly	Monthly	Weekly	2–3 times weekly	Daily
11	500	41.2	31.8	14.6	6.4	6.0
12	706	50.7	29.2	9.5	6.1	4.5
13	1165	60.7	26.2	6.7	2.7	3.8
14	980	64.2	24.4	6.7	2.4	2.2
15	610	67.7	22.6	5.2	2.3	2.1
16	226	69.9	20.4	3.5	2.7	3.5
Percentage of respondents reporting hitting others in past year						
		Never/1–2 times	3–5 times	6–10 times	11–20 times	21+ times
11	500	89.4	5.4	2.0	0.8	2.4
12	706	88.1	5.1	3.0	1.1	2.7
13	1165	87.2	7.4	1.9	1.4	2.1
14	980	85.6	8.7	2.0	1.3	2.3
15	610	81.3	9.5	4.3	2.1	2.8
16	226	74.3	13.7	4.4	4.0	3.5
Percentage of respondents reporting being hit in past year						
		Never/1–2 times	3–5 times	6–10 times	11–20 times	21+ times
11	500	90.4	6.4	1.6	0.6	1.0
12	706	90.7	5.8	1.1	0.8	1.6
13	1165	92.7	3.6	1.7	0.7	1.3
14	980	90.8	5.2	1.5	0.6	1.8
15	610	89.0	7.0	1.5	1.0	1.5
16	226	85.4	8.0	2.7	0.9	3.1

monthly or more often than in those who do not, after making due adjustment for gender (binary) and age (entered as a categorical variable with six categories, which is more flexible than assuming a linear age dependence) using logistic regression. Similarly for the other OR shown. In analyses adjusting for fighting and hitting others, these variables are also entered in similar dichotomized form.

Table 10 gives ORs for associations between fighting, hitting others and being hit with alcohol consumption and drunkenness, each expressed as binary variables. These incorporate adjustment for the confounding effects of age and sex using logistic regression. All effects are highly statistically significant ($p < 0.0001$), and were also evident at each year of age. The relationships for hitting others are strongest, the relationship between fighting and drinking and drunkenness frequency are relatively weak. There was little to choose between drinking and drunkenness frequency as a predictor of violent behaviour. Vulnerability to being hit was more

Table 5

Percentages of respondents reporting habitual fighting frequency, by frequency of alcohol consumption and drunkenness

	Total respondents	Percentage of respondents reporting habitual fighting frequency				
		None/yearly	Monthly	Weekly	2–3 times weekly	Daily
<i>Habitual drinking frequency</i>						
None/yearly	1336	67.2	21.6	6.3	2.2	2.7
Monthly	1423	62.1	26.6	6.4	3.0	1.9
Weekly	1036	52.4	31.0	9.6	4.1	3.0
2–3 times weekly	272	44.9	27.2	14.0	8.1	5.9
Daily	120	20.8	25.8	10.0	10.8	32.5
<i>Drunkenness frequency in past year</i>						
Never/1–2 times	2417	64.2	23.0	6.7	3.3	2.8
3–5 times	703	57.6	28.6	7.4	3.1	3.3
6–10 times	372	53.5	30.6	10.2	2.7	3.0
11–20 times	255	49.4	31.8	10.5	5.5	3.1
21 times +	440	43.2	32.0	7.7	3.6	8.9

Table 6

Percentages of respondents reporting hitting others in the past year, by frequency of alcohol consumption and drunkenness

	Total respondents	Percentage of respondents reporting hitting others				
		Never/2 times	3–5 times	6–10 times	11–20 times	21 + times
<i>Habitual drinking frequency</i>						
None/yearly	1336	96.7	2.2	0.3	0.3	0.5
Monthly	1423	91.9	5.9	1.1	0.6	0.6
Weekly	1036	73.6	14.6	6.3	2.4	3.1
2–3 times weekly	272	67.3	17.3	4.8	5.5	5.1
Daily	120	35.0	10.0	10.0	9.2	35.8
<i>Drunkenness frequency in past year</i>						
Never/1–2 times	2417	94.8	3.3	0.7	0.4	0.9
3–5 times	703	85.3	9.5	2.4	1.1	1.6
6–10 times	372	77.7	13.7	5.1	1.1	2.4
11–20 times	255	68.6	19.6	7.1	2.7	2.0
21 times +	440	53.0	17.3	8.6	8.0	13.2

strongly related to getting drunk (OR 4.01) than to drinking alcohol (OR 2.94), though in a logistic regression model incorporating both factors, each remained independently significant at 0.0001. The relationship between drunkenness and hitting others was particularly high at ages 11–12 (OR 13.65, 95% CI 8.86–21.05). This was highly significantly ($p < 0.0001$) stronger than the corresponding OR for ages 13–16 (5.05, 95% CI 3.97–6.42).

Table 7

Percentages of respondents reporting being hit in the past year, by frequency of alcohol consumption and drunkenness

	Total respondents	Percentage of respondents reporting frequency of being hit				
		Never/2 times	3–5 times	6–10 times	times 11–20 times	21 + times
<i>Habitual drinking frequency</i>						
None/Yearly	1336	95.6	3.1	0.7	0.4	0.2
Monthly	1423	93.5	4.6	1.0	0.4	0.6
Weekly	1036	86.6	7.7	2.7	1.0	2.0
2–3 times weekly	272	80.9	8.5	4.0	2.2	4.4
Daily	120	61.7	14.2	3.3	4.2	16.7
<i>Drunkenness frequency in past year</i>						
Never/1–2 times	2417	95.4	2.9	0.7	0.5	0.5
3–5 times	703	88.6	7.8	1.7	0.3	1.6
6–10 times	372	87.6	7.8	3.0	0.3	1.3
11–20 times	255	80.4	12.2	2.7	1.6	3.1
21 times +	440	77.0	9.5	4.1	2.7	6.6

Table 8

Proportion of respondents reporting being hit three times or more in the past year, by frequency of alcohol consumption and drunkenness

	Proportion of respondents reporting being hit 3 times or more in the past year
<i>Habitual drinking frequency</i>	
None/yearly	22/882 (2.5%)
Monthly	34/833 (4.1%)
Weekly	26/457 (5.7%)
2–3 times weekly	9/99 (9.1%)
Daily	2/13 (15.4%)
<i>Drunkenness frequency in past year</i>	
Never/1–2 times	39/1499 (2.6%)
3–5 times	24/373 (6.4%)
6–10 times	15/173 (8.7%)
11–20 times	7/101 (6.9%)
21 times +	8/138 (5.8%)

Restricted to the 2284 respondents who responded negatively to both questions about fighting and hitting others.

Discussion

The most important finding in this study is the independent link between alcohol consumption and vulnerability to violence—in particular, that non-fighting adolescents who drank had much

Table 9

Results of logistic regression models examining the influence of frequency of drinking alcohol and drunkenness on the proportion reporting being hit three times or more in the past year

Independent variable	Alcohol			Drunkenness	
	<i>n</i>	Odds ratio	95% confidence interval	Odds ratio	95% confidence interval
<i>Factors adjusted for</i>					
Age and sex	4187	2.94	2.19–3.95	4.01	3.16–5.08
Age and sex fighting, hitting others	4187	1.73	1.26–2.37	2.33	1.81–3.01
Age and sex. Excluding those reporting fighting or hitting others	2284	2.25	1.34–3.77	2.99	1.92–4.65

Table 10

Odds ratios for associations of fighting, hitting others and being hit with frequency of alcohol consumption and drunkenness

	Odds ratio	95% confidence interval
<i>Drinking frequency and</i>		
Fighting	2.38	2.04–2.76
Hitting others	6.89	5.00–9.49
Being hit	2.94	2.19–3.95
<i>Drunkenness frequency and</i>		
Fighting	2.10	1.84–2.41
Hitting others	6.62	5.35–8.19
Being hit	4.01	3.17–5.08

From logistic regression models including adjustment for age (categorical) and gender.

more often been hit than non-fighting non-drinkers. This appears to be the first study to identify evidence of a direct link between alcohol misuse and vulnerability to injury independent of the links between drinking and fighting. Findings are consistent however, with research which has identified alcohol intoxication as a risk factor for vulnerability to physical violence (Shepherd et al., 1990; Shepherd & Brickley, 1996; Cherpitel, 1997). Since this study differentiated between frequency of drunkenness and drinking, it is possible, on a study population basis, to look for the possible differential effects of intoxication. Overall, strength of associations (ORs, Table 10) between drunkenness and drinking frequency and measures of physical aggression and vulnerability were similar, suggesting that severe intoxication did not increase risks above those associated with drinking frequency. The exception to this overall observation is that drunkenness frequency was more strongly associated with being hit than drinking frequency. Interestingly, when associations between these variables were ranked, the strongest links are between drinking

frequency and hitting others, followed by being hit and fighting, respectively. Therefore, overall, insofar as these data permit inferences about causation to be drawn, alcohol itself may not increase the expression of physical violence promoted by contextual (e.g. visits to parks late at night with other risk-taking adolescents) or personality (e.g. sensation seeking, impulsiveness) factors. The exception, from this study, is that alcohol, independently of violent behaviour, seems to increase vulnerability to victimization above levels of vulnerability brought about by other factors.

In this study, the proportion of respondents reporting alcohol consumption and drunkenness increased markedly with age, as expected. In contrast, the frequency of self-reported fighting declined significantly with increasing age. This should not necessarily be regarded as reassuring however, since specialization in particular antisocial behaviours is known to occur after overall prevalence peaks at about 13–14 (Shepherd & Farrington, 2003). It is possible that the minor, experimental violence prevalent in younger secondary school children gives place to more serious violence which is more likely to result in injury. However, frequency of hitting others increased with increasing age.

The reliability and validity of self-report data may represent a limitation of this study, particularly since, for adolescents, self-image, vulnerability and underage drinking are sensitive issues. It could be argued that the observed strong relationship between drinking and violent behaviour is not only aetiologically unsurprising per se, but could also arise if, for reasons of bravado, some respondents exaggerated their responses to questions about these behaviours. However, this explanation cannot account for the observed relationship between alcohol consumption or drunkenness and being hit, since respondents would, on this basis, tend to understate, rather than exaggerate, their vulnerability. Research on validity of self-report data has concluded that young people report truthfully about sensitive matters when appropriate precautions are taken (e.g. Winters, Stinchfield, Henly, & Schwartz, 1990), as they were in this study. Importantly, Connell and Farrington (1997) found that self-report was the most accurate and reliable way of gathering data from adolescents about sensitive subjects. Two areas of concern however, are the perceived fear by respondents that they might be “caught out” if they admit to alcohol use and violent behaviour, which could lead to under-reporting. Conversely, a desire to impress peers by claiming greater substance use than actually exists may lead to over-reporting. This study was designed to ensure confidentiality in order to minimize these effects.

Another potential weakness of this study is that responses relate only to pupils who attended School on the day of the survey. It is unlikely given the small numbers of non-attenders involved (range in schools when this information was sought: 7–14%), that the findings would have been materially different if pupils absent at the time of the study had been included. Drinking in this group can be more frequent than for children attending school (Johnston, O’Malley, & Eveland, 1978). However, this survey was carried out at a time when absences because of examinations or illness are known to be low (late spring). Non-response may also have resulted in bias, the extent of which is difficult to estimate, though of course, only differential response leads to bias in the context of this study.

In this study, although the incidence of fighting fell with increasing age, it remained a problem throughout adolescence. Such stability of behaviour suggests childhood environmental and/or genetic explanations. Although examples from twin and candidate gene studies support a contribution of genetics to violence, transmission in families does not follow classic Mendelian

inheritance patterns and this may be due, in part, to extraneous factors such as peer pressure (Alsobrook & Pauls, 2002 for example).

These results confirm an association between adolescent violence and drinking consistent with those of Athanasiadis (1999), who found that frequency of violence was related to frequency of alcohol use, and with those of Parker and Auerhahn (1998) who stated that “...there is substantial evidence to suggest that alcohol use is significantly associated with violence of all kinds” (p. 291), and Komro et al. (1999) who stated that “...alcohol use is an independent risk factor for delinquent and violent behaviours among young people” (p. 13). However, as with adolescent drug use, the quest to identify a single causal factor is probably futile. These findings are also consistent with those of Fergusson et al. (1996) who studied, longitudinally, the association between alcohol misuse and juvenile offending in New Zealand. After controlling for factors such as family background, individual characteristics and peer influence, they concluded that young people who abused alcohol had odds of violent offending 3.2 times greater than their peers who did not abuse alcohol. Cirillo et al. (1998) offered the explanation that adolescents who abuse alcohol may rely on violence as a coping strategy more strongly than adolescents who do not.

The link between drunkenness and hitting others was particularly strong in children aged 11 and 12; it remained highly significant thereafter, but became weaker. The age heterogeneity for this particular association was an unexpected finding, but attained very high statistical significance. None of the other associations between alcohol and violence examined displayed clear age trends in this way. The reason for this particular trend with age needs to be investigated further, and may provide new aetiological information and new directions for violence prevention.

This research provides some new insights which are relevant to alcohol harm reduction, although further evidence, particularly of blood alcohol concentrations (BAC) in violent offenders to set alongside victim BAC data (Shepherd & Brickley, 1996) are needed for definite conclusions to be drawn. The overall implications are that adolescent aggressivity is largely inherent by age 11, and is expressed in association with drinking. It is rational to attempt to reduce violence by reducing frequency of drinking, by situational interventions and through education interventions focused on modifying alcohol expectations. In contrast to aggression, whereas this study identified evidence of an independent relationship between underage alcohol consumption and vulnerability to being hit, vulnerability increased with age. Overall, there were strong relationships between hitting others, fighting, being hit and drinking frequency. Prevention resources should therefore be targeted at both fighting and vulnerability, the latter especially in older adolescents. On the evidence of this study, any reduction in frequency of intoxication without also affecting contextual factors is likely to affect risk of victimization rather than risk of violent behaviour.

In the past, preventive effort in relation to alcohol-related violence has been focused on offending to a much greater extent than vulnerability. From these results, there needs to be much greater emphasis on reducing victimisation in this context. This is recognized in the context of accidental injury, for example of pedestrians, but it should also be a central theme in reducing primary and repeat victimization. One way to do this is to capitalize on the “teachable moment” which has been identified in the aftermath of alcohol-related injury, by combining wound care with a brief alcohol intervention (Smith, Hodgson, Bridgeman, & Shepherd, 2003). Strategically,

primary prevention should also be explored through the integration of brief interventions by parents and teachers in the first two years of secondary education, capitalizing on teachable moments in the immediate aftermath of early, experimental binge drinking.

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