Exploring the temporal association between young people's alcohol consumption patterns and violent behavior

BY CARLY LIGHTOWLERS

Alcohol consumption patterns such as binge drinking have routinely been associated with interpersonal assault amongst young people. Examining how drinking patterns are temporally associated with violent behavior during adolescence and young adulthood further develops an understanding of this relationship. This study employs data from the Offending Crime and Justice Survey in England and Wales, offering insight into young people's drinking and offending behavior. A cross-sectional model examines the extent to which binge drinking is associated with the likelihood of committing assault in the same year. An earlier measure of binge drinking (in the previous year) was subsequently used to examine the influence on later violent behavior. Evidence that the pattern of drinking is associated with violent offending, as well as a contemporaneous association between binge drinking and violence in the same year, supports the existing literature in the field and suggests that frequent acute intoxication is a temporally proximal risk factor for the increased propensity of committing interpersonal assault offenses. However, there is no evidence found in the current study

AUTHOR'S NOTE: *I would like to thank Sarah Roberts, Robin Room and Claire Wilkinson, and anonymous reviewers for their comments on earlier drafts of this article, as well as Kerin Hannon, Corinne Harkins, and Mark Elliot for their assistance in proofreading.* *For additional information about this article contact Carly Lightowlers, University of Manchester, UK. E-mail: carly.lightowlers@postgrad.manchester.ac.uk.*

to suggest that earlier measures of binge drinking frequency are associated with increased propensity for later violent offending. Furthermore, current findings do not suggest that the association between binge drinking and the propensity for violence is moderated by gender, thus suggesting interventions aimed at reducing violent offending ought to address binge drinking in both males and females.

KEY WORDS: *Young people, binge drinking, violence, England, Wales.*

Excessive alcohol consumption in the U.K. has been linked to harms and criminal offenses, including violence (see, for example, Institute of Alcohol Studies, 2002; International Center for Alcohol Policies, 2005; McVeigh et al., 2005) and alcohol-related violence is suffered and committed disproportionately by young people, especially males, in public settings and drinking establishments (Levi, 1997; Graham et al., 1998; McVeigh et al., 2005; Bellis, Hughes, Korf, & Tossman, 2005; World Health Organization, 2006). While associations between alcohol and violence have been identified in many previous studies (see Graham, 1980 and Collins, 1982 for overviews), alcohol consumption and violence are not necessarily linked, and our understanding of how alcohol is implicated remains ambiguous and inconclusive. However, an association between acute intoxication and/or specific alcohol consumption patterns, such as heavy episodic drinking (binge drinking), and an increased risk of interpersonal assault has frequently been identified (see Matthews & Richardson, 2005; Finney, 2004; Shepherd, 1994; Room & Rossow, 2001), with violence being more common among those who drink large quantities on a single occasion and who drink to the point of intoxication (Room & Rossow, 2001). It is thus widely accepted that the pattern of consumption, rather than the frequency of alcohol consump-

tion, is likely to be associated with violent outcomes. Nonetheless, a recent meta-analysis of studies on alcohol consumption and injury suggested that risk of injury increases monotonically with increased alcohol consumption (Taylor et al., 2010).

The toxicological effects of alcohol are known to distort cognitive functioning, such as the perception of risk and decision making. Furthermore, alcohol consumption has also been linked to increased levels of aggression and reduced self-control. It is thus likely that alcohol can, in some instances, influence and distort perceptions, resulting in the escalation of incidents into violent events that, if the person were sober, might have been resolved differently (Graham, 1980; Graham et al., 1998). However, in many instances the cooccurrence of alcohol consumption and violent behavior are due to situational and environmental determinants, as, for example, in high-risk environments such as nightclubs in which young people are likely to be drinking heavily (see Bellis et al., 2005; Bellis, Hughes, & Anderson, 2007; Bottoms & Wiles, 1997; Maguire & Brookman, 2005; McVeigh et al., 2005; Graham & Homel, 2008).

It is noteworthy also that the onset of both offending and drinking occur at similar stages in the life course (Sumner & Parker, 1995): Those aged between 16-24 are most likely to be learning to drink, drinking to excess, and frequenting nightlife venues. This is also an age group disproportionately associated with public and nightlife violence. In light of this, it would seem pertinent to examine young peoples' drinking behavior and how their alcohol consumption patterns impact the potential for violent behavior across the developmental period of young adolescence and early adulthood. Some longitudinal studies have found that alcohol use led to subsequent violent behavior. Blitstein et al. (2005) found alcohol consumption to be a predictor of violent behavior among male and female students, with earlier alcohol use being associated with later vio-

lence. Swahn and Donovan (2004) found high-volume drinking to be both a correlate and predictor of violent behavior among adolescent drinkers. White, Brick, and Hansell (1993) found that aggressive behavior among males 12-18 years led to increased alcohol use and alcohol-related aggression, but that levels of alcohol consumption were not related to later aggression. They conclude that individuals who engage in alcohol-related aggression are likely to be aggressive from early adolescence and to behave aggressively whether or not they use alcohol, proposing a social-learning model (see also Bandura, 1973, 1977) as a possible explanatory model of the alcohol-use-aggression relationship. In another study, Huang, White, Kosterman, Catalano, and Hawkins (2001) found both processes (involving alcohol use and later interpersonal aggression and interpersonal aggression and later alcohol use) to occur in parallel. Thus findings to date on the impact of prior drinking on later violence are mixed. Moreover, there are few studies focused on the longitudinal prediction of violence from prior drinking behavior based on U.K. samples, with many prominent studies centered on American samples of young people (see Blitstein et al., 2005; Swahn & Donovan, 2004; White et al., 1993; Huang et al., 2001).

This study's primary aim is to investigate the temporal links between alcohol use (in particular risky single-occasion drinking) and violence (in the form of assaults with or without injury) in a sample of adolescents and young adults in England and Wales, and to test the hypothesis that current rather than earlier drinking impacts subsequent violent behavior. This aim will be met by performing statistical analyses on secondary data from the Home Office Offending Crime and Justice Survey (OCJS)—a self-report survey of crime and delinquency offering an insight into young people's lives, their drinking, and their offending behavior in England and Wales. Given that a clear distinction between a victim and offender is not always applicable in violent incidents (Plant, Plant, & Thornton, 2002), self-reports from the OCJS can complement findings from existing secondary crime datasets, such

as the British Crime (Victimisation) Survey (BCS), and offer an insight into alcohol consumption and violent offending as perceived by the perpetrators. The study thus offers a unique insight into a 2-year window (2005-2006), during the developmental period of adolescence to young adulthood (16 to 29 years old), of young people's alcohol-consumption patterns and involvement in violence, using their own accounts. Such analyses offer insight into the behaviors adopted during adolescence and early adulthood, a period that captures many key life events, such as leaving school and/or the parental home, the transition from education to employment, and establishing romantic partnerships.

A cross-sectional statistical model that examines correlates of violent offending, including binge drinking frequency in the same year, is presented here. This model is then extended to examine whether earlier binge drinking (the year before) influences violent behavior during the period of adolescence and young adulthood. A third model is subsequently run to examine whether current binge drinking intermediates the effects of prior drinking. Collectively, these models facilitate an exploration of the temporal association between heavy single-occasion alcohol consumption and violent behavior among young people during adolescence and young adulthood (16 to 29 years). Finally, the resulting model was run including an interaction effect between gender and binge drinking frequency to examine whether or not the association between binge drinking and violent outcomes was moderated by gender.

Data and methods

The survey

The Offending Crime and Justice Survey (OCJS) comprises a general-population sample of those aged 10 to 29 years old and asks young people to self-report their offending behavior, including incidents of violent crime. These data contain information on violent offenses such as assault, as well as detailed questions about drinking behavior—a combination that many

other surveys did not investigate in sufficient detail. Furthermore, the OCJS was administered using (audio-) computer assisted interviewing (CASI)[1] to minimize the influence of interviewer presence on reports of offending and drug use, as well as to make the survey accessible to respondents with literacy problems (Phelps et al., 2007).

The OCJS uses a random-probability sample design: namely, a multistage stratified random sample of individuals in households based on postcode districts and quarter-sectors as the primary sampling units, stratified by police force area, region, and district (based on population density and occupational profile) (Phelps et al., 2007). The OCJS was designed as a 4-year rotating panel survey interviewed annually between 2003 and 2006; that is, each year, part of the previous year's sample is reinterviewed in the same manner and is augmented by a fresh sample to ensure cross-sectional representation of young people in each sweep. The survey follows multiple overlapping cohorts, known as an accelerated longitudinal design; that is, in the initial sweep respondents could have been aged between 10 and 25 years and were subsequently followed for up to 4 years. The initial response rate in 2003 was around 74% (Hamlyn, Maxwell, Hales, & Tait, 2003). For more detail on the sampling strategy and survey design please refer to Phelps et al. (2007).

The panel sample

To investigate drinking behavior and its impact on violent behavior over time, it is necessary to consider those individuals who responded on more than one occasion to the survey. However, not all individuals will have responded to all four sweeps. Panel response rates for the most recent sweep (2006) were 85% and 82.3% for the prior sweep (2005). For initial exploratory analyses a subsample of panel members surveyed in 2006 and on at least one prior occasion were used (aged between 12 and 29, $N = 4554$). Regression models were subsequently run on a subsample of regular drinkers aged 16-29 (given low levels of drinking in those aged under 16) for whom measures of binge drinking and assault were obtained in 2006 and 2005 ($N = 1184$).

Weighting is used to correct for differences in probability of selection, nonresponse, and to match the makeup of population (young people in England and Wales) as well as to account for attrition. While attrition rates were relatively low (as outlined above), a rigorous multistage weighting strategy was employed to account for attrition in the longitudinal sample. Longitudinal weights were generated by correcting for the unequal probability of selection in the initial sample and reducing the bias from differential nonresponse. Longitudinal, nonresponse weights were calculated based on logistic regression models predicting factors associated with failure to complete the survey in wave 4, thus accounting for nonresponse in earlier waves and reducing the bias from dropout between waves 3 and 4. These weights were then recalibrated based on age, sex, and region once more (see Phelps et al., 2007 for an overview of the weighting strategy).

In order to examine potential period effects, the fresh samples in each sweep were used to assess the differences in the proportion of individuals committing an assault in the given year in this study. Such differences may be considered annual fluctuations in the prevalence of violent behavior within the population. Such period effects, if present, can skew the interpretation of changes over time. To further examine possible period effects, a series of logistic and multinomial regression models were run on whether respondents had committed an assault offense in the last year and how often respondents usually had an alcoholic drink when considering the last 12 months. The predictive impact of the earlier sweeps was found to be insignificant in both models, suggesting that there were no significant period effects on drinking prevalence overall.

Measures

Violent behavior is captured here by whether or not respondents reported having committed an assault (both with and without causing an injury to the other party). That is, respondents were asked if they had used force or violence on anyone on purpose in the last year, for example, by scratching, hitting, kicking or throwing things, and whether they believed it had

injured the other party in some way. This measure was selected, as assault is the most common form of violence perpetrated by adolescents and young adults and is frequently associated with alcohol consumption and drinking in nightlife environments (Bellis et al., 2005; Bottoms & Wiles, 1997; Finney, 2004; Levi, 1997; Maguire & Brookman, 2005; McVeigh et al., 2005).

As measures of drinking, frequency of drinking, and of binge drinking were used, drinking frequency was only asked of those who had drunk in the last 12 months, and binge drinking frequency in the last month was subsequently only asked of those that drank at least once a month or more. The models run here will thus exclude those people who are abstainers or not regular drinkers (i.e. those that drink less than once a month or not at all), and will examine only the additional impact of drinking pattern on violent outcomes among regular drinkers, not the impact of drinking or drinking frequency per se.[2] The assault outcome measure did not differ significantly between regular drinkers (monthly or more) and nonregular drinkers (less than once a month) (10.9% and 11.1% committed an assault in 2006 respectively). However, a significantly higher proportion of those who had drunk in the last twelve months (used as a proxy for current drinkers) had committed an assault (11%) compared with those who had not drank in the last twelve months (4.8%; $\chi^2 = 5.403$, $df = 1$, $p < .05$).

Binge drinking was captured in the OCJS in the form of drinking in excess of twice the recommended unit allowance for males and females as defined by the government health guidelines (six/eight or more units[3] in one day for females and males respectively). This measure is used as a proxy for binge drinking in other national government surveys such as the General Household Survey, which informs the Alcohol Harm Reduction Strategy for England and National Alcohol Strategy (Herring, Berridge, & Thom, 2008). This variable was measured on a six point frequency scale between "most days" and "less than once every couple of months." To aid interpretation and avoid categories with low numbers, the six original cate-

gories have been collapsed to provide three indicators in the logistic regression models: those that do not binge drink, those that do so at a low frequency (1 to 10 times a month) and those that do so more frequently (11 times a month or more).

Methods

Of those panel respondents that drank at least once a month, and would thus be asked the binge drinking questions ($N = 2649$), the youngest respondents were aged as low as 12 years; however, the mean age was 21.25 years (standard deviation 4.20). The eldest age was 29 years old. When binge drinking frequency is broken down by age group, those aged between 16 and 29 were more likely to binge drink, and to do so frequently, than their younger counterparts (77% of 16-29-year-olds binge, compared with only 47.7% of 12-15-year-olds). Given the lower rates of binge drinking and low base numbers for regular drinkers under 16 years of age, the regression analyses examining the impact of drinking patterns on violent behavior will focus specifically on those aged 16-29. A series of bivariate exploratory analyses were also performed examining age and gender variations in binge drinking and assault outcomes, including an examination of the distribution of both drinking frequency and binge drinking frequency for those who did and did not commit an assault in the same year (2006) using Mann Whitney U tests.

SPSS version 16 was used to run logistic regression models on regular drinkers in the sample aged between 16 and 29 for whom observations to both outcome and explanatory variables were available from both 2006 and 2005 sweeps ($N = 1184$), while controlling for age, gender, and previous violent offending. These models explore whether young people's drinking patterns are associated with the odds of having committed assault (both with and without causing an injury to the other party) in 2006. Given the developmental focus of this study, accounting for prior drinking behavior was deemed necessary, rather than relying solely on current drinking measures, as this may allow for more robust insights into how drinking behavior influences later violent behavior during adolescence and young adulthood. An initial cross-sectional model was run to examine

the propensity for violent offending including a measure of current drinking behavior (in the same year). This model was subsequently respecified to use only a measure of binge drinking from the previous year (2005) to examine whether prior binge drinking was associated with later violent outcomes. A third model was then run reintroducing the current binge drinking measure to examine any attenuation in the regression coefficients, and thus examine the extent to which the association between prior drinking and violence is mediated by current drinking. Finally the original model, using the current binge drinking measure, was adopted and rerun to include an interaction effect of gender and binge drinking frequency, examining the extent to which gender moderated the relationship between current binge drinking and assault outcomes.

Alongside well-established demographic factors associated with violent behavior such as age and gender, measures of previous violent behavior were controlled for. This was used to control for a tendency for violence more generally within individuals. Thus all models presented here control for age and gender as well as previous violent offending (in 2005).

Findings

Exploratory analyses

The OCJS panel sample of regular drinkers aged 12-29 ($N = 2649$) was first examined thoroughly, and results for key variables are summarized here and in Table 1 below. Table 1 displays the distribution of binge drinking frequency in the original variable categories for both males and females. Males were more likely (chi square = 45.991, $df = 5$, $p < .001$) to be heavier binge drinkers and that, on the whole, both males and females were more likely to be low-level binge drinkers as opposed to high-frequency binge drinkers. Although the majority of both males and females reported never having committed an assault offense (10.7% of all regular drinkers had committed an assault offense in 2006), almost twice as many males (12.9%) as females (7.3%) reported committing an assault.

TABLE 1 **Binge drinking frequency in 2006 for males and females aged 12-29 (with 95% confidence intervals)**

Binge drinking frequency	*Male*	*Female*	*Both*
Never in the last month	24.1% (+/- 0.024)	27.3% (+/- 0.023)	25.7% (+/- 0.017)
Once or twice in the last month	31.6% (+/- 0.026)	39.9% (+/- 0.026)	35.7% (+/- 0.015)
3 or 4 times in the last month	18.3% (+/- 0.021)	18.1% (+/- 0.020)	18.3% (+/- 0.015)
Between 5 and 10 times in the last month	14.2% (+/- 0.019)	9.4% (+/- 0.015)	11.8% (+/- 0.012)
Between 11 and 20 times in the last month	6.3% (+/- 0.013)	3.9% (+/- 0.010)	5.1% (+/- 0.008)
More than 20 times in the last month	5.6% (+/- 0.013)	1.3% (+/- 0.005)	3.5% (+/- 0.007)
Total*	100%*	100%*	100%*
(unweighted base)	(1255)	(1394)	(2649)**

*Percentages may not add up due to rounding
**124 respondents didn't know or did not want to answer, while a further 1905 were not asked this question as they did not drink or do so once a month or more (system missing).

Relationships and differences were examined (using the Mann Whitney U tests) between drinking and binge-drinking frequency and having committed a violent assault. Current binge drinking had a significantly different distribution for those who had and who had not committed an assault (Z = -5.430, p <. 01), whereas the simple drinking frequency measure did not. The median frequency for binge drinking for those who had not committed an assault offense was 2 (once or twice in the last month) versus 3 (three or four times in the last month) for those that had.

Cross-tabulations between binge drinking in 2005 and binge drinking in 2006 found that binge drinking the year before was significantly associated with later binge drinking (χ^2 = 384.913, df = 25, p <. 001). Initial models will focus on current binge

drinking and its impact on the odds of committing an assault offense, before going on to explore the impact of the earlier binge-drinking measure.

Model block 1: Examining the association between violent outcomes, current and prior binge drinking

Initially a logistic regression model was run to examine the association between having committed an assault in the past 12 months (2006), binge-drinking frequency, and the frequency of drinking for 16-29-year-olds (N = 1118). However, given that drinking frequency was a nonsignificant correlate of the odds of having committed an assault in the same year (2006), this variable was dropped in subsequent models. The binge-drinking measure ("How often in the last month have you had six/eight or more units of alcohol on any one day?") was significant ($p < 0.01$) and was thus retained in subsequent model specifications.

A model looking at the effect of current binge-drinking frequency (2006) on assault outcomes while controlling for age, gender, and previous violent offending was run. While both age and gender were significantly associated with the odds of committing an assault in a simpler model, their effects were not significant once a violent disposition more generally was controlled for (using a measure of previous violent offending in 2005, which was significantly associated with the odds of a current assault offense). In the initial model (Model 1, Table 2) current binge drinking was significant, with the effect of binge drinking increasing monotonically with increased binge drinking frequency (B = 1.479, $p < .05$ and B = 2.327, $p < .01$ for low- and high-level binge drinking respectively), despite controlling for prior violent behavior (B = 2.610, $p < .01$).

A similar model was subsequently specified to examine the extent to which binge drinking the year before (2005) was associated with assault in 2006 using the same control variables. This model (Model 2) suggests that prior binge drinking (in 2005) was not significantly associated with the propensity to commit an assault offense the year after (2006). It therefore seems there is limited merit in employing the prior binge-drinking measure to estimate the odds of violent outcomes one year later.

TABLE 2

Logistic regression—Whether committed an assault offense in last year (reference category none) based on current and prior binge drinking frequency

	Model 1 Current drinking only	*Model 2 Prior drinking only*	*Model 3 Prior and current drinking*
	B	B	B
Constant	-5.455**	-4.633**	-5.752**
Male	0.554	0.548	0.529
Age	0.045	-0.002	0.034
Committed an assault in 2005	2.610**	2.667**	2.602**
Binge drinking frequency 2005 (base none)		n.s	n.s
Low binge drinking frequency 2005 (1-10 times a month)		1.090	0.593
High-binge drinking frequency 2005 (11 or more times a month)		0.975	-0.106
Binge drinking frequency 2006 (base none)	**		**
Low binge drinking frequency 2006 (1-10 times a month)	1.479*		1.360
High binge drinking frequency 2006 (11 or more times a month)	2.327**		2.395**
R2 Cox & Snell	.130	.121	.133
R2 Nagelkerke	.308	.286	.315
Chi-square	125.252	115.648	122.777
–2 Log likelihood	368.121	377.725	365.090
N	1118	1118	1118

*$p \leq .05$; **$p \leq .01$; n.s. = overall impact of variable not significant.

Taken together, results from Models 1 and 2 suggest that prior drinking patterns do not seem to be associated with current violent behavior, whereas current drinking pattern—in the form of frequent binge drinking—is. A further model (Model 3) examined the attenuation in the regression coefficients for prior drinking when current binge drinking was added. Results from this model suggest that assault outcomes are linked particularly for current drinking, as coefficients for current binge-drinking frequency at the higher level remain significant (B = 2.395, $p < .01$), whereas prior binge-drinking frequency coefficients remain insignificant. Subsequent modelling thus focuses

on the contemporaneous association of current binge-drinking frequency with violent outcomes in the same year, using the above outlined model (Model 1). This model will be further developed to examine the extent to which the temporally proximal association between binge-drinking frequency and assault outcomes holds for both males and females in Model block 2.

Model block 2: Examining the association between violent outcomes, current binge drinking, and gender

The original model (Model 1) based on temporally proximal binge drinking in 2006 was rerun to look at the propensity for committing assault, including interaction terms between gender and the binge-drinking frequency categories (Model 1.1). This model examines whether gender moderates the relationship between binge-drinking frequency and violent behavior; that is, whether the relationship is different for males and females. The insignificant interaction terms and main effects of binge drinking in this model suggest that gender does not moderate effects of binge drinking on assault outcomes in this instance.

TABLE 3

Logistic regression—Whether committed an assault offense in last year (reference category none) based on current drinking with gender*binge drinking interaction terms

	Model 1.1 *B*
Constant	-4.062**
Male	-18.145
Age	0.045
Committed an assault in 2005	2.650**
Binge drinking frequency 2006 (base none)	n.s
Low binge drinking frequency 2006 (1-10 times a month)	-0.051
High binge drinking frequency 2006 (11 or more times a month)	0.884
Male* binge drinking frequency 2006 (base none)	n.s.
Male* low binge drinking frequency 2006	18.872
Male* high binge drinking frequency 2006	18.737
R2 Cox & Snell	.136
R2 Nagelkerke	.322
Chi-square	131.263
–2 Log likelihood	362.110
N	1118

*$p \leq .05$; **$p \leq .01$; n.s. = overall impact of variable not significant

Discussion

The logistic regression models presented here examine to what extent current and prior binge-drinking frequency are associated with the odds of committing an assault offense in the same year, using data from the OCJS panel respondents (aged 16-29). Four logistic regression models were run with self-reported assault in 2006 as the outcome measure. The analyses provide several findings and points of interest which will be discussed in turn in this section.

The temporal association between drinking pattern and violent behavior

The current findings provide further evidence to strengthen the existing literature and evidence base that asserts that the pattern of drinking (in this instance, the frequency of binge drinking) is important in determining the odds of violent offending, while drinking frequency per se is not important. These findings are in line with other studies (see, for example, Matthews & Richardson, 2005; Finney, 2004; Room & Rossow, 2001; Sumner & Parker, 1995, Swahn & Donovan, 2004; Huang et al., 2001). Frequent current binge drinking was significantly associated with violent behavioral outcomes in the same year. At a minimum, frequent acute intoxication is a potential risk factor for interpersonal assault, although a causal link cannot be established in the current study.

The measure of binge drinking adopted here is twice the U.K. government recommended unit allowance for females and males: six/eight units respectively, which equates to 48 and 64 grams of pure alcohol respectively. Compared with many other studies in the field which employ a measure of five or six United States standard drinks (each standard drink containing 14 grams of alcohol[4]), this is a relatively low threshold, as the latter measures would equate to 70 or 84 grams of pure alcohol. Estimates from this study may thus appear to inflate the prevalence of binge drinking among young people in England and Wales, compared to estimates derived from other measures.

While a contemporaneous association between alcohol consumption and violent behavior was identified here, the rela-

tionship between alcohol consumption and violence is not always simple; rather than being intrinsic to violent behavior, an individual's drinking may be one of many features which make an individual more likely to behave violently. To facilitate more robust claims about causal processes, further analysis looking at the role of alcohol in violent incidents may prove useful: examining more closely how alcohol consumption is linked to violent incidents and addressing whether the offender was under the influence of alcohol at the time of an offense. Also, as drinking can not only make people more prone to respond violently to social cues, but also puts them at increased risk of violent victimization (Graham et al., 1998), further work looking at the relationship between drinking patterns and being a victim of violence should also be encouraged. It may also prove useful to consider the settings in which respondents drink in further work of this kind, as the drinking context and setting often play a central role in facilitating alcohol-fuelled violent behavior (Graham et al., 1998; Plant, Plant, & Thornton, 2002; McVeigh et al., 2005).

Finally, while age did not feature as a significant correlate in the models here, it may be pertinent to consider the age of onset of drinking in relation to violent offending and young people's development in further studies of this kind, as this may shed light on how to tackle both young people's drinking patterns and violent behavior, especially given that those as young as 12 are drinking regularly in England and Wales and some are involved in committing assault offenses.

The merit of considering previous drinking patterns

Given a strong contemporaneous association between heavy episodic drinking and assault outcomes, as well as a current focus on the development of drinking patterns over adolescence and young adulthood, the impact of prior binge drinking behavior was assessed in the models. However, while current binge drinking is associated with violent behavior in the same year, the findings here suggest limited influence from earlier measures of binge drinking (one year previously). This appears to be consistent with research highlighting that sub-

stance use during early adulthood is associated with time-specific variations away from individuals' longitudinal patterns of aggressive behavior (Hussong, Curran, Moffitt, Caspi, & Carrig, 2004). That is, at times when young people drink more, they were also more likely to behave violently, even when accounting for previous levels of aggression.

Thus the hypothesis that current, rather than prior, binge drinking is associated with violent offending is verified here. However, given the significant association found between current and earlier drinking in the exploratory analyses (prior binge drinking was found to be significantly associated with later binge drinking both one and two years on), it seems that a life-course perspective is nonetheless useful to further understand alcohol consumption patterns and associated violence. It may thus be worth exploring impact of escalated binge drinking on violent outcomes in further work of this kind; that is, whether or not those increasing or remaining constant with their drinking are more likely to be violent in subsequent years and whether those reducing their binge drinking frequency are less likely to offend.

In summary, frequent acute intoxication is associated with contemporaneous violent behavior while prior binge drinking behavior is not, suggesting a time-specific link between alcohol consumption patterns and their impact on violent offending.

The role of previous violent offending and gender

It is important not to overemphasize the role of gender in the association between binge drinking and violent behavior, as the main effects of gender and the interaction between gender and binge drinking frequency, once previous violence was controlled for, were not significant in the current study. The lack of a moderating effect of gender corresponds with findings obtained by the studies by Swahn and Donovan (2004) and Huang et al. (2001) that did not identify moderating effects of gender on the association between binge drinking and violent or aggressive outcomes, although Blitstein et al. (2005) had contrary findings. This suggests it is important to address

drinking behavior and patterns in both males and females in interventions aimed at reducing or preventing violent behavior.

Limitations and recommendations for further research

This article is concerned with assault, given previously established findings that this is the most common form of violence perpetrated by young people, often involving alcohol and occurring in public settings where alcohol is readily consumed (Levi, 1997; Graham et al., 1998; McVeigh et al., 2005; Bellis et al., 2005; World Health Organization, 2006). The current study is not concerned with the relationship between alcohol and other forms of violence, such as domestic violence, sexual, financial, or emotional abuse. Furthermore, the 2-year snapshot considered here has limited value for making claims about development over the life course more generally, as many criminal and drinking careers will continue outside of this period, will start thereafter, or have indeed commenced prior to the reference period.

The models specified in the current article pertain only to associations between alcohol consumption patterns in the last month and violence in the past year. They do not link alcohol consumption temporally to a violent incident, or highlight the sequencing of behavior within any one year. They are consequently limited in their ability to ascertain any causal processes. Moreover, logistic regression models assume independence between observations between the independent variables. Methods examining within-individual change may therefore prove useful in further work. Furthermore, given the significant association of earlier offending measures with subsequent assault offenses, it would seem that there is merit in examining violent behavior from a developmental perspective using such techniques. From this vantage point, it would also seem valuable to expand on the models presented here to explore this relationship at different stages in life course and how changes in alcohol consumption patterns over adolescence and young adulthood alter the likelihood of violent offending, while controlling for other intervening factors and life events.

Models presented in this paper control only for a limited set of independent variables, and may suffer problems of observable

variable bias, as other exogenous factors not included or accounted for in this study (as outlined in the methods section above) may be influencing alcohol consumption and/or violent behavior and mediating the relationship between them. Finally the missing data in the models should be mentioned. From sensitivity analyses it seems that younger respondents and male respondents may be slightly less represented in the current models due to item non-response. However, the complex weighting strategy employed in the OCJS addresses the issues of demographic characteristics and attrition (see Phelps et al., 2007 for further details on the weighting strategy). Nonetheless, initial non-respondents may be systematically different from respondents in their binge drinking and/or violent offending behavior and thus, inferences to the population should be made with due caution.

Summary and conclusions

Overall, the current paper emphasizes the merit of considering current alcohol consumption patterns when considering the impact of alcohol consumption on violent behavior. Despite an insignificant association of prior binge drinking with later violent behavior, previous violent offending was significantly associated with the likelihood of further offenses. Thus, considering behavioral problems associated with violent behavior in a wider developmental framework during the period of young adolescence and early adulthood would seem worthwhile.

Notes

1 Audio-CASI allows respondents to listen to questions and possible answers via headphones before entering their response directly into a computer.

2 Where no data are recorded for regular drinkers, in the drinking or assault variables, these were treated as missing. There were 1655 missing observations to these items over the two sweeps. Of those respondents that did not respond to these items 50.1% were male and the mean age was 20, compared to a mean age of 23 for those whom observations were not missing ($t = 14.069$, $df = 1241.554$, $p < .001$).

3 A unit is a measurement of alcohol used in the U.K. to define recommended limits for alcohol consumption. One unit equates to 10 millilitres or 8 grams of pure ethanol; approximately the equivalent amount of alcohol contained in half a pint of beer or lager, a small glass of wine, or in a standard measure of spirits (Department of Health, 1995).

4 http://rethinkingdrinking.niaaa.nih.gov/WhatCountsDrink/WhatsAStandardDrink.asp

References

Bandura, A. (1973). *Aggression: A social learning analysis*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Bellis, M. A., Hughes, K., Korf, D.J., & Tossman, P. (2005). *Violence in general places of entertainment. Drugs and alcohol: Violence and insecurity?*, Strasbourg: Council for Europe.

Bellis, M., Hughes, K., & Anderson, Z. (2007). *Youth violence, alcohol and nightlife.* Violence Prevention Alliance Fact Sheet 1. Liverpool: Centre for Public Health.

Blitstein, J.L., Murray, D.M., Lytle, L.A., Birnbaum, A.S., & Perry, C.L. (2005). Predictors of violent behavior in an early adolescent cohort: Similarities and differences across genders. *Health Education & Behavior*, *32*, 175-194.

Bottoms, A. E., & Wiles, P. (1997). Environmental Criminology. In M. Maguire, R. Morgan & R. Reiner, (Eds.), *Oxford handbook of criminology*, (pp. 305-359). Oxford: Oxford University Press .

Collins, J. (1982). Alcohol use and criminal behaviour: An empirical, theoretical and methodological overview. In J. Collins (ed.), *Drinking and crime (*pp. 288-316). New York: Tavistock Publications.

Department of Health (1995). *Sensible drinking: The report of an interdepartmental working group*. London: Department of Health.

Finney, A. (2004). *Violence in the night-time economy: Key findings from the research.* Home Office Findings 214. London: Home Office.

Graham, K. (1980). Theories of intoxicated aggression. *Canadian Journal of Behavioural Science*, *12*(2), 141-158.

Graham, K., & Homel, R. (2008). *Raising the bar: Preventing aggression in and around bars, pubs and clubs*. Cullompton Devon, U.K.: Willan Publishing.

Graham, K., Leonard, K., Room, R., Wild, C., Pihl, R., Bois C., et al. (1998). Current directions in research on understanding and preventing intoxicated aggression. *Addiction*, *93*(5), 659-676.

Hamlyn, B., Maxwell, C., Hales, J. & Tait, C. (2003). *2003 Crime & Justice Survey (England and Wales).* London: National Centre for Social Research.

Herring, R., Berridge, V., & Thom, B. (2008). Binge drinking: An exploration of a confused concept. *Journal of Epidemiological Community Health*, *62*, 476-479.

Home Office. Research, Development and Statistics Directorate. Offending Surveys and Research, National Centre for Social Research and BMRB. Offending, Crime and Justice Survey, 2003 [computer file]. 3rd Edition. Colchester, Essex: UK Data Archive [distributor], August 2008. SN: 5248.

Home Office. Research, Development and Statistics Directorate. Offending Surveys and Research, National Centre for Social Research and BMRB. Offending, Crime and Justice Survey, 2004 [computer file]. 4th Edition. Colchester, Essex: UK Data Archive [distributor], December 2008. SN: 5374.

Home Office. Research, Development and Statistics Directorate. Offending Surveys and Research, National Centre for Social Research and BMRB. Offending, Crime and Justice Survey, 2005 [computer file]. 3rd Edition. Colchester, Essex: UK Data Archive [distributor], December 2008. SN: 5601.

Home Office. Research, Development and Statistics Directorate. Offending Surveys and Research, National Centre for Social Research and BMRB. Offending, Crime and Justice Survey, 2006 [computer file]. 2nd Edition. Colchester, Essex: UK Data Archive [distributor], December 2008. SN: 6000.

Huang, B., White, H.R., Kosterman, R., Catalano, R.F., & Hawkins, J.D. (2001). Developmental associations between alcohol and interpersonal aggression during adolescence. *Journal of Research in Crime and Delinquency*, *38*, 64–83.

Hussong, A., Curran, P., Moffitt, T., Caspi, A., & Carrig, M. (2004). Substance abuse hinders desistance in young adults' antisocial behaviour. *Development and Psychopathology*, *16*, 1029-1046.

Institute of Alcohol Studies. (2002). Alcohol and Crime Factsheet. London: Institute of Alcohol Studies.

International Center for Alcohol Policies. (2005). *The ICAP Blue Book: Practical guides for alcohol policy and prevention approaches*. Retrieved May 1, 2011, from www.icap.org

Levi, M. (1997). Violent crime. In M. Maguire, R. Morgan, & R. Reiner (Eds.), *The Oxford Handbook of Criminology* (pp. 841-849). Oxford: Clarendon Press.

Maguire, M., & Brookman, F. (2005). Violent and sexual crime. In N. Tilley (Ed.), *Handbook of crime prevention and community safety*. (pp. 516-562). Cullompton, U.K.:Willan Publishing.

Matthews, S., & Richardson, A. (2005). *Findings from the 2003 Offending, Crime and Justice Survey: Alcohol-related crime and disorder*. Home Office Findings 261. London: Home Office.

McVeigh, C., Hughes, K., Bellis, M.A., Reed, E., Ashton, J.R., & Syed, Q. (2005). *Violent Britain: People, prevention and public health*. Liverpool: Liverpool John Moores University.

Phelps, A., Maxwell, C., Fong, B., McCracken, H., Nevill, C., Pickering, K., et al.) (2007). *Offending, Crime & Justice Survey 2006 (England and Wales).* Technical Report Volume 1. London: National Centre for Social Research.

Plant, M., Plant, M., & Thornton, C. (2002). People and places: Some factors in the alcohol-violence link. *Journal of Substance Use*, *7*, 207-213.

Room, R., & Rossow, I. (2001). The share of violence attributable to drinking. *Journal of Substance Use*, *6*, 218-228.

Shepherd, J. (1994). Violent crime: The role of alcohol and new approaches to the prevention of injury. *Alcohol and Alcoholism*, *29*(1), 5-10.

Sumner, M., & Parker, H. (1995). Low in alcohol: A review of international research into alcohol's role in crime causation. London: Portman Group.

Swahn, M.H., & Donovan, J.E. (2004). Correlates and predictors of violent behavior among adolescent drinkers. *Journal of Adolescent Health*, *34*, 480-492.

Taylor, B., Irving, H.M., Kanteres, F., Room, R., Borges, G., Cherpitel, C.et al. (2010). The more you drink, the harder you fall: A systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. *Drug and Alcohol Dependence*, *110*, 108-116.

White, H.R., Brick, J., & Hansell, S. (1993). A longitudinal investigation of alcohol use and aggression in adolescence *Journal of Studies on Alcohol and Drugs, 11*(Suppl.):62–77.

World Health Organization. (2006). *WHO factsheet: Youth violence and alcohol*. Geneva: World Health Organization.