

# The effect of rugby match outcome on spectator aggression and intention to drink alcohol

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## ABSTRACT

**Background** Alcohol, aggression and assault injury are strongly associated with popular sporting events, but mediating factors are not clear.

**Aims** To explore aggression, happiness and plans to consume alcohol among spectators before and spectators after sports matches.

**Methods** Cross-sectional surveys of male rugby football fans at an international stadium generated four groups: a pre-match group of 111 men, and three post-match groups of supporters, 17 whose team had won, 23 whose team had lost and 46 whose team had drawn. Consenting participants were assessed using the assault sub-scale of the Buss-Durkee Hostility Inventory, on a self-rating of happiness (Likert scale), for planned alcohol consumption and demographic variables. Pre- and post-match group mean responses were compared.

**Results** Analyses were performed on 197 male spectators (mean age 42 years). Spectators in 'win' ( $z = 2.63$ ,  $p < 0.01$ ) and 'draw' ( $z = 2.76$ ,  $p < 0.01$ ) groups rated themselves as more aggressive than those in the pre-game group, but those in the losing group did not ( $z = -0.03$ ,  $p > 0.05$ ). No differences, however, were observed between pre-match, 'win', 'draw' or 'lose' groups on the decision to drink after the match. Winning did not increase happiness ( $t = 0.25$ ,  $p > 0.05$ ), but losing ( $t = 2.09$ ,  $p < 0.05$ ) or drawing ( $t = 7.64$ ,  $p < 0.001$ ) decreased it.

**Conclusions** This study suggests that team success but not failure may increase aggression among supporters, and that aggression, not celebration, drives post-match alcohol consumption. Losing and drawing decreased happiness but winning did not increase it. Better understanding of pathways to violence in these circumstances will pave the way for more effective prevention and management strategies. Copyright © 2007 John Wiley & Sons, Ltd.

## Introduction

Alcohol, aggression and assault injury are strongly associated with popular sporting events (Gutman, 1986; Taylor and Chermack, 1993). No attempts have yet been made to assess spectator aggression before and after sports events or to relate changes in aggression to match outcome, although Sivarajasingam et al. (2005) have shown that winning at home is associated with more assault injury than losing. It is important to determine what mediates aggression in these circumstances, since violence prevention strategies in this context will vary according to whether aggression is associated directly with match result or other factors, such as alcohol consumption.

Three studies have examined how sporting events impact on victimization. First, Sachs and Chu (2000) developed the hypothesis that 'Super Bowl Sunday is often the biggest day of the year for domestic violence' (p. 1192), and subsequently evaluated the relationship between emergency department admissions of women, domestic violence calls to the local police department and local American football team match outcome. Data indicated a trend such that greater domestic violence was identified on match days. Second, Sivarajasingam et al. (2005) analysed the relationship between Cardiff emergency department (ED) attendance and the outcome of 106 Welsh international matches: 74 rugby and 32 soccer (association football) international matches between 1995 and 2002. When Wales won at home, controlling for match attendance, there were higher numbers of ED attendances for treatment of assault injuries than with other results. This was also the case when Wales played away from home, in Paris or Johannesburg for example. Third, White et al. (1992) found that assault, stabbings and shootings of women increased in Washington, DC when the local ice hockey team (Washington Redskins) won compared with non-match days, but neither increased nor decreased when the local team lost.

The research reported here explores two plausible mechanisms relating match outcome to aggression. First, match outcome may affect sports fans' drinking habits and, given the association between alcohol and aggression (Bushman and Cooper, 1990), facilitate violence. Second, match outcome may directly affect supporters' levels of aggression. However, drinking patterns may be different on match days compared with non-event days, or may vary by match outcome. Neal et al. (2004) found that alcohol consumption on high-profile sports days was significantly higher than on other days for college students attending college sports events and that fans of the winning team drank more heavily compared with fans of the losing team.

Alcohol is associated with aggression and violence. Murdoch et al. (1990) found that at least 50% of the perpetrators of violent crime were intoxicated at the time of the offence. Haggard-Grann et al. (2006) performed a crossover study in Sweden of 133 violent offenders, and concluded that alcohol is a strong trigger for violence. A review of experimental research by Bushman and Cooper (1990)

suggests a mediating relationship where greater intoxication promotes aggression. Thus, it may not be winning *per se* that leads to aggression, but rather that increased alcohol consumption after winning promotes aggression (Bushman and Cooper, 1990).

The frustration–aggression hypothesis of Dollard et al. (1939) proposes that aggression is a consequence of thwarting an individual's efforts to attain a goal. Thus, if the goal of sports fans is to see their team win then frustration and aggression might result from their team losing. Although the frustration–aggression hypothesis predicts a direct relationship between match outcome and aggression that is not mediated by alcohol, its direction is inconsistent with the studies of Sivarajasingam et al. (2005) and White et al. (1992). An alternative explanation, which is consistent with these studies, is that there is a direct relationship between match outcome and aggression. White et al. (1992) interpreted their findings (see above) in terms of winning heightening fans' self-confidence, assertiveness and patriotism, which in turn promotes aggression generally and violence specifically against rival fans.

The purpose of our study was to explore candidate mechanisms through which match outcome and aggression might be related. Our hypotheses were, first, that fans of winning teams would be more likely to engage in celebratory drinking-increased alcohol intoxication in a risky environment (e.g. city-centre bars) may promote violence and injury – second, fans of a winning team may be more aggressive than fans of teams which lost.

## Methods

### *Participants*

Two hundred and two male sports fans (mean age = 39.97 years, SD = 15.08) volunteered to participate, 115 before matches and 87 after matches. Potential participants were approached at random at the main entrance to the Millennium Stadium complex in Cardiff, Wales, the venue for many international rugby football matches, where all five matches were played.

### *Questionnaires*

The time available for interviews was limited, particularly when large crowds of fans left the stadium. For this reason the questionnaire was kept short. Respondents were asked their age in years, who they were with (i.e. on their own, with family/friends), and which team they were supporting. Information on planned alcohol consumption was collected by asking about intention to drink alcohol after the game, where they would drink alcohol after the game and how much alcohol, in units, they estimated they would drink. A unit was defined for them as half a pint of beer/lager, a standard glass of wine or a single shot of spirits. The

aggression measure chosen was the assault subscale from the Buss-Durkee Hostility Inventory (BDHI, Buss and Durkee, 1951). Participants responded 'true' or 'false' to 10 questions concerning response to provocation. The entire BDHI was judged to take too long to complete given the circumstances. Happiness was measured using the question 'on a scale of one to ten how happy are you at the moment?' This approach to estimating happiness is established (e.g. Moore, 2006) and is regarded as a valid measure generally (Diener, 2000).

### *Procedure*

The study was approved by the local Medical and Dental Research Ethics Committee, Cardiff University.

Participants were asked whether they would be willing to participate in a study of rugby football supporters' attitudes and told that if they agreed their responses would be anonymous and that they were at liberty not to answer particular questions.

Questionnaires were administered to consenting sports fans attending major rugby union football matches, played in national competitions (Powergen Cup, Celtic League and Six Nations Championship). South Wales Police were briefed on the study to ensure surveyors' safety and officers patrolled the environment of the Stadium complex in which surveyors were working. Since the majority of violent incidents involve exclusively males (e.g. Maguire and Nettleton, 2003; Sivaraajasingam et al., 2005) surveys were limited to male fans. Interviewers read the questions to participants and noted responses. The interview took about five minutes. Once participants had answered all questions they were thanked for their time.

### *Data reduction and analysis*

Data from four groups of participants were recorded. Group 1, the before-match group, served as the baseline comparator group; the other three groups were defined by match outcome: win, lose or draw. Data from the last three groups were compared with the baseline group (see Table 1 for descriptive statistics). Missing data were dealt with by list-wise deletion, resulting in 197 cases in the final analyses.

The hypotheses were tested using two statistical models. The first specified participants' BDHI assault subscale score as the dependent variable, with match outcome and other measures as the independent variables. The BDHI assault score was treated as an ordinal variable and the model specified was a maximum likelihood ordinal logit. The second model specified the decision to drink as a binary dependent variable with match outcome and the other measures as the independent variables; the decision to drink was treated as a binary variable.

Table 1: Survey description and descriptive statistics

Section	Description	Pre-match group		Win		Lose		Draw	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	Age in years	42.26	15.02	41.24	16.38	33.70	14.87	36.96	13.90
Company	Who the respondent was with: <sup>a</sup>								
	Own	0.11		0.29		0.04		0.06	
	Family	0.53		0.35		0.35		0.45	
Team	Friends	0.49		0.35		0.65		0.60	
	The team supported <sup>b</sup>								
Aggression	None	0.02		0.00		0.00		0.00	
	Level of aggression (see text)	3.68	2.14	4.17	1.98	3.91	2.25	4.60	2.47
Happiness	Current happiness, rated on an ordinal scale of 1 to 10, where 10 was described as 'the happiest you have ever felt'	7.59	1.37	7.47	2.00	6.70	2.08	5.11	2.63
	Whether they intend to drink alcohol after the game <sup>c</sup>	0.63		0.53		0.74		0.80	
Where	Where they intend to drink alcohol after the game								
	Cardiff city centre <sup>c</sup>	0.72		0.67		0.82		0.73	
Quantity	Cardiff but not the city centre <sup>c</sup>	0.07		0.00		0.00		0.00	
	Local to usual place of residence <sup>c</sup>	0.11		0.33		0.06		0.11	
	Other <sup>c</sup>	0.01		0.00		0.00		0.016	
	Don't know <sup>c</sup>	0.08		0.00		0.12		0.00	
	How much alcohol in units they intend to drink, in standard units of alcohol (i.e. half a pint of beer/lager, a standard glass of wine, a single shot of spirits)	5.50	5.34	4.71	5.16	5.26	4.60	7.84	5.32
	n		111	17		23		46	

Notes: <sup>a</sup>Fans could be with both friends and family. <sup>b</sup>Fans supporting all eight teams were sampled (summary statistics not shown for brevity); two respondents stated that they were impartial. <sup>c</sup>Proportions are reported for these binary variables.

## Results

Table 1 shows the characteristics of the four groups.

Table 2 sets out the results from the ordered logistic regression, with the BDHI assault subscale as the independent variable. Supporters whose team won or drew rated themselves as feeling significantly more aggressive than did supporters in the pre-match group. No significant difference in such aggression between pre-match and losing supporters was noted. There was an independent, non-linear relationship between age and aggression, with older participants more likely to rate themselves as feeling aggressive than younger participants. There was also an independent relationship between self-rated aggression and intention to consume more alcohol.

Table 3 sets out the results from the binary logistic regression with decision to drink as the dependent variable. Being in the drawn match group had a modest effect on the decision to drink compared with being in the pre-match group. Supporters with family or on their own were less likely to state an intention to drink than supporters with friends.

Happiness levels did not vary significantly with aggression (Spearman's  $\rho = 0.08$ ), but compared with the pre-match group (mean = 7.59, SD = 1.37) the winners' group (mean = 7.47, SD = 2.00) showed no change in happiness levels ( $t < 1$ ) whereas the drawing (mean = 5.10, SD = 2.63) or losing groups (mean = 6.70, SD = 2.08) were less happy ( $t > 2.00$  and  $p < 0.05$  for both). Intention to drink did not vary with happiness (Spearman's  $\rho = 0.002$ ).

Table 2: Ordered logistic regression with the BDHI assault subscale score as the dependent variable

Aggression	Coefficient	$z$	95% confidence interval	
Age	-0.13	-2.90**	-0.22	-0.04
Age <sup>2</sup>	0.001	2.56*	0.00	0.00
Win	0.42	2.63**	0.12	0.73
Lose	0.01	-0.03	-0.58	0.59
Draw	0.64	2.76**	0.19	1.10
No. of intended drinks	0.08	2.41*	0.12	0.15
Companions: With family	0.06	0.33	-0.28	0.40
On own	0.27	1.27	-0.15	0.69
$n$	197			
Log pseudo-likelihood	-415.39			

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ .

Table 3: Binary logistic regression with the intention to drink alcohol following the match as the dependent variable

Decision to drink	Coefficient	<i>z</i>	95% confidence interval	
Age	-0.05	-0.72	-0.18	0.08
Age <sup>2</sup>	0.00	-0.02	0.00	0.00
Win	-0.47	-0.80	-1.62	0.68
Lose	0.12	0.20	-1.05	1.30
Draw	1.11	2.00*	0.02	2.21
Companions: With family	-1.04	-2.70**	-1.80	-0.29
On own	-0.99	-1.70	-2.13	0.15
Happiness	0.15	1.47	-0.49	0.34
<i>n</i>	197			
Log pseudo-likelihood	-102.93			

Note: \* $p < 0.05$ ; \*\* $p < 0.01$ .

## Discussion

These results suggest that aggression increases in fans whose team wins or draws but that the motivation to drink alcohol is unchanged by match result. Although this study is restricted in several ways, discussed below, these results, together with those of Sivarajasingam et al. (2005), offer insights into what factors may promote post-match violence. The management of sports-related aggression and violence should take account of these. In particular, this study suggests that winning promotes aggression and that aggression, not celebration, drives post-match alcohol consumption, an observation which is consistent with psychological models of aggression.

Researchers have found that people who disregard the future and are motivated by immediate rewards (Rahman et al., 2001) are both more aggressive (Manuck et al., 1998) and consume more alcohol (Murphy et al., 2005) relative to controls. Perhaps supporters of winning or drawing teams experience such a disregard for the future; if so, aggression and planned alcohol consumption may not be causally associated but linked by the same underlying cognitive process (see also McMurrin, 2003). If this assumption is confirmed in sports fans, it will have implications for the management of crowd aggression. If crowd members are aggressive and predisposed to consume alcohol in relatively large quantities then ameliorating these behaviours through the threat of later punishment or future poor health will have little effect. Policy should be adjusted to include more immediate measures, such as rapid deployment of police and other law enforcement personnel to fans of winning teams in particular, and perhaps fixed penalty

notices for those who do not respond to direction to disperse and away from sources of alcohol.

With regard to changes in happiness, of interest is the finding that a match result could only decrease it, in the event of losing. Winning did not apparently result in increased happiness compared with pre-match levels. One interpretation of these findings is that spectators' expectation is that their team will win, so a win meets expectations and therefore does not increase happiness further, whereas losing is unexpected and reduces happiness. This also raises an important point that should be considered in future work. Levels of aggression may not be simply associated with winning or losing but rather with outcome relative to expected match outcome. For example, fans' unhappiness may be greater if they expect their team to win but it loses. Conversely, fans' aggression may be greater if they expect to lose but win. Complex interaction effects may impact on the outcome variable of interest (see also Day et al., 2006); for example affect may interact with personality and a predisposition for alcohol to produce heightened levels of aggression. Future studies should be carefully designed so that a sufficient number of participants is available to test these interactions.

This study provides evidence that no single factor explains aggression among fans after sporting events, but that several factors interact. Future research should attempt to take account of the various limitations in this work. The same men were not interviewed before and after a match – in this study, the focus of interest was fans of winning and losing teams and not a longitudinal study. These findings suggest that this is the next important step. It is likely that some financial reward would have to be offered to participants to secure their continued participation in such studies, and the means of doing that and the ethical implications, given the imminent propensity for alcohol consumption, would have to be considered carefully. Then, too, there is the question of generalizability of the results of this exploratory study. Future studies should seek a larger sample size, consider both male and female fans, measure levels of intoxication pre- and post-match, and study fans of other sports.

Our study did not take account of potential sampling biases. Surveys of aggressive and/or intoxicated people are prone to self-selection; for example, surveyors may avoid more aggressive or drunk-looking people. Similarly, sober or antisocial people may not wish to participate. Such sampling biases can seriously distort inferences and should be taken into account (e.g. Heckman, 1979; Perham et al., 2007). Doing so, however, increases research costs, through requiring additional information collection, and necessitates assessment of inter-rater reliability. The study employed a between-subject design through assessing the effect of match outcome by comparing post-match groups defined by the match outcome with a baseline group drawn from pre-match spectators across all matches. A further limitation is that our results were based on self-ratings and statement of intent. Future studies should measure actual violence, alcohol consumption and intoxication, and relate these to earlier intent. Similarly, scores from the BDHI employed

in this study may not correlate well with actual violence – feelings and intentions may not always be translated into action.

Despite these limitations, however, this study does provide potentially important insights into the relationship between alcohol consumption, match outcome and violence. First, it has identified several methodological issues to be addressed in future studies and, second, provides a theoretical basis for future studies. Third, evidence for links between winning matches and violence and between aggression and drinking behaviour has been found.

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