

## **The impact of alcohol sales on perceptions of security amongst Brazilian football fans**

### **Abstract**

In 2003, the *Estatuto de Defesa do Torcedor* (Fans' Bill of Rights Act) was introduced in an effort to curb fan violence, resulting in the prohibition of alcohol sales in Brazilian sports stadiums. This study uses Santos FC as a case study to explore football fans' perceptions of the link between alcohol and violence, and investigate how introducing alcohol sales may potentially impact future attendance. Exploratory Factor Analysis and Ordinal Logistic Regression Models based on an online survey (n=562) are used to identify factors influencing Santos fans' decisions about whether to attend football matches where alcohol is sold. The main driver for a change in attendance is the perception of the link between alcohol consumption and violence. This relationship is mitigated by individual fans' attitudes to alcohol and their likelihood of avoiding matches if violence increases.

**Key words:** Violence, alcohol, legislation, policy, sport, Brazil, Exploratory Factor Analysis, Ordinal Logistic Regression.

## Introduction

The consumption of alcohol is often central to experiences of leisure in a variety of contexts (Carr 2008; Sagolsem 2023). However, although alcohol consumption is often ingrained in everyday life and is strongly associated with gatherings, festivals and celebrations (Sagolsem 2023), there is also a body of research that examines alcohol consumption as a factor in violence (for example Graham and Wells 2003; Valentine et al. 2008; Lightowlers, Elliott and Tranmer 2014). This is unsurprising given the longstanding perception that alcohol and violence are linked – Measey (1973) suggests that this has been observed for centuries –, and in the broad context of leisure this has led to the regulation of alcohol consumption through policy interventions based both on “moral arguments”, and on practical concerns regarding event regulation (Kramer and Wittmann 2023).

Alcohol is often a crucial element of the entertainment package at live sporting events (Gee, Jackson and Sam 2016) but in the particular context of football fandom, alcohol consumption has become associated with violence and disorder (Giulianotti 1995; Weed 2006; Millward 2009; Pearson and Sale 2011). Political authorities and governing bodies in sport have often seen restrictive legislation around alcohol consumption as a tool to solve wider issues of fan violence (Pearson and Sale 2011) and this is certainly true in the geographical location for our research: Brazil. In 2003, the Brazilian government introduced the *Estatuto de Defesa do Torcedor (Fans’ Bill of Rights Act)*. This law prevented carrying “objects, drinks or prohibited substances susceptible to generate acts of violence” (*Estatuto do Torcedor - Lei 10671/03*). The rules of competitions organised by the CBF were adjusted to include a clause prohibiting event organisers from selling alcoholic drinks inside football venues.

The act was introduced because in Brazil, the late 20th century saw a significant increase in violence and crowd disorder, not only in stadiums but pre and post-match (dos Reis and Lopes, 2016). Football became the hook around which organised fans clashed on a regular basis (Vieira and Siqueira, 2008), with the murder of a Mancha Verde leader and the “battle of Pacaembu” prompting action (dos Reis and Lopes, 2016). In the early 90s, the main organized fanclubs from the top football teams in the city of São Paulo grew to four times their official fanbase: Mancha-Verde (Palmeiras biggest fanclub) raised from 4,000 to 18,000 members; Independente (biggest São Paulo FC fanclub) went from 7,000 to 28,000 club members and Gaviões da Fiel (biggest Corinthians fanclub) went from 12,000 to 46.000 club members (Lopes 2013). However, instead of being recognized for the support they gave to their team,

these fanclubs were in the spotlight for the violence in and outside the stadiums (Lopes 2013). It appears fair to suggest that some of the attraction of these fan groups was not football, but football-related violence. In 1995, a match between Palmeiras and São Paulo at Pacaembu Stadium drew attention nationwide for violence among both fanclubs. Before the end of the game, fans from each team invaded the pitch and started a fight using rocks, sticks and concrete pieces from the stands. This event, known as the “Battle of Pacaembu” resulted in the death of one fan and hundreds of injuries and was televised live on a national broadcaster (Buarque de Holanda 2024).

There is a wider issue of violence in Brazilian football: a survey of 8,112 Brazilian football fans suggested that the main reason people do not attend games at the stadium is the lack of security (Stochos Sports and Entertainment Institute, 2015). Almost half of the survey participants (43%) blame the violent atmosphere of football stadiums throughout the country. Rocha and Fleury (2017) researched reasons for the low attendance levels in the Brazilian National Football Championship, finding that supporters rate safety as one of the most significant factors behind decisions not to attend matches in stadiums.

Brazil is not the only context in which alcohol consumption has been subject to prohibitive legislation. The work we discuss here is timely given wider debates around alcohol consumption at sport events. The continuing globalisation of sport and the integration of new cultures as part of the processes of globalisation has brought the relationships we examine into question. This was highlighted on a global scale by the decision to prohibit the sale of alcohol at the 2022 Qatar football World Cup, just two days before the tournament began (BBC Sport 2022).

The Qatari decision is in contrast to previous hosts of mega-events, who have typically altered domestic legalisation, often under pressure from event owners and corporate sponsors, a phenomenon termed “legal seizure” by Müller (2017). This was the case in Brazil, both for the 2014 FIFA World Cup and 2016 Olympic Games. The *Estatuto de Defesa do Torcedor* initially lasted until Brazil hosted these events. Two years before the World Cup, then President Dilma Rousseff overrode domestic legislation to allow alcohol sales within stadia (MercoPress, 2012). A similar approach was taken by the International Olympic Committee (IOC) to allow alcohol sales during the 2016 Rio Olympics (Gornall, 2014; Ferraz, 2016). The decision to overturn the ban on alcohol sales was termed the “Budweiser Bill”, as this particular corporation are a long term sponsor of the World Cup (MercoPress, 2012). Several states in

Brazil then used the World Cup and Olympic Games precedent to pass local laws. In the months following the 2016 Olympic Games, seven states legalised alcohol sales at sports events, while another two soon followed. In 2017 this was reversed again by some states (including São Paulo which we focus upon here), meaning that clubs have had to adapt rapidly to changes in policy regarding alcohol consumption.

The geographical context for this article is the city of Santos, home to Santos FC, a football club playing in the top level of Brazilian competition. As the article will examine, the city of Santos and its football club experienced a longstanding ban on alcohol consumption, which was reversed for the 2014 World Cup. The ban was then reintroduced a year after the tournament. In 2015, Santos City Council passed a law allowing alcohol commercialisation in sports events (ESPN, 2015). However, one year later, members of the public prosecution reported this situation to the Ministry of Justice, who declared that the city council was not permitted to regulate alcohol commercialisation above the São Paulo state law and the Act upon which we focus (Thadeu and De Vico, 2017). Santos FC was the only major sports organisation in the state of São Paulo that experienced the legalisation of alcohol sales in the stadiums for a determined period. Furthermore, following the restatement of the law, Santos FC was one of four São Paulo-based football clubs to pressure the state governor, João Doria Júnior, to abolish the law on alcohol sale in sports events (Máquina do Esporte, 2019). Given the changes in legislation that Santos has experienced, the city and its club are an apt choice for a study into the impacts of the ban on alcohol consumption, and also the impacts of the brief reversal of that ban.

The decisions made in Brazil bear resemblance to policy in Europe. From 2006-2018, UEFA did not permit the sale of alcohol at Champions League and Europa League matches, as part of Article 36 of its stadium and security regulations (RTE 2018). While the change of legislation impacted nations where fans can drink alcohol in stadiums, it had less impact on nations where alcohol consumption is regulated, such as the United Kingdom (UK). Following a decade of hooliganism within English football, the UK government passed *The Sporting Events (Control of Alcohol) Act 1985*, which forbade drunken entry into a football ground, and prevented fans from drinking alcohol within sight of the football pitch. This is a notable forerunner to the *Estatuto de Defesa do Torcedor* and it seems reasonable to argue that across a number of national contexts, alcohol and violence are considered by policymakers to have a strong relationship.

Our overall research objective is to explore perceptions of the links between alcohol and violence amongst fans of Santos FC, and how these perceptions might influence attendance at games if alcohol was on sale. In particular, the aim was to explore the following research questions:

RQ1: How does the sale of alcohol in stadia influence attendance?

RQ2: What are the perceived links between alcohol being on sale in stadia and violence?

RQ3: How is attendance influenced by perceptions of violence in stadia?

RQ4: How is attendance also influenced by overall attitudes to alcohol and other factors, including demographics of fans of Santos FC?

We utilise empirical data from an online survey of Santos FC fans ( $n = 623$ ) to gain answers to this question. The work also investigates the potential impact of introducing alcohol sales on future attendance at football matches. Exploratory Factor Analysis and Ordinal Logistic Regression models are used to examine the data. Ours is one of the first studies to examine the impact of the ban on alcohol consumption in the context of Brazilian sport, and also one of the first to examine the perception of Brazilian fans regarding alcohol consumption.

### **Alcohol consumption and football-related violence**

Existing research on the relationship between alcohol and violence at sport events, analysed in a wide-ranging review carried out by Ostrowsky (2018), reveals a mixed picture. Ostrowsky (2018) finds that while there may be a link, we cannot assume that alcohol consumption automatically leads to violence. Critical studies into alcohol consumption and fan culture specifically related to football often show nuanced results. Pearson and Sale (2011) note that alcohol consumption may lower inhibitions and result in violence, but a causal link is not established. At the height of violence within English football, Dunning, Murphy and Williams (1986) wrote that football hooliganism is widely accepted as a cause of violence among football fans, yet pointed out that not all fans who drink engage in violence, and not all hooligans are drunk.

One of the landmark studies in the area is Giulianotti's (1995) extensive description of the activities of fans of the Scotland national team. Giulianotti (1995) describes in detail the significance of, and consequences of, alcohol consumption within what he describes as the "carnival" of their support. The "carnival" performed by Scotland fans was perhaps best

defined by the word “excess”, and as Giulianotti (1995: 215) argues, “by definition, fan carnival harbours the potentialities of socially and politically disruptive activity”. However, Scotland fans did not become violent during this tournament.

Giulianotti’s (1995) work has influenced later examinations of fan culture, and particularly analyses of violence at football matches and fan events. In his analysis of the degeneration of what had been intended to be a “fan party” into a riot (involving supporters of Rangers), Millward (2009: 393) notes that many involved had been drinking heavily, and suggests that “it is likely that intoxication played a major part in the downturn of the day’s events”. However, Millward (2009) indicates that alcohol consumption was just one of several relevant factors that contributed to the violence he observed, and is critical of the way the event was organised and policed.

Outside of a European context, barra fan culture involves extreme behaviour, including violence and drunkenness. Varela’s (2014) ethnographic study finds that alcohol consumption and violence are vital aspects of the barra fan culture but agrees with Menéndez and Di Pardo (1998) that alcohol is an instrument for violence rather than the cause. This aligns with research within Brazil, where Romera and dos Reis (2009) identify that football fans have high levels of alcohol consumption but argue that alcohol itself does not cause violence. Issues with violence arise from broader societal issues within urban Brazilian communities, such as “spatial segregation, unequal access to urban facilities, [and] the split between public and private” access to basic resources (Raspaud and da Cunha Bastos, 2013, p. 195). A survey directed to younger members of organised fan clubs found that alcohol was the least important indicator of the reasons for violent acts in football stadiums (dos Reis and Lopes, 2016). Rival teams, social issues, lack of education and external factors, such as the relationship between fans and the police, were considered more critical issues than the influence of alcohol consumption (dos Reis and Lopes, 2016).

The research in Brazil aligns to research outside the context of football carried out by Graham and Wells (2003), which suggests that although there are identifiable links between violence and alcohol, other factors such as group loyalty motivate violent behaviour amongst young males. We note that most research on football-related violence focuses on men and masculinities (for example Spaij 2008; Cleland and Cashmore 2016) and there are some male football fans who do engage in violence. However, as Cleland and Cashmore (2016) argue, most male supporters **do not engage in violence, nor use it to express their masculinity**. Given

that Schwery and Cade (2009) and Berendt and Urich (2018) identify sporting rivalries (which involve strong group loyalties) as a critical factor in fan violence, there is a link between this research and research that suggests that fan rivalries are a more significant issue than alcohol consumption.

Other codes of football also face issues with alcohol consumption. In the context of Australian Rules Football, Thompson, Palmer and Raven (2011) developed a typology of fans based on their levels and patterns of alcohol consumption. The authors identified “drinkers”, “non-drinkers” and “deferrers” – this latter group are people who do drink alcohol but drank little to none while attending live matches. The typology developed by Thompson, Palmer and Raven (2011) owes something to an earlier, well-known typology of football fan behaviour developed by Giulianotti (2002). In terms of defining fan behaviour at its broadest level, there is a certain value to developing typologies as an initial phase of analysis. However, there are reasonable criticisms of this approach too - perhaps most notable are those of Crawford (2003). To be clear, we do not attempt a typology of alcohol consumption here and broadly agree with Crawford’s contention that the approach can be somewhat restrictive. This is not least the case because the social problem of hooliganism can also exist where alcohol sales are unlikely to be a significant factor. Kabiri et al. (2021) examine hooliganism in the context of Iran and therefore alcohol plays no significant role in their data collection. The same is true of Shadmanfaat et al.’s (2019) work on hooliganism, which also focuses on Iran. It is useful to note that violence and aggressive behaviour at sport events can occur in contexts that are free of alcohol sales.

The efficacy of legislation prohibiting alcohol sales in stadiums is also open to question, as discussed in the 2021 Fan-Led Review of Football Governance in the UK. Pearson and Sale’s (2011) study found that limiting alcohol consumption during a match had the adverse effect of increasing pre-match drinking. Based on 15 years of observations and interviews with stakeholders, including fans and the police, Pearson and Sale (2011) conclude that measures taken to control the consumption of alcohol did not appear to achieve their aims, as the overall intoxication of fans was not reduced. This was reinforced by the 2021 Fan Led Review into Football Governance which notes that restrictions within the stadium can lead to fans “loading up” before kick-off (DCMS, 2021), and so recommended a review of the legislation and the trialling of alcohol sales at lower league football. Martin et al.’s (2022) study of attitudes towards relaxing alcohol regulations within the UK suggested that most stakeholders believed that the current legislation should be reviewed. However, it seems probable that a factor behind

restrictive legislation is the concern of sport event managers about the impact of alcohol on matchday behaviour. A 2009 Turnkey Sports Poll found that managers view alcohol-related incidents as the biggest threat to sports event attendance (Muret, 2009). Related to this, Wakefield and Wann (2006) put forward nine managerial tools to manage the matchday environment, with three of these recommendations related explicitly to limiting alcohol consumption.

It seems clear that for sport event managers as well as policymakers, alcohol consumption is a safety concern. A study carried out by Filce, Hall and Phillips (2016) focuses on reducing the risks of fan intoxication, noting that beyond violence, failure to correctly manage consumption has previously led to sports and event managers facing legal challenges from injured fans. Given the increasing commercial pressures, sports clubs and organisations must balance the risks of selling alcohol to fans with the need to secure revenues. However, thus far, the evidence that limiting alcohol sales would adversely affect ticket or concessions sales is inconclusive (Chastain, Gohmann and Stephenson, 2017; Chupp, Stephenson and Taylor, 2007).

Brazilian football clubs should be mindful that measures put in place to attract one group of fans may actively dissuade attendance from current fans, especially in a context where alcohol consumption in stadia has not become normalised (Purves et al., 2022). As well as the implications for domestic policy, this article is particularly pertinent for managers of sports clubs for whom the decision as to whether to sell alcohol is out of their hands. The sale of alcohol within sports stadia may actively alienate groups of fans who wish to avoid alcohol, particularly in countries where football hooliganism is rife. Therefore, decision-makers within sports clubs need to understand all potential consequences of selling alcohol within their stadiums.

## **Methodology**

In order to explore fan attitudes towards alcohol and violence in football stadia, an online survey was distributed to viewers and attendees of FC Santos games. Ethical permission was granted by X University.<sup>1</sup> The survey questions were loosely based on research by Gee, Jackson and Sam (2016), who examined fan perception of alcohol as part of the atmosphere of sports events. Gee, Jackson and Sam (2016) looked for insights from fans who attended the

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<sup>1</sup> Permission was given by the Ethics Committee of X University's Faculty of Business, Law and Social Sciences. The associated number is P89356. Each participant gave informed consent after reading a statement on the purpose of the research and ticking a box to indicate their consent. All participants were given full opportunity to withdraw their data in line with legislation in the nation where X University is located.



Wellington Sevens, a rugby event, to explore their attitudes towards alcohol and sport, and drinking cultures at sport events (Gee, Jackson and Sam, 2016, p. 271). Of the 18 questions in the study, nine asked the participants to identify, on a five-point Likert scale (strongly agree; agree; neither agree nor disagree; disagree; strongly disagree), their level of agreement on a range of statements regarding alcohol as part of the atmosphere of sport; reasons for attending football matches; alcohol consumption in the stadiums; alcohol sales and the contribution of this to violence; and the relationship between violence and attendance levels in Brazilian football. To provide a context for their answers, respondents were also asked questions regarding their own alcohol consumption, the number of Santos FC matches watched during the previous season, and whether these matches were watched in the stadium, live on TV or live in a public place. Given the context of this case, the survey was written in Portuguese.

The survey was initially distributed through Facebook, Instagram, Twitter, WhatsApp and LinkedIn, and subsequently via the Santos FC marketing team, organised fan clubs and local journalists who promoted the survey. The survey was completed by 623 respondents, of whom 562 (90.2%) identify as Santos FC fans. Since the focus of this work is on Santos fans, we present the results only for these 562 respondents. While this sample has a bias towards male respondents (89.7%), this is consistent with the work of Mazzei et al. (2020), who suggested that women represent 10 to 15% of organised supporters in Brazil. Therefore, we are happy that the gender distribution in our sample is likely to be representative of the wider population of fans of Santos FC. In addition, the median age range of 26-35 years is also consistent with Mazzei et al. (2020), who found the mean age amongst Brazilian football fans to be 32.8 years.

The characteristics of the respondents can be seen in Table 1.

<b>Table 1: Respondent Characteristics</b>	
<b>Characteristic</b>	<b>n (%)</b>
Gender*	
Male	503 (89.7)
Female	58 (10.3)
Overall	561
Age (yrs.)	
18-25	177 (31.5)
26-35	178 (31.7)
36-45	109 (19.4)
46-55	45 (8.0)
56-65	48 (8.5)
66+	5 (0.9)
Overall	562

*\*1 participant declined to respond*

## Results

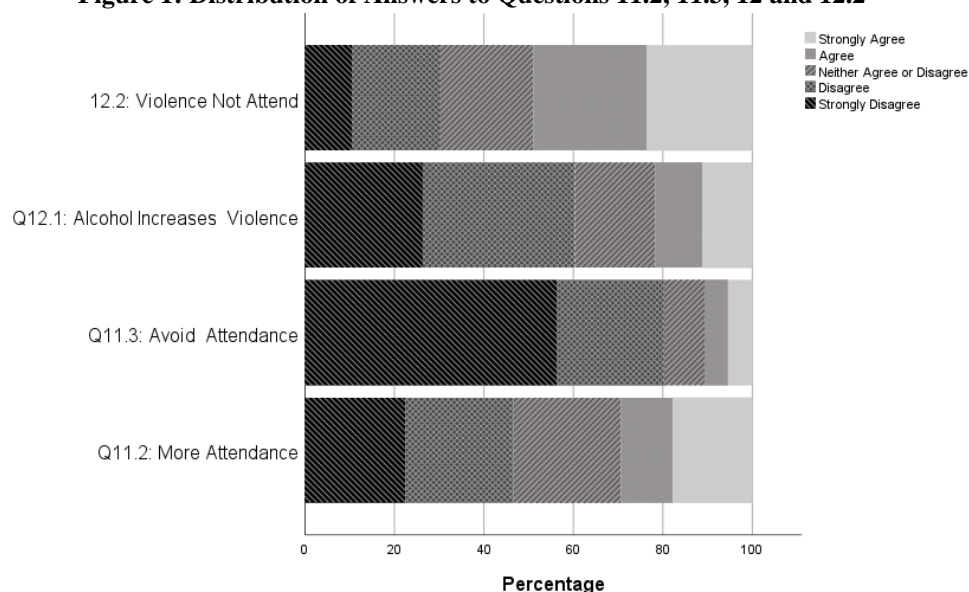
Participants were asked to state their level of agreement with the following four statements, all of which make reference to links between alcohol, violence and attendance:

- Q11.2: “If there was alcohol on sale at the stadium, I would attend more games”;
- Q11.3: “If there was alcohol on sale at the stadium, I would avoid attending games”;
- Q12.1: “I think alcohol on sale at the stadium would lead to increased violence among fans”;
- Q12.2: “If the violence increases in the stadium, I would not attend football games”.

For ease of exposition, in what follows, we refer to these four statements respectively as follows: **More Attendance** (Q11.2), **Avoid Attendance** (Q11.3), **Alcohol Increases Violence** (Q12.1) and **Violence Not Attend** (Q12.2). The distributions of agreement with each of these four statements are summarised in Figure 1.

<Insert Figure 1 here>

**Figure 1: Distribution of Answers to Questions 11.2, 11.3, 12 and 12.2**



In relation to RQ1, a descriptive analysis of the findings suggests that views were very mixed in relation to **More Attendance**, with 28.9% agreeing that alcohol on sale at the stadium would mean they would attend more games. However, the vast majority disagreed with **Avoid Attendance**, with only 10.9% agreeing they would avoid attending games with alcohol on sale at the stadium. These results suggest that the sale of alcohol could result in a net increase in

attendees. Turning next to RQ2 and the links between alcohol and violence, most respondents also disagreed that Alcohol Increases Violence, with just 22.3% sharing the view that alcohol on sale at the stadium would increase violence among fans. In relation to RQ3, there was also a slight majority agreeing with **Violence Not Attend**, where 56.3% said that if violence increases in the stadium, they will not attend football games. Hence, whilst this suggests violence in stadia would lead to lower attendance, only a minority believe that alcohol on sale in stadia would lead to more violence.

In order to address RQ4, we needed to determine a potential measure of attitudes to alcohol along with other potential explanatory variables. Participants answered six questions relating to their alcohol consumption and overall attitudes towards alcohol. These are Q8.1, Q9.1, Q9.2, Q10.1, Q10.4 and Q11.1 and are shown in the second column of Table 2 along with the possible responses to each question. The response to each question was coded 1 to 5 (or 0 to 4 in the case of Q9.1 and Q9.2) to reflect the ordered categorical (ordinal) nature of the data. Therefore, a higher score in each of these refers to either greater consumption or a more positive attitude to alcohol. In order to measure the extent to which individual participants engaged with watching Santos matches, a further eight questions were asked relating to their consumption of Santos matches (Q5.1, Q5.2, Q6.1, Q6.2, Q7.1, Q7.2, coded 0 to 4, along with Q10.2 and Q10.3 coded 1-5 in Table 2). In order to address RQ4, we therefore used these 14 questions that we have outlined - which relate to alcohol consumption and to consumption of Santos FC matches, whether in person or in other locations - to test whether a model could be developed which would be able to predict responses to the four statements outlined at the start of this section.

One issue with such model development is that many of the predictors are ordinal (ordered categorical) responses and so cannot necessarily be treated as continuous predictor variables. If treated as categorical predictor variables, these 14 variables could potentially require a very large number ( $48=14 \times 4$ ) of parameter estimates in such a model. In addition, many of these predictor variables are also by design deliberately correlated, as they measure different aspects of alcohol consumption/perception or consumption of Santos matches. Spearman correlations were used since the data are ordinal. Amongst the six questions relating to alcohol consumption (Q8.1, Q9.1, Q9.2, Q10.1, Q10.4 and Q 11.1) the correlations ranged from 0.40 to 0.72 and all were statistically significant ( $p<0.001$ ). For the remaining questions (Q5.1, Q5.2, Q6.1, Q6.2, Q7.1, Q7.2, Q10.2 and Q10.3) there were some large statistically significant correlations up to 0.85 between Q6.1 and Q6.2, ( $p<0.001$ ), but as you would expect some small and non-

significant correlations, for example 0.017 between Q6.2 and Q7.2 ( $p=0.68$ ). The full table of correlations is not included for brevity.

An exploratory factor analysis (see for example Field, 2024) of all 14 questions was therefore undertaken, in order to examine if these did indeed provide reliable measures of alcohol consumption/perception and consumption of Santos matches. This approach also reduces the potential number of predictors in the model to facilitate a more parsimonious approach. The results suggested that these 14 questions can be reduced to five different factors that explain 76% of the information in the data. Table 2 lists the questions asked and the resulting factor loadings and highlights those questions mostly associated with each of the five factors (labelled as PC1 to PC5) suggested by the factor analysis. For example, the results show that the first factor (PC1) is made up from a combination (e.g. mean) of the responses to the six questions related to attitudes to alcohol. In contrast the factor analysis suggested that Q5.1 and Q5.2 measure something similar to each other (i.e. attendance at games in the stadium), whilst Q6.1 and Q6.2 measure a different aspect of consumption of games (i.e. games watched in a public place), and Q7.1 and Q7.2 measure consumption of games on TV. Finally, Q10.2 and Q10.3 were found to measure something else (consumption of games for the atmosphere or sport). We refer to these five factors or new variables as *Attitude to Alcohol*, *Attended*, *Watched Public*, *Watched TV* and *Atmosphere*, respectively. The method of principal components with Varimax rotation was used, and all model assessments supported this being a good model for these factors. Alternative methods of rotation were examined, but all gave the same conclusions. For *Attitude to Alcohol*, a Cronbach's alpha value of 0.87 was also obtained, providing further support for combining those six questions into one factor.

<Insert Table 2 here>

**Table 2: Factor Loadings (showing cumulative variance explained)**

<b>Proposed Factor Name</b>	<b>Question</b>	<b>PC1 (32%)</b>	<b>PC2 (46%)</b>	<b>PC3 (58%)</b>	<b>PC4 (68%)</b>	<b>PC5 (76%)</b>
<i>Attended</i>	5.1. How many State Championship Santos FC games have you attended at the stadium last season? (0, 1-4, 5-9, 10-14, 14+)				0.92	
	5.2. How many Brazilian Championship Santos FC games have you attended at the stadium last season? (0, 1-4, 5-9, 10-14, 14+)				0.93	
<i>Watched Public</i>	6.1. How many State Championship Santos FC games have you watched in a public place (e.g. pub, bar, restaurant)? (0, 1-4, 5-9, 10-14, 14+)		0.93			
	6.2. How many Brazilian Championship Santos FC games have you watched in a public place? (0, 1-4, 5-9, 10-14, 14+)		0.91			
<i>Watched TV</i>	7.1. How many State Championship Santos FC games have you watched live on TV last season? (0, 1-4, 5-9, 10-14, 14+)			0.95		
	7.2. How many Brazilian Championship Santos FC games have you watched live on TV last season? (0, 1-4, 5-9, 10-14, 14+)			0.95		
<i>Attitude to Alcohol</i>	8.1. How often do you consume alcohol? (Never, Once a month, Once a week, Several times a week, Every day)	0.80				
	9.1. How many alcoholic drinks do you consume watching Santos FC game on TV? (0, 1-2, 3-5, 6-8, 9+)	0.71				
	9.2. How many alcoholic drinks do you consume watching Santos FC games in a public place? (0, 1-2, 3-5, 6-8, 9+)	0.77				
	10.1. "I think drinking alcohol is part of the football atmosphere" (Strongly disagree, Disagree, Neither agree or disagree, Agree, Strongly agree)	0.72				
	10.4. "The atmosphere of football events makes me feel like drinking alcohol" (Strongly disagree, Disagree, Neither agree or disagree, Agree, Strongly agree)	0.71				
	11.1. "If there was alcohol on sale at the stadium, I would definitely drink" (Strongly disagree, Disagree, Neither agree or disagree, Agree, Strongly agree)	0.88				
<i>Atmosphere</i>	10.2. "I attend football matches because of the atmosphere"					0.67
	10.3. "I attend football matches because of the sport"					0.74

Individual responses were combined for each group of questions to give simple mean scores. This approach, rather than utilising the factor scores from the Factor Analysis, was chosen as it provides a more straightforward interpretation of the results. The fact that the loadings on each factor in Table 2 are similar supported this decision. Summary statistics for the new variables can be seen in Table 3.

<Insert Table 3 here>

**Table 3: Summary Statistics**

<b>Variable</b>	<b>Mean</b>	<b>sd</b>	<b>(Min, Max)</b>
<i>Attitude to Alcohol</i>	2.60	0.925	(0.6, 4.4)
<i>Attended</i>	1.29	0.983	(0.0, 4.0)
<i>Watched Public</i>	1.24	1.078	(0.0, 4.0)
<i>Watched TV</i>	2.78	1.162	(0.0, 4.0)
<i>Atmosphere</i>	4.32	0.673	(2.0, 5.0)

We now turn to further explore our research objectives, which are the fan perception of the links between alcohol and violence (RQ2) and how this might impact future attendance should alcohol sales be reintroduced (RQ1, RQ3 and RQ4). First, intention to attend is measured through the questions **More Attendance** (Q11.2) and **Avoid Attendance** (Q11.3). For simplicity and to allow for a more robust estimation of the model, these variables are redefined where a score of 1 is used for strongly disagree or disagree, 2 for neither agree or disagree, and 3 for strongly agree or agree. These are then both treated as ordinal responses and modelled using ordinal logistic regression models. A model is required in order to explore the combined associations of a number of different predictor variables with our outcomes (Q11.2 and Q11.3). An ordinal logistic regression modelling approach was used since the outcomes are ordinal (rather than continuous where more common standard linear regression models could be used). Technical details of the model used are not shown for brevity but can be found in Authors (2022). Next, fan perceptions of the links between alcohol and violence are treated as explanatory variables and are measured in terms of the answers to **Alcohol Increases Violence** (Q12) and **Violence Not Attend** (Q12.2). However, it should be noted that when included as explanatory variables, these are both treated as scale variables (scored as 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree and 5= strongly agree). Although the data for these two explanatory factors are inherently ordinal, they are treated as scale variables for two reasons. Firstly, their impact on both **More Attendance** and **Avoid Attendance** was broadly linear when either *Alcohol Increases Violence* and *Violence Not Attend* moved from one ordinal category to the next (i.e. from a score of 1 to 2, 2 to 3, etc.). Secondly, this approach facilitates more robust parameter estimation and a more straightforward interpretation of the results. Finally, attitudes to alcohol are based on the *Attitude to Alcohol* scores already discussed and are treated as a scale explanatory variable throughout.

### ***Would Alcohol Sales Encourage More Attendance?***

With **More Attendance** as the ordinal response, three different models were developed, each with just one of the three explanatory variables; MA1-a, which includes *Alcohol Increases Violence*, MA1-b utilises *Violence Not Attend*, and MA1-c uses *Attitudes to Alcohol*. As can be seen in Table 4, Attitudes to Alcohol is the single most crucial factor, with MA1-c having a Nagelkerke  $R^2$  value of 0.43, the largest amongst the three initial models. Taken with a statistically significant p-value ( $<0.001$ ), this suggests that attitudes to alcohol significantly impact whether a fan will attend more matches should alcohol be sold. The positive estimate

of 1.80 suggests that fans with a more positive attitude to alcohol may see alcohol as a reason to attend more matches at the stadium.

<Insert Table 4 here>

**Table 4: Models for More Attendance as the ordinal response**

Model	Explanatory Variable						Nagelkerke R <sup>2</sup>
	<i>Alcohol Increases Violence</i>		<i>Violence Not Attend</i>		<i>Attitudes to Alcohol</i>		
	Estimate (sd)	p	Estimate (sd)	p	Estimate (sd)	p	
MA1-a	-0.45 (0.07)	<0.001					0.09
MA1-b			-0.23 (0.06)	<0.001			0.03
MA1-c					1.80 (0.14)	<0.001	0.43
MA2-a	-0.07 (0.08)	0.37			1.76 (0.14)	<0.001	0.43
MA2-b			0.05 (0.07)	0.50	1.82 (0.14)	<0.001	0.43

Whilst both *Alcohol Increases Violence* and *Violence Not Attend* are statistically significant, the Nagelkerke R<sup>2</sup> values in both cases are extremely small (0.09 and 0.03). Further, when we account for Attitudes to Alcohol within the model (MA2-a and MA2-b), neither are statistically significant. This finding suggests that violence, or a belief that alcohol increases violence, does not factor into decision-making when attending more matches if alcohol is sold. Rather, the underlying attitude to alcohol is the dominant driving factor.

Finally, the explanatory variables detailed in Table 2 were added to explore whether any of these might explain why fans might attend more if alcohol was on sale. As seen in Table 5, the decision as to whether to attend games depending on alcohol sales is influenced by the reasons fans watch sports in the first place. The positive parameter estimate for *Atmosphere* of 0.50 suggests that those who watch football for either the sport or the atmosphere are more likely to attend if alcohol is on sale (p=0.001). There is no evidence that any other factors play a role in this decision, including gender (p=0.28) and age (p=0.19). It is perhaps worth highlighting that the positive parameter estimate of 0.37 associated with Gender (Males), would be consistent with conclusion that, after accounting for overall attitudes to alcohol, male spectators are more likely to attend if alcohol is on sale. This suggests that given two spectators, one male and one female, both with the same attitude to alcohol, the male spectator is more likely to be influenced to attend if alcohol was on sale. However, as stated above, there was insufficient evidence this gender difference truly exists (p=0.28).

<Insert Table 5 here>

**Table 5: Model MA3 (Nagelkerke R<sup>2</sup> = 0.45)**

Explanatory Variable	Estimate (sd)	p
<i>Attitude to Alcohol</i>	1.68 (0.14)	<0.001
<i>Attended</i>	-0.12 (0.10)	0.23
<i>Watch TV</i>	0.11 (0.08)	0.18
<i>Watch Public</i>	0.12(0.09)	0.21
<i>Atmosphere</i>	0.50 ((0.15)	0.001
<i>Gender (Males)</i>	0.37 (0.34)	0.28
<i>Age (18-35)</i>	-0.26 (0.19)	0.19

### ***Would Alcohol Sales Discourage Attendance?***

As well as considering whether alcohol sales may encourage fans to attend, it is also worth exploring whether it may act as a deterrent. The first three rows of Table 6 consider each of the same three initial explanatory variables in turn considered earlier, but in terms of their association with **Avoid Attendance** as the ordinal response. Each is statistically significant, and the positive estimate (1,68) for *Alcohol Increases Violence* (AA1-a) indicates that an increased perception that alcohol leads to violence increases the likelihood of fans choosing not to attend if alcohol was on sale. Similarly, the positive estimate (1.20) for *Violence Not Attend* (AA1-b) suggests that fans with a greater predisposition not to attend if there is violence may also not attend if alcohol is on sale. Finally, the negative estimate (-1.05) for *Attitudes to Alcohol* (AA1-c) suggests that those with positive attitudes to alcohol are unlikely to be discouraged from attending by alcohol sales. All of these are intuitively sensible outcomes, but it is worth highlighting that the most important factor is *Alcohol Increases Violence* (AA1-a), with a Nagelkerke R<sup>2</sup> value of 0.53. This finding suggests that one of the most important factors influencing whether people elect not to attend if alcohol is on sale is whether they perceive the sale of alcohol as leading to increased violence.

<Insert Table 6 here>

**Table 6: Models for Avoid Attendance as the ordinal response**

Model	Explanatory Variable						Nagelkerke R <sup>2</sup>
	<i>Alcohol Increases Violence</i>		<i>Violence Not Attend</i>		<i>Attitudes to Alcohol</i>		
	Estimate (sd)	p	Estimate (sd)	p	Estimate (sd)	p	
AA1-a	1.68 (0.13)	<0.001					0.53
AA1-b			1.20 (0.13)	<0.001			0.28
AA1-c					-1.05 (0.13)	<0.001	0.17
AA2-a	1.46 (0.14)	<0.001	0.61 (0.15)	<0.001			0.56
AA2-b	1.60 (0.14)	<0.001			-0.37 (0.15)	0.014	0.54



However, when combining *Alcohol Increases Violence* with either *Violence Not Attend* or *Attitudes to Alcohol* (AA2-a and AA2-b), *Violence Not Attend* and *Attitudes to Alcohol* both have an additional impact on not attending if alcohol was on sale ( $p < 0.001$  and increased  $R^2$  with both additional explanatory variables). These results also indicate that the original estimated effect of *Alcohol Increases Violence* (AA1-a) is not changed much by inclusion of either of the two additional explanatory variables, with the estimated effects for *Alcohol Increases Violence* reducing from 1.68 (AA1-a) to 1.46 (AA2-a) and 1.60 (AA2-b).

It is also of note that, in Table 6, the size of the estimates for *Violence Not Attend* and *Attitudes to Alcohol* are much reduced from 1.20 (AA1-b) and -1.05 (AA1-c) to 0.61 (AA2-a) and -0.37 (AA2-b). This reduction in the parameter estimates suggests that *Violence Not Attend* and *Attitudes to Alcohol* both potentially have a direct effect on Avoid Attendance, but also an indirect effect, mediated through *Alcohol Increases Violence*. These mediation effects are indeed confirmed by models AV1 and AV2 in Table 7, where *Alcohol Increases Violence* is taken to be an ordinal response in an ordinal logistic regression model with either *Violence Not Attend* or *Attitudes to Alcohol* as the single explanatory variable. Mediation is evidenced in both cases as these relationships are significant ( $p < 0.001$ ,  $R^2 = 0.22$  and  $0.24$  respectively).

<Insert Table 7 here>

<b>Table 7: Models with Alcohol Increases Violence taken to be the (ordinal) response</b>				
<b>Model</b>	<b>Explanatory Variable</b>	<b>Estimate (sd)</b>	<b>p</b>	<b>Nagelkerke <math>R^2</math></b>
AV1	<i>Attitudes to Alcohol</i>	-1.05 (0.11)	<0.001	0.22
AV2	<i>Violence Not Attend</i>	0.85 (0.08)	<0.001	0.24

These findings suggest that the perception as to whether alcohol leads to violence is the key driver when deciding not to attend matches if alcohol is on sale. While there is a direct link between these views, the effect is also, in part, driven indirectly by underlying attitudes to alcohol. The models and the estimated parameter estimates suggest that those with a more positive attitude to alcohol are less likely to believe that alcohol leads to violence (Model AV1, estimate = -1.05) and hence would be less likely to avoid attending if alcohol was on sale. Similarly, those more likely to not attend if there was violence are also more likely to believe that alcohol leads to violence (Model AV2, estimate = +0.85) and hence would be more likely to avoid attending if alcohol was on sale.

Finally, we consider whether any remaining explanatory variables in Table 2 provide further insight into fans not attending if alcohol is on sale. The results in Table 8 suggest that the

propensity to avoid attending if alcohol is on sale is not influenced by any other factors, including gender ( $p=0.92$ ) and age ( $p=0.66$ ). Hence in this case it is quite clear that gender plays no further part in influencing a person's likelihood of avoiding attending if alcohol is on sale, once we take account of their attitudes to alcohol and their perceptions of whether alcohol leads to violence. Hence in this case it is quite clear that gender plays no further part in influencing a person's likelihood of avoiding attending if alcohol is on sale, once we take account of their attitudes to alcohol and their perceptions of whether alcohol leads to violence. Both attitudes to alcohol and perceptions of alcohol leading to violence differ by gender, confirmed using an independent samples t-test to compare attitudes to alcohol by gender,  $t(559)=3.51$ ,  $p<0.001$ , and Mann-Whitney test (due to the ordinal nature of the response in this case) to compare perceptions of alcohol leading to violence,  $z=-6.29$ ,  $p>0.001$ . This suggests that it is both attitudes to alcohol and perceptions of whether alcohol leads to violence that actually account for any gender influence on the likelihood of attending if alcohol is on sale.

The very high value of Nagelkerke  $R^2$  (0.58) suggests that the model is good at explaining what might be behind a person's decision to avoid attending if alcohol was on sale. In addition, a test of the assumption of parallel lines (assumed in the model) revealed no evidence to doubt this assumption ( $p=0.32$ ).

<Insert Table 8 here>

**Table 8: Model AA3 with Avoid Attendance as the ordinal response (Nagelkerke  $R^2 = 0.58$ )**

<b>Explanatory Variable</b>	<b>Estimate (sd)</b>	<b>p</b>
<i>Alcohol Increases Violence</i>	1.40 (0.15)	<0.001
<i>Violence Not Attend</i>	0.55 (0.16)	<0.001
<i>Attitude to Alcohol</i>	-0.43 (0.17)	0.013
<i>Attended</i>	0.05 (0.16)	0.74
<i>Watch TV</i>	-0.13 (0.13)	0.29
<i>Watch Public</i>	0.27 (0.15)	0.064
<i>Atmosphere</i>	-0.20 (0.21)	0.36
<i>Gender (Males)</i>	0.04 (0.40)	0.92
<i>Age (18-35)</i>	-0.14 (0.31)	0.66

## Discussion

The results are summarised in Figure 2 and provide a visual representation of the two models developed in the previous section; namely model MA3 for attending more if alcohol was on sale (model on the left) and model AA3 for avoiding attending if alcohol was on sale (model on the right). The predictors shown in Figure 2 are those that were shown empirically in the

previous section to be statistically significant. Fans have different motivations for attending. Fans who attend for the atmosphere have a positive attitude to alcohol and may increase their attendance should alcohol sales be introduced. Broadly speaking, these fans are “drinkers” (Thompson, Palmer and Raven 2011). Conversely, the sale of alcohol may discourage those who would not attend if violence increased and those with negative attitudes to alcohol. This latter group of “non-drinkers” (Thompson, Raven and Palmer 2011) are less likely to attend if and when bans on alcohol consumption are lifted. While both attitudes to violence and alcohol directly affect the decision not to attend (solid lines), it is important to note that both are also mediated by whether they believe increased alcohol leads to violence (dotted lines).

<Insert Figure 2 here>

**Figure 2: Impact of Alcohol Sales on Attendance**



These findings ultimately present a mixed picture. This is in line with the broader trend in the topic area identified by Ostrowsky (2018). Our data suggest that a reversal of the ban on alcohol sales at Brazilian stadia would potentially increase attendance levels amongst those fans who displayed positive attitudes towards alcohol consumption, and another group of fans for whom stadium atmosphere is an essential factor in attendance. In addition, the findings suggest that alcohol sales at the stadium may encourage the group of fans who currently watch matches on television to attend the match in person. However, the marginal p-value for this finding suggests we cannot draw a firm conclusion for this. Therefore, a reversal of the ban may lead to increased attendance amongst certain fan groups; essentially, these are fans who drink alcohol and/or do not have a negative attitude to alcohol consumption.

However, any gains in attendance and associated revenue may need to be mitigated against another group of fans for whom alcohol sales would discourage attendance. This risk is particularly the case for those fans who believe alcohol can lead to violent disorder. Although some (mostly younger) fans in Brazil identify factors other than alcohol consumption as significant contributors to violent disorder (see for example the work of dos Reis and Lopes 2016), our data suggests that there are fans who do believe that alcohol consumption is a significant factor in violence. This is unsurprising given that links between violence and alcohol are frequently observed and frequently examined (Measey 1973; Graham and Wells 2003; Valentine et al. 2008; Lightowlers, Elliott and Tranmer 2014). A reversal of the ban on alcohol sales would be likely to decrease attendance levels amongst these fans. The potentially “socially disruptive” consequences of alcohol consumption discussed in Giulianotti’s (1995) and Millward’s (2009) work do not attract these fans; rather, they would actively seek to avoid an atmosphere where alcohol is a factor. This finding was the same regardless of respondents’ age or gender. Both Spaiij (2008) and Cleland and Cashmore (2016) link masculinity to football-related violence. Our findings suggest that both male and female fans who seek to avoid violence at football matches would stop attending live fixtures if alcohol were on sale. The perception that alcohol increases violence remains important, although a definitive link in the context of football fandom remains unproven (Menéndez and Di Pardo, 1998; Nepomuceno et al., 2017; Romera and dos Reis, 2009).

Additionally, we found that fans who already watch matches in public spaces would not be inclined to attend matches more regularly if the ban on alcohol sales were to be reversed. This finding aligns with research suggesting that fans do not necessarily have to attend a football match itself to say they were “there” (Bason, 2022; Dixon, 2014). Instead, the pub has become somewhere to watch football in its own right, replacing the stadium as a “space” for football fandom (Dixon, 2014; Weed, 2006, 2007). It is possible that the fans currently watching matches within public spaces actively prefer this experience rather than watching in the stadium. Nevertheless, this complex finding requires more investigation, potentially in further research involving this specific group. We can tentatively suggest though that the lack of specific legislation preventing alcohol consumption outside of the context of stadiums is significant, although it is important to also stress, as per Dixon (2014), that not all fans who watch matches in public spaces such as bars or pubs have any interest in “carnavalesque” excess.

It is important to note that, as Pearson and Sale (2011) and the Fan Led Review (DCMS, 2021) discuss, fan culture has altered from drinking alcohol at matches to loading up before matches start. The perceived problem of alcohol consumption has not gone away, but patterns of behaviour have shifted. The Brazilian Act we are examining has been in place for nearly twenty years. Sports fans are notoriously rooted in their traditions and rituals (Foster and Hyatt, 2008; Grant, Heere and Dickson 2011; Webber and Turner 2023), and any behavioural shift may not occur quickly. As such, this may further impact expected increases in attendance and associated revenue. The question of whether the reversal of existing restrictions will benefit football clubs is an unclear one and requires further investigation.

## **Implications**

Football fandom involves organised fan groups which inspire extreme loyalty, and this type of loyalty has been discussed as a factor in violence in contexts related to football (Dos Reis and Lopes 2016) and not related to football (Graham and Wells 2003). While there are number of factors in football-related violence, alcohol consumption is the principal focus of legislators in the context of Brazil, arguably because this is the easiest factor on which to build legislation. Our findings underscore the deep-seated concern among one group of fans regarding the link between alcohol consumption and violence at football matches. The perception that alcohol leads to violence is a long-established belief among fans, influencing their decisions to abstain from attending matches where alcohol sales are permitted. Fans who perceive a link between alcohol consumption and violence clearly indicated that alcohol sales at stadia would result in their non-attendance at live matches. One potential route is for sports clubs to reassure fans that alcohol sales would not lead to increased violence. However, should such a campaign fail, and fans still believe that alcohol leads to violence, they are likely to stop attending games.

Our findings highlight the potential trade-off between revenue generation and attendance levels associated with deregulating alcohol sales at sports events. While there may be opportunities for increased revenue through alcohol sales, there is a risk of decreased ticket sales due to fan concerns about safety. There is, therefore, a careful balance between increasing revenue through alcohol sales and a potential reduction in ticket sales. As policies regarding alcohol sales evolve, individual clubs must carefully consider the implications of deregulation on a micro level. Decisions regarding alcohol sales should align with the specific needs and concerns of fans and prioritise safety alongside revenue generation. In addition, the entrenched nature of fan behaviour, such as 'pre-loading' before matches, presents a significant challenge

for clubs seeking to increase revenue through alcohol sales. Efforts to shift fan behaviour may require innovative strategies and long-term planning. Our data suggest that fans who currently watch football in public spaces are unlikely to be enticed into the stadium by the potential to purchase alcohol. If this is also the case for fans who, for the last two decades, may have spent their time pre- and post-match in pubs, this will limit the financial gains for the clubs. Matchday alcohol sales may not be a panacea for clubs seeking increased revenues.

Ensuring fan safety should be paramount, with potential marginal increases in revenue from alcohol sales being a secondary consideration. Clubs must take proactive measures to create a safe and secure environment for all attendees and ensure that the stadium is a place where fans feel safe. Martin et al. (2022) suggest that deregulated alcohol sales could enhance safety by encouraging fans to arrive early and avoiding potential crushes as fans leave pubs for kick-off. However, this could have the opposite effect when considering *perceptions* of safety, as alcohol-averse fans may be further alienated if pre-match drinking in the stadium is actively encouraged. It may be prudent for sports clubs to provide “alcohol-free” zones at stadia to reassure fans who believe alcohol and violence are linked.

## **Conclusions and recommendations for future research**

We are aware that any research carries limitations, particularly research reliant on self-reported attitudes towards alcohol. As such the data might be influenced by social desirability bias or recall bias, potentially affecting the validity of the findings. Further, the paper is rooted within the context of Brazilian football, a country that has experienced challenges in terms of fan behaviour, and indeed has a culture that is unlike other countries. Therefore, while we believe that our research has utility both inside and outside of this context, we acknowledge that further research may be needed before the findings can conclusively be extrapolated further. For example, it could be valuable to repeat the research in contexts where there have historically been fewer incidents of violence to see if fan perceptions are the same concerning the link between alcohol and violent behaviour. There could also be value in examining fan attitudes to the use of drugs other than alcohol, including illegal substances. While use of drugs such as cocaine and marijuana is less prevalent than use of alcohol by Brazilian fans (Rodrigues and Sarriera, 2015), Ayres and Treadwell (2012) find that both cocaine and alcohol contribute to the rituals of those who partake in football firm violence. Substance abuse is not just a concern in Brazil; cocaine was identified as a contributor to violence at the Euro 2021 final held at Wembley Stadium (The Baroness Casey of Blackstock, 2021). While drug-taking, by its

nature, is likely to be less visible than alcohol consumption, further research into the links between attendance, violence and illegal substances seems prudent.

A conclusion made by the Fan Led Review (DCMS, 2021) is that changing regulations to allow increased alcohol sales in stadia may positively impact loading up in the form of binge drinking. However, the extent to which fans would elect to change their pre-match rituals is unclear and may lead to fans continuing to drink to excess pre-game, and then drinking more during the match. Should the policy we examine here be changed, research into the long-term impacts of this, and the extent to which fans are prepared to change behaviours that have become embedded over the last two decades should be considered. This would be important to ascertain whether there are positive benefits for clubs, fans, and policymakers.

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