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# Underage adolescents' reactions to adverts for beer and spirit brands and associations with higher risk drinking and susceptibility to drink: a cross-sectional study in the UK

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## **Abstract**

### **Aims**

In the UK, adolescents under the minimum legal purchasing age (<18 years) are aware of a variety of alcohol marketing activities. It is therefore important to examine how such marketing appeals and how it might shape consumption. This study assessed the relationships between positive reactions to alcohol adverts and susceptibility to drink among never drinkers and higher-risk drinking among current drinkers.

### **Methods**

Online cross-sectional survey of 11-17 year olds (n=2,582) in the UK. Adolescents were shown three video alcohol adverts (Fosters Radler/Haig Club Clubman/Smirnoff). Reactions to each were measured by eight scale-items (e.g. 1=Makes [Brand] seem unappealing to 5=Makes [Brand] seem appealing), which were combined into a composite score (coded: positive versus other). Logistic regressions assessed associations between overall positive advert reactions and drinking behaviours.

### **Results**

Half of adolescents had overall positive reactions to the Smirnoff (52%) and Fosters (53%) adverts, and a third (34%) had a positive reaction to the Haig Club advert. Across all three adverts, positive reactions were associated with approximately 1.5 times increased odds of being susceptible to drink among never drinkers. Among current drinkers, positive reactions to the Foster's Radler and Haig Club adverts were associated with around 1.4 times increased odds of being a higher-risk drinker.

### **Conclusions**

These alcohol advertisements commonly appealed to underage adolescents, and these reactions were associated with susceptibility among never-drinkers and higher-risk consumption among current drinkers. Regulatory consideration should be given to what messages are permitted in alcohol advertising, including international alternatives (e.g. only factual information).

## **Short summary**

This cross-sectional study builds on earlier work which established underage adolescents are aware of various alcohol marketing activities. Between a third and half of underage UK adolescents reacted positively to the alcohol adverts studied. Positive reactions were associated with increased susceptibility among never drinkers and higher-risk drinking among current drinkers.

## Background

Europe is the heaviest drinking region in the world and alcohol use is associated with over 200 medical conditions, including a dose-response relationship with seven types of cancer (World Health Organization, 2018). Over the past 10-15 years there has been a decline in adolescent alcohol consumption in many countries as well as an increased prevalence of abstaining from alcohol (Pennay *et al.*, 2018). This trend has been seen in England, although considerable levels of increasing risk drinking and alcohol-related harm remain: for example the 2018 Smoking Drinking and Drug Use survey found 9% of 11-15 year old schoolchildren reported being drunk in the last four weeks and, among those who drank in the past week, 21% were estimated to have drunk 15+ units, which exceeds the weekly lower risk guidelines for adults (NHS Digital, 2019).

Systematic reviews of longitudinal studies have concluded adolescents' exposure to alcohol marketing is associated with subsequent alcohol use (Smith and Foxcroft, 2009; Jernigan *et al.*, 2017), and a recent review of reviews against the Bradford Hill criteria for causality concluded this is a causal association (Sargent and Babor, 2020). In this review, multiple reviews were identified under the 'biological plausibility' criterion, which explain the psychological processes by which alcohol marketing influences alcohol consumption, and neurobiological bases for these, in the context of adolescent development (Sargent and Babor, 2020). A recent study pooling data from 277,000 adolescents in 84 countries (from the Global School-Based Health Survey and the European School Survey Project on Alcohol and Drugs) also identified more restrictive marketing policies were inversely associated with lifetime drinking status (Noel, 2019).

Regulations on alcohol marketing aim to limit the reach and appeal of marketing to children and young people. In the United Kingdom (UK), this is through a complaints-led system of self-regulation by the alcohol and the advertising industries as well as co-regulation with The Office of Communications (Ofcom). The Advertising Standards Authority, funded by a levy on the advertising industry, has self-regulatory codes which apply to broadcast (e.g. television, overseen by Ofcom) and non-broadcast (e.g. print) marketing. These codes state – among other stipulations– that alcohol marketing must not be likely to appeal particularly to people under 18 years, must not be targeted to people under 18 years through the selection of media in which it appears, and must not feature people drinking seeming to be under the age of 25 years or behaving in an “adolescent, juvenile or loutish way” (Advertising Standards Authority, 2014a, 2014b). For product naming, packaging and promotion, the Portman Group's (funded by the alcohol industry) code of practice states products must not have particular appeal to under-18s (the minimum legal purchase age) or show people who look under 25 drinking alcohol (Portman Group, 2019).

Complaints-led self-regulation of alcohol marketing has been criticised for failing to protect young people. International systematic reviews have identified frequent violations of content guidelines (Noel, Babor, and Robaina, 2017), and conflicts of interest and procedural weaknesses in studies of complaints and compliance (Noel and Babor, 2017), with the latter findings mirrored in UK-specific research (Alcohol Concern and Alcohol Research UK, 2018). In the UK, for example, over 80% of 11-19 year olds recalled seeing at least one form of alcohol marketing in the past month (Critchlow *et al.*, 2019c). Digital media is a growing channel for alcohol marketing but there are documented flaws in age verification on websites and social

media, resulting in young people's exposure to alcohol content (Nicholls, 2012; Barry *et al.*, 2020). Paid-for advertising on social media through use of 'influencers', individuals' participation in marketing on social media (e.g. through likes, comments, shares), and online targeting of advertisements all present further challenges to regulating marketing in digital media. In response to these limitations, the World Health Organization (WHO) recommends bans or comprehensive restrictions on alcohol advertising across multiple types of media (World Health Organization, 2017).

One of the alcohol industry's arguments is that the primary aim of marketing is to promote brand switching among existing consumers rather than attracting new drinkers (Maani Hessari *et al.*, 2019). This, however, is at odds with US studies which have shown alcohol marketing reaches and appeals to those who are underage (Siegel *et al.*, 2016; Padon *et al.*, 2018). Much of the UK evidence around the appeal of alcohol marketing comes from qualitative research with young people (Atkinson *et al.*, 2017; Eadie *et al.*, 2018; Purves, Stead, and Eadie, 2018) which, albeit valuable, is not designed to be generalisable. There is little empirical evidence which has quantified how UK adolescents react to alcohol advertising, whether there are differences by demography, and to what extent (if at all) reactions are associated with drinking behaviours. A better understanding of underage adolescents' reactions to alcohol adverts, and their associations with alcohol use, will provide evidence as to whether alternative approaches to protect young people are preferable to the existing complaints-led self-regulation system.

The aim of this study is to assess the relationships between reactions to alcohol adverts and susceptibility to drink among never-drinkers and, higher risk drinking among current drinkers.

## **Methods**

### **Design**

The Youth Alcohol Policy Survey (YAPS) was an online cross-sectional survey conducted with 11-19 year olds in April and May 2017 (n=3,339). The survey was hosted by YouGov, a market research company, who recruited a sample designed to be representative of the UK population from their existing panel. Participants aged 16 years or over were approached directly to participate, while those aged under 16 years were approached through existing adult panel members known to have children. A survey weight was provided for each respondent (based on age, gender, ethnicity, region and deprivation decile) to enable descriptive results to be representative of the UK population. Further details on survey design and recruitment have been reported previously (Critchlow *et al.*, 2019c, 2019b). For the present study, we restricted the analysis to 2,582 11-17 year olds (under the legal minimum purchase age for alcohol in the UK).

### **Alcohol adverts**

Participants were shown three television alcohol adverts. These were chosen to represent a variety of well-known alcohol brands from major producers, varied by product type (beer and spirits), and with different advert content and stylistic themes. Choice of product was also informed by prior qualitative focus group research conducted with the target population (Morey *et al.*, 2017). The adverts selected were from the 'Good Call' campaign for Fosters Radler (a type of lager flavoured with lemon juice (2% ABV)), the 'Make Your Own Rules'

campaign for Haig Club Clubman whisky (40% ABV) featuring David Beckham, and the 'We're Open' campaign for Smirnoff vodka (37.5% ABV). These adverts have not been ruled to breach any of the existing marketing codes in the UK. Detailed descriptions, still images and links to the adverts are available in Table 1.

## Measures

### *Demography*

Demographic information was available from YouGov's information about panel participants and supplemented with survey questions. Demographic variables included age, gender, ethnicity (recoded as white British and other), resident country (England, Scotland, Wales, Northern Ireland), and area deprivation quintile (measured through the Index of Multiple Deprivation, a quantitative measure of local area deprivation based on elements such as income, crime and education).

### *Alcohol use*

Participants were asked 'Have you ever had a whole alcohol drink? Not just a sip'. Participants who answered 'No' were classified as never drinkers and those who answered 'Yes' were classified as ever drinkers.

For the never drinkers, participants were asked 'Do you think you will drink alcohol at any time during the next year?' (1 = *Definitely No* to 4 = *Definitely Yes*; or *Not Sure*). As in previous studies (Critchlow *et al.*, 2019a, 2019c), never-drinkers were defined as 'non-susceptible' if they answered '*Definitely No*', and defined as 'susceptible' if they gave any other answer.

Ever drinkers were asked their age of first drink. Alcohol consumption was measured using the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) (Babor *et al.*, 2001), a three-item scale measuring a) frequency of alcohol consumption, b) number of units of alcohol (1 UK unit = 10ml/8g pure ethanol) drunk on a typical occasion and c) frequency of heavy episodic drinking (>8/6 UK units.). Participants who answered anything other than 'Never' to the first item completed items two and three and were classified as current drinkers. The AUDIT-C score (range 0-12) was calculated and this had acceptable internal consistency ( $\alpha=0.79$ ). A cut-off score of  $\geq 5$  was used for higher risk drinking, in line with previous studies and national guidance (Research in Practice, 2015; Public Health England, 2017; Critchlow *et al.*, 2019a, 2019c, 2019b).

### *Reactions to the adverts*

Immediately after each advert, participants were asked to confirm if they were able to watch the content (*Yes/No*). Participants who had successfully watched the advert were asked to rate a series of statements (e.g. temptation to try) (see footnote to results Table 3 for more detail). These questions were developed from focus groups with young people (Eadie *et al.*, 2018), and adapted from previous studies in tobacco control (Ford *et al.*, 2013). For each domain, a five-point Likert scale of 1 (positive) to 5 (negative) was used (e.g. 1 = *I like this advert* to 5 = *I dislike this advert*). These were then reverse coded for analysis purposes (in this study, higher scores reflect more positive reactions). For each advert, the overall reaction across the eight domains was summarised in an overall score (range 8-40), this had high internal consistency in each case (Fosters  $\alpha=0.896$ , Haig  $\alpha=0.911$ , Smirnoff  $\alpha=0.892$ ). Scores below the mid-point (<24) were coded as '*Negative or Neutral Reaction*' and scores above the

mid-point (25+) were coded '*Positive Reaction*', an approach which reflected the Likert scale descriptors and is consistent with previous studies (Ford *et al.*, 2013).

### *Covariates*

As well as demographic and alcohol use variables, factors associated with adolescent alcohol use and social norms were included in the model as covariates. These included the participant's perceptions that a) their parents and b) their peers ('*most people your age*') would think it is acceptable that they drank alcohol (both binary variables: unacceptable or neutral versus acceptable). This was based on evidence that parental and peer attitudes towards alcohol use are associated with drinking in adolescence (NHS Digital, 2019).

### **Ethics**

Ethical approval was obtained from the University of Stirling General Ethics Panel (GUEP59).

### **Analysis**

The analysis plan was pre-registered on the Open Science Framework (<https://osf.io/s5ktz/>).

Frequencies examined sample characteristics. Reactions to the alcohol adverts across the eight items were compared across adverts using Wilcoxon signed rank tests for paired data, Bonferroni corrected for multiple pairwise comparisons. Weighted bivariate analysis was conducted using Pearson's chi-squared tests to investigate positive reactions (overall score of 25+) to the alcohol adverts by socio-demographic characteristics and alcohol use, including susceptibility to drink and higher risk drinking. Descriptive data were weighted to be representative of the demographic profile of the UK.

Logistic regression models examined the association between having positive reactions to the alcohol adverts and the binary outcomes of (a) susceptibility to drink among never-drinkers and (b) higher risk drinking among current drinkers. Separate models were run for each advert as these were selected to reflect different alcohol products and content. These models controlled for the potential influence of demographic and alcohol-related factors identified in previous research as associated with adolescent alcohol use, including: parental and peer approval of drinking alcohol, gender, age, ethnicity and deprivation. In the regression models, unweighted data were used because variables used to construct the weights were included as covariates in the models. Data were analysed using SPSS version 26.

## **Results**

### **Sample characteristics**

The weighted sample comprised 2,582 adolescents aged 11-17 (49% female), the majority of whom were White British ethnicity (77%) (Table 2). Participants were recruited from all four UK nations and the majority lived in England (83%). Regarding alcohol use, 60% of participants had never drunk alcohol and 40% had ever drunk alcohol (Table 2). Among ever drinkers, the mean age of first drink was 13.5 years of age (SD 2.1 years). Among current drinkers (n=909), one-third were classed as higher risk drinkers (AUDIT-C  $\geq 5$ ).

[Table 2 about here]

### **Ratings of the three alcohol adverts**

In Table 3 reactions to each of the alcohol adverts are compared based on responses to a five-point Likert scale across eight domains (higher scores indicated more positive reactions). After accounting for a Bonferonni corrections for multiple comparisons, reactions to Fosters Radler were significantly more positive than Haig Club Clubman across every domain measured. Reactions to Smirnoff were also significantly more positive than for Haig Club Clubman across every domain measured. The comparison between Fosters Radler and Smirnoff was more mixed, with Fosters Radler having higher scores on temptation to try, product appeal, advert fun, and perceived product fun, but the Smirnoff advert had higher scores on perceived product healthiness and appeal to age group.

[Table 3 about here]

### **Overall reactions to the adverts**

Overall, 53% adolescents had a positive reaction to the Fosters Radler advert, 52% to the Smirnoff advert, and 34% to the Haig Club Clubman advert.

For all three adverts, positive reactions were more prevalent among 14-17 year olds than 11-13 year olds ( $P<0.001$ ) (Table 4). The Fosters Radler advert was more popular among males than females ( $P<0.001$ ), but the Smirnoff advert was more popular among females ( $P<0.001$ ) and there was no gender difference in the proportion of adolescents who had a positive reaction to the Haig Club Clubman advert ( $P=0.867$ ). A greater proportion of adolescents identifying as White British ethnicity had a positive reaction to the Fosters Radler advert than adolescents belonging to other ethnic groups ( $P=0.002$ ), whereas a greater proportion of adolescents belonging to other ethnic groups had a positive reaction to the Haig Club Clubman advert ( $P=0.016$ ), but there was no difference in the reactions to the Smirnoff advert by ethnicity. There were no significant differences in positive reactions to any of the adverts by country or deprivation quintile.

Among the 1,520 never-drinkers, a greater proportion of those who were categorised as susceptible to drink had a positive reaction to all three alcohol adverts than those who were not susceptible ( $P<0.001$  for each advert). For each advert, the proportion of adolescents who had a positive reaction was at least 10-percentage points higher among those who were susceptible to drink than those who were non-susceptible. Among the 909 current drinkers, a greater proportion of higher risk drinkers (AUDIT-C 5+) had a positive reaction to the Fosters Radler and Haig Club Clubman adverts than lower risk drinkers ( $P=0.016$  and  $0.002$  respectively), but there was no difference in the proportion who had a positive reaction to the Smirnoff advert by higher risk drinking.

[Table 4 about here]

### **Multivariable analysis**

Among never-drinkers, logistic regression found having a positive reaction to each of the adverts was associated with around one and a half times the odds of susceptibility to drink, after adjusting for demographic and alcohol-related potential confounders (Table 5). The Fosters Radler advert was associated with 1.65 increased odds of susceptibility to drink (95% CI 1.32-2.06,  $P<0.001$ ), the Haig Club Clubman advert was associated with 1.59 times



increased odds (95% CI 1.23-2.07,  $P < 0.001$ ), and the Smirnoff advert was associated with 1.44 times increased odds (95% CI 1.15-1.80,  $P = 0.001$ ). Covariates associated with susceptibility to drink in the final model were parents thinking it is acceptable for child to drink alcohol, peers thinking it is acceptable for a child to drink alcohol, age, and ethnicity.

[Table 5 about here]

Among current drinkers, for two of the three adverts the logistic regression found having a positive reaction was associated with higher risk drinking, after adjusting for demographic and alcohol-related confounders (Table 6). Positive reactions to the Fosters Radler advert were associated with 1.46 times increased odds of higher risk drinking (95% CI 1.06-2.00,  $P = 0.021$ ) and positive reactions to the Haig Club Clubman advert were associated with 1.37 times increased odds (95% CI 1.02-1.85,  $P = 0.038$ ). Positive reactions to the Smirnoff advert were not significantly associated with higher risk drinking. Covariates associated with higher risk drinking in the final model were parents thinking it is acceptable for child to drink alcohol and age.

[Table 6 about here]

## Discussion

We found that the alcohol adverts investigated in this study appealed to between a third and a half of UK adolescents below the legal purchase age. Positive reactions were more prevalent among older adolescents than their younger counterparts, perhaps because alcohol use is a more salient topic to this age group. Other demographic variation identified by sex and ethnicity in the appeal of specific adverts could be explained speculatively, however a larger range of adverts would be needed to identify patterns. There was variation between adverts and in the ratings on the different items that were used to measure the reactions, with an overall greater proportion of adolescents having a positive reaction to two adverts with content including humour and fun (Fosters Radler and Smirnoff) than the advert with content that was more sophisticated and stylish (Haig Club Clubman).

Among the 1,520 never drinkers, positive reactions to each of the alcohol adverts was associated with susceptibility to drink among never drinkers, with around 1.5 times increased odds in each case. Among the 909 current drinkers, having a positive reaction to two of the three alcohol adverts was associated with around 1.4 times increased odds of being a higher risk drinker. These findings corroborate other research that alcohol marketing potentially influences consumption in a variety of ways, including attracting new consumers and increasing existing consumers' consumption (Maani Hessari *et al.*, 2019). It is of note that the elevated odds of susceptibility to drink among never drinkers below the legal purchase age was consistent for each advert studied and after adjusting for demographic and parental and peer influences, suggesting that alcohol marketing may play an appreciable role in initiation of drinking and that marketing does not simply maintain market share among existing drinkers.

This study provides a large-scale nationally-representative picture that adds to a body of research evidence on the appeal of alcohol marketing to underage adolescents and young

people (Siegel *et al.*, 2016; Atkinson *et al.*, 2017; Eadie *et al.*, 2018; Purves *et al.*, 2018; Padon *et al.*, 2018). These findings are mirrored in other areas of public health. For example in the obesity prevention field, adolescents have been found to react positively to adverts for high fat, salt and sugar foods and drinks (Critchlow *et al.*, 2020), and in the smoking field cigarette packaging was found to appeal to adolescents and was strongly linked to susceptibility to smoke among never smokers (Ford *et al.*, 2013).

Strengths of this study include the large sample size and that 95% of participants were able to watch the adverts. Three distinct alcohol adverts were chosen intentionally for their appeal to different audiences in different ways. Reactions to alcohol adverts were systematically and quantitatively assessed, with participants asked to rate each of the adverts on eight items relevant to their age group, capturing their reaction to the adverts on a range of dimensions (for example whether they tempted them to drink the product, or whether it made the product seem a popular choice) rather than simply whether or not they liked the advert. Recall bias regarding alcohol consumption was minimised by using a validated tool to measure risky drinking. Finally, we controlled for demographic and other factors known to be associated with alcohol use.

Limitations of this study include the cross-sectional design, meaning that the associations observed between positive reactions to the adverts and susceptibility to drink among non-drinkers or higher risk drinking among current drinkers are not temporal or causal. However there is substantial evidence from longitudinal studies that alcohol marketing is associated with future drinking among adolescents (Smith and Foxcroft, 2009; de Bruijn *et al.*, 2016; Jernigan *et al.*, 2017) and another recent study concluded this is a causal association (Sargent and Babor, 2020). This study measured reactions to adverts pre-selected by the research team in an online experimental setting rather than a naturalistic one, so we are not able to confirm the reactions to the adverts we observed would be identical based on exposure in day-to-day life. It is possible that experimenter bias exists through use of pre-selected adverts, however there was clear benefit in representing a range of alcohol products and adverts. A random selection of adverts could have been used instead, however a larger number of adverts would be needed to ensure a range of marketing was presented, increasing burden on participants and potentially reducing response rates. There is also the possibility of social desirability bias influencing the survey responses. This was minimised through the use of an anonymous online self-completion survey, however this bias cannot be ruled out, for example parents may have been present while their children responded to the survey. Such bias would likely under-estimate the appeal of adverts and levels of alcohol consumption measured in this study. The YAPS 2017 survey did not include a measure of advertising effectiveness (for example effect of the advert on beliefs, attitudes, emotion or affect), although future studies could do this. Finally, we only investigated reactions to video alcohol adverts (from television and social media), which cover some but not all channels for alcohol marketing. Increasingly alcohol marketing exposure takes place on digital and social media, and the appeal and influence of these marketing channels on alcohol use among young people is an area in which further research is necessary.

If the results of this study are typical of reactions to other marketing activities for alcohol brands in the UK, then these findings contribute to wider concerns about complaints-led self-regulatory approaches (Noel and Babor, 2017; Noel *et al.*, 2017). For example, the UK's

current industry self-regulatory codes state alcohol marketing must not particularly appeal to under 18s (Advertising Standards Authority, 2014a, 2014b). This was a study of underage adolescents, so we did not investigate whether the adverts studied potentially breached UK codes through having ‘particular appeal’ to adolescents, over and above their appeal to adults. However there is evident subjectivity in applying this code where an advert is appealing to both adults and young people under the legal purchase age. The subjective nature of criteria included in codes also makes them difficult to apply effectively in complaints-led systems. For example, in studies when young people are included in expert panels rating whether alcohol marketing violates self-regulatory codes to protect young people (or replicate the decision-making of these panels), young people are more likely than adults to rule that the codes have been violated (Noel and Babor, 2017). Ongoing (Australia) and past (UK) initiatives have aimed to bring expertise of young people into these processes (Alcohol Advertising Review Board, 2020). One solution within the current self-regulatory system would be to require including young people in the decisions about what kinds of marketing appeals to them.

Beyond the current UK system, alternatives include introducing tighter restrictions or bans on certain types of media or different marketing channels. Other countries have alcohol advertising bans in place, such as Norway (European Centre for Monitoring Alcohol Marketing, 2018a) and Lithuania (European Centre for Monitoring Alcohol Marketing, 2018b). This would be the most comprehensive way of mitigating young people’s exposure to alcohol marketing, which is important since other aspects of alcohol content exposure are very difficult to regulate. These include product placement (Barker *et al.*, 2019) and alibi marketing where features of a brand’s slogan or typeface are used in marketing in lieu of using the brand’s actual name or logo (Purves, Critchlow, and Stead, 2017). WHO recommends bans or comprehensive restrictions on alcohol advertising across multiple types of media as one of the ‘best buy’ policies for non-communicable disease prevention (World Health Organization, 2017).

In the absence of bans on marketing, controls on what types of messages are permitted could also help to limit both exposure and appeal. A high-profile example of this is the Loi Évin in France as it was originally implemented in 1991. In addition to limiting the placement of alcohol advertising to adult only media, the 1991 Loi Évin also restricted advertising to only factual information about the product and mandated a clearly displayed health message (Institute of Alcohol Studies, 2004; Gallopel-Morvan *et al.*, 2017). While this regulation is sometimes circumvented by marketers (Purves *et al.*, 2017), this approach of only permitting factual information marketing, and not the evocative or lifestyle messages shown in the advert stimuli used in this study, reduces the subjectivity in interpreting advertising codes described above. There are now also plans to implement similar restrictions on advertising content as part of the Public Health (Alcohol) Act in the Republic of Ireland (Houses of the Oireachtas, 2018).

## **Conclusions**

Using a large and nationally representative sample, this study found a substantial proportion of adolescents below the minimum legal purchasing age had positive reactions towards the alcohol adverts studied, and that positive reactions were associated with increased

susceptibility to drink among never drinkers, and higher-risk drinking among current drinkers. These adverts had not been ruled to breach any of the UK marketing codes, so the finding that they commonly appealed to underage adolescents indicates there may be weaknesses in the codes themselves, their implementation, or both. Previous research has also shown that adolescents in the UK report frequent exposure to a variety of alcohol marketing activities (Critchlow *et al.*, 2019c, 2019b). Taken together, these findings indicate the current UK alcohol marketing regulations are inadequate in protecting young people from being exposed to content that does appeal to them and influences their behaviour. Within the current complaints-led self-regulation system, there is some scope to mitigate the reach and appeal of alcohol marketing to underage adolescents. There are also opportunities for Government to regulate alcohol advertising more strongly by controlling the content and placement allowed across different channels, or by introducing bans or comprehensive restrictions as suggested by the WHO.

**Data availability**

The data that support the findings of this study belong to Cancer Research UK and are available on reasonable request permission of the Cancer Policy Research Centre.

**Funding details**

This research received no funding. NC was a paid consultant with CRUK at the time of conducting the study.

**Conflict of interest statement**

SB and KS work at the Institute of Alcohol Studies which receives funding from the Alliance House Foundation. NC is on the Board of Directors at Alcohol Focus Scotland.

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## Tables

Table 1: Detailed descriptions of the three alcohol adverts used in this study

Product name	Advert description	Still image and link to full advert
<p>Fosters Radler - a type of lager flavoured with lemon juice (2% ABV)</p>	<p>The advert depicts a sunny beach scene in Australia with a number of young adults and a Fosters-branded beach hut. It focuses on two male characters (Brad and Dan, featured in numerous Fosters advertising campaigns) playing a game of beach volleyball against two women. The advert has a humorous theme, with the two men cheating at the game to score a point against the two women, then celebrating and immediately stopping the game saying “we’ve earned some light refreshment”. Throughout the advert rock music is playing in the background (Burning Heart by Survivor, from the Rocky IV soundtrack) and the advert finishes with the slogan “#GoodCall”. Duration: 50 seconds.</p>	 <p>Still image from Fosters Radler “Good Call” advert, available at <a href="https://www.youtube.com/watch?v=eJS1slpJIns">https://www.youtube.com/watch?v=eJS1slpJIns</a></p>
<p>Haig Club Clubman whisky (40% ABV)</p>	<p>The advert begins in the Scottish countryside with a river in a valley and a voiceover says “let’s talk about the rules of whisky”. The advert cuts to a city skyline at night and then a bar, while a voiceover describes several ‘rules’ which are simultaneously broken on-screen. For example the voiceover says “they say you should drink it neat” while on-screen a group of people including David Beckham are enjoying long drinks in a bar (whisky mixed with cola), and “if you must, a single cube of ice” while on-screen an ice cube is run down the back of a woman’s neck and an ice sculpture is shattered for dramatic effect at an event. The overall theme of the advert is one of playful rebelliousness and it depicts an exclusive high-end lifestyle. Music is playing in the background (W.A.R.R.I.O.R. by Ebony Bones) throughout, and the ad ends with the slogan “Make Your Own Rules”. Duration: 60 seconds</p>	 <p>Still image from Haig Club Clubman “Make Your Own Rules” advert, available at <a href="https://www.youtube.com/watch?v=pYi246nl7-Q">https://www.youtube.com/watch?v=pYi246nl7-Q</a></p>

Smirnoff vodka  
(37.5% ABV)

The advert begins introducing the viewer to a deaf dance teacher and shows him walking around a housing estate in an urban area and preparing to teach. Dancehall music plays in the background (Watch Me Now by Busy Signal), becoming increasingly upbeat throughout the advert. The teacher leads a group in a choreographed routine which progresses into members of the group taking turns to improvise, encouraged by the rest of the group. The theme is inclusivity, with an ethnically diverse group of dancers who are deaf led by an inspiring teacher also with a disability. This theme was part of the “We’re Open” Smirnoff campaign around inclusivity (other adverts featured people who are LGBT, migrants and a DJ/model with albinism). The advert ends with the slogan “Whatever Your Beat” and the “We’re Open” slogan for the Smirnoff Experience music festival. There is also an adapted responsible drinking message: “party intelligently”. Duration: 43 seconds



Still image from Smirnoff “We’re Open” advert, available at [https://www.youtube.com/watch?v=vkrMTmy\\_-Xk](https://www.youtube.com/watch?v=vkrMTmy_-Xk)

Table 2: Socio-demographic characteristics and alcohol use among 2,582 11-17 year-olds in YAPS 2017

		Unweighted		Weighted	
		%	n	%	n
Total			2,551		2,582
Age					
	11-13 years	41%	1,058	41%	1,050
	14-17 years	59%	1,493	59%	1,532
Gender					
	Male	50%	1,273	51%	1,324
	Female	50%	1,278	49%	1,258
Ethnicity					
	White British	81%	2,048	77%	1,980
	Other	19%	477	23%	579
Country					
	England	74%	1,883	83%	2,138
	Scotland	14%	349	9%	226
	Wales	8%	214	5%	127
	Northern Ireland	4%	105	4%	92
Deprivation quintile					
	1 (most deprived)	22%	570	19%	579
	2	20%	501	20%	524
	3	22%	553	21%	530
	4	17%	421	18%	464
	5 (least deprived)	20%	505	19%	485
Drinking status					
	Never Drinker	60%	1495	60%	1520
	Ever Drinker	40%	1006	40%	1010
Current drinking status					
	Non-drinker	64%	1594	64%	1621
	Current drinker	36%	907	36%	909
Susceptibility to drink (among never drinkers)					
	Not Susceptible	47%	705	48%	724
	Susceptible	53%	790	52%	796
Age first drink (among ever-drinkers)	Mean	SD	Mean	SD	
		13.4	2.1	13.5	2.1
AUDIT-C score (among current drinkers )					
	Lower risk (0-4)	68%	613	67%	605
	Higher risk (5+)	32%	294	33%	304

Table 3: Reactions to three alcohol adverts across eight items among approx. 2,500 11-17 year olds

	Fosters Radler		Haig Club Clubman		Smirnoff		Fosters Radler vs Haig Club Clubman	Fosters Radler vs Smirnoff	Haig Club Clubman vs Smirnoff
	Mean	SD	Mean	SD	Mean	SD	p	p	p
To what extent do you like or dislike that advert?	3.34	1.289	2.75	1.261	3.42	1.256	<0.001	0.069	<0.001
Tempts me to drink the product	2.35	1.336	2.12	1.303	2.21	1.284	<0.001	<0.001	0.001
Makes the product look appealing	3.24	1.232	2.97	1.302	3.08	1.172	<0.001	<0.001	<0.001
Do you feel the advert is fun	3.67	1.281	2.78	1.309	3.63	1.241	<0.001	0.007	<0.001
Makes the product seem a healthy choice	2.85	1.110	2.53	1.037	2.94	1.065	<0.001	0.001	<0.001
Makes the product seem a popular choice	3.44	1.093	3.32	1.201	3.41	1.101	<0.001	0.220	0.001
Makes me think that drinking the product is fun	3.31	1.196	2.98	1.263	3.24	0.175	<0.001	0.002	<0.001
Would be appealing to people my age	2.93	1.299	2.40	1.302	3.05	1.314	<0.001	<0.001	<0.001

SD = standard deviation. Base = all participants, excluding those not able to watch the video (Fosters Radler n=63, Haig Club Clubman n=65, Smirnoff n=59). Where question items refer to "the product" in the table, the brand name was used in the survey. Items were presented to participants with lower scores representing positive reactions on a Likert scale, and recoded for analysis purposes to read: I like that advert (5)/ dislike (1), Tempts me to drink [Brand] (5) / Does not tempt (1), Makes [Brand] look appealing (5) / unappealing (1) [Advert] is fun (5) / boring (1), Makes [Brand] seem a healthy choice (5) / unhealthy choice (1), Makes [Brand] seem a popular choice (5) / unpopular choice (1), Makes me think that drinking [Brand] is fun (5) / boring (1), Would be appealing to people my age (5) / unappealing (1). Means and standard deviations are weighted. p value from Wilcoxon signed rank test (unweighted). Cases with missing data excluded on a test-by-test basis. Bonferroni correction applied for three pairwise comparisons, so critical P value = 0.016

Table 4: Positive reactions to the three alcohol adverts, by socio-demographics and drinking status

		Fosters Radler			Haig Club Clubman			Smirnoff		
		%	n	p	%	n	p	%	n	p
Total		53%	1,368		34%	880		52%	1,351	
Age										
	11-13 years	49%	497	<0.001	23%	237	<0.001	45%	464	<0.001
	14-17 years	58%	871		43%	643		60%	887	
Gender										
	Male	60%	776	<0.001	35%	453	0.867	50%	652	0.001
	Female	48%	593		35%	428		57%	699	
Ethnicity										
	White British	56%	1,092	0.002	34%	658	0.016	53%	1,037	0.499
	Other	49%	273		40%	219		55%	307	
Country										
	England	53%	1,108	0.090	35%	736	0.829	54%	1,120	0.168
	Scotland	59%	131		34%	75		51%	112	
	Wales	58%	72		33%	41		49%	61	
	Northern Ireland	64%	58		32%	29		63%	57	
Deprivation quintile										
	1 (most deprived)	50%	283	0.119	32%	178	0.097	50%	282	0.069
	2	57%	289		34%	173		56%	286	
	3	56%	292		37%	195		57%	299	
	4	56%	256		39%	175		54%	244	
	5 (least deprived)	53%	249		34%	160		51%	239	
Susceptibility to drink (among 1,520 never-drinkers)										
	Non-susceptible	41%	290	<0.001	20%	136	<0.001	40%	283	<0.001
	Susceptible	56%	436		31%	244		54%	417	
Higher risk drinking (AUDIT-C, among 909 current drinkers)										
	Low risk (0-4)	60%	362	0.016	45%	263	0.002	63%	374	0.146
	Higher risk (5+)	69%	202		56%	166		68%	202	

Base = all participants, excluding those not able to watch the advert. Data are weighted. Bivariate analysis from Pearson's chi-squared test. Positive reaction = scored 25 or more across the eight reaction items (scores ranged from 8-40, with 24 as the mid-point/cut-off for positive reaction).

Table 5: Odds of being susceptible to drink alcohol among never drinkers, from multivariable logistic regression

		Fosters Radler					Haig Club Clubman					Smirnoff				
		n	AOR	lower 95% CI	upper 95% CI	p	n	AOR	lower 95% CI	upper 95% CI	p	n	AOR	lower 95% CI	upper 95% CI	p
Parents would think it is acceptable for child to drink alcohol																
	No	1312	1.00				1318	1.00				1318	1.00			
	Yes	168	1.57	1.08	2.28	0.017	165	1.59	1.09	2.32	0.016	167	1.48	1.02	2.16	0.038
Peers would think it is acceptable for child to drink alcohol																
	No	869	1.00				875	1.00				873	1.00			
	Yes	612	2.60	2.03	3.33	<0.001	609	2.48	1.94	3.17	<0.001	611	2.49	1.94	3.19	<0.001
Gender																
	Male	754	1.00				755	1.00				758	1.00			
	Female	726	0.90	0.72	1.13	0.371	729	0.89	0.71	1.11	0.292	726	0.87	0.70	1.09	0.223
Age																
	11-13 years	858	1.00					1.00				864	1.00			
	14-17 years	622	1.56	1.22	2.00	<0.001		1.58	1.23	2.02	<0.001	621	1.63	1.27	2.09	<0.001
Ethnicity																
	White British	1079	1.00				1086	1.00				1085	1.00			
	Other	386	0.55	0.42	0.73	<0.001	383	0.51	0.39	0.67	<0.001	385	0.53	0.40	0.69	<0.001
Deprivation quintile																
	1 (most deprived)	377	1.00				382	1.00				380	1.00			
	2	276	1.02	0.73	1.44	0.902	277	1.10	0.78	1.54	0.596	279	1.06	0.75	1.49	0.742
	3	310	1.28	0.93	1.78	0.134	310	1.32	0.95	1.82	0.098	311	1.33	0.96	1.83	0.088
	4	240	1.09	0.75	1.56	0.661	237	1.16	0.80	1.67	0.431	237	1.14	0.80	1.65	0.469
	5 (least deprived)	278	0.97	0.69	1.35	0.842	278	0.98	0.70	1.37	0.904	276	1.00	0.71	1.39	0.986
Reaction to alcohol advert																
	Negative or neutral	754	1.00				1091	1.00				785	1.00			
	Positive	726	1.65	1.32	2.06	<0.001	392	1.59	1.23	2.07	<0.001	699	1.44	1.15	1.80	0.001

Among approx. 1,500 adolescents (exact number differs for each regression model due to different numbers who saw each advert) who have never drunk alcohol and watched the advert (95% of whole sample of non drinkers). Dependent variable: susceptibility to drink (0= not susceptible, 1=susceptible). AOR = adjusted odds ratio. CI = confidence interval.

Table 6: Odds of higher risk drinking as measured by AUDIT-C among current drinkers, from multivariable logistic regression

		Fosters Radler					Haig Club Clubman					Smirnoff				
		n	AOR	lower 95% CI	upper 95% CI	p	n	AOR	lower 95% CI	upper 95% CI	p	n	AOR	lower 95% CI	upper 95% CI	p
Parents would think it is acceptable for child to drink alcohol																
	No	367	1.00				359	1.00				363	1.00			
	Yes	525	1.93	1.39	2.68	<0.001	526	1.84	1.32	2.56	<0.001	527	1.90	1.37	2.63	<0.001
Peers would think it is acceptable for child to drink alcohol																
	No	111	1.00				104	1.00				111	1.00			
	Yes	781	1.68	0.95	2.98	0.074	781	1.85	1.02	3.35	0.042	780	1.77	0.99	3.17	0.054
Gender																
	Male	458	1.00				453	1.00				458	1.00			
	Female	434	0.97	0.72	1.31	0.856	432	0.89	0.67	1.20	0.459	433	0.88	0.66	1.19	0.404
Age																
	11-13 years	125	1.00				122	1.00				123	1.00			
	14-17 years	767	1.85	1.09	3.14	0.023	763	1.92	1.12	3.29	0.019	768	2.13	1.23	3.68	0.007
Ethnicity																
	White British	747	1.00				742	1.00				746	1.00			
	Other	141	1.61	1.05	2.45	0.028	138	1.64	1.08	2.50	0.02	139	1.58	1.04	2.39	0.034
Deprivation quintile																
	1 (most deprived)	156	1.00				152	1.00				156	1.00			
	2	192	1.15	0.70	1.90	0.578	189	1.20	0.72	1.98	0.487	192	1.15	0.70	1.90	0.580
	3	178	1.22	0.74	2.00	0.444	178	1.27	0.77	2.09	0.358	178	1.26	0.76	2.06	0.370
	4	190	1.36	0.83	2.25	0.227	187	1.38	0.83	2.29	0.211	187	1.44	0.87	2.37	0.155
	5 (least deprived)	176	1.59	0.97	2.59	0.064	177	1.59	0.97	2.61	0.066	176	1.66	1.02	2.71	0.041
Reaction to alcohol advert																
	Negative or neutral	329	1.00				456	1.00				314	1.00			
	Positive	564	1.46	1.06	2.00	0.021	429	1.37	1.02	1.85	0.038	576	1.18	0.86	1.62	0.314

Among approx. 900 adolescents (exact number differs for each regression model due to different numbers who saw each advert) who were current drinkers and watched the advert (95% of whole sample of non-drinkers). Dependent variable: higher risk drinking (0=lower risk, 1=higher risk). AOR = adjusted odds ratio. CI = confidence interval



