Alcohol Measures for Public Health Research Alliance (AMPHORA)

Report on the impact of European alcohol marketing exposure on youth alcohol expectancies and youth drinking

Deliverable 2.3 and 3.7, Work Package 4

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Introduction

This deliverable reports on two possible outcomes of alcohol marketing exposure among youth: its impact on expectancies on alcohol as well as the drinking behavior. By including both outcomes in one analysis it was not only studied whether alcohol marketing exposure affects youth drinking behavior, but also whether the possible effect is mediated by expectancies on drinking alcohol. In this way, the authors attempt to provide a deeper understanding into the mechanisms behind the hypothesised impact of alcohol marketing exposure.

In order to study the impact of alcohol marketing exposure, two studies have been conducted: one study on online alcohol marketing (Study A) and a second study on alcohol-branded sport sponsorship (Study B). Focus groups held within the AMPHORA study revealed the possible importance of digital media and sport sponsorship according to European youth. Although alcohol marketing expenditures of these types of alcohol marketing are growing steadily, there is still a gap within the scientific literature on the impact of these types of alcohol marketing.

This report concludes with take home messages which give a summary of the most important findings.

Study A.

Online alcohol marketing exposure: its impact on alcohol use and alcohol expectancies among European youth

Abstract

This study investigates associations between online alcohol marketing exposure and drinking among adolescents in Germany, Italy, the Netherlands and Poland and the role of their alcohol expectancies.

Regression analyses of cross-sectional cross-country survey data were undertaken. A total of 6.651 students with a mean age of 13.95 (*SD* = .72) participated in the study. The effect of online alcohol marketing exposure at Time 1 on alcohol expectancies of adolescents on Time 2 and their subsequent drinking behavior in last 30 days at Time 2 was investigated.

Adjusting for relevant confounders, higher exposure to online alcohol marketing exposure was found to increase the odds of alcohol expectancies as well as drinking in the last 30 days. This effect was found to be consistent in all four countries. Secondly, it was found that the influence of online alcohol marketing exposure on drinking behavior was mediated by alcohol expectancies, indicating that in addition to the direct influence of online alcohol marketing on drinking, there was an indirect influence on the increase in drinking through alcohol expectancies. Youngsters in the four European countries report to be frequently exposed to online alcohol marketing. The association between this exposure and adolescents' alcohol expectancies and drinking was robust and seems consistent in several national contexts.

Introduction

Underage drinking in the European Union

Drinking among youth is associated with being involved in accidents, getting into fights, problems at school or work, passing out, having unsafe sex (Wechsler & Nelson, 2001). Long term effects are among others: liver damage, depression, brain impairment and alcohol problems later in life *(McCambridge, McAlaney, & Rowe, 2011; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994).* Investigating what causes underage adolescents to drink is therefore of the utmost importance.

The role of alcohol advertising

The role of alcohol advertising on adolescents' drinking behavior has recently gained more attention. In general, longitudinal studies show a moderate but significant effect of alcohol advertising exposure on adolescents' drinking behavior (Anderson, de Bruijn, Angus, Gordon, & Hastings, 2009; Smith & Foxcroft, 2009). Most of these studies examine the impact of traditional media and do not include alcohol advertising in digital media. However, lately somewhat more attention has been given to this issue. The only study conducted in Europe, suggests a cumulative effect of alcohol marketing channels on drinking among Scottish youth, which includes exposure to non-traditional media (Gordon, Harris, Marie Mackintosh, & Moodie, 2010, 2011; Gordon, MacKintosh, & Moodie, 2010). A study by Lin et al. (2011) underlines the importance of examining the impact of web-based marketing in addition to

traditional marketing, which has found online marketing to be a significant predictor of onset of drinking and amount of drinking among teenagers from New Zealand. Additionally, results of a cross sectional study among Australian adolescents are consistent with studies from other countries and suggest that exposure to online alcohol advertisements is associated with underage drinking (Jones & Magee, 2011), suggesting that alcohol producers are able to reach young people at a very vulnerable age.

Alcohol advertising in digital media in Europe

The current study looked into the impact of alcohol marketing exposure on recent drinking among European youth from Germany, Italy, the Netherlands and Poland in a longitudinal setting. It had a special focus on the impact of alcohol marketing in digital media, which is highly relevant due to the large amounts of time that European youngsters spend using digital media. The internet is the leading medium with adolescents: adolescents spend more time on the internet than they do watching television (*EIAA Mediascope Europe, 2007).* For that reason the alcohol industry utilizes the internet as an important marketing tool, especially via the producers' websites, by banners on other websites, and on social networking sites (Nicholls, 2012). The extent of the use of the internet by alcohol brands can be illustrated by the fact that, as of November 2011, ten alcohol brands, chosen for their youth appeal, had uploaded 35,725 photos on Facebook (CAMY, 2011).

The role of alcohol expectancies

The Theory of Reasoned Action suggests that a person's health behaviour is determined by an individual's intention (motivation) to perform the behaviour. This intention is, in turn, predicted by an individual's attitude toward the behaviour and his/her subjective norms (Spare 2004). Attitudes are personal beliefs about the consequences of a behaviour, and subjective norms are the individual's beliefs about the approval of significant others when performing the behaviour (Conner & Sparks 1996). There is indeed empirical support for this model. Positive attitudes towards smoking mediate the exposure to tobacco advertising and the likelihood of smoking (Aloise-Young et al, 2006). A similar effect is found for positive alcohol attitudes on intention to use alcohol and consumption (Marcoux & Shope, 1997; Norman et al, 1998). Alcohol marketing can thus (positively) influence adolescents' expectancies of how drinking will affect them, which in turn can predict the actual drinking behaviour (Wiers van Woerden, Smulders & de Jong, 2002). In other words, as alcohol marketing suggests to adolescents that drinking alcohol has positive influences on their behaviours, this will then increase the likelihood for underage drinking.

Objectives of the study

The present study has been conducted in Germany, Italy, the Netherlands and Poland, and it is the first cross-national European survey that examines the association of alcohol marketing exposure with adolescents' drinking in a longitudinal setting. Following de Bruijn (2012) the study focuses on the impact of alcohol marketing in digital media, a marketing channel that has been neglected in most previous research efforts and is of relevance for European youngsters due to their extensive use of the internet. The study following a longitudinal methodology in which exposure to online media is measured at Time 1 (November 2010-February 2011) and drinking at Time 2 (March-April 2012).

What we did

Participants
The longitudinal study was conducted by research institutes in Germany, Italy, the Netherlands and Poland. At Time 1 in each country a stratified sample of schools in an urban and rural area was taken. In total, 339 schools were examined for eligibility, of which 163 schools participated. Of the eligible 10810 students that were invited, 9709 participated (89.8% response rate). Two thirds of the non-response of individuals were due to lack of active parental consent (N=732); non-response in the remainder was mostly due to lack of motivation in the students' teachers. Technical difficulties concerning the internet connection at the times of the survey or other technical failures reduced the sample to 9032 students. For these, data was recorded using the online questionnaire and responses to appropriate questions. Between Time 1 (November 2010-February 2011) and Time 2 (March-April 2012) 14 to 15 months passed. Due to technical problems, school dropout and non-response of individuals, the sample size was 6651 students at Time 2 [1] for those who participated in both Time 1 and Time 2. Of these, 51.1% was female (48.5 % male) with a Mean age of 13.95 (*SD* = .72) and 21 % were smokers at Time 1. Classes or schools from different education levels were randomly sampled. 1398 students were from Germany, 1771 from Italy, 1525 from the Netherlands and 2001 from Poland.

Survey design
Before drafting the questionnaire, 8 focus groups were held in each country with 12-15 year-olds (total of 32 focus groups, N=218) to examine the cultural context of the concepts of interest (see also Hellman et al., 2011). A draft of the survey was pre-tested and commented upon by approximately 100 students in each country. In the four countries, data was collected through self-administered online questionnaires which were anonymous. Students who volunteered to participate gave active consent. In Germany active parental consent was required, in all other countries passive parental consent was used. Ethical approval of the study was gained by the European Commission and the Ethical board of the Radboud University, Nijmegen, The Netherlands (number ECG 24092009).

Measures

Alcohol use
Alcohol use at Time 2 was established by asking respondents 'did you drink any alcoholic beverages during the last 30 days?'. Answers ranged from 0 (0 times); 1 (1-2 times); 2 (3-5 times); 3 (6-9 times) 4 (10-19 times); 5 (20 times or more). This question mirrored questions used in the ESPAD survey (Hibell, 2009).

Alcohol expectancies
The alcohol expectancy questionnaire-adolescent version (AEQ-A) is a validated measure of propensity to initiate alcohol use (Fromme & D'Amico, 2000). Shortened adaptations of this scale have been shown to be a valid indicator of susceptibility of young people to drink alcohol (Aas, 1993). A shortened version, used previously by Fisher et al (2004), was used in the current study. The alcohol expectancies consisted of either positive and negative items (valence IAT) or arousal and sedation items. Questions consisted of asking respondents 'How do you expect alcohol will make you feel?'. For the positive–negative dimension, the following words were used: *positive* words (labelled *positive*) were "sociable," "good," "pleasant,"

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[1] Non-responses between Time 1 and Time 2 are due to drop-out of older students, as the mean age differs significantly between all respondents at time 1 and the sample remaining at Time 2.

"nice," "enjoyable," "sympathetic"; *negative* words (labelled *negative*) were "antisocial," "bad," "unpleasant," "stupid," "obnoxious," "tedious." *Arousal* words (labelled *active*) were "energetic," "lively," "funny," "cheerful," "loose," "aroused"; *sedation* words (labelled *passive*) were "relaxed," "sleepy," "woozy," "quiet," "calm," "listless" (Wiers, 2008; Wiers et al., 2002).

Alcohol marketing exposure online

Dichotomous questions used by Gordon et al (2010; 2011; Lin et al 2011) were adapted to measure the frequency of exposure to alcohol marketing in online media on Time 1 with a 5-point Likert scale (1 never, 2 rarely, 3 sometimes, 4 often, 5 very often). Respondents were asked whether they ever have received 'promotional mail, e-mails or joke, chain, or wind up e-mails mentioning alcohol brands?', 'looked at a web site for alcohol brands or about drinking (doesn't include health related sites)?', 'downloaded a mobile phone or computer screensaver containing an alcohol brand name or logo?', 'used a profile page on sites such as hyves, facebook, msn or myspace containing alcohol brand or logo?', and 'noticed an internet page that contained an alcohol advertisement?'. All items were combined into one factor (see Table 1).

Control variables
Demographic data was recorded for age, gender, education and smoking (yes/no). Internet use was measured by asking respondents 'On a usual school day (Monday to Friday) how many hours do you spend using the internet?' indicating (1) None; (2) Less than 1 hour; (3) 1-2 hours; (4) 3-4 hours; (5) 5 hours or more. In addition, alcohol use (yes/no) on Time 1 was measured by asking the respondents 'did you drink any alcoholic beverages during the last 30 days?'.

What we found

See Table 1 for means, standard deviations, intercorrelations and crombach's alphas for all variables used in the study.

Alcohol expectancies

Positive expectancies
We conducted a hierarchical regression analysis with positive alcohol expectancies as the dependent variable and alcohol use on Time 1, online alcohol marketing, and the 'alcohol use at Time 1 × online alcohol marketing' -term as predictors. Gender, age, smoking, education, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Time spent behind the computer was added after the predictors as to control for its influence (See Table 2).

We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to positive alcohol expectancies. We also found a main effect of online alcohol marketing: Online alcohol marketing was positively related to positive alcohol expectancies. Furthermore, we found an interaction between the alcohol use at Time 1 and online alcohol marketing. This interaction revealed that the influence of online marketing on positive alcohol expectancies was most pronounced when it was reported that there was no alcohol use at Time 1.

All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and online alcohol marketing are significant predictors even when the control variables and time spent on the internet were significantly related to alcohol expectancies.

Negative expectancies
We conducted a hierarchical regression analysis[2,] with the negative alcohol expectancies as dependent variable and alcohol use on time 1, online alcohol marketing, and the alcohol use Time 1 × online alcohol marketing -term as predictors. Gender, age, smoking, education, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Time spent behind the computer was added after the predictors as a covariate (See Table 2).

We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was negatively related to negative alcohol expectancies. Ad with positive expectancies, we found a main effect of online alcohol marketing: As with positive expectancies, online alcohol marketing was positively related to negative alcohol expectancies. Furthermore, we found an interaction between the alcohol use Time 1 and online alcohol marketing. This interaction revealed that the influence on negative alcohol expectancies by online marketing was most pronounced when it was reported that there was no alcohol use on Time 1.
All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and online alcohol marketing were significant predictors even when the control variables and covariate were significantly related to alcohol expectancies.

Arousal expectancies
We conducted a hierarchical regression analysis with the arousal alcohol expectancies as dependent variable and alcohol use at Time 1, online alcohol marketing, and the 'alcohol use at Time 1 × online alcohol marketing' -term as predictors. Gender, age, smoking, education, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Time spent behind the computer was added after the predictors as covariate (See Table 2).

We found a main effect of alcohol use at Time 1: Alcohol usage at Time 1 was positively related to arousal alcohol expectancies. We also found a main effect of online alcohol marketing: Online alcohol marketing was positively related to arousal alcohol expectancies. Furthermore, we found an interaction between the alcohol use at Time 1 and online alcohol marketing. This interaction revealed that the influence on arousal alcohol expectancies by online marketing was most pronounced when it was reported that there was no alcohol use at Time 1.
All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and online alcohol marketing are predictors even when the control variables and time spent on the internet were significantly related to alcohol expectancies.

Sedation expectancies
We conducted a hierarchical regression analysis' with the sedation alcohol expectancies as dependent variable and alcohol use at time 1, online alcohol marketing, and the alcohol use at Time 1 × online alcohol marketing -term as predictors. Gender, age, smoking, education, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control

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[2] Online Marketing Exposure did differ between countries, but this did not explain the effects of online marketing on alcohol expectances and alcohol usage and are therefore not depicted in the analyses.

variables before the predictors were added. Time spent behind the computer was added after the predictors as covariate (see Table 2).

We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to sedation alcohol expectancies. We also found a main effect of online alcohol marketing: Online alcohol marketing was positively related to sedation alcohol expectancies. Furthermore, we found an interaction between the alcohol use at Time 1 and online alcohol marketing: This interaction revealed that the influence on sedation alcohol expectancies by online marketing was most pronounced when it was reported that there was no alcohol use at Time 1.
All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and online alcohol marketing are predictors even when the control variables and time spent on the internet were significantly related to alcohol expectancies.

Alcohol use
We conducted a hierarchical regression analysis [3] with alcohol use at Time 2 as dependent variable and alcohol use at Time 1, online alcohol marketing, and the 'alcohol use at Time 1 × online alcohol marketing' -term as predictors. Gender, age, smoking, education, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Time spent behind the computer was added after the predictors as covariate (See Table 3).

We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to alcohol use at Time 2. We also found a main effect of online alcohol marketing: Online alcohol marketing at Time 1 was positively related to alcohol use at Time 2. Furthermore, we found an interaction between the alcohol use Time 1 and online alcohol marketing: This interaction revealed that the influence of online marketing on alcohol usage was most pronounced when it was reported that there was no alcohol use at Time 1.
All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and online alcohol marketing are predictors even when the control variables and time spent on the internet were significantly related to alcohol use at Time 2.

Mediation Analysis
According to Baron and Kenny (1986) a variable can be called a mediator when (1) variations in levels of the independent variable account for variations in the presumed mediator, (2) variations in the mediator account for variations in the dependent variable, and (3) when the effect of the presumed mediator is controlled for, a previously significant effect of the independent variable on the dependent variable disappears or decreases.
In this study we expected participants' alcohol expectancies to mediate the effects of online alcohol marketing on alcohol use.

We conducted a hierarchical regression analysis [3] with alcohol use at Time 2 as dependent variable and alcohol use at Time 1, online alcohol marketing, and the alcohol use at Time 1 × online alcohol marketing -term as predictors. Gender, age, smoking, education, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Time spent behind the computer was added after the predictors as covariate. We added participants' alcohol expectancies as covariates.

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[3] Analyses showed the same patterns for only non-drinkers at Time 1. All effects were thus significant, meaning non-drinkers at Time 1 became drinkers at Time 2 due to exposure to online alcohol marketing

All expectancies were positively related except for negative alcohol expectancies, these were negatively related (See Table 3). Additionally, the effect of online alcohol marketing on alcohol use at Time 2 decreased when adding the negative, positive, arousal and sedation alcohol expectancies. Sobel-tests (negative: z = -2.92, p = .003; positive: z = 6.30, p < .00001; arousal: z = 3.13, p = .002; sedation: z = 3.24, p = .001) show this is a significant decrease, meaning that online alcohol marketing not only directly affects participants' increase in alcohol use at Time 2, but also indirectly by influencing participants' alcohol expectancies.

What does this mean?

The frequency of exposure to alcohol marketing was shown to influence underage adolescents' alcohol expectancies as well as their drinking behavior, even when controlling for hours spent using the internet and demographic factors. Overall, adolescents expect, due to online alcohol marketing, that alcohol will make them feel positive, activated and relaxed. Moreover, the influence of alcohol marketing on negative alcohol expectancies shows that adolescents expect to experience more negative feelings due to alcohol use, yet non-drinkers especially seem to expect this more than drinkers at Time 1 do. Furthermore, online marketing also influences alcohol use. Seeing more online alcohol marketing increases the likelihood that adolescents (start to) drink. The latter effect is mediated by adolescents' alcohol expectancies. That is, when adolescents expect that alcohol will make them feel less negative, more positive, aroused and sedated, due to alcohol marketing online, they report that they drink.

This finding is in line with other studies that examined the impact of exposure to online alcohol marketing on adolescent drinking (Gordon et al 2010, 2011; Lin et al 2011; Jones & Magee 2011). To our knowledge, this is the first study that has examined the impact of different levels of exposure to online alcohol marketing practices and the first cross-country study to have examined the impact of online alcohol advertising on adolescent drinking behavior and alcohol expectancies over time.

A limitation of this study is the measurement of online alcohol marketing exposure by reported exposure. This memory-based measure can be affected by the interpretation of the respondent and can be highly correlated to potential confounders, such as past drinking experience (Stacy, Zogg, Unger, & Dent, 2004). That is, drinkers may be more familiar with the product and may memorize alcohol advertisements better. We cannot rule out the possibility that higher (reported) online alcohol marketing exposure is a result of drinking experience. Yet, by adding drinking behavior at Time 1 as predictor, our analyses show that, although alcohol usage and expectancies are already influenced by drinking at the start of the study, online alcohol marketing has a unique influence, suggesting that non-drinkers at Time 1 were influenced by the marketing endeavours and started drinking during the course of our investigation. The pattern of results was also found when only investigating the non-drinkers at Time 1 (see footnote 3, above). These analyses thus support the model we have presented. The frequency of exposure to online alcohol marketing among respondents indicates the degree to which alcohol producers are able to reach young people at a very vulnerable age, and that this effect is long-term. For example, Heineken and Google have started a global partnership which increases the international beer producer's YouTube activity. This deal, made in 2011, will very likely mean that at least 103 million minors around the world are being exposed to the harmful effects of alcohol marketing on a monthly basis (EUCAM, 2011). As in most countries, the volume of alcohol marketing on the internet is not regulated by law in the

countries examined. These countries rely on self-regulation, which seems to be unable to protect young people against high exposure to alcohol marketing on the internet, nor protect them against the harmful impact of this exposure on their drinking. Results of this study show a need for governments to seriously address this issue and to limit the volume of alcohol marketing in digital media through legislation.

Conclusions of Study A

The data analyses presented here suggest that exposure to online alcohol marketing is associated with subsequent drinking over time. This finding was robust after controlling for the number of hours using the internet, demographics and alcohol use at the start of the study. Consequently, alcohol marketing on the internet (like alcohol marketing practices in other media channels) can be seen as a serious but avoidable threat to adolescents' health. The consistency of this effect across the four European countries and its effect size seriously raises the demand for legal restrictions on the volume of alcohol marketing permitted in online media in European countries.

Study B.

Alcohol branded sport sponsorship: its impact on alcohol use and alcohol expectancies among European youth

Abstract

This study investigates associations between alcohol-branded sport sponsorship exposure and drinking among adolescents in Germany, Italy, the Netherlands and Poland and the role of their alcohol expectancies in a longitudinal setting.

Regression analyses of cross-sectional cross-country survey data were undertaken. A total of 6.652 students with a mean age of 13.95 (SD = .72) participated in the study. The effect of alcohol-branded sport sponsorship exposure at Time 1 on alcohol expectancies of adolescents at Time 2 and their subsequent drinking behaviour in the last 30 days at Time 2 was investigated.

Adjusting for relevant confounders, higher exposure to alcohol-branded sport sponsorship was found to increase the odds of alcohol expectancies as well as drinking in the last 30 days. Secondly, it was found that the influence of alcohol-branded sport sponsorship exposure on drinking behaviour was mediated by alcohol expectancies, indicating that in addition to the direct influence of alcohol-branded sport sponsorship exposure, there was an indirect influence on the increase in drinking through alcohol expectancies. Youngsters in the four European countries report to be frequently exposed to alcohol-branded sport sponsorship. The association between this exposure and adolescents' alcohol expectancies and drinking was robust, even when controlling for national differences and demographics. Conclusions: Alcohol-branded sport sponsorship influences alcohol consumption among adolescents. Exposure to sport sponsoring can predict future drinking. Since sport sponsoring is poorly regulated in most countries and its effect on alcohol consumption is evident, policy makers are recommended to take action on alcohol marketing via sports events, in order to prevent hazardous drinking among youth.

Introduction

Hazardous alcohol consumption is a burden on society. The heavy use of alcohol has led to high costs in Europe: the estimated economic costs in the EU are 125 billion Euros (Anderson & Baumberg 2006). The estimated mortality due to hazardous alcohol consumption in Europe has been estimated to be 195,000 deaths per year (Eurobarometer 2010). Furthermore, according to Anderson and Baumberg, alcohol consumption in Europe results in 12% of male and 2% of female premature death and disability. Especially among youngsters between the ages of fifteen and twenty-four, drinking is a major cause of death, with high levels resulting from intentional and unintentional injury as a primary cause (CAPS 2012).

Alcohol consumption during adolescence is related to drinking problems later in life and potential long-term consequences such as brain damage through early alcohol consumption (McCambridge, McAlaney & Rowe 2011). Unfortunately, these consequences do not appear to discourage adolescents from drinking alcohol (Anderson et al 2009; Engels et al 2009; Monshouwer et al 2003).

Participation in sports and alcohol consumption

Recent literature has indicated the alarming role of participation in sports as a predictor of alcohol consumption (Lisha & Sussman 2010; O'Brien et al 2005). According to Lisha and Sussmann (2010) participation in sports clearly reduces the use of some substances, such as illicit drugs and tobacco, whereas the opposite applied to alcohol consumption.

Indeed, research among college athletes (high-level but non-professional) in the US, for example, showed that sportspeople consume the same amount of alcohol as their non-sporting fellow students, if not even more (Martens et al 2006). A study at the Harvard School of Public Health from the year 2000 presented significant relationships between college athletes and increased levels of drinking. This is confirmed by Martens and colleagues (Martens et al 2008), showing that U.S. college athletes consumed more alcoholic drinks per week and were at the same time more likely to binge drink than non-athletes. Furthermore, a review study by Lisha and Sussmann (2010) underlines that, in 29 of 34 studies, a relationship between participation in sports and alcohol consumption was found. In 22 studies being active in sports was positively associated with alcohol consumption whereas in seven studies this was not the case.

Why is being active in sports associated with increased alcohol consumption? Collins and Vamplew (2002) described the centrality of pubs and bars in sporting life (Hibell et al 2012; Rehm & Kanteres 2008) as contributing factors. Often sport is connected with a club membership and social commitments as spending time with the team, coaching or having a drink after a game. Therefore, not only activities revolving around sports but also club membership are factors that might increase alcohol consumption among youngsters. A further possibility that has been suggested and will be discussed in more detail below is the contribution of alcohol marketing in sports.

The impact of alcohol-branded sport sponsorship

A study by O'brien (2011) underlined the involvement of sport sponsoring in marketing alcohol products and stressed the involvement of alcohol producers in Australian sports and their relationship to alcohol consumption among athletes. O'Brien measured AUDIT scores and Australian adult sportspeople's drinking behavior by comparing sportspeople exposed to sponsoring by either the alcohol or the non-alcohol industry. It was concluded that sportspeople exposed to alcohol sport sponsoring had higher AUDIT scores and simultaneously showed a much more hazardous form of drinking than sportspeople receiving non-alcohol sponsoring. This was in line with earlier findings of a comparable study by O'Brien & Kypri (2008) in New Zealand.

Similar effects of sport sponsoring among sportspeople have been suggested with local sport events as well as at popular mass events such as football and rugby matches in the UK (Davies & Foxall 2011). These events are often associated with a considerable amount of (alcohol) sport sponsoring in the UK (Davies & Foxall 2011). Therefore, it has been suggested that alcohol consumption is not only increased through local alcohol sport sponsoring, aimed at the individual in their personal surrounding, but also by exposure during mass sport events. Hence, alcohol sport sponsoring during mass sports events (for instance the Champions League) can be assumed to influence adolescent alcohol consumption.

The role of alcohol expectancies

The Theory of Planned Behaviour suggests that a person's health behaviour is determined by an individual's intention (motivation) to perform the behaviour. This intention is, in turn, predicted by an individual's attitude toward the behaviour and his/her subjective norms (Spare

2004). Attitudes are personal beliefs about the consequences of a behaviour, and subjective norms are the individual's beliefs about the approval of significant others when performing the behaviour (Conner & Sparks 1996). There is indeed empirical support for this model. Positive attitudes towards smoking mediate the exposure to tobacco advertising and the likelihood of smoking (Aloise-Young et al, 2006). A similar effect is found for positive alcohol attitudes on intention to use alcohol and consumption (Marcoux & Shope, 1997; Norman et al, 1998). Alcohol marketing can thus (positively) influence adolescents' expectancies of how drinking will affect them, which in turn can predict the actual drinking behaviour (Wiers van Woerden, Smulders & de Jong, 2002). In other words, as alcohol marketing suggests to adolescents that drinking alcohol has positive influences on their behaviours, this will then increase the likelihood of underage drinking.

Objectives of the study
The present study has been conducted in Germany, Italy, the Netherlands and Poland, and it is the first cross-national European survey that examines the association of alcohol marketing exposure and, more specifically, alcohol-branded sport sponsorship with adolescents' drinking and alcohol expectancies in a longitudinal setting.

What we did

Participants
The longitudinal study was conducted by research institutes in Germany, Italy, the Netherlands and Poland. At Time 1 in each country, a stratified sample of schools in an urban and rural area was taken. In total, 339 schools were examined for eligibility of which 163 schools participated. Of the eligible 10810 students that were invited, 9709 participated (89.8% response rate). Two thirds of the non-response of individuals were due to lack of active parental consent (N=732); non-response in the remainder was mostly due to lack of motivation in the students' teachers. Technical difficulties concerning the internet connection at the times of the survey or other technical failures reduced the sample to 9032 students. For these, data was recorded using the online questionnaire and responses to appropriate questions. Between Time 1 (November 2010-February 2011) and Time 2 (March-April 2012) 14 to 15 months passed. Due to technical problems, school dropout and non-response of individuals, the sample size was 6651 students at Time 2 who had participated in both Time 1 and Time 2[4]. Of which 51.1% was female (48.5 % male) with a Mean age of 13.95 (SD = .72) and 21 % were smokers at Time 1. Classes or schools from different educational levels were randomly sampled. 1398 students were from Germany, 1771 from Italy, 1525 from the Netherlands and 2001 from Poland.

Survey design
Before drafting the questionnaire, 8 focus groups were held in each country with 12-15 year-olds (total of 32 focus groups, N=218) to examine the cultural context of the concepts of interest (see also Hellman et al., 2011). A draft of the survey was pre-tested and commented upon by approximately 100 students in each country. In the four countries, data was collected through self-administered online questionnaires which were anonymous. Students who volunteered to participate gave active consent. In Germany, active parental consent was required, in all other countries passive parental consent was used. Ethical approval of the study was granted by the European Commission and the Ethical board of the Radboud University, Nijmegen, The Netherlands (number ECG 24092009).

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[4] Non-responses between Time 1 and Time 2 are due to drop-out of older students, as the mean age differs significantly between all respondents at Time 1 and the sample remaining at Time 2.

Measures

Alcohol use

Alcohol use at Time 2 was established by asking respondents 'did you drink any alcoholic beverages during the last 30 days?'. Answers ranged from 0 (0 times); 1 (1-2 times); 2 (3-5 times); 3 (6-9 times) 4 (10-19 times); 5 (20 times or more). This question mirrored questions used in the ESPAD survey (Hibell, 2009).

Alcohol expectancies

The alcohol expectancy questionnaire-adolescent version (AEQ-A) is a validated measure of propensity to initiate alcohol use (Fromme & D'Amico, 2000). Shortened adaptations of this scale have been shown to be a valid indicator of susceptibility of young people to drink alcohol (Aas, 1993). A shortened version, used previously by Fisher et al (2004), was used in the current study. The alcohol expectancies consisted of either positive and negative items (valence IAT) or arousal and sedation items. Questions consisted of asking respondents 'How do you expect alcohol will make you feel?'. For the positive–negative dimension, the following words were used: positive words (labelled positive) were "sociable," "good," "pleasant," "nice," "enjoyable," "sympathetic"; negative words (labelled negative) were "antisocial," "bad," "unpleasant," "stupid," "obnoxious," "tedious." Arousal words (labelled active) were "energetic," "lively," "funny," "cheerful," "loose," "aroused"; sedation words (labelled passive) were "relaxed," "sleepy," "woozy," "quiet," "calm," "listless" (Wiers, 2008; Wiers et al., 2002).

Alcohol sport sponsorship exposure

In stage 1, exposure to alcohol-sponsored football championships was measured by asking participants 'How often have you watched the following four football championships?' (names of the championships are country specific, see appendix 1). Answers were given by means of a 5-point scale (0 Never, 1 Rarely, 2 Sometimes, 3 Often, 4 Very often). Answers to this question were coded by whether the specific sports event was sponsored by the alcohol industry or not. For instance when respondents indicated that they had watched the football Champions League, they were classified as being exposed to sport sponsoring, since the league is sponsored by Heineken beer. A total score was composed by adding total frequency of watching of all alcohol-sponsored football championships.

In stage 2, perceived exposure to sport sponsoring of the own sport club was measured by asking respondents whether they had seen any kind of alcohol branded sport advertisements at their own club. For a maximum of three clubs they were involved in, they had to answer for every club whether they had seen such sport sponsoring. In the Netherlands a distinction between indoor and outdoor sport sponsoring at the club's facilities was made. This was done because the majority of the sport clubs in the Netherlands run their own sports bars. In the other three countries no such distinction was made. Adolescent sportspeople were asked whether they had seen any form of alcohol sport sponsoring at the club's facilities. Respondents reported whether they had seen alcohol sport sponsoring within the facilities (for instance at the sports bar), in advertising on the sport fields or in other background advertising. Respondents who answered affirmatively were categorized as exposed (1) to sport sponsoring and respondents who answered negatively or whom were not a member of a sport club were categorized as not-exposed (0).

Alcohol use Time 1
Alcohol use at Time 1 was established by asking respondents 'did you drink any alcoholic beverages during the last 30 days?'. Answers ranged from 0 (0 times); 1 (1-2 times); 2 (3-5 times); 3 (6-9 times) 4 (10-19 times); 5 (20 times or more). This question mirrored questions used in the ESPAD survey (Hibell, 2009).

Control variables
Demographic data was recorded for age, gender, education and smoking (yes/no). In the survey respondents were asked whether they were involved in sports. In stage 1, the frequency of exposure to non-alcohol sponsored football championships was included, similar to exposure to alcohol-sponsored football championships, in stage 2, membership of sport clubs (yes/no).

What we found

See Table 1 for means, standard deviations, intercorrelations and cronbach's alpha for all variables used in the study.

Stage 1. – Alcohol expectancies and alcohol sponsored championships

Negative expectancies
We conducted a hierarchical regression analysis[2], with the negative alcohol expectancies as dependent variable, and alcohol use at Time 1 and alcohol-sponsored football championships exposure as predictors. Gender, age, smoking, education, participating in sport, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Non-alcohol-sponsored football championship exposure was added after the predictors as covariate (See Table 2).
We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was negatively related to negative alcohol expectancies at Time 2. We did not find a main effect of alcohol-sponsored football championships exposure, while controlling for confounders. Exposure to non-alcohol-sponsored football championships was not found to be related to negative expectancies.

Positive expectancies
We conducted a hierarchical regression analysis2, with the positive alcohol expectancies as dependent variable, and alcohol use at Time 1 and alcohol-sponsored football championships exposure as predictors. Gender, age, smoking, education, participating in sport, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Non-alcohol-sponsored football championship exposure was added after the predictors as covariate (See Table 2).
We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to positive alcohol expectancies. Interestingly, along with the effect of alcohol use we also found a main effect of exposure to alcohol-sponsored football championships: Alcohol-sponsored football championships exposure was positively related to positive alcohol expectancies.
All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and alcohol-sponsored football championships are significant predictors even when the control variables were significantly related to alcohol expectancies. Exposure to non-alcohol sponsored football championships was not found to be related to positive expectancies.

Arousal expectancies

We conducted a hierarchical regression analysis[5], with the arousal alcohol expectancies as dependent variable, and alcohol use at Time 1 and alcohol-sponsored football championships exposure as predictors. Gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Non-alcohol-sponsored football championship exposure was added after the predictors as covariate (See Table 2).

We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to arousal alcohol expectancies. As well as the effect of alcohol use we also found a main effect of exposure to alcohol-sponsored football championships: Alcohol-sponsored football championships exposure was positively related to arousal alcohol expectancies.

All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and alcohol-sponsored football championships exposure are significant predictors even when the control variables were significantly related to arousal alcohol expectancies. Exposure to non-alcohol-sponsored football championships was not found to be related to arousal expectancies.

Sedation expectancies

We conducted a hierarchical regression analysis[5], with the sedative alcohol expectancies as dependent variable and alcohol use at Time 1, and alcohol-sponsored football championships exposure as predictors. Gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Non-alcohol-sponsored football championship exposure was added after the predictors as covariate (See Table 2).

We found a main effect of alcohol use at Time: Alcohol use at Time 1 was positively related to sedative alcohol expectancies at Time 2. We did not find a main effect of exposure to alcohol-sponsored football championships, while controlling for confounders. Exposure to non-alcohol-sponsored football championships was not found to be related to sedative expectancies.

Alcohol use and alcohol-sponsored championships

We conducted a hierarchical regression analysis[5, 6] with alcohol use at Time 2 as dependent variable, and alcohol use at Time 1 and alcohol-sponsored football championships exposure as predictors. Gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Exposure to non-alcohol-sponsored football championships was added after the predictors as covariate (See Table 3).

We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to alcohol use at Time 2. We also found a main effect of exposure to alcohol-sponsored football championships. Alcohol-sponsored football championships exposure was positively related to alcohol use at Time 2.

All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and online alcohol marketing are predictors even when the control variables and were significantly related to alcohol use at Time 2. Exposure to non-alcohol sponsored football championships was not found to be related to alcohol use at Time 2.

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[5] Alcohol-branded sports sponsorship did differ between countries, but this did not explain the effects of online marketing on alcohol expectances and alcohol usage and are therefore not depicted in the analyses.

[6] Analyses showed the same patterns for only non-drinkers at Time 1. All effects were thus significant, meaning non-drinkers at Time 1 became drinkers at Time 2 due to exposure to alcohol-branded sports sponsorship.

Mediation Analysis

According to Baron and Kenny (1986) a variable can be called a mediator when (1) variations in levels of the independent variable account for variations in the presumed mediator, (2) variations in the mediator account for variations in the dependent variable, and (3) when the effect of the presumed mediator is controlled for, a previously significant effect of the independent variable on the dependent variable disappears or decreases.

In this study, we expected participants' alcohol expectancies to mediate the effects of exposure to alcohol sponsored football championships on alcohol use.

We again conducted a hierarchical regression analysis [5, 6] with alcohol use at Time 2 as dependent variable and alcohol use at Time 1, and exposure to alcohol sponsored football championships as predictors. Again, gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Exposure to non-alcohol-sponsored football championships was added after the predictors as covariate. To test mediation we added participants' alcohol expectancies as covariates.

All expectancies were positively related except for negative alcohol expectancies, which were negatively related (See Table 3). Additionally, the effect of exposure to alcohol-sponsored football championships on alcohol use at Time 2 became insignificant when adding the negative, positive, arousal and sedation alcohol expectancies. Sobel-tests (negative: $z = 1.62$, $p = .10$; positive: $z = 2.52$, $p = .01$; arousal: $z = 3.80$, $p < .001$; sedation: $z = 1.49$, $p = .13$) indicate that this is a significant decrease due to the positive and arousal alcohol expectancies. The effect of exposure to alcohol-sponsored football championships is fully mediated by alcohol expectancies, meaning that exposure to alcohol-sponsored football championships affects alcohol use at Time 2 indirectly by influencing participants' alcohol expectancies.

Stage 2. - Alcohol expectancies and alcohol sponsored sport clubs

Negative expectancies

We conducted a hierarchical regression analysis[5], with the negative alcohol expectancies as dependent variable and alcohol use at Time 1, and alcohol sponsored sport clubs exposure as predictors. Gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Being a member of a sport club was added after the predictors as covariate (See Table 2).

We did not found a main effect of alcohol use at Time 1. Interestingly, we did find a main effect of exposure to alcohol-sponsored football championships, while controlling for confounders: Exposure to alcohol sponsored football championships at Time 1 was negatively related to negative alcohol expectancies at Time 2. Exposure to non-alcohol-sponsored football championships was not found to be related to negative expectancies.

Positive expectancies

We conducted a hierarchical regression analysis[5], with the positive alcohol expectancies as dependent variable and alcohol use at Time 1, and alcohol sponsored sport clubs exposure as predictors. Gender, age, smoking, education, participating in sport, and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Membership of a sport club was added after the predictors as covariate (See Table 2).

We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to positive alcohol expectancies at Time 2. We did not find a main effect of alcohol-sponsored sport clubs exposure while controlling for confounders. Membership of a sport club was not found to be related to positive expectancies.

Arousal expectancies
We conducted a hierarchical regression analysis[5] with the arousal alcohol expectancies as dependent variable, and alcohol use at Time 1 and alcohol sponsored sport clubs exposure as predictors. Gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Membership of a sport club was added after the predictors as covariate (See Table 2).
We found a main effect of alcohol use at Time 1. Alcohol use at Time 1 was positively related to arousal alcohol expectancies at Time 2. We did not find a main effect of exposure to alcohol-sponsored sport clubs while controlling for confounders. Membership of a sport club was not found to be related to arousal expectancies.

Sedation expectancies
We conducted a hierarchical regression analysis[5] with the sedative alcohol expectancies as dependent variable and alcohol use at Time 1 and alcohol sponsored sport clubs exposure as predictors. Gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Membership of a sport club was added after the predictors as covariate (See Table 2).
We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to sedative alcohol expectancies at Time 2. We did not find a main effect of alcohol-sponsored sport clubs exposure while controlling for confounders. Membership of a sport club was not found to be related to sedative expectancies.

Alcohol use and alcohol-sponsored sport clubs
We conducted a hierarchical regression analysis[5, 6] with alcohol use at Time 2 as dependent variable and alcohol use at Time 1, and alcohol sponsored sport club exposure as predictors. Gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables before the predictors were added. Membership of a sport club was added after the predictors as covariate (See Table 3).
We found a main effect of alcohol use at Time 1: Alcohol use at Time 1 was positively related to alcohol use at Time 2. Interestingly, next to the effect of alcohol use we also found a main effect of alcohol sponsored sport club exposure. Alcohol-sponsored sport exposure was positively related to alcohol use at Time 2.
All effects were found while correcting for the control variables, meaning that alcohol use at Time 1 and online alcohol marketing are predictors even when the control variables and membership of a sport club were significantly related to alcohol use at Time 2.

Mediation Analysis
In this study we hypothesised that participants' alcohol expectancies would mediate the effects of exposure to alcohol-sponsored sport clubs on alcohol use.
We again conducted a hierarchical regression analysis[5, 6] with alcohol use at Time 2 as dependent variable, and alcohol use at Time 1 and exposure to alcohol sponsored sport clubs as predictors. Again, gender, age, smoking, education, participating in sport and the 4 countries (Germany, Italy, The Netherlands and Poland) were entered as control variables

before the predictors were added. Membership of a sport club was added after the predictors as covariate. To test mediation we added participants' alcohol expectancies as covariates.

All expectancies were positively related except for negative alcohol expectancies, these were negatively related (See Table 3). Additionally, the effect of exposure to alcohol-sponsored sport clubs on alcohol use at Time 2 decreased when adding the negative, positive, arousal and sedation alcohol expectancies. Sobel-tests (negative: $z = 2.66$, $p = .007$; positive: $z = 1.47$, $p = .140$; arousal: $z = .71$, $p = .500$; sedation: $z = -.64$, $p = .517$) indicate that this is a significant decrease due to negative alcohol expectancies. The effect of exposure to alcohol-sponsored sport clubs is partly mediated by alcohol expectancies, meaning that exposure to alcohol-sponsored sport clubs affects alcohol use at Time 2 indirectly, by influencing participants' alcohol expectancies.

What does this mean?

In the last decade, research in the field of marketing has explored prospective relationships between alcohol marketing and alcohol consumption. This research suggested that that exposure to alcohol portrayals on TV and radio (Robinson et al 1998; Engels et al 2009; Snyder et al 2006), alcohol in movies (Hanewinkel et al 2008) and in internet marketing (Gordon et al 2011; Lin et al 2012; De Bruijn et al 2012) is associated with higher levels of alcohol consumption among adolescents. In line with the study by O'Brien et al. (2008), findings presented in this study indicate that the effect of sport sponsorship is no different.

The frequency of exposure to alcohol-branded sport sponsorship was shown to influence underage adolescents' alcohol expectancies as well as their drinking behavior, even when controlling for exposure to non-alcohol sponsored football championships, membership of a sport club and demographic factors. Overall, adolescents expect, due to alcohol-branded sport sponsorship, that alcohol will make them feel positive, activated and sedated or experience less negative effects from using alcohol. Furthermore, alcohol-branded sport sponsorship was found to also influence alcohol use. Seeing more alcohol-branded sport sponsorship increases the likelihood that adolescents (start to) drink and increases the frequency of using alcohol. The latter effect is mediated by adolescents' alcohol expectancies. When adolescents expect that alcohol will make them feel less negative, more positive, aroused and relaxed because of alcohol-branded sport sponsorship, they are more likely to drink alcohol more frequently.

All in all, our results suggested a relationship between activities in sport clubs and alcohol consumption among adolescents based on exposure to alcohol marketing in this environment. Collins & Vamplew (2002), already suggested the centrality of pubs and bars in sporting life as potential influencers. The present study indicates that it is not the membership of sport clubs itself, but the exposure to alcohol-branded sport sponsorship in sport clubs that influences alcohol expectancies and alcohol use.

To our knowledge this is the first study that has examined the impact of seeing alcohol-branded football championships and the first cross-country study to have examined the impact of alcohol-branded sport sponsorship on adolescents' drinking behavior and alcohol expectancies over time.

Exposure to alcohol sponsored football championships was measured by an indirect measure avoiding the potential bias of self-report of alcohol marketing exposure. We did not have such an opportunity when measuring exposure to alcohol branded sponsorship in sport clubs. Here we did need to rely on self-report by respondents. This memory-based measure can be affected by the interpretation of the respondent and can be highly correlated to potential

confounders, such as past drinking experience (Stacy, Zogg, Unger, & Dent, 2004) in the sense that drinkers may be more familiar with the product and may memorize alcohol branding better. This brings us to an important limitation of this study: The use of cross-sectional data. We cannot rule out the possibility that higher (report of) alcohol branded sponsorship exposure is a result of drinking experience. Yet, by adding drinking behavior at Time 1 as predictor, analyses show that, although alcohol usage and expectancies are already influenced by drinking at the start of the study, the fact that different types of alcohol-branded sport sponsorship has an unique influence, suggests that non-drinkers at Time 1 were influenced by the marketing endeavours and started drinking during the course of our investigation. The pattern of results was also found when only investigating the non-drinkers at Time 1 (see footnote 6). These analyses thus support the model we have presented. The frequency of exposure to alcohol-branded sport sponsorship among respondents indicates the degree in which alcohol producers are able to reach young people at a very vulnerable age, and that this effect is long-term.

As in most countries, the volume of sport sponsorship within television programs and within sport clubs is not regulated by law in the countries examined. These countries rely on self-regulation which seems to be unable to protect young people against high exposure to alcohol marketing in sports, nor protect them against the harmful impact of this exposure on their drinking. Results of this study show a need for governments to seriously address this issue and to limit the volume of alcohol branded sport sponsorship through legislation.

Conclusions study B

The data analyses presented suggest that exposure to alcohol-branded sport sponsorship is associated with recent drinking over time. This finding was robust after controlling for both exposure to non-alcohol-sponsored football championships and membership of sport clubs, demographic factors and alcohol use at the start of the study. Consequently, alcohol-branded sport sponsorship (similar to alcohol marketing practices in other media channels) can be seen as a serious but avoidable danger to adolescents' health. The consistency of this effect among the four European countries and its effect size seriously raises the demand for legal restrictions on the volume of alcohol-branded sport sponsorship in European countries.

Conclusions

Take home messages:

1. AMPHORA survey data indicate that European youngsters from various countries are highly aware of alcohol marketing on the internet;
2. AMPHORA survey data indicate that European youngsters report high exposure to online alcohol marketing;
3. Our findings indicate that higher exposure to online alcohol marketing is associated with higher expectancies of alcohol and higher odds of drinking, and that this effect is maintained over time.
4. The results of the analysis support a ban on online alcohol marketing in order to protect youngsters from the harmful effects of exposure to alcohol marketing via the internet.
5. AMPHORA survey data indicate that European youngsters from various countries are highly aware of alcohol-branded sport sponsorship in sport clubs;
6. AMPHORA survey data indicate that European youngsters report high exposure to alcohol-branded sport sponsoring on TV and in sports clubs;
7. The findings reported here indicate that higher exposure to alcohol-branded sport sponsorship is associated with higher alcohol expectancies and higher frequencies of recent drinking, and that this effect is sustained over time.
8. The impact of alcohol marketing (online and at sports events) on the drinking behaviour of young people is largely mediated by alcohol expectancies.
9. Results of these analyses strongly support a ban on alcohol-branded sport sponsorship at televised events and in sports clubs, to protect young people from the harmful effects of exposure to alcohol-branded sport sponsorship.
10. The impact of alcohol-branded sport sponsorship is no different from the impact of exposure to other types of alcohol marketing. Consequently, policy initiatives need to be comprehensive and to address alcohol marketing in its many varied forms.

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Tables study A.

Table 1. Descriptives of variables included in the analyses

	M	SD	1.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Gender	-	-	-															
2. Age	13.95	.72	.03*	-														
3. Smoking	-	-	.05**	.26**	-													
4. Education	-	-	-.03*	.31**	-.03*	-												
5. Germany	-	-	.02	-.08**	-.06**	.22**	-											
6. Italy	-	-	-.01	.60**	.19**	.40**	-.31**	-										
7. Netherlands	-	-	.01	-.12**	-.09**	.21**	-.28**	-.33**	-									
8. Poland	-	-	-.01	-.40**	-.04**	-.77**	-.34**	-.39**	-.36**	-								
9. Alcohol usage last 30 days T1	-	-	.08**	.27**	.50**	.06**	-.01	.20**	-.08**	-.11**	-							
10. Online marketing	1.65	.69	.07**	.04**	.30**	-.11**	-.11**	.02	-.05**	.12**	.38**	(.74)						
11. Alcohol usage last 30 days T2	-	-	.08**	.20**	.35**	.07**	.06**	.13**	-.02	-.16**	.41**	.22**	-					
12. Negative alcohol expectancies	1.81	.87	.06**	.04**	.03*	.05**	-.05**	.07**	.03**	-.05**	.01	.06**	.01	(.87)				
13. Activated alcohol expectancies	2.81	1.31	-.06**	.09**	.18**	.09**	.02	.10**	-.03*	-.09**	.18**	.17**	.30**	.44**	(.91)			
14. Positive alcohol expectancies	2.64	1.10	.01	.06**	.20**.	.04**	.07**	.003	.001	-.06**	.20**	.18**	.35**	.29**	.85**	(.91)		
15. Sedation alcohol expectancies	2.14	1.33	.09**	.10**	14**	.07**	.04**	.10**	-.07**	-.07**	.13**	.14**	.22**	.64**	.63**	.63**	(.78)	
16. Computer time	-	-	-.09**	-.03**	.15**	-.13**	.08**	-.16**	-.01	.10**	.15**	.21**	.13**	-.04**	.09**	.13**	.01	-

Note. N = 6651 (listwise); Cronbach's Alpha's are depicted on the diagonal

* $p < .05$; ** $p < .001$

Table 2. Regression results online alcohol marketing exposure on alcohol expectancy scales on T2.

	Model 1. Negative		Model 2. Activated		Model 3. Positive		Model 4. Sedation	
	β	t	β	t	β	t	β	t
Male	.05***	4.29	-.07***	-5.94	-.03*	-2.20	.08***	6.43
Age	-.01	-.83	-.03	-1.88	.004	.25	.01	.62
Smoking	.02	1.25	.10***	7.36	.11***	7.93	.08***	5.38
Education	.01	.54	.07***	3.77	.03	1.31	.04*	2.12
Germany(a)	-.08***	-4.84	-.02	-1.37	.10***	5.97	-.03	-.19
Netherlands(a)	-.03	-1.63	-.06***	-3.55	.05**	3.11	-.08***	-4.87
Poland(a)	-.10***	-3.68	-.08**	-3.12	.004	.18	-.07**	-2.60
Alcohol use last 30 days T1	-.10**	-3.42	.17***	5.87	.21***	6.99	.08**	2.84
Online T1	.05**	3.28	.15***	9.67	.15***	9.23	.12***	7.67
Alcohol use T1 * online T1	.08*	2.42	-.13***	-4.04	-.14***	-4.31	-.07*	-.2.19
Computer time	-.03*	-2.52	.04**	3.38	.06***	4.94	-.01	-.93
N	6651		6651		6651		6651	
R2	0.018		0.074		0.065		0.049	

***p<.001; **p<.01; *p<.05. Adjusted for all predictors shown in the table. (a) Italy is taken as a reference group.

Table 3. Regression results online alcohol marketing exposure on alcohol use last 30 days on T2.

	Model 1.		Model 2. Mediation model	
	β	t	β	t
Male	.09***	8.01	.10***	9.49
Age	.04*	2.57	.04*	2.56
Smoking	.15***	12.04	.12***	10.03
Education	-.08***	-4.62	-.09***	-5.34
Germany(a)	.05**	3.17	.02	1.03
Netherlands(a)	.01	.41	-.01	-.31
Poland(a)	-.17***	-7.23	-.18***	-7.81
Alcohol use last 30 days T1	.41***	15.37	.34***	13.31
Online T1	.12***	8.01	.08***	5.41
Alcohol use T1 * online T1	-.18***	-6.22	-.13***	-4.74
Comp4	.06***	4.79	.04***	3.67
negativeT2			-.13***	-9.24
activatedT2			.07***	3.36
positiveT2			.19***	8.65
SedationT2			.061***	3.55
N	6651		6651	
R2	0.231		0.301	

***p<.001; **p<.01; *p<.05. Adjusted for all predictors shown in the table. (a) Italy is taken as a reference group.

Tables Study B.

Table 1. Descriptives of variables included in the analyses

Correlations[c]

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.
1. Male	,49	,500	1																		
2. Age	13,950	,717	,029*	1																	
3. Smoking behaviour T1	-	-	,050**	,261**	1																
4. Education level T1	-	-	-,025*	,314**	-,028*	1															
5. Playing sports T1	-	-	,068**	-,214**	-,028*	-,160**	1														
6. Germany	,208	,406	,020	-,076**	-,062**	,223**	,062**	1													
7. Italy	,262	,440	-,013	,601**	,190**	,402**	-,211**	-,305**	1												
8. Netherlands	,229	,420	,009	-,116**	-,093**	,215**	-,131**	-,279**	-,325**	1											
9. Poland	,302	,459	-,012	-,403**	-,041**	-,779**	,267**	-,336**	-,392**	-,358**	1										
10. Alcohol usage last 30 days T1	-	-	,081**	,268**	,499**	,054**	,006	-,013	,200**	-,084**	-,104**	1									
11. Sponsoring own sport club	,09	,306	,113**	-,028*	,018	,089**	,089**	,008	-,129**	,278**	-,138**	,059**	1								
12. Watching alcohol championships	2,77	1,308	,366**	-,060**	,031*	,028*	,191**	,204**	-,155**	,063**	-,090**	,086**	,209**	1							
13. Alcohol usage last 30 days T2	-	-	,123**	,196**	,345**	,069**	,015	,064**	,124**	-,016	-,161**	,412**	,075**	,137**	1						
14. Negative alcohol expectancies	1,806	,866	,058**	,037**	,024	,050**	-,025*	-,047**	,066**	,033**	-,052**	,005	-,018	,000	,007	1	(.87)				
15. Activated alcohol expectancies	2,812	1,132	-,058**	,086**	,182**	,094**	,018	,019	,104**	-,033**	-,087**	,179**	-,001	,028*	,300**	,435**	1	(.91)			
16. Positive alcohol expectancies	2,644	1,101	-,009	,058**	,195**	,040**	,045**	,070**	,002	-,003	-,061**	,199**	,031*	,090**	,349**	,290**	,852**	1	(.91)		

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.
17. Sedation alcohol expectancies	2,135	,836	,092**	,098**	,141**	,067**	-,005	,034**	,102**	-,066**	-,067**	,131**	-,009	,053**	,218**	,642**	,634**	,630**	1	(.78)	
18. Watching non-alcohol championships	2,64	1,518	,382**	,044**	,083**	,055**	,154**	-,019	,038**	,094**	-,105**	,122**	,209**	,836**	,148**	,025*	,027*	,067**	,057**	1	
19. Member sport club	,11	,319	,182**	-,022	,050**	,045**	,051**	,014	-,120**	,207**	-,086**	,058**	,249**	,253**	,088**	,001	-,004	,040**	,022	,271**	1

Note. N = 6608 (listwise); Cronbach's Alpha's are depicted on the diagonal

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2. Regression results sponsored championships on alcohol expectancy scales.

	Model 1. Negative		Model 2. Activated		Model 3. Positive		Model 4. Sedation	
	Standardized B	t	Standardized B	t	Standardized B	t	Standardized B	t
Male	.07***	4.90	-.09***	-6.75	-.06***	-4.30	.08***	5.93
Age	-.02	-1.14	-.02	-1.52	.01	.77	.01	.49
Smoking	.03	1,71	.13***	9.26	.14***	9.90	.09***	6.54
Education	.02	.76	.07**	3.43	.02	.90	.05*	2.26
sports	-.01	-.41	.04**	3.06	.04**	3.36	.00	.105
Germany(a)	-.01	-.25	.02	.91	.06**	3.13	.03	1.429
Netherlands(a)	.05**	2.63	.01	.36	.04	1.95	-.04	-1.74
Italy(a)	.08**	3.22	.07**	2.88	-.01	-.36	.06*	2.12
Non-alcohol championships	.01	.49	-.04	-1.66	-.03	-1.21	-.02	-.71
alcohol championships	-.04	-1.62	.09***	3.59	.11***	4.16	.04	1.60
Alcohol use last 30 days T1	-.10**	-3.21	.16***	5.50	.17***	5.89	.09**	2.98
Alcoholchampionships* alcoholuse T1	.09**	2.97	-.06*	-2.04	-.05	-1.58	-.03*	-1.10
N	6652		6652		6652		6652	
R2	0.014		0.063		0.068		0.040	

***p<.001; **p<.01; *p<.05. Adjusted for all predictors shown in the table. (a) Poland is taken as a reference group.

Table 3. Regression results sponsorship own sport club on alcohol expectancy scales.

	Model 1. Negative		Model 2. Activated		Model 3. Positive		Model 4. Sedation	
	Standardized B	t	Standardized B	t	Standardized B	t	Standardized B	t
Male	.07***	4.90	-.07***	-6.75	-.04**	-4.30	.08***	6.65
Age	-.01	-1.14	-.02	-1.52	.01	.77	.01	.66
Smoking	.03	1,71	.13***	9.26	.14***	9.90	.10***	6.71
Education	.02	.76	.07***	3.43	.02	.90	.05*	2.46
sports	.00	-.41	.05***	3.06	.05***	3.36	.01	.43
Germany(a)	-.01	-.25	.03	.91	.08***	3.13	.03	1.64
Netherlands(a)	.06**	2.63	.01	.36	.04	1.95	-.04	-1.77
Italy(a)	.08**	3.22	.06**	2.88	-.02	-.36	.05	1.79
Member sport club	-.01	.49	-.01	-1.66	.02	-1.21	.01	1.01
Sponsorship own club	-.04*	-1.62	.01	3.59	.02	4.16	-.01	-.66
Alcohol use last 30 days T1	-.02	-3.21	.12***	5.50	.15***	5.89	.06***	4.25
Sponsorship own club* alcoholuse T1	.022	2.97	-.03*	-2.04	-.04**	-1.58	-.01	-.79
N	6608		6608		6608		6608	
R2	0.013		0.061		0.065		0.042	

***p<.001; **p<.01; *p<.05. Adjusted for all predictors shown in the table. (a) Poland is taken as a reference group.

Table 4. Regression results sponsorship championships on alcohol use last 30 days on T2.

	Model 1.		Model 2. Mediation model	
	Standardized B	t	Standardized B	t
Male	.06***	4.73	.08***	6.77
Age	.05**	3.16	.04**	3.06
Smoking	.18***	13.73	.14***	11.09
Education	-.09***	-4.91	-.10***	-5.68
sports	.04***	3.77	.03**	2.86
Italy(a)	-.03	-1.77	-.01	-.59
Netherlands(a)	-.03*	-2.22	-.01	-1.03
Poland(a)	-.20***	-9.78	-.18***	-9.33
Non-alcohol championships	.01	.62	.03	1.20
alcohol championships	.07**	3.23	.04	1.76
Alcohol use last 30 days T1	.38***	14.27	.31***	12.36
Alcoholchampionships* alcoholuse T1	-.10***	-3.86	-.07**	-2.95
negativeT2			-.14***	-9.35
activatedT2			.08***	3.60
positiveT2			.19***	8.64
SedationT2			.06***	3.64
N	6652		6652	
R2	0.228		0.300	

***p<.001; **p<.01; *p<.05. Adjusted for all predictors shown in the table. (a) Germany is taken as a reference group.

Table 5. Regression results sponsorship own sport club on alcohol use last 30 days on T2.

	Model 1.		Model 2. Mediation model	
	Standardized B	t	Standardized B	t
Male	.07***	6.56	.09***	8.30
Age	.04**	2.86	.04**	2.76
Smoking	.18***	13.80	.14***	11.14
Education	-.09***	-5.12	-.10***	-5.92
sports	.05***	4.12	.03***	3.03
Italy(a)	-.04*	-2.42	-.01	-.63
Netherlands(a)	-.05**	-3.47	-.02*	-1.77
Poland(a)	-.21***	-10.74	-.19***	-9.98
Member sport club	.03**	2.82	.03	2.53
Sponsorship own club	.04**	3.23	.03**	2.60
Alcohol use last 30 days T1	.30***	22.80	.26***	20.20
Sponsorship own club* alcohol use T1	-.05***	-3.39	-.03*	-2.39
negativeT2			-.14***	-9.43
activatedT2			.08***	3.73
positiveT2			.19***	8.59
SedationT2			.06***	3.69
N	6652		6652	
R2	0.300		0.302	

***p<.001; **p<.01; *p<.05. Adjusted for all predictors shown in the table. (a) Germany is taken as a reference group.