

## SPECIAL ISSUE: THE MESSAGE AND THE MEDIA

### Alcohol Portrayal on Television Affects Actual Drinking Behaviour

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**Abstract** — **Aims:** Alcohol portrayal in movies and commercials is generally positive and might stimulate young people to drink. We tested experimentally whether portrayal of alcohol images in movies and commercials on television promotes actual drinking. **Methods:** In a naturalistic setting (a bar lab), young adult male pairs watched a movie clip for 1 h with two commercial breaks and were allowed to drink non-alcohol and alcoholic beverages. These participants were randomly assigned to one of four conditions varying on the type of movie (many versus few alcohol portrayals) and commercials (alcohol commercials present or not). **Results:** Participants assigned to the conditions with substantial alcohol exposure in either movies or commercials consume more alcohol than other participants. Those in the condition with alcohol portrayal in movie and commercials drank on average 1.5 glasses more than those in the condition with no alcohol portrayal, within a period of 1 h. **Conclusions:** This study—for the first time—shows a causal link between exposure to drinking models and alcohol commercials on acute alcohol consumption.

## INTRODUCTION

The ethics and legality of advertising disputed commodities is under debate. For tobacco, the use of which has straightforward detrimental health consequences, advertising has been prohibited or minimized, in many countries. For alcohol, the use of which (as opposed to misuse) is generally accepted in most Western countries, the picture is more complex. Many prevention workers and policy makers demand total prohibition of alcohol advertising, whereas the alcohol-producing industry claims to be responsible, encouraging sensible drinking habits, e.g. in the Netherlands by only aiming adverts at mature age groups. One argument in this debate is whether or not alcohol portrayals and advertising have a causal effect on drinking behaviour.

Despite ample survey research on portrayal of alcohol in movies, soaps and commercials, and the potential link with alcohol preferences and drinking behaviours, little evidence has been found on actual effects of alcohol commercials on television or, broader, the overall exposure of alcohol on television (Baillie, 1996). A number of survey studies have reported associations between recall of alcohol in the media (Connolly *et al.*, 1994) and outcomes like alcohol expectancies (Kotch *et al.*, 1986; Kulick and Rosenberg, 1996; Winslow, 1998) or consumption (Stacy *et al.*, 2004; Ellickson *et al.*, 2005), and argue that this can be interpreted as an effect of alcohol exposure in movies, television programmes and commercials on drinking behaviour of young people. In addition, substance use by leading characters in movies and soaps, as well as alcohol commercials on television, might increase social acceptance of substance use and might foster initial and continued use in young people (Aitken *et al.*, 1988; Grube, 1993; Robinson *et al.*, 1998; Engels *et al.*, 1999; Distefan *et al.*, 2004; Ellickson *et al.*, 2005; Thomsen and Revke, 2006). Finally, some studies show prospective associations between exposure to alcohol images (Connolly *et al.*, 1994; Sargent *et al.*, 2006) or television and music video exposure in general (Van den Bulck

and Beullens, 2006; Van den Bulck *et al.*, 2006), and alcohol consumption.

As far as we know, no controlled, randomized experiment has been conducted on whether exposure to alcohol on television affects actual drinking. A reason for this lack of research may lie in the fact that influence from exposure to television images is expected to take place over a longer time, through changes in associations, cognitions and expectancies (Robinson *et al.*, 1998), which hampers the possibility to conduct a thorough experiment. This expectation of the mechanism of influence may be accurate when it comes to persuading people in their considerations to buy long-lasting goods like, for example, cars or kitchen equipment; however, exposure to alcohol on television may have direct effects on consumption. This may be the case, since drinking alcohol, just like eating snacks (Halford *et al.*, 2004; Snoek *et al.*, 2006) or smoking cigarettes, often takes place while watching television. Even though the linkage between direct and long-term effects of exposure to alcohol on television may be modest, direct influence from television may illustrate the persuasive power of exposure to alcohol images, and moreover, direct consumption resulting from effects of alcohol exposure on television may be harmful in itself, when it leads to higher drinking levels.

Potential underlying mechanisms for a direct link between alcohol portrayals and individual alcohol use are related to norm setting, habit formation and imitation. First, movies, soap operas and advertisements mostly portray substances in a positive way by using prototypes of the 'ideal' person in an appealing context (Everett *et al.*, 1998), e.g. drinking by popular leading characters in movies, soaps and alcohol commercials.

Second, when people associate a specific cue or event (e.g. watching a soap in which one of the actors often drink) to a specific behavioural pattern (e.g. taking a beer), this might become habitual and automatic behaviour (Aarts and Dijksterhuis, 2003). In a sense, the alcohol cues imbedded in a specific context might lead to direct responses (craving and subsequent alcohol use), especially when this link becomes automatic.

Third, alcohol cues in commercials and watching characters consuming alcohol on screen might lead to drinking through the mechanism of imitation. Research on imitation and substance use (Quigley and Collins, 1999) strongly support the assumption that when people are in the company of a drinker, the drinking pace of the other affects individual drinking rates. There are at least two reasons why this effect occurs: direct imitation and identification. There is a great amount of evidence from neuroscience and psychology showing that people automatically and outside awareness are 'wired' to take over each other's behaviour. When we observe someone perform a certain action (e.g. pick up a glass and drink), the pre-motor representation of that action (the goal and the muscles involved) is activated in our brains as if we are about to perform that action ourselves. There is ample evidence indicating that also on an overt level, people often imitate others, most of the time without their conscious awareness (Chartrand and Bargh, 1999). This might also apply to watching people drinking on screen. Furthermore, our tendency to take over other people's behaviour depends on the closeness we feel towards those people. How much do we empathize with them? Like them? Feel connected to them? Overt imitation is moderated by these subjective factors (Chartrand and Bargh, 1999). With respect to alcohol portrayals, this suggests that identification with actors and transportation into the storyline may be important factors in the imitation of an actor's drinking behaviour—especially since actors are often selected on their capacity to get people engaged and empathizing with him or her. Furthermore, most TV-shows, movies and commercials are designed to get people emotionally involved in them (transportation). Together this might imply that good actors in good programmes are most likely to be imitated (consciously or non-consciously). In sum, different mechanisms might account for the effect that exposure to alcohol cues in movies or commercials causes people to drink.

In the current experimental study, we test whether exposure to alcohol portrayal in movies and in commercials affects alcohol consumption.

## METHODS

### Participants

The sample consisted of 80 male students recruited at the university, ranging in age from 18 to 29 years old ( $M = 21.45$ ,  $SD = 2.19$ ). The males were recruited by handing out flyers and also by directly asking people to participate. They were asked to come with a male friend.

### Design

All 40 couples were randomly assigned to one of the four different movie conditions, resulting in 20 males in each condition. The four movie conditions were alcoholic movie with neutral and alcohol commercials: AM/AC; alcoholic movie with neutral commercials: AM/NC; non-alcoholic movie with neutral and alcohol commercials: NM/AC; and non-alcoholic movie with neutral commercials; NM/NC (Table 1).

### Procedure

The couples were invited to the bar laboratory at the campus of the Radboud University Nijmegen for a 1.5-h session. Even

Table 1. Overview of the design of the study

		Alcohol commercial (AC)	
		Yes	No
Movie Alcohol	Yes	10 couples $N = 20$ AM/AC	10 couples $N = 20$ AM/NC
	No	10 couples $N = 20$ NM/AC	10 couples $N = 20$ NM/NC

though it was unnecessary for our research questions to invite couples, we did so to encourage the participants to feel free to drink alcohol while watching the movie, which would be less likely if participants would be alone. The study was presented as an examination of general TV viewing behaviour in daily life and took place in the late afternoon. We used a naturalistic setting, to increase the ecological validity of the study and minimize demand characteristics (see Bot *et al.*, 2005). The setting is a specially equipped relaxing room at our lab, with a comfortable couch and a big TV screen, like a home cinema. Participants were told that staff members normally used this setting. We created a cosy corner in this room, just like a student room, with a leather couch, an easy chair and a small table with an ashtray and nuts or chips, situated in front of a large screen and a projector. A refrigerator with soft-alcoholic beverages (i.e. beer and wine) and soft drinks (i.e. cola and orange soda) was within arm's reach. The choice of the four different drinks arose from the assumption that these are the most popular drinks consumed by young Dutch people while watching a movie. It is essential to mention that soft-alcoholic drinks in the Netherlands are relatively cheap. This implies that offering drinks for free does not encourage excess drinking for the majority of Dutch youths. Afterwards, we asked the participants if they had an idea of the real aim of the study. They strongly endorsed the credibility of the setting because only eight of them had more or less an idea of the aim of our study; the others did not even think alcohol was part of it. None of them guessed the real aim of the study. The local ethical committee agreed on the protocols used in the bar lab studies.

First, each couple was randomly assigned to one of the four conditions. After the couple entered the bar laboratory, they were asked to sit in front of the large screen, where the procedure of the study was explained to them. They were told that they would see a movie clip interrupted by two commercial breaks and just had to act like they were relaxing at home. Further they were told that they could get free drinks out of the refrigerator and that they were allowed to smoke while watching the movie. Nuts or chips were offered for free as well. After the instructions, the experimenter left the room to let the participants watch the movie clip.

The movie clip lasted ~1 h. When the movie clip ended, participants were asked to fill in a questionnaire containing various questions about the movie, the commercials, drinking habits, type of relationship with the one with whom they watched the movie and personality. This took ~30 min. After 1.5 h, participants went home. They were offered a free taxi when they drank three bottles of beer or wine or more (0.2 l). Participants received 9 euros for their participation.

The movies 'American Pie 2' (2001) and '40 Days and 40 Nights' (2002) were selected because they were comparable concerning genre and MPAA-rating (The Motion Picture Association of America). This movie rating system is a voluntary

system sponsored by the Motion Picture Association of America and the National Association of Theatre Owners to provide parents with advance information on films, enabling parents to make judgements on movies they may or may not want their offspring to see. '40 Days and 40 Nights' is a comedy with an R-rating for strong sexual content, nudity and language, and was used in the 'Non Alcoholic movie' condition. 'American Pie 2' is a comedy with the same rating with the addition of crude humour and drinking content and was used in the 'Alcoholic movie' condition. The user ratings on IMDB.com (Internet Movie Database; an internet site visited by 38 million visitors each month) were 6.2 for 'American Pie 2', judged by 29,769 users, and 5.3 for '40 Days and 40 Nights', judged by 11,901 users, on a scale from 1 'awful' to 10 'excellent'.

In 'American Pie 2', characters drank alcohol 18 times and an additional 23 times alcoholic beverages were portrayed. In '40 Days and 40 Nights' characters consumed alcohol 3 times and alcoholic beverages were portrayed 15 times. Alcohol portrayal in the movies was coded by two observers and correspondence in terms of Cohen's kappa was high ( $>0.90$ ).

After 14 and 33 min, the movie clips were interrupted by a commercial break for 3.5 min, containing either exclusively neutral ads (e.g. promoting a car or a video camera) or neutral ads combined with alcohol ads. Each of the combined breaks contained two alcohol commercials; adding more alcohol commercials would be unrealistic. Please note that in the Netherlands alcohol commercials are allowed in movie theatres as well as on national TV channels. The ads were selected carefully; we avoided humour and made sure the two commercial breaks did not differ in number of ads, length and diversity of the presented products.

During the hour, the participants were watching the movie clip; video and audio recordings were conducted. One camera was used (flexible with a zoom), hidden in a corner of the bar laboratory. We operated the camera in an observation room next to the bar laboratory. We asked all participants to give written permission for making video and audio recordings during the experiment and to allow us using them for research purposes. We informed people about the observations afterwards. We have done this before and got ethical approval for this procedure (cf. Larsen *et al.*, 2009). We explicitly asked people afterwards whether they agreed on using these observations, and none of the declined.

### Measures

*Appreciation of the movie.* Appreciation of the movie was measured with nine questions on a 5-point rating scale with responses ranging from 1 'completely disagree' to 5 'completely agree'. Examples of items are 'I liked the movie' and 'I appreciated the theme of the movie' (Cronbach's  $\alpha = 0.88$ ).

*Familiarity with the movie.* Participants were asked if they had seen the movie before.

*Alcohol consumption (self-reports).* The questionnaire contained questions about participants' alcohol use and they were asked to fill in how many drinks they normally drink in 1 h while watching TV (Bot *et al.*, 2005). They had to provide answers for the number of alcoholic and non-alcoholic drinks. Further, heavy drinking was assessed by the frequency of 6+ drinking with responses ranging from 1 'never' to 7 'more

than twice a week' (Engels *et al.*, 1999). Also, frequency of drinking was assessed by asking about how often participants had drunk in the past 12 months. We finally asked to report which of the past 6 days (Tuesday to Sunday) they drank alcoholic beverages and how many. The summed total of the last 7 days was the measure used in the analyses (Hajema and Knibbe, 1998).

*Alcohol consumption (observational data).* We counted the bottles of drinks consumed in the 1-h movie session. To assess the amount consumed by each participant, each recording was observed by two independently coding-trained observers. The reliability was very high: correspondence in terms of number of consumptions, type of beverage and number of sips was 100%. Bottles of beer contained 200 ml; bottles of wine and soft drink contained 250 ml. To assess the total amount of alcohol consumed, we multiplied the counted number of bottles of wine consumed by 1.6, to attain an outcome relating to the amount of alcohol in one bottle of beer. Consumed soft drinks did not contribute to the total amount of alcohol consumed. If participants did not finish their drinks at the end of the session, we subtracted the estimated remaining volume from the total volume of the bottle.

### Strategy for analysis

First, we reported on the participants' scores on alcohol consumption and appreciation of and familiarity with the movie. Then, we tested our main hypothesis by conducting an analysis of variance on differences in total alcohol consumption between conditions. Further, we conducted multilevel analyses in which we corrected for within-dyad similarities in drinking.

## RESULTS

### Descriptives

The participants' self-reported consumption was relatively high. Only one person reported no occasion in the last 12 months in which he consumed more than six glasses, whereas 36.3% reported to have heavy drinking occasions once or twice a week and 17.5% more than twice a week. The average weekly consumption was 21.05 (SD = 15.12) glasses. Even though the friendship pairs were randomly assigned to one of the experimental conditions, differences were found on initial drinking habits between the participants in the different conditions. The frequency of 6+ drinking did not differ significantly between the conditions, but last week's alcohol consumption was higher in the AM/AC than in the NM/NC condition ( $M = 31.2$ , SD = 17.1 versus  $M = 17.8$ , SD = 11.7 consumptions;  $t(38) = 2.9$ ;  $P < 0.01$ ) [it is also possible that participants exposed to alcohol on TV were biased to reporting higher initial drinking levels (in terms of weekly drinking)].

A total of 59 respondents (73.8%) indicated afterwards that they saw the displayed movie before. In terms of appreciation of the movie, 'American Pie 2' had a score of 3.52 (SD = 0.65) on a 5-point Likert scale ranging from 1 to 5, whereas '40 days and 40 nights' had a score of 3.69 (SD = 0.72) [ $t(78) = 1.05$ ;  $P = 0.30$ ], indicating that differences in actual alcohol consumption cannot be attributed to differences in movie appreciation. Drinking habits (in terms of self-reported heavy drinking) of the 59 participants who indicated to have seen the movie in

Table 2. Corrected means of the total amount of alcohol consumed in each condition

Condition	Alcohol commercials	Non-alcohol commercials	Total
	Mean (SE)	Mean (SE)	Mean (SE)
Alcoholic movie	2.98 (0.29)	1.86 (0.27)	2.38 (0.21)
Non-alcoholic movie	1.95 (0.28)	1.51 (0.29)	1.73 (0.21)
Total	2.42 (0.20)	1.69 (0.21)	2.05 (0.16)

Note.  $N = 80$ ; 20 participants in each condition.

Table 3. Multilevel analyses on the impact of movie and commercial conditions on total alcohol consumption

	Empty model	Full model
	Values (SE)	Values (SE)
Fixed effects		
Intercept	1.32 (0.36)**	1.27 (0.30)**
Alcoholic movie		0.74 (0.35)*
Alcohol commercial		0.83 (0.35)*
Random effects		
Level 1		
Intercept	1.10 (0.36)**	0.79 (0.29)**
Deviance	267.17	258.22 $\chi^2 \Delta(df = 2): 8.95^*$

Note.  $N = 80$ .

\*\* $P < 0.01$ ; \* $P < 0.05$ .

their condition before, did not differ from that of participants who had not seen the movie [ $M = 5.6$ ,  $SD = 1.2$  versus  $M = 5.7$ ,  $SD = 1.0$ ];  $t(38) = -0.15$ , ns, for viewers of 'American Pie 2', and  $M = 5.4$ ,  $SD = 1.4$  versus  $5.07$   $SD = 1.0$ ;  $t(38) = 0.72$ , ns, for '40 Days and 40 Nights']. During the current study, the participants drank an average of 2.05 ( $SD = 1.42$ ) alcoholic consumptions.

### Main analyses

Because differences existed in weekly drinking between conditions, we corrected for these differences by conducting an ANCOVA. This ANCOVA (Table 2) shows that both the portrayal of alcohol in the movie ( $F = 4.44$ ;  $P < 0.05$ ) and that in the commercials ( $F = 4.93$ ;  $P < 0.05$ ) affect alcohol consumption independently when corrected for the participant's weekly alcohol consumption. So, people drank more when exposed to alcohol portrayal in films as well as commercials. We also tested an interaction effect between commercials and movies on observed drinking. There seemed to be a tendency towards significance that may be further explored in future research ( $F = 1.57$ ;  $P > 0.05$ ). Finally, we tested whether our findings were affected by possible clustering effects within pairs. Therefore, we ran our analyses using multilevel regression package MLwiN 2.02. In this model, we entered the occurrence of alcoholic movie and alcohol commercials as dummy variables, considering the respondent pair as level 1 and the individual as level 2. The results are shown in Table 3 and indicate that indeed there is a clustering of drinking within pairs, but even then significant effects were found for both the alcoholic movie and alcohol commercials. There was no significant interaction between conditions.

### Additional analyses

Additional analyses were conducted to test (a) what people drank at the beginning of the movie and whether this differs

across conditions (e.g. when people in the alcohol commercial condition would drink more alcohol immediately in the beginning of the session as compared to the non-alcohol commercial condition, then it would be incorrect to attribute differences between conditions to the effect of commercials) and (b) whether people switched between types of drinks, and whether this differs across conditions. First, we tested for differences between the four conditions on whether they took an alcoholic or non-alcoholic drink in the beginning of the session (ANOVA). There were no significant ( $P = 0.725$ ) differences between conditions. Second, we examined switching in the type of drinks (alcohol versus non-alcohol) in the session. We coded whether people switched the beverage type or not and then we ran an ANOVA. There were no significant differences between conditions ( $P = 0.616$ ). Thus, the percentage that switched from non-alcohol to alcohol beverages, or vice versa, in the session did not vary across conditions. However, this can also be due to lack of statistical power. If one considers the percentages that switched from soda to alcohol, it seems to be different across conditions at first glance: 25% in alcohol movie/alcohol commercial condition, 0% in the alcohol movie/non-alcohol commercial condition, 5% in the non-alcohol movie/non-alcohol commercial condition and 25% in the non-alcohol movie/alcohol commercial condition. Nonetheless, as said, these differences are not significant.

## DISCUSSION

Viewing a movie in which alcohol is portrayed appears to lead to higher total alcohol consumption of young people while watching the movie. Results were straightforward and substantial: those in the condition with alcohol portrayal in movie and commercials drank on average 1.5 glasses more than those in the condition with no alcohol portrayal, within a period of 1 h. They are also in line with the outcomes of several epidemiological and qualitative studies on the associations between alcohol portrayal in the mass media and drinking levels of (mainly young) people (excellent example: Sargent *et al.*, 2006). In contrast with many other studies, however, our study was experimental in nature and focused on actual drinking levels, rather than reported alcohol consumption. To our knowledge, this is the first study in which portrayal of alcohol on a television screen has been linked to immediate drinking behaviour.

One may wonder why many debates have taken place on this subject, without studies on the actual effects of drinking from portrayal of alcohol being conducted. We assume a reason may be that common sense and marketing science state that advertising primarily works by changing consumer attitudes towards a product or by increasing brand salience (e.g. Miller and Berry, 1998), before changes in behavioural patterns can occur. Moreover, to change attitudes, exposure to messages is thought to ideally occur several times. This may have led researchers to assume that effects from alcohol exposure on television can only be found in the long run and cannot be uncovered in an experimental study looking at immediate effects. The present study nevertheless shows that also immediate drinking behaviour is influenced by alcohol portrayals on television. Given the fact that many people watching television at home have the opportunity to drink, these direct effects may actually account for some of overall consumption. If these findings are replicated

in future experimental studies using larger samples, different sub-samples (e.g. women, light drinkers) and also different films and commercials, then there might be implications for policy. First, in many countries, alcohol commercials on TV and in the movie theatres are still allowed. If alcohol commercials lead to direct consumption, even non-brand-specific drinks (e.g. people drink more Heineken after having seen a commercial of Grolsch), banning commercials might lead to lower drinking levels at home. Further, although we obviously do not argue for ban of alcohol portrayals in movies, it might be an idea to explicitly warn people, and especially parents, that (a) movies contain alcohol portrayals and (b) that these alcohol portrayals affect drinking directly.

Based on the recent literature on imitation, there may be several reasons why the observed effects have occurred. First, on a relative low level, seeing an action increases the chances of performing the same action (Chartrand and Bargh, 1999; Iacobini, 2003). This effect might occur regardless of whether it concerns a real-life interaction (Quigley and Collins, 1999) or a stimulus person on a TV screen (Van Baaren *et al.*, 2004). When in real life, anticipation on others' reactions may be among the causes of imitation. Since viewers are aware that they will not be evaluated by characters from a TV screen, this imitation will take place independent from this anticipation. This adds to the evidence for the assumption that humans are wired to imitate. Furthermore, mimicry is increased when we observe people we like or find attractive (Bernieri, 1988). It is not unlikely that the characters in the movies are generally regarded as positive (McIntosh *et al.*, 1999), which should add to the low level priming effect of observing drinking behaviour. Future research could look at the moderating role of liking and identification/transportation (Dal Cin *et al.*, 2004) in imitating drinking behaviour from TV and movie characters. Furthermore, it is also possible that besides imitation, the activation of alcohol norms appeals to pre-existing norms and expectancies of people, which might lead to alcohol intake, or that alcohol portrayals on films and in commercials function as a cue that affects craving in drinkers (Larsen *et al.*, 2009). Future experimental research should reveal which underlying mechanisms account for the link between alcohol portrayals in movies and commercials on one hand and alcohol use on the other. Finally, one might wonder whether effects of portrayals of alcohol are specific to this type of substance. We do not know yet. Nonetheless, there is some preliminary evidence that exposure to food commercials leads to direct palatable food intake in children (Anschutz *et al.*, 2008a) and exposure to thin models in commercials leads restricted intake of palatable food in restraint eaters (Anschutz *et al.*, 2008b). However, it is unknown whether the underlying mechanisms differ for food or drink portrayals in the media.

### Limitations

It is unfortunate that in our experiment, in which participants were randomly assigned, small differences in initial drinking were found between the participants in the various conditions. These differences may be due to the fact that participants reporting higher consumption levels were primed to overrate their weekly drinking by the condition they were in. If this is the case, the actual effect of the portrayal of alcohol may be even stronger. But still, equal reports on drinking habits between the

participants in the conditions would have been more appealing in terms of the straightforwardness of the results. In the future, it may be sensible to assess drinking habits in advance, if possible without triggering the participants to guess the aim of the study.

Also, in our design, we deliberately chose to invite young male pairs (often friends). We did this to ensure that participants felt free to have an alcoholic drink (for which we assumed a certain amount of company would be beneficial), which might have not been the case when they entered our laboratory setting alone. A problem with this choice, however, is that drinking of one participant was not independent of the other in the same pair. It might have been that a movie in which a lot of partying is involved triggers a social process between two participants that affects total drinking amounts. It is on the other hand unlikely that the presence of someone else would affect the finding that individuals directly imitate movie images. Still, it is important to replicate our findings with individual participants (and women) in the future.

This is the first experimental study on alcohol portrayal and actual drinking while watching. It is important to test whether the type of movie is important and whether specific alcohol commercials are more strongly related to drinking. For instance, it would be interesting to test whether the effects of alcohol commercials are beverage specific. Perhaps beer commercials also lead to increased wine consumption or vice versa. We decided to look at movies within a specific genre, which would generally appeal to male young adults in the Netherlands. It is difficult to find movies that are similar on most aspects (familiarity with the movie, likeability of the movie, popularity of characters, distribution of male and female characters, possibility to identify with characters or to transport in the story line) and primarily differ on alcohol use. Nevertheless, from an experimental perspective, it would be better to (a) compare a movie without any alcohol portrayals versus a movie with many alcohol portrayals or (b) to use one movie but to do careful editing to leave out all alcohol scenes in one version. This would lead to a design in which it is easier to attribute differences in findings exclusively to alcohol portrayals. Further, a highly relevant issue is whether alcohol commercials operate as a reinforcer of the effects of alcohol portrayals in movies. Although we did not find a significant interaction effect in our study, future studies with larger samples are needed to reveal whether this still might be the case.

### CONCLUSION

Our study showed that the portrayal of alcohol and drinking characters in movies directly leads to more alcohol consumption in young adult male viewers when alcohol is available within the situation. We want to stress that due to our experimental design, with randomization to conditions, differences between conditions cannot be explained by third factors (as is the case in correlational and observational research). Implication of these findings may be that, if moderation of alcohol consumption in certain groups is strived for, it may be sensible to cut down on the portrayal of alcohol in programmes aimed at these groups and the commercials shown in between. Another implication may be that in situations in which this is possible (e.g. cinemas), availability of alcohol should be reduced

when movies and commercials contain alcohol portrayal and individuals in a group at risk for problematic drinking are present. All in all, it can be concluded that, for young adult males, the portrayal of alcohol on a television screen might lead to increased alcohol consumption.

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