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# **Self-Persuasion in Media Messages**

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# Self-Persuasion in Media Messages

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*Up and down,  
over and through,  
back around-  
the joke's on you.*

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# Chapter 1

**General Introduction,  
Summary and Discussion**

## OPENING WORDS ON ALCOHOL CONSUMPTION

From a global health perspective, alcohol consumption is causally linked to more than 60 types of disease and trauma (Corrao, Bagnardi, Zambon & Veccia, 2004; Rehm et al., 2003; see also Wood et al., 2018). It is currently ranked as the third highest contributor to mortality worldwide (World Health Organization, 2014) and is one of the major avoidable risk factors contributing to global disease and death (Rehm et al., 2009; Rehm et al., 2017).

Steps need to be taken to lower levels of alcohol consumption in order to reduce these serious negative effects on health and mortality (e.g., Casswell & Thamarangsi, 2009). The most effective and cost-effective interventions are regulations that make alcohol more expensive and reduce its availability, reduce or ban alcohol advertising, drink-driving counter measures, and individually-directed interventions for at-risk individuals (Anderson, Chisholm and Fuhr, 2009). There is little scientific research available regarding the effectiveness of counter-advertising and media advocacy, and that which is available has inconclusive results (Anderson, et al., 2009; Babor et al., 2003; Wakefield, Loken & Hornik, 2010; see also Beaglehole & Bonita, 2009). Part of the problem is that media campaigns that promote responsible drinking are ineffective compared to the much larger number of high-quality pro-drinking advertisements in the mass media. In light of these findings, and from the perspective of persuasive communication, serious efforts should be made to test alternative and innovative persuasion methods to increase the effectiveness of anti-alcohol media interventions.

A new and promising persuasion strategy will be the main focus of investigation in this dissertation: self-persuasion. The core of self-persuasion techniques is that people persuade themselves by creating their own reasons to do or not do something. The main aim of this dissertation is to examine whether self-persuasion can be successfully applied in media interventions to reduce alcohol consumption. In the following sections of this introduction, a theoretical framework is first provided via a discussion of the key concepts of self-persuasion. Next, a summary of the empirical chapters in this dissertation is given. Finally, key findings are highlighted in relation to existing research literature, and suggestions for future research are provided.

## SELF-PERSUASION

‘Self-persuasion’ literally refers to all forms of persuasion that are created by oneself and that persuade oneself. This broad definition includes, for example, inner monologue in which one tries to motivate oneself to get off the couch to go to the gym instead of playing video games all day (“*I really need to work out because it is good for my health*”), and exactly the opposite, in which one tells oneself that it is ok to take it easy today, play

some games and not go to the gym (“*I need to relax because yesterday I did a lot of work at the office*”). In the current dissertation, however, self-persuasion is viewed from the perspective of persuasive communication and is therefore more narrowly considered as a compliance-inducing technique. Specifically, self-persuasion from here on in refers to techniques that instigate targets of persuasion to create the means of influence themselves (Briñol, McCaslin & Petty, 2012; Maio & Thomas, 2007). If implemented in the examples given above, this would, for instance mean that my girlfriend would send me a text asking “*Why do you have to go to the gym?*” (if she wants me to work out) or conversely “*Why do you have to take time to relax?*” (if she wants me to play games). In response I will then think of reasons why I should work out (or relax). In other words, by sending the text message, my girlfriend is effectively making me persuade myself in the direction that she intends. It is exactly this technique that is the main focus of investigation in this dissertation, applied in media interventions to reduce alcohol consumption.

Why is self-persuasion effective? This can best be understood by comparing self-persuasion with more commonly used *direct* forms of persuasion in which the means of influence (e.g., arguments or statements) are externally provided instead of self-generated. To put it plainly, people do not like to be influenced, and the persuasive intent of direct forms of persuasion is likely to be recognized (*cf.* Aronson, 1999; Dillard & Shen, 2005; Mussweiler & Neumann, 2000). In turn, this can be experienced as a threat to an individual’s freedom to choose (Brehm, 1966), resulting in self-guarding strategies, such as reactance (Crawford, McConnell, Lewis & Sherman, 2002), which reduce the effectiveness of the persuasion attempt or even increase the unwanted behavior so as to restore freedom of choice (Ringold, 2002).

Self-persuasion (generating your own arguments) has three distinct advantages over direct persuasion. First, self-guarding strategies activated by direct persuasion are much less likely to be used when people persuade themselves. This is because people mentally detect and correct for internally generated information to a lesser extent than for externally provided information (Mussweiler & Neumann, 2000; Wilson & Brekke, 1994). Secondly, reactance -a motivational reaction to resist attempts of influence that threaten freedom of choice (Brem, 1966)- is not activated in response to self-generated arguments, because the freedom to choose is not restricted. Third, when individuals generate arguments, they tend to come up with reasons that they find the most compelling (Brinol et al., 2012; Greenwald & Albert, 1968; Slamecka & Graf, 1986).

For these reasons, self-persuasion seems to hold great promise as a persuasive technique for application in media interventions. Not only do self-persuasive messages have the potential to bypass corrections and reactance responses, by having individuals generate their own arguments, they are effectively tailoring the most persuasive message possible

for themselves. Research into this topic, however - especially in the domain of mediated communication-, is limited. What follows is an overview of self-persuasion research to date, organized in two sections: traditional methods of self-persuasion (overview of self-persuasion research) and self-persuasion in media messages (research implementing self-persuasion techniques in mediated communication).

## TRADITIONAL METHODS OF SELF-PERSUASION

The origin of self-persuasion as a compliance-inducing technique can be traced back to role-playing research by Janis and King (1954). When individuals were instructed to present arguments in favor of various topics (movie theatres, meat supply, and a cold cure) publicly in an informal talk, this ‘role-playing’ resulted in greater opinion change than listening passively to the same talk. The researchers also identified improvisation as another key variable (King & Janis, 1956). Individuals who improvised a speech contrary to their own position (forced military service) adjusted their attitudes to conform to their role behavior more than individuals who read a prepared speech opposing their own position, even though both the improvised and prepared speeches contained similar arguments and conclusions. Combined, these studies show that opinions and attitudes are successfully and indirectly modified by instructing individuals to generate arguments and to present them publicly.

A growing line of research has replicated the findings from these role-playing-based self-persuasion tasks to change attitudes in a variety of contexts, such as smoking (Elms, 1966), politics (Watts, 1967), undergraduate education (Greenwald & Albert, 1968), the importance of empirical research (Friedrich, 1990), and clean local environments (Damen, Müller, van Baaren & Dijksterhuis, 2015). Recent studies have also successfully used self-persuasion tasks to change smoking behavior (Müller et al., 2009) and tipping behavior (Bernritter, van Ooien & Müller, 2017). Over time, self-persuasion techniques have become easier to apply in all types of interventions for two main reasons. First, the presence of an audience is not required for self-persuasion to occur as self-persuasion effects have been found not only by role-playing but also by writing essays (Watts, 1967; Greenwald & Albert, 1968; Friedrich, 1990) or by listing arguments (Damen et al. 2015; Bernritter et al., 2017; Müller et al., 2009). Second, the key factor of the persuasive effects has become clearer, changing from concepts such as “improvisation” (Janis & King, 1954; King & Janis, 1956), “fantasy ability” (Elms, 1966), and “improvised arguments” (Greenwald & Albert, 1968), to simply self-generation of arguments (e.g., Müller et al., 2009). Combined, these studies show that attitudes and behavior can be successfully modified by having individuals generate their own arguments.

Constant in this line of research however, is that self-persuasion techniques rely on *instruction*, and more importantly compliance with this instruction, to generate and present arguments for the effects of self-persuasion to occur. On the one hand, such instruction-based self-persuasion techniques seem a perfect fit for social media platforms because the content there is mostly user-generated. Applied to the topic of this dissertation, interventions could, for example, instruct users to post reasons why they should drink less alcohol, which should result in self-persuasion. The requirement for instruction (and compliance), however, hinders the application of self-persuasion techniques in more traditional mass media messages in the form of, for example, print or television advertisements. That is, it is reasonable to assume that individuals will follow instructions in a laboratory setting, however, in a real-life setting it seems unlikely that individuals will disrupt their ongoing activities to generate and present anti-alcohol arguments when exposed to an advertisement instructing them to do so. Interestingly, research has found a new way to apply the self-persuasion-technique in media messages without the use of instruction.

## SELF-PERSUASION IN MEDIA MESSAGES

Recent research shows that rather than instructing individuals to generate arguments for a certain position, it is also possible to *trigger* the self-generation of arguments by providing an open question in media messages (Glock, Müller & Ritter, 2013; Müller et al., 2009; Müller, Ritter, Glock, Dijksterhuis, Engels & van Baaren, 2016). The underlying idea is that reading a question elicits argument generation in line with the question in the message receiver, effectively resulting in self-persuasion.

Prior to the current dissertation, three studies successfully applied self-persuasion in media messages. Glock et al. (2013) demonstrated that formulating warning labels on cigarette packages as open-ended questions resulted in higher smoking related risk-perception compared to warning labels formulated as statements. Müller et al. (2016) expanded these results on a behavioral level by demonstrating that smokers refrained from smoking longer after seeing a television clip containing questions about “why smoking is bad” compared to statements providing the arguments. Finally, a recent pilot study by Krischler and Glock (2015) showed that formulating alcohol warning labels as closed questions (e.g., “Do you really want alcohol to help you test your limits?”) resulted in higher negative alcohol related outcome expectancies compared to no warning labels. Warning labels formulated as statements had no influence on participants.

This ‘new’ self-persuasion method not only produced promising results in the studies in which it was first developed, it also seems very applicable to media campaigns, especially in the form of print or television advertisements. Such messages could have



a real impact because they have the potential to reach large audiences relatively easily, and would not require (active) compliance from the message receivers, since argument generation would be triggered automatically in response to the question in the message. The latter assumption, however, has yet to be tested empirically, in order to confirm the underlying mechanism of self-persuasion.

### Questions Versus Instruction

The question-based method of self-persuasion operates differently than the instruction-based self-persuasion method. The innovative idea of triggering self-generation of arguments by providing questions removes the requirement for an instruction (and of course compliance with the instruction) to generate arguments. Although this increases the applicability of self-persuasion strategies in media messages greatly, the differences between these methods suggest two important moderators that need to be addressed: message elaboration and commitment.

**Message elaboration.** In traditional self-persuasion method tasks individuals are actively and attentively generating arguments for or against a specified position. In contrast, when applying the new self-persuasion method (i.e., providing questions) in persuasive media messages, it is not guaranteed that individuals exposed to the message will also actively and attentively engage in argument generation. Providing questions should trigger this process (Müller et al., 2016), however, the number of arguments generated is assumed to depend greatly on the extent to which message receivers elaborate on the message, as research has shown that a greater opportunity to elaborate results in more generated thoughts (Clarkson, Tormala & Leone, 2011). Greater message elaboration should result in more arguments generated, and more arguments - based on both common sense as well as research into attitude formation - increase the persuasiveness of the message (e.g., Chaiken, 1980; Maddux & Rogers, 1980; Petty & Cacioppo, 1984).

It should therefore be concluded that self-persuasive media messages providing questions to trigger argument generation are most effective under conditions of high message elaboration. There are however, two reasons why these messages could very well be more effective under conditions of low message elaboration. First, research has shown that generating a few arguments can actually be more persuasive than generating many (Müller, van Someren, Gloudemans, van Leeuwen & Greifeneder 2017). Generating a few arguments is easier than generating many, resulting in feelings of fluency due to the experienced ease of retrieval of the arguments, which in turn results in greater persuasion. Secondly, when messages are more highly elaborated, it becomes increasingly likely that the message receivers will generate counter arguments for the behavior suggested, in conjunction with arguments in line with the question (e.g., Clarkson et al., 2011; Petty, Cacioppo & Heesacker, 1981), which could render the messages less persuasive or even ineffective.

For these reasons, it is important to investigate the role of message elaboration in the effectiveness of self-persuasive media messages. If self-persuasive media messages are effective under conditions of low message elaboration, a short exposure to the messages would be sufficient to produce self-persuasion effects, for example using questions on billboards or in television commercials. Alternatively, if self-persuasive messages are more effective when elaboration of the message is high, interventions could aim for longer exposure, such as by hanging up posters in bars.

**Commitment.** Traditional methods of self-persuasion in the form of presenting arguments to an audience (e.g., Janis & King, 1954; King & Janis, 1956), writing essays (e.g., Friedrich, 1990; Watts, 1967), writing down arguments in an experiment- (e.g., Damen et al., 2015; Müller et al., 2017) or in real-life (Bernritter et al., 2017), and even just in conversations (e.g., Dickerson, Thibodeau, Aronson & Miller, 1992), share the commonality that arguments are presented *publicly*, or are at the very least visible to others. This is important, because publicly presenting arguments in favor or against a position results in the attempts of the presenter/writer to behave and feel in accordance with those arguments. The reason for this can be found in the principle of commitment and consistency (for a review see Cialdini, 2009). Specifically, individuals feel a strong need to appear and behave consistently in their actions to (1) avoid serious interpersonal repercussions, and (2) to enhance their self-concept. Once individuals commit to an act, they then move to appear consistent with those acts in attitudes and behavior. The instruction-based self-persuasion method can therefore be effective, at least in part, because individuals attempt to appear consistent with the arguments they have presented.

When considering the application of the new self-persuasion method (i.e., providing questions) to persuasive printed and/or television media messages, this poses a problem: in such a context public commitment to the arguments generated is not possible. Private commitment, however, might be sufficient to produce self-persuasion effects (if required at all). The reason is that although individuals feel a need to appear consistent towards others (Cialdini, 2009), they also feel the need to be consistent for themselves. That is, people have a strong need to enhance their self-concepts by behaving consistently with their actions, statements, commitments, beliefs and self-ascribed traits (Cialdini & Trost, 1998). The fact that self-persuasion effects were found in the studies by Glock et al. (2013) and Müller et al. (2016), even though no public commitment was required, provides further support for this notion.

Commitment effects are important, however, when considering the application of self-persuasion on social media platforms because posted content there is visible to others. Self-persuasion effects resulting from generating arguments might therefore be enhanced by posting them online because it results in public commitment to the arguments. If so,

this would demonstrate the advantage of self-persuasion interventions on social media over more traditional print- or advertisement media messages. In the context of reducing alcohol consumption, such moderation effects might translate into interventions that aim to have social media users share their reasons for drinking less alcohol, which would result in a greater reduction in alcohol consumption.

## THE PRESENT DISSERTATION

The main aim of this dissertation is to examine whether self-persuasion can be successfully applied in anti-alcohol media interventions to change alcohol-related attitudes, cognitions, and behavior. The dissertation consists of three empirical studies addressing three sub-aims, presented in Chapters 2 to 4. The first sub-aim (Chapter 2) is to assess the previously untested cognitive reactions to self-persuasive media messages, and serves as a proof of principle, establishing that the self-persuasion technique can be applied in a previously untested form (posters) to change a previously untested behavior (alcohol consumption). The second sub-aim (Chapter 3) is to investigate the potentially moderating role of public versus private commitment to self-generated anti-alcohol arguments by having participants post reasons on Facebook why they should not drink alcohol, where they are visible to other users. Finally, the third sub-aim (Chapter 4) is to examine the role of message elaboration in self-persuasion by manipulating exposure time to the anti-alcohol posters from Chapter 2. The content of the chapters is equal to papers which have been published, or are under review for publication.

### Chapter 2: Self-Persuasion in Media Messages: Reducing Alcohol Consumption Among Students With Open-Ended Questions

The two experiments described in Chapter 2 (Loman, Müller, Oude Groote Beverborg, van Baaren & Buijzen, 2018a) investigate whether self-persuasion can be successfully applied in anti-alcohol posters by framing the message as an open-ended question. The first of two experiments in Chapter 2 exposed participants ( $N = 131$ ) either to an anti-alcohol poster framed as an open-ended question (self-persuasion), or as a statement (direct persuasion) for thirty seconds, and subsequently assessed cognitive reactions to the posters. The main outcome variables were the number of pro- and counter- alcohol arguments generated during exposure to the posters assessed using a thought-listing task, and message evaluation, recognition of persuasive intent and experienced negative affect measured using questionnaires.

The results demonstrate that participants indeed generated anti-alcohol arguments in response to the question, providing support for the hypothesis that questions trigger argument generation in line with the question. The questions also resulted in more

favorable message evaluations, a lower recognition of persuasive intent and less experienced negative affect –indicative of less reactance– than the statements. This pattern of results supports the idea that self-persuasive media messages evoke lower reactance responses than direct persuasion counterparts. The second experiment in Chapter 2 built on these findings by testing whether the posters from Experiment 1 were effective in changing actual alcohol consumption. This was done by exposing dyads (i.e., friends;  $N = 122$ ) to one of the two posters or no poster (control condition) during an *ad libitum* drinking session in a bar laboratory, with the amount of alcohol consumed during the session as the main outcome variable. The results show that the self-persuasion poster did not affect the choice to consume alcohol but did reduce alcohol consumption for individuals who chose to drink any alcohol, compared to a direct persuasion poster or no intervention.

Together, the two experiments in Chapter 2 demonstrate the potential of self-persuasion for application in persuasive media messages. Self-persuasion can be applied relatively easily in traditional mass media messages by framing the message as an open-ended question, and is effective in reducing alcohol consumption behavior specifically, or can be adopted and translated into interventions targeting other (health) behaviors.

### Chapter 3: Self-Persuasion on Facebook Increases Alcohol Risk Perception

Chapter 3 (Loman, Müller, Oude Groote Beverborg, van Baaren & Buijzen, 2018b) examined the potentially moderating role of public commitment to generated anti-alcohol arguments by having participants post reasons on Facebook why they should not drink. The fact that posts on the platform are visible to other users allows the possible moderation of self-persuasion via the principle of commitment and consistency (Cialdini, 2009). Specifically, whether self-persuasion could be applied on Facebook was examined by having participants ( $N = 111$ ) generate anti-alcohol arguments for a Facebook group (versus only reading anti-alcohol arguments in other people's posts), while simultaneously examining the potentially moderating role of public commitment to the arguments by having participants actually post (vs. not post) in the Facebook group. The main outcome variables were alcohol consumed during an *ad libitum* drinking session in dyads following the Facebook manipulation, and alcohol risk perception as well as attitudes and intentions to limit alcohol consumption assessed using questionnaires.

The results indicate that generating arguments for the Facebook group is an effective way to increase alcohol risk perception regardless of whether the arguments were posted or not. Contrary to the hypotheses, public commitment to the generated arguments resulted in more negative attitudes towards limiting alcohol consumption, however, no differences in alcohol consumption were found during the *ad libitum* drinking session.

The combined results of this experiment indicate that self-persuasion can be used on Facebook to increase awareness of the risks associated with alcohol consumption, but it does not reduce subsequent alcohol consumption.

#### **Chapter 4: Quick Question or Intensive Inquiry: The Role of Message Elaboration in the Effectiveness of Self-Persuasive Anti-Alcohol Posters**

Chapter 4 (Loman, de Vries, Kukken, van Baaren, Buijzen & Müller, 2018) examined the role of message elaboration in the effectiveness of self-persuasive anti-alcohol posters. Similar to the procedure in Chapter 2, this was addressed by examining whether the anti-alcohol posters framed as an open-ended question (self-persuasion) were more effective than posters framed as statement (direct persuasion) to reduce alcohol consumption in a beer taste test. The role of message elaboration was examined by briefly exposing participants ( $N = 149$ ) to one of the posters when entering the bar laboratory (low message elaboration) or continuously during the experiment (high message elaboration), compared to a control condition (no poster). The results show, contrary to expectations, that both posters failed to affect alcohol consumption, regardless of exposure length. This null finding was surprising, but might be a result of the novel alcohol consumption measurement task (the beer taste test) employed in the experiment which forced participants to drink, instead of the free-choice paradigm used in the other studies in this dissertation.

### **DISCUSSION**

The present dissertation investigated whether self-persuasion can be successfully applied in anti-alcohol media interventions to change alcohol-related attitudes, cognitions and behavior. The implications of the experiments (Chapter 2 through 4) are discussed in the following section.

#### **Questions Trigger Argument Generation**

Prior to the current dissertation, two studies showed that self-persuasion can be successfully applied in media messages by framing the messages as open-ended questions to increase smoking risk perception (Glock, et al., 2013) and to decrease smoking behavior (Müller et al., 2016). The authors of these studies assumed that reading the question triggered the self-generation of arguments ‘why not to smoke’, which subsequently resulted in self-persuasion. The current dissertation took a step back and started by empirically testing this assumption. The results of Experiment 1 in Chapter 2 show that participants who were exposed to an anti-alcohol poster framed as an open-ended question indeed generated their own arguments as to ‘why they should drink less alcohol’, which did not

happen in response to anti-alcohol statements. To our best knowledge this is the first experiment to show that questions trigger argument generation, providing an empirical foundation for the mechanism underlying self-persuasion in media messages through question-framing. The experiment also shows that questions resulted in more favorable message evaluations, a lower recognition of persuasive intent, and lower experienced negative affect compared to statements, indicative of lower reactance responses to the self-persuasion posters. This supports the idea that self-persuasion evokes less reactance than direct persuasion. Taken together, these findings support the hypothesized underlying mechanism of self-persuasion through question framing in persuasive media messages, providing a missing link that connects theory with experimental studies targeting behavioral change employing self-persuasion in traditional media messages (Glock et al., 2013; Müller et al., 2016).

#### **Self-Persuasion in Posters**

Having established that message receivers indeed generated anti-alcohol arguments when exposed to self-persuasion posters in Experiment 1, the second experiment of Chapter 2 built on these findings by showing that self-persuasion applied in media messages can successfully change behavior on a previously untested topic (alcohol consumption) in a new form (posters). Note that the manipulation was simple (i.e., the presence of a poster) yet effective in reducing alcohol consumption for individuals who chose to consume alcohol. The finding that the choice to consume alcohol was unaffected by the poster, but the amount consumed when chosen to drink was reduced, aligns well with the only previous experiment employing self-persuasion in media messages to change behavior (Müller et al., 2016). Müller et al. (2016) similarly showed that the choice to engage in the target behavior (smoking) was unaffected, but the extent to which the behavior was engaged in (time abstaining from smoking) was reduced.

The experiments in Chapter 2 complement each other. Note that by testing the cognitive reactions to the posters and subsequent behavioral effects in separate experiments, mediation through argument generation cannot be explicitly tested, however, this separation increased the ecological validity of the behavioral effects, because measuring argument generation would probably have made that process more salient, which would have inflated behavioral effects. When combined, the results show that self-persuasion can indeed be successfully applied in posters to change actual alcohol consumption behavior, which is promising for real world application of the persuasion technique.

The experiment described in Chapter 4 attempted to build on the findings in Chapter 2 by examining the role of message elaboration through the manipulation of exposure to the self- and direct persuasion posters. Contrary to expectations however, no behavioral

change effects were found in the experiment, regardless of exposure length. This is surprising, given that the posters are identical in both experiments. We were unable to replicate the findings of Experiment 2 (Chapter 2), or the results of Müller et al. (2016), in Chapter 4. The methodological choice for a beer-taste test paradigm in Chapter 4 could be at the root of the null result. The beer taste test *required* participants to consume alcohol, versus the free choice paradigm used in the other studies. As a direct consequence, participants could have seen the anti-alcohol posters in Chapter 4 as not applicable to them, because they had already agreed to consume alcohol when signing up for the experiment. Participants could therefore have thought the posters were irrelevant to them in this situation instead of thinking of arguments, rendering them ineffective regardless of exposure length.

Alternatively, because participants had already agreed to consume alcohol prior to the start of the beer taste test, their sense of agency over their alcohol consumption might have been reduced, which is shown to decrease the effectiveness of self-persuasion techniques (Damen et al., 2015). In other words, because participants did not feel they could control their alcohol consumption behavior (they had already agreed to drink), there was no self-persuasion.

### Self-Persuasion on Facebook

The experiment described in Chapter 3 adopted a more traditional instruction-based approach by applying self-persuasion on Facebook. This paradigm allowed us to test the potentially moderating role of public commitment on self-persuasion effects in a natural way, which fits the user-generated nature of Facebook content. The findings in this experiment were mixed. On the one hand, it was found that self-persuasion (generating anti-alcohol arguments for Facebook) was effective in increasing alcohol risk perception, a finding that aligns with previous findings by Glock et al. (2013). Notably, this finding was unaffected by actually posting (public commitment) or generating without posting (private commitment) the arguments on Facebook, providing no indication that public commitment can moderate self-persuasion effects. On the other hand, actual alcohol consumption in an *ad libitum* drinking session (similar to Experiment 2 Chapter 2) was unaffected by the manipulations.

The absence of behavioral effects is surprising, because the manipulation required more effort (generating and posting arguments) than the relatively passive exposure manipulations in Experiment 2 in Loman et al. (2018a; Chapter 2). Increased effort was expected to increase behavioral change similarly to the way it increases attitude change due to the higher levels of dissonance experienced between original opinions and the act of presenting counter-attitudinal arguments, resulting in dissonance reducing effort justification (e.g., Linder & Worchel, 1970; Zimbardo, 1965; also see Inzlicht, Shenhav

& Olivola, 2018). In the Facebook experiment therefore, larger behavioral effects in line with Experiment 2 (Chapter 2) were expected. Interestingly, a possible explanation for the ineffectiveness of self-persuasion to change alcohol consumption in the current experiment springs from this very manipulation.

In the Facebook experiment, participants were *instructed* ('forced') to generate their anti-alcohol arguments, whereas in other self-persuasion experiments they were 'triggered' with questions in media messages (Loman et al., 2018a; Müller et al. 2016). This instruction could have reduced self-persuasion effects because participants felt their freedom of choice was restricted, which could have resulted in reactance and therefore no behavioral change. Similarly, "forcing" participants to generate anti-alcohol arguments might have resulted in attributing the reason for generating the arguments to the task instead of to themselves (as a reflection of their own ideas and attitudes), and therefore, reduced the self-persuasion effects. The fact that instruction to generate arguments did result in self-persuasion in previous self-persuasion experiments (for an overview see Loman et al., 2018a), might be due to the Facebook environment in which the arguments were posted. That is, because alcohol consumption -especially on Facebook- is generally discussed positively, instruction to generate and post anti-alcohol arguments might be considered as notably unusual in that context. This in turn increased the likelihood of attributing the reason for doing so to the task. Previous self-persuasion studies were mostly conducted in laboratory settings, in which participants might consider instruction to defend a counter-attitudinal position less unusual because they have less experience in that situation and therefore cannot consider what they would normally do.

Finally, general attitudes towards limiting alcohol consumption were more positive when individuals could keep their arguments private, compared to making them public by posting them on Facebook. This finding is unexpected, because the principle of commitment and consistency (Cialdini, 2009) predicts an opposite pattern of results. It fits, however, with the previously described reactance effect: the self-persuasion manipulation might unintentionally have resulted in a reactance response due to 'forcing' participants to generate and post their arguments online. As a result, participant attitudes were less positive because their freedom to choose was limited. This might have been less of an issue when participants were only asked to generate the arguments without posting them.

### Self-Persuasion in Media Messages

Taken together, the results of the experiments are mixed. Based on published literature, if self-persuasion effects were straightforward, we should have found them consistently throughout the experiments in the current dissertation. Although we tried to trigger self-persuasion in two distinct ways (relatively passive with posters, and with more effort by

creating arguments for Facebook), and measured alcohol consumption in two distinct tasks (*ad libitum* drinking sessions and an alcohol taste test), the mixed results mean we do not have a clear picture of self-persuasion techniques applied in media messages. Overall, the findings in the current dissertation bring up several considerations.

First, it is important to consider the possibility that the behavioral change effects found in Chapter 2 were a result of chance. The fact that only one prior experiment in published literature had a positive behavioral change effect following exposure to a self-persuasion media message (i.e., Müller et al. 2016; note that other self-persuasion media effect studies focused on non-behavioral outcome measures) increases the plausibility of this possibility. For this reason, a conservative interpretation should be used for the results from the combined experiments of Müller et al. (2016) and Loman et al. (2018a). Future experimentation would benefit from pre-registration (in order to avoid publication bias) and ideally a meta-analysis to assess behavioral change effects once a larger number of experiments is available.

Second, it is possible that self-persuasion effects triggered by media interventions to reduce alcohol consumption are simply very small, too small to detect behavioral change effects in Chapter 3 and 4, because the samples were not of sufficient size. Note that even small effect sizes might have tangible real world behavioral change effects when applied in mass media messages. Future experimentation should therefore be more conservative in estimating the effect sizes of self-persuasive media interventions and aim for a large number of test-subjects in order to detect small effects.

Thirdly, it is conceivable that self-persuasion techniques are effective in changing cognitions, but immediate behavior is unaffected or only affected to a very small degree. This idea fits with the increased alcohol risk perception following a self-persuasion intervention in Chapter 3, and the mixed behavioral change effects overall. Theoretically, this interpretation aligns with studies which show that self-generated arguments are seen as more accurate than information that is externally provided (e.g., Hoch & Deighton, 1989; Levin, Johnson & Chapman, 1988; also see Glock et al., 2013). This could mean that self-persuasion interventions can contribute to more perceived risks for health outcomes associated with alcohol consumption, which could reduce consumption patterns (e.g., Health Believe Model; Janz & Becker, 1984; Social Cognitive Theory; Bandura, 1989; 1991; Rosenstock, Strecher & Becker, 1988; Theory of Planned Behavior; Ajzen, 1991; also see: Brewer, Chapman, Gibbons, Gerrard, McCaul & Weinstein, 2007). It is conceivable that such effects only emerge in the long term or after repeated exposure. It could, therefore, be fruitful to assess the long term effects of self-persuasion interventions, possibly in combination with repeated exposure paradigms.

Finally, there could be another factor at play that we did not take into account. In hindsight the overall pattern of results, given the methodological changes made in the experiments, does seem to hint at one specific factor: freedom of choice.

### Freedom of Choice

One of the main advantages of self-persuasion over direct persuasion is that it does not restrict freedom of choice and is therefore less likely to evoke defensive responses such as reactance that guard against the persuasion attempt. ‘*People are convinced that the motivation for change comes from within*’ (Aronson, 1999, p. 875) and therefore do not mentally detect and correct against internally generated information to the same extent as against external persuasion attempts (Mussweiler & Neumann, 2000; Wilson & Brekke, 1994). It is therefore important to consider not only the self-persuasion technique itself when testing its effectiveness in changing behavior, but also the way the technique is applied, and how the target behavior is measured.

Specifically, it is possible that behavioral change is only found in Chapter 2 of this dissertation because the manipulation was ‘triggered’ by posters, and the choice of whether or not to consume alcohol in a drinking session was completely up to participants themselves. In other words, freedom of choice was not restricted anywhere, resulting in positive behavioral change effects. In the third chapter however, participants were instructed (‘forced’) to generate anti-alcohol arguments for Facebook. It is possible that this manipulation was perceived as a restriction of freedom of choice, which could have negated any self-persuasion effects.

In Chapter 4 the manipulation again triggered argument generation using anti-alcohol posters, however this time the choice to consume alcohol was non-optional: participants had agreed to consume alcohol in a beer taste test prior to the start of the experiment. This could have rendered self-persuasion less effective due to reduced agency (Damen et al. 2017), or the participants might have considered the posters not applicable in that setting because they felt they could not control their alcohol consumption. Note that the effects of reduced agency and reduced perceived freedom of choice are similar, but their cause is different. Reduced agency does not result in behavioral change because individuals think they *cannot* change their behavior because they are not free to choose it. Reduced perceived freedom of choice does not result in behavioral change because people *will not* change their behavior because it is not perceived as their own choice to do so.

Future research should prioritize testing the impact of (reduced) freedom to choose on the effectiveness of self-persuasion in media interventions. This could be done, for example, by comparing instruction-based interventions with alternatives that rely on stimulating argument generation by giving individuals a ‘free-choice’ to add comments

to a Facebook group. Alternatively, future research could examine the impact of the measurement task on self-persuasion by directly comparing the effects of self-persuasion posters in an *ad libitum* drinking task with the effects in a forced drinking task, such as the beer taste test.

If indeed self-persuasion is only effective when individuals have full freedom to choose their behavior, this might have important consequences for how self-persuasion effects are researched. Forced-choice measurement tasks would have to be avoided. Such a finding should not be a problem for real life interventions, however, because freedom of choice is generally untampered with there (as opposed to in laboratory tasks). Future studies could therefore examine the effectiveness of the posters to reduce actual alcohol consumption in a real life setting such as a bar.

### Practical Implications

Overall, the application of self-persuasion in anti-alcohol media interventions as investigated in this dissertation yielded mixed results. At the very least, the results are less promising than initially anticipated.

Theoretically, self-persuasion has clear advantages over direct forms of persuasion, as supported by findings in this dissertation. Specifically, lower reactance responses to questions compared to statements, and fewer corrections to internally generated information relative to externally provided information, fit nicely with the results obtained in Chapter 2 (positive message evaluations in Experiment 1) and Chapter 3 (increased alcohol risk perception) respectively. From this we can carefully conclude that (1) self-persuasion techniques are a good option in media interventions that target behaviors that are likely to evoke reactance responses when addressed with direct forms of persuasion, such as alcohol consumption or smoking; and (2) self-persuasion techniques are the preferred option with which to increase risk perception *if* there is some prior knowledge about the target behavior, in order to generate arguments in response to questions. If no arguments, or only ‘bad arguments’ can be thought of, self-persuasion will probably backfire.

Empirically, however, the benefits of self-persuasion over direct persuasion for behavioral change only seem to be visible in the current research when freedom of choice was not tampered with (as in Experiment 2, Chapter 2), and effect sizes were small. In laboratory settings, instructing participation in self-persuasion interventions (as in Chapter 3) or instructing alcohol consumption in the measurement task (as in Chapter 4) appear to remove the immediate behavioral self-persuasion effects. We conclude from this that self-persuasive media interventions in real-life settings should *stimulate* argument generation and participation rather than more ‘forceful’ *instruction*, and are probably most effective in situations where the choice to drink is completely up to the person in

question. Note that the suggestion to stimulate rather than instruct would fit better with real-life interventions in the first place, because instruction will result in compliance in a laboratory setting, but is unlikely to be followed in real life.

Overall, these considerations raise the question of whether it is really helpful to use self-persuasion strategies in media interventions. As stated in the introduction, anti-alcohol messages yield little behavioral change. The studies in this dissertation indicate that the application of self-persuasion techniques in such messages will not be enough to reduce consumption and put a dent in alcohol’s contribution to global disease and mortality. Still, it should be noted that positive effects are found in certain situations in a relatively new and growing line of experimentation (Bernritter et al., 2017; Glock et al., 2013; Krischler & Glock, 2015; Loman et al., 2018a; 2018b; Müller et al., 2016; Müller et al., 2009). In these studies, self-persuasion has consistently outperformed direct persuasion and no persuasion controls. Large scale application might therefore still yield tangible benefits, and at the very least self-persuasion seems more effective than direct persuasion. Further testing seems appropriate.

### Conclusion

The research in this dissertation had mixed results regarding the effectiveness of self-persuasion in media interventions to change alcohol consumption. On the one hand, self-persuasion can be successfully applied in anti-alcohol posters by framing the message as an open-ended question, which results in the self-generation of arguments regarding ‘why to drink less alcohol’, and is more effective than direct persuasion or no persuasion in reducing the alcohol consumption of individuals who choose to drink. Self-persuasion can also be successfully applied on Facebook to increase the awareness of the health risks of alcohol consumption by having individuals generate anti-alcohol arguments for an anti-alcohol Facebook group. On the other hand, two of three experiments failed to change alcohol consumption behavior. This overall pattern of results warrants careful and conservative interpretation. The suggestions for future research above –specifically, the role of freedom of choice- could be fruitful in order to identify the boundary conditions for successful self-persuasion in media interventions.

Overall, it is certainly possible to apply self-persuasion in media interventions; however, the benefit over direct forms of persuasion is small - if present at all. Nonetheless, no studies to date have shown the reduced effectiveness of self-persuasion techniques compared to no persuasion or direct persuasion, and therefore, the real world large scale application of self-persuasion techniques in media interventions can have tangible benefits. As a first step, however, additional research is recommended, focusing on stimulating argument generation in free choice measurement tasks, ideally in real life interventions.

## REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Anderson, P., Chrisholm, D., & Fuhr, D. C. (2009). Effectiveness and cost-effectiveness of policies and programs to reduce the harm caused by alcohol. *The Lancet*, 373, 2234-2246. [https://doi.org/10.1016/S0140-6736\(09\)60744-3](https://doi.org/10.1016/S0140-6736(09)60744-3)
- Aronson, E. (1999). The Power of Self-Persuasion. *American Psychologist*, 54, 875-884. <http://dx.doi.org/10.1037/h0088188>
- Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., ...Rossow, I. (2003). *Alcohol: No ordinary commodity-research and public policy*. Oxford: Oxford University Press.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44, 1175-1184. <http://dx.doi.org/10.1037/0003-066X.44.9.1175>
- Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, 50, 248-287. [http://doi.org/10.1016/0749-5978\(91\)90022-L](http://doi.org/10.1016/0749-5978(91)90022-L)
- Beaglehole, R., & Bonita, R. (2009). Alcohol: A global health priority. *The Lancet*, 373, 2173-4. [http://doi.org/10.1016/S0140-6736\(09\)61168-5](http://doi.org/10.1016/S0140-6736(09)61168-5)
- Bernritter, S. F., van Ooien, I., & Müller, B. C. N. (2017). Self-persuasion as marketing technique: The role of consumers' involvement. *European Journal of Marketing*, 51, 1075-1090. <http://doi.org/10.1108/EJM-04-2015-0213>
- Brehm, J. W., (1966). *A theory of psychological reactance*. New York: Academic Press.
- Brewer, N. T., Chapman, G. B., Gibbons, F. X., Gerrard, M., McCaul, K. D., & Weinstein, N. D. (2007). Meta-analysis of the relationship between risk perception and health behavior: The example of vaccination. *Health Psychology*, 26, 136-145. <http://dx.doi.org/10.1037/0278-6133.26.2.136>
- Briñol, P., McCaslin, M. J., & Petty, R. E. (2012). Self-generated persuasion: Effects of target and direction of arguments. *Journal of Personality and Social Psychology*, 102, 925-940. <http://dx.doi.org/10.1037/a0027231>
- Casswell, S., Thamarangsi, T. (2009). Reducing harm from alcohol: call to action. *The Lancet*, 373, 2247-2257. [http://doi.org/10.1016/S0140-6736\(09\)60745-5](http://doi.org/10.1016/S0140-6736(09)60745-5)
- Crawford, M. T., McConnell, A. R., Lewis, A. C., & Sherman, S. J. (2002). Reactance, compliance and anticipated regret. *Journal of Experimental Social Psychology*, 38, 56-63. <http://doi.org/10.1006/jesp.2001.1481>
- Cialdini, R. B. (2009). *Influence: Science and practice*. Boston: Pearson Education.
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4<sup>th</sup> ed., vol. 2, pp. 151-192). Boston: McGraw-Hill.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Experimental Social Psychology*, 39, 752-766. <http://dx.doi.org/10.1037/0022-3514.39.5.752>
- Clarkson, J. J., Tormala, Z. L., & Leone, C. (2011). A self-validation perspective on the mere thought effect. *Journal of Experimental Psychology*, 47, 449-454. <http://dx.doi.org/10.1016/j.jesp.2010.12.003>
- Corrao, G., Bagnardi, V., Zambon, A., & Vecchia, C. (2004). A meta-analysis of alcohol consumption and the risk of 15 diseases. *Preventive Medicine*, 38, 613-619. <http://dx.doi.org/10.1016/j.ypmed.2003.11.027>
- Damen, T. G. E., Müller, B. C. N., van Baaren, R. B., & Dijksterhuis, A. (2015). Re-examining the agentic shift: The sense of agency influences the effectiveness of (self)persuasion. *PLoS ONE*, 10(6): e0128635. <http://dx.doi.org/10.1371/journal.pone.0128635>
- Dickerson, C. A., Thibodeau, R., Aronson, E., Miller, D. (1992). Using cognitive dissonance to encourage water conservation. *Journal of Applied and Social Psychology*, 22, 841-854. <http://doi.org/10.1111/j.1559-1816.1992.tb00928.x>
- Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs*, 72, 144-168. <http://dx.doi.org/10.1080/03637750500111815>
- Elms, A. C. (1966). Influence of fantasy ability on attitude change through role playing. *Journal of Personality and Social Psychology*, 4(1), 36-43. <http://dx.doi.org/10.1037/h0023509>
- Emerson, J. R., & Bennet, D. A. (2006). Effects of alcohol on risk of coronary heart disease and stroke: causality, bias, or a bit of both? *Vascular Health and Risk Management*, 2, 239-249.
- Friedrich, J. (1990). Learning to view psychology as a science: Self-persuasion through writing. *Teaching of Psychology*, 17, 23-27. [http://dx.doi.org/10.1207/s15328023top1701\\_5](http://dx.doi.org/10.1207/s15328023top1701_5)
- Glock, S., Müller, B. C. N., & Ritter, S. (2013). Warning labels formulated as questions positively influence smoking-related risk perception. *Journal of Health Psychology*, 18, 252-262. <http://dx.doi.org/10.1177/1359105312439734>
- Greenwald, A.G., & Albert, R. D. (1968). Acceptance and recall of improvised arguments. *Journal of Personality and Social Psychology*, 8(1), 31-34. <http://dx.doi.org/10.1037/h0021237>
- Hoch, S. J., & Deighton, J. (1989). Managing what consumers learn from experience. *Journal of Marketing*, 53, 1-20. <http://dx.doi.org/10.2307/1251410>
- Inzlicht, M., Shenav, A., & Olivola, C. Y. (2018). The effort paradox: Effort is both costly and valued. *Trends in Cognitive Sciences*, 22, 337-349. <http://doi.org/10.1016/j.tics.2018.01.007>
- Janis, I. L., & King, B. T. (1954). The influence of role playing on opinion change. *Journal of Abnormal and Social Psychology*, 49, 211-218. <http://dx.doi.org/10.1037/h0056957>
- Janz, N. K. & Becker, M. H. (1984). The health believe model: A decade later. *Health Education Quarterly*, 11, 1-47. <http://doi.org/10.1177/109019818401100101>
- King, B. T., & Janis, I. L. (1956). Comparison of the effectiveness of improvised versus non-improvised role-playing in producing opinion changes. *Human Relations*, 9, 177-186. <http://dx.doi.org/10.1177/001872675600900202>
- Krischler, M., & Glock, S. (2015). Alcohol warning labels formulated as questions change alcohol-related outcome expectancies: A pilot study. *Addiction Research & Theory*, 23, 343-349. <http://dx.doi.org/10.3109/16066359.2015.1009829>
- Levin, I. P., Johnson, R. D., & Chapman, D. P. (1988). Confidence in judgments based on incomplete information: An investigation using both hypothetical and real gambles. *Journal of Behavioral Decision Making*, 1, 669-679. <https://doi.org/10.1002/bdm.3960010105>
- Linder, D. E., & Worchel, S. (1970). Opinion change as a result of effortfully drawing a counterattitudinal conclusion. *Journal of Experimental Social Psychology*, 6, 432-448. [http://doi.org/10.1016/0022-1031\(70\)90054-5](http://doi.org/10.1016/0022-1031(70)90054-5)
- Loman, J. G. B., Müller, B. C. N., Oude Groote Beverborg, A., van Baaren, R. B., & Buijzen, M. (2018a). Self-persuasion in media messages: Reducing alcohol consumption among students with open-ended questions. *Journal of Experimental Psychology: Applied*, 24, 81-91 <http://dx.doi.org/10.1037/xap0000162>
- Loman, J. G. B., Müller, B. C. N., Oude Groote Beverborg, A., van Baaren, R. B., & Buijzen, M. (2018b). Self-persuasion on Facebook increases alcohol risk perception. *Cyberpsychology, Behavior and Social Networking*, 21, 672-678. <http://dx.doi.org/10.1089/cyber.2018.0235>
- Loman, J. G. B., de Vries, S. A., Kukken, N., van Baaren, R. B., Buijzen, M., & Müller, B. C. N. (2018). *Quick question or intensive inquiry: The role of message elaboration in the effectiveness of self-persuasive anti-alcohol posters*. *PLoS ONE*, 14(1): e0211030. <https://doi.org/10.1371/journal.pone.0211030>
- Maddux, J. E., & Rogers, R. W. (1980). Effects of source expertness, physical attractiveness, and supporting arguments on persuasion: A case of brains over beauty. *Journal of Personality and Social Psychology*, 39, 235-244. <http://dx.doi.org/10.1037/0022-3514.39.2.235>
- Maio, G. R., & Thomas, G. (2007). The epistemic-teleologic model of deliberate self-persuasion. *Personality and Social Psychology Review*, 11, 46-67. <http://dx.doi.org/10.1177/1088868306294589>

- Merritt, A. C., Effron, D. A., & Monin, B. (2010). Moral self-licensing: When being good frees us to be bad. *Social and Personality Psychology Compass*, 4, 344-357. <http://dx.doi.org/10.1111/j.1751-9004.2010.00263.x>
- Müller, B. C. N., Ritter, S. M., Glock, S., Dijksterhuis, A., Engels, R. C. M. E., & van Baaren, R. B. (2016). Smoking-related warning messages formulated as questions positively influence short-term smoking behaviour. *Journal of Health Psychology*, 21, 60-68. <http://dx.doi.org/10.1177/1359105314522083>
- Müller, B. C. N., van Baaren, R. B., Ritter, S. M., Woud, M. L., Bergmann, H., ... Dijksterhuis, A. (2009). Tell me why... The influence of self-involvement on short term smoking behaviour. *Addictive Behaviors*, 34, 427-431. <http://dx.doi.org/10.1016/j.addbeh.2008.12.016>
- Müller, B. C. N., van Someren, D. H., Gloude-mans, R. T. M., van Leeuwen, M. L., & Greifeneder, R. (2017). Helping made easy: Ease of argument generation enhances intentions to help. *Social Psychology*, 48, 113-121. <http://doi.org/10.1027/1864-9335/a000293>
- Mussweiler, T., & Neumann, R. (2000). Sources of mental contamination: Comparing the effects of self-generated versus externally provided primes. *Journal of Experimental Social Psychology*, 36, 194-206. <http://dx.doi.org/10.1006/jesp.1999.1415>
- Petty, R. E., Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, 46, 69-81. <http://dx.doi.org/10.1037/0022-3514.46.1.69>
- Petty, R. E., Cacioppo, J. T., & Heesacker, M. (1981). Effects of rhetorical questions on persuasion: A cognitive response analysis. *Journal of Personality and Social Psychology*, 40, 432-440. <http://dx.doi.org/10.1037/0022-3514.40.3.432>
- Rehm, J., Gmel, G. E., Gmel, G., Hasan, O. S. M., Imtiaz, S., Popova, S., ... Shuper, P. A. (2017). The relationship between different dimensions of alcohol use and the burden of disease-an update. *Addiction*, 112, 968-1001. <http://doi.org/10.1111/add.13757>
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet*, 373, 2223-2233. [http://doi.org/10.1016/S0140-6736\(09\)60746-7](http://doi.org/10.1016/S0140-6736(09)60746-7)
- Rehm, J., Room, R., Monteiro, M., Gmel, G., Graham, K., Rehn, N., ... Jernigan, D. (2003). Alcohol as a risk factor for global burden of disease. *European Addiction Research*, 9, 157-164. <http://dx.doi.org/10.1159/000072222>
- Ringold, D. J. (2002). Boomerang effects in response to public health interventions: Some unintended consequences in the alcohol beverage market. *Journal of Consumer Policy*, 25, 27-63. <http://dx.doi.org/10.1023/A:1014588126336>
- Rosenstock, I. M., Strecher, V. J. & Becker, M. H. (1988) Social learning theory and the health believe model. *Health Education Quarterly*, 15, 175-183. <http://doi.org/10.1177/109019818801500203>
- Schwarz, N. (1997). Moods and attitude judgments: A comment on Fishbein and Middlestadt. *Journal of Consumer Psychology*, 6, 93-98. [http://doi.org/10.1207/s15327663jcp0601\\_06](http://doi.org/10.1207/s15327663jcp0601_06)
- Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory*, 4, 592-604. <http://dx.doi.org/10.1037/0278-7393.4.6.592>
- Tedeschi, J. T. (Ed.). (1981). *Impression management theory and social psychological research*. New York, NY: Academic Press.
- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of media campaigns to change health behavior. *The Lancet*, 376, 1216-1217. [http://dx.doi.org/10.1016/S0140-6736\(10\)60809-4](http://dx.doi.org/10.1016/S0140-6736(10)60809-4)
- Watts, W. A. (1967). Relative persistence of opinion change induced by active compared to passive participation. *Journal of Personality and Social Psychology*, 5, 4-15. <http://dx.doi.org/10.1037/h0021196>
- Wilson, T. D., & Brekke, N. (1994). Mental contamination and mental correction: Unwanted influences on judgements and evaluations. *Psychological Bulletin*, 116, 117-142. <http://dx.doi.org/10.1037/0033-2909.116.1.117>
- Wood, A. M., Kaptoge, S., Butterworth, A. S., Willeit, P., Warnakula, S., Bolton, T., . . . Danesh, J. (2018). Risk thresholds for alcohol consumption: Combined analysis of individual-participant data for 599912 current drinkers in 83 prospective studies. *The Lancet*, 391, 1513-1523. [https://doi.org/10.1016/S0140-6736\(18\)30134-X](https://doi.org/10.1016/S0140-6736(18)30134-X)
- World Health Organization. (2014). *Global status report on alcohol and health*. Retrieved from [Apps.who.int/iris/bitstream/10665/112736/1/9789240692763\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/112736/1/9789240692763_eng.pdf)
- Zimbardo, P. G. (1965). The effect of effort and improvisation on self-persuasion produced by role-playing. *Journal of Experimental Social Psychology*, 1, 103-120. [http://doi.org/10.1016/0022-1031\(65\)90039-9](http://doi.org/10.1016/0022-1031(65)90039-9)



# Chapter 2

## **Self-Persuasion in Media Messages: Reducing Alcohol Consumption Among Students With Open-Ended Questions**

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## ABSTRACT

Self-persuasion (self-generation of arguments) is often a more effective influence technique than direct persuasion (providing arguments). However, the application of this technique in health media communications has received limited attention. In two experiments, it was examined whether self-persuasion can be successfully applied to anti-alcohol media communications by framing the message as an open-ended question. In Experiment 1 ( $N = 131$ ) cognitive reactions to anti-alcohol posters framed either as open-ended questions or statements were examined. In Experiment 2 ( $N = 122$ ) the effectiveness of this framing to reduce actual alcohol consumption was tested. Experiment 1 demonstrated that exposure to an anti-alcohol poster framed as an open-ended question resulted in more self-generated arguments for drinking less alcohol and more favorable message evaluations, than framing the same message as a statement. Experiment 2 showed that the self-persuasion poster did not affect the choice to consume alcohol but did reduce alcohol consumption for individuals who chose to drink any alcohol, compared to a direct persuasion poster or no intervention. Together, the results demonstrated the potential of self-persuasion in persuasive media messages for interventions aimed at alcohol consumption reduction specifically and for health communication in general.

*Keywords:* self-persuasion, framing, health communication, alcohol.

*Public significance statement:* Two experiments provide support for the idea that framing anti-alcohol messages as open questions results in self-persuasion: Questions evoke more favorable message reactions (Experiment 1) and reduce alcohol consumption for individuals who choose to drink (Experiment 2). This method can be directly applied to media interventions aiming to reduce alcohol consumption, as well as interventions targeting other health behaviors.

## INTRODUCTION

Alcohol has been causally linked to over 60 types of disease and trauma (Corrao, Bagnardi, Zambon, & Veccia, 2004; Rehm et al., 2003) and is currently ranked as the third highest contributor to disease and mortality worldwide (World Health Organization, 2014). Despite extensive media education and persuasion interventions, alcohol consumption is still rising on a global level (World Health Organization, 2014). Because research has consistently shown that knowledge about the harmful effects of alcohol is extremely high (Ringold, 2002), the main problem appears to be the ineffectiveness of anti-alcohol media interventions to change behavior (Wakefield, Loken & Hornik, 2010). The goal of the current study is to solve this incongruence between knowledge and behavior by introducing an alternative media persuasion strategy to reduce alcohol consumption: the use of open-ended questions to trigger self-generation of arguments, in other words, the application of self-persuasion to anti-alcohol media messages.

Persuasive media messages aimed at reducing alcohol consumption primarily consist of direct forms of persuasion (i.e., providing factual information or statements indicating that people should reduce their alcohol consumption). These direct methods, however, are mainly ineffective (Wakefield et al., 2010). One of the main reasons for this is that individuals recognize the persuasive intent of the communications (*cf.* Aronson, 1999, 2007; Dillard & Shen, 2007). The message may therefore be experienced as a threat to their freedom to choose. As a consequence, individuals may experience reactance (Brehm, 1966), resulting in rejection of the message or even an increase of the unwanted behavior in an attempt to restore freedom of choice (Ringold, 2002).

An alternative to conventional direct persuasion methods is the “self-persuasion-technique”. Rather than providing individuals with arguments or statements, they are asked to generate arguments themselves. By doing so, the target of persuasion creates the means of influence her- himself (e.g., Briñol, McCaslin, & Petty, 2012; Maio & Thomas, 2007). This technique is considered to be more effective than direct persuasion for three main reasons. First, individuals mentally detect, and correct for, internally generated information to a lesser extent than externally provided information (e.g., Mussweiler & Neumann, 2000; Wilson & Brekke, 1994). Second, reactance is not activated in response to self-generated arguments because they do not restrict freedom of choice. Third, when individuals generate arguments, they tend to come up with reasons that they find the most compelling (Briñol et al., 2012; Greenwald & Albert, 1968; Slamecka & Graf, 1987). For these reasons, self-persuasion as a persuasive technique seems to hold great promise for application in media interventions. Not only do self-persuasive messages have the potential to bypass corrections and reactance responses, by instructing individuals to generate arguments they are effectively tailoring the most convincing message for

themselves. The question, therefore, is: How can self-persuasion be applied to persuasive health media communications?

### Applying Self-Persuasion in Media Messages: Instruction vs. Open-Ended Questions

The origins of self-persuasion as a compliance-inducing technique can be traced back to research on attitude change resulting from role-playing (Janis & King, 1954). When individuals were instructed to present arguments in favor of various topics (i.e., movie theatres, meat supply, and cold cure) in an informal talk, this “role-playing” resulted in greater attitude change than passively listening to the same talk. The effectiveness of such self-persuasion tasks is evident from the growing line of research that replicated this finding in a variety of contexts, such as forced military service (King & Janis, 1956), smoking (Elms, 1966), politics (Watts, 1967), undergraduate education (Greenwald & Albert, 1968), importance of empirical research (Friedrich, 1990), and clean local environment (Damen, Müller, van Baaren & Dijksterhuis, 2015) to change attitudes, as well as smoking behavior (Müller et al., 2009) and tipping behavior (Bernritter, van Ooien, & Müller, in press). Over time, self-persuasion techniques have become easier to apply in interventions for two main reasons. First, it was found that self-persuasion occurs not only by role-playing but also in writing tasks (i.e., Watts, 1967; Greenwald & Albert, 1968; Friedrich, 1990; Damen et al. 2015; Bernritter et al., 2017; Müller et al., 2009), showing that the presence of an audience is not required for self-persuasion to occur. Second, the key factor of the persuasive effects has become clearer, changing from concepts such as “improvisation” (Janis & King, 1954; King & Janis, 1956), “fantasy ability” (Elms, 1966), and “improvised arguments” (Greenwald & Albert, 1968), to simply self-generation of arguments (e.g., Müller et al., 2009). Combined, these studies show that attitudes and behavior can be successfully modified by having individuals generate their own arguments.

Constant throughout this line of research, however, remains that the self-persuasion tasks all require the *instruction* to generate arguments for its effects to occur. This requirement seems to indicate that the self-persuasion method is not applicable in a media context, especially for traditional media messages in the form of persuasive print or television messages. That is, individuals will follow instructions in a laboratory, but in a real-life setting they are unlikely to disrupt their on-going activities to generate arguments in favor of or against an issue when exposed to a media message instructing them to do so. Nevertheless, research has found a new way of applying the self-persuasion-technique to overcome this problem.

Recent research has shown that, rather than *instructing* individuals to generate arguments for a certain position, it is also possible to *trigger* self-generation of arguments, by providing a question in persuasive messages (e.g., “Why is it good to stop smoking?”; Glock, Müller, & Ritter, 2013, Müller et al., 2016). The authors assumed that reading the question should elicit argument generation in line with the question in the message receiver effectively resulting in self-persuasion (e.g., attitude and behavioral change in line with the generated arguments). Glock et al. (2013) demonstrated that formulating warning labels on cigarette packages as open-ended questions resulted in higher smoking related risk-perception compared to warning labels formulated as statements. Müller et al. (2016) expanded these results on a behavioral level by demonstrating that smokers refrained from smoking longer after seeing a television clip containing questions about “why smoking is bad” compared to statements providing the arguments. Finally, a recent pilot study by Krischler and Glock (2015) showed that formulating alcohol warning labels as closed questions (e.g., “Do you really want alcohol to help you test your limits?”) resulted in higher negative alcohol related outcome expectancies compared to no warning labels. Warning labels formulated as statements had no influence on participants.

This new application of self-persuasion not only has produced promising results, it also seems a very applicable strategy for media campaigns, for example persuasive poster, television or social media messages. Research on this new self-persuasion method in media messages, however, is limited (for the exceptions, see, Glock et al., 2013; Krischler, & Glock, 2015; Müller et al., 2016). In order to fully test the effectiveness of the method in persuasive media messages, there is therefore a need to first explore the as yet untested cognitive responses to self-persuasive media messages, and to subsequently test their effectiveness at a behavioral level. In the current study, both questions are addressed in two experiments. The goal of Experiment 1 was to test whether framing of persuasive anti-alcohol messages (i.e., posters) as open-ended questions resulted in self-generation of arguments “why to drink less alcohol” and more favorable message evaluations indicative of lower reactance to the message. The goal of Experiment 2 was to test whether the poster was successful in reducing actual alcohol consumption. Importantly, the current studies aim to replicate earlier findings in the self-persuasion field in a new and easy to apply form in an important applied field, that is providing persuasive posters to reduce alcohol consumption. Thus, not only do we try to replicate and validate earlier findings from a lab setting, an important goal in itself given the often low replication rates. Current findings could also have important implications for current mass media interventions designed to make people drink less alcohol.

## EXPERIMENT 1

The aim of Experiment 1 was to examine whether self-persuasion can be successfully applied to media communications in the form of an anti-alcohol poster by framing the message as an open-ended question. This framing should result in more self-generation of arguments and more favorable message evaluations (more positive message judgment, lower recognition of persuasive intent, and lower experienced negative affect), indicative of less reactance to the message. As a sub-goal, the role of message wording (i.e., self-references and “forcefulness” of language) in these effects was also examined. Based on the definition of the Oxford dictionaries (<https://www.oxforddictionaries.com/>), the wordings “should” (meaning to be advised to do something) “have to” (meaning be obliged to do something) and “it is better” (meaning that it is more desirable to do something) were used to investigate differences in perceived forcefulness. Based on reactance theory (Brehm, 1966) it was expected that less forceful language and the absence of self-references would be perceived to restrict freedom of choice to a lesser extent, resulting in lower recognition of persuasive intent and lower experienced negative affect.

### Method

#### Participants and design.

One hundred and thirty-three participants were tested, however two of them did not complete the main task (i.e., the thought-listing task) and were therefore excluded from all analyses. Both participants were in the self-persuasion “it is better” message framing condition. Their exclusion did not change any of the results. The remaining 131 individuals (100 women; 31 men) ranged in age from 18 to 60 years ( $M = 22.31$ ,  $SD = 4.35$ ), and participated in the experiment for course credit or a €5,- reward. They were recruited at the University, country, and randomly assigned to one of six conditions in a 2 (Persuasion Technique: self-persuasion vs. direct persuasion) x 3 (Message Wording: “you should” vs. “you have to” vs. “it is better”) between-subjects design with number of generated pro- and counter-arguments, message judgment, recognition of persuasive intent, and experienced negative affect as the dependent variables. Self-reported attitudes- and behavioral intentions towards limiting future alcohol consumption measures (adopted from Keer et al., 2013) were also completed. However, because no differences between conditions were found, these measures are not reported in the current article. Details about the measurements, results, and conclusion are available as online supplement materials. The experiment was approved by the Universities ethics committee.

#### Procedure and materials.

The experiment comprised of several computer tasks and was conducted at a cubicle laboratory. Upon arrival participants were informed that the goal of the experiment was to pretest materials for a future experiment and that, therefore, the researchers were interested in their opinions about a poster. After obtaining informed consent they were seated in front of a computer and asked to follow the instructions on screen.

The first task was a thought-listing task. Participants were exposed to one of six anti-alcohol posters for 10 seconds, and were subsequently asked to report all thoughts they had while viewing it out loud into a microphone for 30 seconds, from which the number of pro- and counter arguments that were generated were assessed. After this task, participants answered several questions assessing the remaining dependent variables (message judgment, recognition of persuasive intent, and experienced negative affect), control variables (frequency of alcohol consumption over the past four weeks and intensity of alcohol consumption in the previous week), and demographics (age, gender, native language and country of birth). After completion, participants were thanked, rewarded, debriefed, and dismissed.

**Stimulus materials.** Participants were exposed to one of six anti-alcohol posters varying in message wording: (1) a self-reference using the wording “you should”, (2) a self-reference using the wording “you have to” or (3) no self-reference using the wording “it is better”, and persuasion technique: either framed as an open-ended question (i.e., the self-persuasion versions, e.g., “Why do you have to drink less alcohol?”) or as a statement (i.e., the direct persuasion versions, e.g., “You have to drink less alcohol!”). All six posters had an identical layout: A black frame against a white background with the message text centered both vertically and horizontally. The posters had an image size of 720 x 960 pixels and were displayed in the center of the computer screen with a resolution of 1920 x 1080 pixels (96 dpi). Pictures of the posters including the original wording in Dutch are available in the online supplement materials.

**Argument generation.** In order to analyze the responses to the thought-listing task, all verbalizations were transcribed and subsequently grouped into segments representing “thoughts” by defining meaningful units. Meaningful units referred to verbalizations containing one line of reasoning, one specific argument, or one statement (Blackwell, Glassy, Galassi, & Watson, 1985). As a first step, all meaningful units were coded as either relevant or irrelevant by three independent coders (Krippendorff’s  $\alpha$  ranged from  $\alpha = .27$  to  $.71$ ;  $Ma = .61$ ;  $SD = .31$ ). Discrepancies were resolved via three-way discussion. Next, in order to assess whether or not the posters succeeded in triggering argument

<sup>a</sup> All Krippendorff’s  $\alpha < .27$  were based on more than 6 meaningful units (few participants had more than 7 separate meaningful units) and are therefore omitted from the statistics reported. Including them results in Krippendorff’s  $\alpha$  ranging from  $-.11$  to  $.71$ ;  $Ma = .44$ ;  $SD = .31$ ).

generation, a second round of coding followed in which all relevant meaningful units were coded as either a pro-argument, a counter-argument, or no argument via the same procedure (i.e., two independent coders; Krippendorff's  $\alpha$  ranged from<sup>b</sup> = .54 to .93;  $M\alpha$  = .79;  $SD$  = .14). Subsequently, two scales were created: one consisting of the summed pro-arguments ( $M$  = 1.19,  $SD$  = 1.76), and one consisting of the summed counter-arguments ( $M$  = .05,  $SD$  = .26).

**Message judgment.** Judgment of the poster was measured by having participants indicate how well 11 words in randomized order described the poster on a 7-point scale ranging from 1 (*completely not*) to 7 (*completely*). Example items were: “believable,” “interesting,” and “irritating” (adopted from Keer, van den Putte, Neijens, & de Wit, 2013). A total scale was constructed by averaging the scores of the 11 items (Cronbach's  $\alpha$  = .84,  $M$  = 4.06,  $SD$  = .98).

**Recognition of persuasive intent.** Recognition of persuasive intent of the posters was measured by having participants indicate their agreement to four statements in randomized order on a 7-point scale ranging from 1 (*completely disagree*) to 7 (*completely agree*). Example items were: “the poster tried to make a decision for me” and “the poster tried to manipulate me” (adopted from Dillard & Shen, 2005). A total scale was constructed by averaging the scores on the four items (Cronbach's  $\alpha$  = .82,  $M$  = 3.48,  $SD$  = 1.40).

**Experienced negative affect.** Experienced negative affect was measured as an indication of reactance to the posters. Participants indicated on a 7-point scale ranging from 1 (*completely not*) to 7 (*completely*) and in randomized order the extent to which they felt four emotions: “irritated”, “aggravated”, “annoyed” and “angry” (adopted from Dillard & Shen, 2005). A total scale was constructed by averaging the scores on the four items (Cronbach's  $\alpha$  = .91,  $M$  = 2.47,  $SD$  = 1.39).

**Alcohol consumption frequency.** In order to control for the effects of previous alcohol consumption behavior, frequency of alcohol consumption over the past four weeks was measured using four questions (one for each of the preceding four weeks; e.g., “On how many days did you drink alcohol in the past week?”; adopted from Engels & Knibbe, 2000). For each participant, the mean over these four items was calculated as an indication of the frequency of previous alcohol consumption (Cronbach's  $\alpha$  = .89,  $M$  = 2.96,  $SD$  = 1.49).

**Alcohol consumption intensity.** In order to control for the effects of intensity of previous alcohol consumption behavior, amount of alcohol consumed in the previous week was measured using four questions: during weekdays and in the weekend, inside and outside the home (e.g., “How many glasses of alcohol did you consume in the past

<sup>b</sup> All Krippendorff's  $\alpha < .54$  were based on more than 6 meaningful units (few participants had more than 7 separate meaningful units) and are therefore omitted from the statistics reported. Including them results in Krippendorff's  $\alpha$  ranging from .00 to 1.00;  $M\alpha$  = .66;  $SD$  = .36).

week, during weekdays, at home?”; adopted from Engels, Knibbe, & Drop, 1999). For each participant, the sum of these four items was calculated as an indication of intensity of previous alcohol consumption ( $M$  = 8.75,  $SD$  = 12.68).

## Results and Discussion

### Descriptive statistics.

For both the alcohol consumption frequency and intensity measurements, 18% of participants reported no alcohol consumption in the week(s) prior to the experiment. Table 1 provides the means and standard deviations of all measurements in this experiment. Because the two measures of alcohol consumption (frequency and intensity) did not correlate significantly with any of the dependent measures (self-generation of arguments, message judgment, recognition of persuasive intent, and experienced negative affect) (all  $p$ 's > .10), they were not included as covariates in the main analyses.

TABLE 1. Experiment 1 Sample Means and Standard Deviations by Condition

Persuasion technique	Self-persuasion			Direct persuasion			Total <i>n</i> = 131
	“You should” <i>n</i> = 22	“You have to” <i>n</i> = 22	“It is better” <i>n</i> = 22	“You should” <i>n</i> = 22	“You have to” <i>n</i> = 21	“It is better” <i>n</i> = 22	
Message wording	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )
# Pro-arguments	1.36 (1.76)	2.18 (2.09)	2.55 (2.20)	.27 (.63)	.24 (.63)	.50 (.96)	1.19 (1.76)
# Counter-arguments	.09 (.29)	.05 (.21)	.09 (.29)	.09 (.43)	.00 (.00)	.00 (.00)	.05 (.26)
Message judgment	4.25 (.79)	4.29 (1.00)	4.30 (.61)	3.88 (1.31)	3.41 (.89)	4.21 (.93)	4.06 (.98)
Persuasive intent	3.30 (1.21)	3.65 (1.48)	2.65 (1.17)	3.77 (1.39)	3.94 (1.53)	3.63 (1.36)	3.48 (1.40)
Negative affect	1.92 (.80)	2.51 (1.61)	1.95 (1.02)	2.94 (1.76)	2.88 (1.47)	2.65 (1.25)	2.47 (1.39)
Alcohol consumption frequency	2.81 (1.41)	3.00 (1.16)	3.33 (2.00)	3.06 (1.59)	2.46 (1.22)	3.10 (1.41)	2.96 (1.49)
Alcohol consumption intensity	10.14 (16.68)	10.41 (12.39)	10.45 (14.83)	7.91 (11.21)	6.61 (13.03)	6.91 (6.32)	8.75 (12.68)

Randomization checks showed no significant differences between conditions for any of the control variables (i.e., alcohol consumption frequency, alcohol consumption intensity, age, gender, native language, county of birth), indicating successful randomization.

### Main analyses.

A 2 (Persuasion Technique: self-persuasion vs. direct persuasion) x 3 (Message Wording: “you should” vs. “you have to” vs. “it is better”) between-subjects MANOVA on all dependent variables (number of pro-arguments generated, number of counter-arguments generated, message judgment, recognition of persuasive intent, and experienced negative affect) yielded a main effect for persuasion technique,  $F(5, 121) = 9.24, p < .01$ , partial  $\eta^2 = .28$ . The main effect for message wording and the interaction between persuasion technique and message wording were both nonsignificant,  $F(10, 244) = 1.55, p = .12$ , partial  $\eta^2 = .06$  and  $F(10, 244) = 1.36, p = .20$ , respectively.

**Argument generation.** The MANOVA yielded a main effect for persuasion technique on number of pro-arguments generated,  $F(1, 125) = 39.99, p < .01$ , partial  $\eta^2 = .24$ , indicating that the self-persuasion poster versions resulted in significantly more generated arguments ( $M = 2.03, SD = 2.05$ ) compared to the direct-persuasion versions ( $M = .34, SD = .76$ ). The main effect for message wording and the interaction between persuasion technique and message wording were both nonsignificant,  $F(2, 125) = 2.34, p = .10$  and  $F(2, 125) = 1.28, p = .28$ , respectively. For number of counter-arguments generated, the main effect for persuasion technique, the main effect for message wording and the interaction effect of persuasion technique and message wording were all nonsignificant,  $F(1, 125) = 1.01, p = .32$ ;  $F(2, 125) = .78, p = .46$  and  $F(2, 125) = .34, p = .71$  respectively.

**Message judgment.** The MANOVA yielded a main effect for persuasion technique on message judgment,  $F(1, 125) = 6.42, p < .01$ , partial  $\eta^2 = .05$ , indicating that the self-persuasion poster versions resulted in significantly more positive message judgment ( $M = 4.28, SD = .80$ ) compared to the direct-persuasion versions ( $M = 3.84, SD = 1.10$ ). The main effect for message wording as well as the interaction between persuasion technique and message wording were both nonsignificant,  $F(2, 125) = 2.00, p = .14$  and  $F(2, 125) = 1.92, p = .15$ , respectively.

**Recognition of persuasive intent.** The MANOVA yielded a main effect for persuasion technique on recognition of persuasive intent,  $F(1, 125) = 5.99, p = .02$ , partial  $\eta^2 = .05$ , indicating that the self-persuasion poster versions resulted in significantly less recognition of persuasive intent ( $M = 3.20, SD = 1.34$ ) compared to the direct-persuasion versions ( $M = 3.78, SD = 1.41$ ). The main effect for message wording was a nonsignificant trend,  $F(2, 125) = 2.58, p = .08$ , partial  $\eta^2 = .04$ . Bonferroni post hoc comparison indicated a nonsignificant trend difference between the “you have to” and “it is better” wording ( $p = .08$ ), with the “you have to” wording ( $M = 3.80, SD = 1.50$ ) resulting in higher recognition of persuasive intent compared to the “it is better” wording ( $M = 3.14, SD = 1.35$ ). The interaction between persuasion technique and message wording was nonsignificant,  $F(2, 125) = .74, p = .48$ .

**Experienced negative affect.** The MANOVA yielded a main effect for persuasion technique on experienced negative affect,  $F(1, 125) = 8.58, p < .01$ , partial  $\eta^2 = .06$ , indicating that the self-persuasion poster versions resulted in significantly less experienced negative affect ( $M = 2.13, SD = 1.21$ ) compared to the direct-persuasion versions ( $M = 2.82, SD = 1.49$ ). The main effect for message wording as well as the interaction between persuasion technique and message wording were both nonsignificant,  $F(2, 125) = .95, p = .39$  and  $F(2, 125) = .63, p = .53$ , respectively.

### Conclusion.

The aim of Experiment 1 was to examine whether self-persuasion can be successfully applied to media anti-alcohol posters by framing the message as a question. Persuasive anti-alcohol messages framed as questions resulted in self-generation of arguments why to drink less alcohol, whereas similar messages framed as statements did not. Furthermore, messages framed as questions resulted in more positive message judgment, less recognition of persuasive intent, and less experienced negative affect compared to the statement counterparts, indicative of lower evoked reactance. Message wording did not affect argument generation, message evaluations or reactance to the messages. This could be due to participants not perceiving the difference in forcefulness between the three wordings. However, as the common definition is very clear cut, we doubt that differences in forcefulness were not perceived. The aim of Experiment 2 was to examine whether a self-persuasion poster from Experiment 1 was more effective to reduce actual alcohol consumption compared to both its direct persuasion counterpart and a control condition (i.e., no poster).

## EXPERIMENT 2

Given the often small correlation between attitudes and behavior in risky and socially undesirable behaviors (e.g., Fazio & Towles-Schwen, 1999) in Experiment 2 the effectiveness of the posters developed in Experiment 1 to change actual alcohol consumption behavior were tested. It was expected that an open-ended question would reduce alcohol consumption compared to a statement poster and no poster. It was further expected that a statement poster would produce a reactance effect, effectively increasing alcohol consumption compared to no poster.

## Method

### Participants and design.

Based on an *a priori* estimation of statistical power of  $(1-\beta) = .8$  and a slightly conservative estimated effect size Cohen's  $f = .30$  (derived from the effect size Cohen's  $f^2 = .14$  found by Müller et al., 2016), a minimum of 111 participants was required for this experiment. One hundred and twenty-six participants were tested, however, four influential cases were identified based on  $Z$ -scores  $> 1.96$  on the main outcome measurement (i.e., pure ml of alcohol consumed) and after closer inspection dropped from the analyses: two were removed from the control condition for drinking hard liquor during the one hour ad libitum drinking session (hard liquor was present in the room, but not intended nor introduced as an option for drink choice). Another two were removed from the self-persuasion condition because after entering the bar lab, they both stated that they intend to drink "as much free drinks as possible". They actively searched for more alcohol after drinking all beer present next to the set-up, which reflects very different intentions than all other participants, and suggests that they did not follow instructions of the experiment thoroughly. The remaining 122 participants (98 women and 24 men) ranged in age from 18 to 34 years ( $M = 20.57$ ,  $SD = 2.38$ ) and participated for course credit or a €15,- reward.

Participants were recruited at the University, Country, and were eligible to participate if they were older than 18 years (the legal drinking age in the Netherlands) and consumed alcohol. The participants were randomly assigned to one of three conditions in a between-subjects design: a self-persuasion condition (i.e., an anti-alcohol poster framed as a question present in the room), a direct-persuasion condition (i.e., an anti-alcohol poster framed as a statement) or a control condition (i.e., no poster). The dependent variable was milliliters of pure alcohol consumed during a one-hour ad libitum drinking session. Self-reported attitudes- and behavioral intentions towards limiting future alcohol consumption measures (adopted from Keer et al., 2013) were also completed, however, because no differences between conditions were found, these measures are not reported in the current article. Details about the measurements, results, and conclusion are available as online supplement materials. The experiment was approved by the Universities ethics committee.

### Procedure and materials.

The experiment took place in an interaction room outfitted as a bar (see Müller et al., 2009) between 16:00 and 21:00 hours (i.e., three timeslots of 90 minutes each, with the self-persuasion condition, direct-persuasion condition and control condition rotated each day to ensure equal time of day testing distribution for each condition). Participants arrived at the bar lab in dyads because drinking typically occurs in a social setting (e.g.,

Christiansen, Vik & Jarchow, 2002). After informed consent was obtained, they were first told the cover story that the goal of the experiment was "to examine the effects of different environments on the judgment of movie clips" and that in this case, that setting was a bar. The participants were then told that "to further simulate the setting" they are free to take as much and whatever kind of drinks they liked from a refrigerator (containing beer, wine, soda and water) present in the bar lab.

After this explanation, the experimenter started a 1-hour DVD that displayed five clips (i.e., short films that did not contain any alcohol related content about a failed robbery, falling in love, a college lecture, an expert meeting, and a missed phone call) on a television present in the room, behind which the posters were displayed. After each clip, a black screen was displayed for 5 minutes during which the participants were instructed to answer bogus questions (i.e., assessing both their own as well as their co-participant's attitudes) about the clip they just viewed. During this one-hour ad libitum drinking session all drinks consumed were registered.

After the drinking session, the participants were taken to separate cubicles to complete additional questionnaires assessing the control variables (i.e., frequency of alcohol consumption over the past four weeks, intensity of alcohol consumption in the previous week), manipulation checks (i.e., poster exposure), and demographics (i.e., age, gender, native language and country of birth) on a computer. Finally, the participants were thanked, rewarded, debriefed and dismissed.

**Stimulus materials.** The posters used in this experiment were adopted from Experiment 1. Because no main effects for message wording was found, the "you have to" framing using a self-reference (i.e., "Why do you have to drink less alcohol?"/"You have to drink less alcohol!") was selected for two reasons: (1) this framing was most forceful and therefore less ambiguous in expressing the importance of reducing alcohol consumption, and (2) the self-reference increased the likelihood that individuals will generate arguments to convince themselves, which should increase the persuasiveness of the message for individuals with positive attitudes towards drinking (Briñol et al., 2012). The size of the posters was A2 and they were displayed, clearly visible, behind the television on which participants watched the movie clips.

**Alcohol consumption.** The main outcome measurement in this experiment is total alcohol consumption during the one-hour ad libitum drinking session in the bar lab. Participant's choice of drinks (i.e., beer, wine, soda or nothing), number of drinks and the total number of milliliters consumed (for each type of drink) were measured. If participants did not finish their final drink, the remaining volume in milliliters was subtracted from the total consumption. Finally, the total amount of pure alcohol consumed (in milliliters) was calculated by multiplying the volume of beer and/or wine

consumed (in milliliters) with the percentage of alcohol in the drinks (i.e., .050 and .125 respectively;  $M = 12.21$ ,  $SD = 13.28$ ).

**Alcohol consumption frequency.** Frequency of previous alcohol consumption was measured identically to the measurement employed in Experiment 1 (Cronbach's  $\alpha = .85$ ,  $M = 1.98$ ,  $SD = 1.19$ ).

**Alcohol consumption intensity.** Intensity of previous alcohol consumption was measured identically to the measurement employed in Experiment 1 ( $M = 10.79$ ,  $SD = 12.19$ ).

**Manipulation check.** Successful poster exposure was checked via a funnel debriefing with the following questions (1) "Did you see a poster in the bar-lab?", (2) "What was the poster about?" and (3) "What exactly was on the poster?". 73 of the 82 participants (89%) in the experimental conditions reported spotting the posters, 57 (70%) were able to correctly recall the exact message wording.

#### Analysis strategy.

The effects of persuasion technique (i.e., self-persuasion vs. direct-persuasion) on alcohol consumption was tested with a form of multilevel regression analysis. Because individuals were tested in dyads, the data had a nested structure. Therefore, possible non-independence of the data had to be corrected to avoid underestimation of the standard errors and incorrectly finding a significant effect (i.e., to avoid a type I error). In other words, dyad level variance needed to be separated from individual level variance, while testing effects on the individual level only. To take the nested structure of the data into account in this way, the statistical software Mplus 6.12 (Muthén & Muthén, 2010) was used, employing the TYPE = COMPLEX procedure.

A large proportion of participants (41.8%) chose not to consume any alcohol during the experiment. The main outcome variable, milliliters of pure alcohol consumed, therefore contained a meaningful spike at the value zero, violating the assumption of a normal distribution. In order to correctly analyze the data, the original research question was separated into two sub-questions: (1) "Does persuasion technique affect the choice to consume alcohol (yes vs. no)?" and (2) "Does persuasion technique affect alcohol consumption for individuals who chose to consume any alcohol?"

The first question was answered by examining the effects of condition (i.e., persuasion technique) on the choice to consume alcohol (yes vs. no) for the complete sample with multilevel probit regression analysis. The main effects for persuasion technique were tested by dummy coding condition (0 = control). The analysis was repeated while controlling for the influence of the control variables (i.e., previous alcohol consumption frequency, previous alcohol consumption intensity, age, and gender) by entering them as covariates.

These steps were repeated with the self-persuasion condition as the reference condition in order to compare the self-persuasion condition with the direct persuasion condition.

The second question was answered by creating a subsample comprising only of participants who chose to consume alcohol. This subsample was subjected to a multilevel regression analysis with milliliters of pure alcohol consumed as the outcome variable. The analysis was repeated while controlling for the influence of the control variables (i.e., previous alcohol consumption frequency, previous alcohol consumption intensity, age, and gender) by entering them as covariates. Finally, these steps were again repeated with the self-persuasion condition as the reference condition to be able to compare the self-persuasion condition with the direct persuasion condition.

## Results and Discussion

### Descriptive statistics.

One participant reported drinking no alcohol on any day in the past four weeks prior to the experiment and 9% of participants reported having consumed zero glasses of alcohol in the week prior to the experiment. The dependent measure milliliters of pure alcohol consumed correlated significantly with previous alcohol consumption frequency,  $r(120) = .42$ ,  $p < .01$ , and previous alcohol consumption intensity,  $r(120) = .32$ ,  $p < .01$ . Therefore, both measures were added as covariates in the main analyses. See Table 2 for the means and standard deviations of previous alcohol consumption frequency and intensity by condition.

TABLE 2. Experiment 2 Sample Means and Standard Deviations by Condition

	Self-persuasion		Direct persuasion		Control		Total	
	$n = 38$		$n = 44$		$n = 40$		$n = 122$	
	$M$	$SD$	$M$	$SD$	$M$	$SD$	$M$	$SD$
Alcohol consumption frequency	2.13	1.14	1.66	1.16	2.18	1.22	1.98	1.19
Alcohol consumption intensity	10.89	10.00	8.24	9.68	13.53	15.74	10.79	12.19

Randomization was unsuccessful for age,  $F(2, 119) = 3.17$ ;  $p = .046$ . A Games-Howell post hoc comparison showed a nonsignificant trend difference between the self-persuasion condition and the control condition ( $p = .072$ ), indicating that participants were slightly younger in the self-persuasion condition ( $M = 20.08$ ,  $SD = .38$  and  $M = 21.32$ ,  $SD = .35$  respectively). No differences were found for all other comparisons ( $p > .201$ ). For all remaining control variables (i.e., gender, previous alcohol consumption frequency,



previous alcohol consumption intensity, time of day, and day of the week) randomization was successful (all  $p$ 's  $>.05$ ).

Of all participants, 41.8% did not consume any alcohol. The intraclass correlation for drinking within the dyads was .85, indicating high similarity of alcohol consumption within the dyads.

### Main Analyses.

**Choice to drink alcohol.** The multilevel probit regression analysis of persuasion technique (i.e., self-persuasion vs. direct persuasion) on the choice to consume alcohol (1 = yes; 0 = no), did not yield a significant main effect for the self-persuasion poster ( $b = .08, p = .83$ ), nor for the direct-persuasion poster ( $b = -.20, p = .60$ ) compared to the control condition (reference group). Repeating the analysis including all control variables as covariates yielded a main effect for previous alcohol consumption frequency ( $\beta = .44, p = .001$ ). Repeating the analysis including only previous alcohol consumption frequency as a covariate did not yield a significant main effect for the self-persuasion poster ( $\beta = .05, p = .74$ ), nor, for the direct-persuasion poster ( $\beta = .03, p = .84$ ) compared to the control condition. The effect of previous alcohol consumption frequency was significant ( $\beta = .56, p < .001; R^2 = .31$ ).

The multilevel probit regression analysis of persuasion technique (i.e., direct persuasion vs. control) on the choice to consume alcohol (1 = yes; 0 = no), did not yield a significant main effect for the direct persuasion poster ( $b = -.13, p = .46$ ), nor for the control condition ( $b = -.04, p = .83$ ) compared to the self-persuasion poster (reference group). Repeating the analysis including all control variables as covariates again yielded a main effect for previous alcohol consumption frequency ( $\beta = .44, p = .001$ ) only. Repeating the analysis including only previous alcohol consumption frequency as a covariate did not yield a significant main effect for the direct persuasion poster ( $\beta = -.02, p = .91$ ), nor for the control condition ( $\beta = -.05, p = .74$ ) compared to the self-persuasion condition. The effect of previous alcohol consumption frequency was significant ( $\beta = .56, p = .000; R^2 = .31$ ).

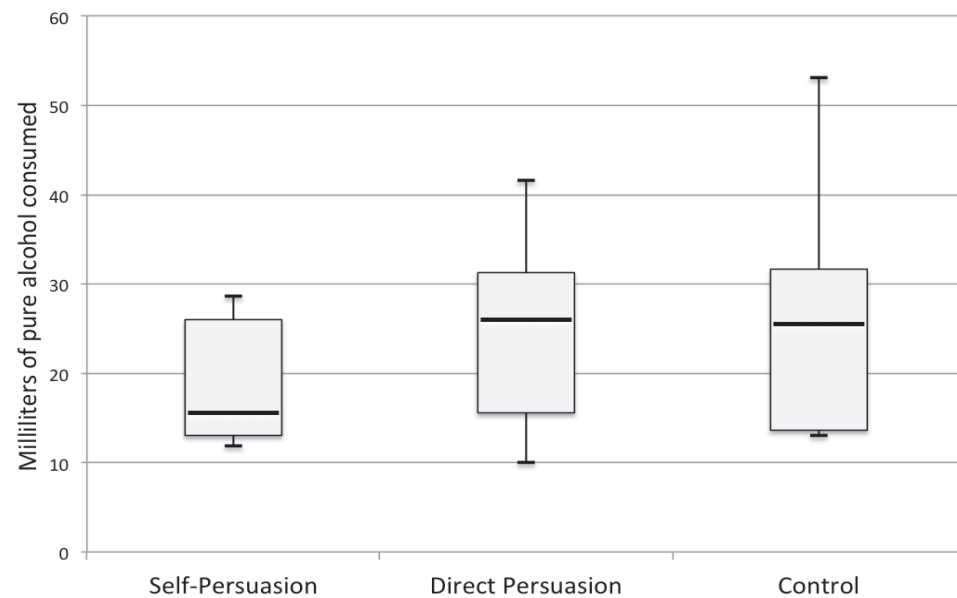
**Alcohol consumption for participants who chose to drink any alcohol.** The multilevel regression analysis of persuasion technique (i.e., self-persuasion vs. direct persuasion) on alcohol consumption (i.e., milliliters of pure alcohol consumed) for participants who consumed any alcohol, yielded a significant main effect for the self-persuasion poster ( $b = -6.70, p = .035$ ), but not for the direct-persuasion poster ( $b = -2.23, p = .52$ ) compared to the control condition (reference group). Repeating the analysis including all control variables as covariates, yielded a main effect the self-persuasion poster ( $\beta = -.31, p = .031$ ) and a nonsignificant trend for previous alcohol consumption intensity ( $\beta = .20, p = .052$ ). Repeating the analysis including only previous alcohol

consumption intensity as a covariate again yielded a significant main effect for the self-persuasion poster ( $\beta = -.35, p = .009$ ) but not for the direct persuasion poster ( $\beta = -.10, p = .548$ ) and yielded a significant main effect for previous alcohol consumption intensity ( $\beta = .25, p = .012; R^2 = .155$ ).

The multilevel regression analysis of persuasion technique (i.e., direct persuasion vs. control) on alcohol consumption (i.e., milliliters of pure alcohol consumed) for participants who consumed any alcohol yielded a nonsignificant trend for the direct persuasion poster ( $b = 4.47, p = .095$ ), and a significant main effect for the control condition ( $b = 6.69, p = .035$ ) compared to the self-persuasion poster (reference group). Repeating the analysis including all control variables as covariates yielded a nonsignificant trend for the direct persuasion poster ( $\beta = .24, p = .061$ ), a significant main effect for the control condition ( $\beta = .31, p = .032$ ), and a nonsignificant trend for previous alcohol consumption intensity ( $\beta = .20, p = .052$ ). Repeating the analysis including only previous alcohol consumption intensity as a covariate yielded a significant main effect for the direct persuasion poster ( $\beta = .25, p = .047$ ), a significant main effect for the control condition ( $\beta = .35, p = .009$ ), and a significant main effect for previous alcohol consumption intensity ( $\beta = .25, p = .012; R^2 = .155$ ). See Table 3 for an overview of the means and standard deviations of milliliters of pure alcohol consumed by condition for the subsample of only participants who consumed any alcohol during the experiment and Figure 1 for the box plot. Retaining the four excluded participants results in finding nonsignificant trends only (see Table 4).

**TABLE 3.** Experiment 2 Means and Standard Deviations of Milliliters of Pure Alcohol Consumed by Condition for the Complete- and Subsample (i.e., Only Participants Who Consumed Any Alcohol).

	Complete sample			Subsample		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Self-persuasion	38	11.99	10.46	24	18.98	6.11
Direct persuasion	44	12.26	13.38	23	23.45	8.70
Control	40	15.41	15.46	24	25.68	11.40
Total	122	13.21	13.28	71	22.69	9.31



**FIGURE 1.** Box plot of milliliters of pure alcohol consumed by condition for the subsample (i.e., only participants who consumed any alcohol).

**TABLE 4.** Multilevel Regression Analysis: Standardized Regression Coefficients Predicting Milliliters of Pure Alcohol Consumed for Participants Who Chose to Consume Alcohol Including All Outliers ( $n = 75$ ) in Study 2.

Variable	$\beta$	SE	R <sup>2</sup> change	$p$
Step 1				
Self-persuasion (dummy)	-.27	.16		.088
Direct persuasion (dummy)	-.22	.14	.07	.101
Step 2				
Self-persuasion (dummy)	-.27	.15		.062
Direct persuasion (dummy)	-.19	.12		.121
Alcohol consumption amount	.32*	.15	.10	.031

Total R<sup>2</sup> = .17;  $n = 75$ ; \* $p < .05$ , \*\*\* $p < .01$

### Conclusion.

The aim of Experiment 2 was to examine whether the selected self-persuasion poster from Experiment 1 was effective to reduce actual alcohol consumption compared to a direct persuasion poster or no poster. Results demonstrate that only for participants who chose to drink, the presence of a self-persuasion poster in the room reduced their alcohol consumption compared to a direct persuasion or no poster condition. A self-persuasive anti-alcohol poster did not affect the choice whether or not to consume alcohol, but it did reduce alcohol consumption for individuals who choose to drink alcohol compared to a direct persuasion poster, or no poster. There were no differences in alcohol consumption between the direct persuasion and no poster conditions, indicating that the direct persuasion posters did not produce a reactance effect.

## GENERAL DISCUSSION

The main goal of this research was to test whether self-persuasion can be successfully applied to media communications by framing the message as an open-ended question. Two experiments provided support that this is indeed possible and effective. Experiment 1 showed that framing anti-alcohol messages as open-ended questions triggered the generation of arguments “why to drink less alcohol” and resulted in more favorable evaluations of the message, indicative of lower reactance responses. Experiment 2 showed that exposure to a poster with a message framed as an open-ended question did not affect the choice to consume alcohol, but did reduce alcohol consumption for participants who chose to consume any alcohol compared to exposure to a poster framed as a statement or a no poster condition. Combined, the experiments support the idea that anti-alcohol messages framed as open-ended questions trigger self-generation of arguments “why to drink less alcohol” which subsequently reduces actual alcohol consumption for young adults who choose to consume alcohol.

The results from the current experiments add to the literature on the effectiveness of applying self-persuasion in health communications. To our best knowledge, Experiment 1 is the first study to empirically test and confirm that framing persuasive media messages as open-ended questions results in self-generation of arguments in line with the question. These findings support the idea that questions *trigger* argument generation, which has not been explicitly tested up to this point (Glock et al., 2013; Krischler & Glock, 2015; Müller et al. 2016). Additionally, Experiment 1 expands existing literature by showing indications of lower reactance responses to messages employing self-persuasion compared to direct persuasion, supporting the idea that messages framed as open-ended question evoke less reactance, which had also not been explicitly tested (Glock et al., 2013; Krischler & Glock, 2015; Müller et al. 2016). Taken together, these findings provide support for

the hypothesized underlying mechanism of self-persuasion through question framing in persuasive media messages, providing a missing link to connect theory with experimental studies targeting behavioral change (Glock et al., 2013; Müller et al. 2016).

The effect of the posters on alcohol consumption found in Experiment 2 further corroborates self-persuasion research by showing that self-persuasion-techniques applied to media messages can successfully modify actual behavior on a previously untested topic (alcohol) and in a new form (printed media messages). Note that the manipulation was simple but effective. The only difference between conditions was the presence of a poster containing a question or a statement. The effect size was small, as is typical in media effects research (e.g., Snyder et al., 2004; Valkenburg & Peter, 2013). Nonetheless, participants who chose to consume alcohol in the self-persuasion condition consumed about half a beer less compared to drinkers in the other conditions (who consumed almost two beers on average). The application of self-persuasive anti-alcohol messages on a large scale, such as in mass media, might therefore have actual tangible benefits in the real world.

At a behavioral level specifically, the results from Experiment 2 closely match the findings by Müller et al. (2016), which showed that persuasive health messages framed as questions did not affect the choice to engage in the behavior addressed (i.e., smoking), but did affect the extent to which the behavior was engaged in (i.e., increases abstinence from smoking). In the current study, failure to affect the choice to consume alcohol in Experiment 2 may have been the result of the selected message wording: “Why do you have to *reduce* your alcohol consumption?” rather than for example “Why do you have to *stop* consuming alcohol?”. Future research could explore whether the latter wording is successful in changing the choice to engage in the advocated behavior.

None of the control variables were related to any of the cognitive reactions to the anti-alcohol messages in Experiment 1. Only frequency of alcohol consumption predicted the choice to consume alcohol, and the number of alcoholic drinks consumed in the week prior to the experiment predicted alcohol consumption for individuals who chose to drink any alcohol, in Experiment 2. That is, individuals who reported more frequent alcohol consumption in the weeks prior to the experiment were more likely to consume alcohol during the drinking session, and similarly individuals who reported higher alcohol consumption in the week prior to the experiment also consumed more alcohol during the drinking session. The absence of other relations between these variables is likely a result of two limitations of the current study sample. First, the current sample consisted mainly of light drinkers. It is possible that light and heavy drinkers are affected to a different extent by self-persuasion media messages. On the one hand, it is possible that light drinkers are affected less, simply because their initial response to self-persuasive posters might be “that does not apply to me”, resulting in rejection of the message. Adding

to this, Briñol et al. (2012) showed that individuals will put more effort into generating arguments to convince themselves for a counter attitudinal-position, resulting in greater self-persuasion. Light drinkers are more likely to have positive attitudes towards limiting alcohol consumption, which should result in less effortful argument generation and therefore less self-persuasion. On the other hand, it is possible that heavy drinkers might be affected less because they respond more defensive to the messages (Lieberman & Chaiken, 1992) and are more likely to exhibit reactance behavior (Ringold, 2002). Second, the current samples consisted mainly of women. Because research has consistently shown that women consume less alcohol compared to men (e.g., Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000), the people in the current samples might have been less susceptible to the self-persuasion messages because they felt they are not applicable to them or they put less effort into generating arguments to convince themselves. Unfortunately, exploration of gender effects was not possible due to the low number of male participants. Future research should focus on recruiting a more mixed sample both in terms of light and heavy drinkers as well as men and women to assess possible differences in the effectiveness of self-persuasive media messages.

The cognitive reactions- and subsequent behavioral effects to the media messages are tested in two separate experiments, which combined suggest that argument generation mediates the effects of the self-persuasion posters on reduced alcohol consumption. However, it was decided to not directly test this mediation in one single experiment to avoid any interference effects. That is, measuring the process of generating arguments would make the process more salient, which would likely result in inflated behavioral effects. For future research, however, it could be valuable to explicitly test the mediation, having established that behavior is affected when exposure to the posters occurs naturally. In addition, other possible underlying processes (e.g., a possible increase in self-awareness) could be investigated with such a design.

Further limitations of the current research pertain to the ecological validity of Experiment 2. In this experiment, participants’ drinking behavior was observed in a bar setting while they were watching short movies. Even though this highly controlled setting ensured minimal effects of possible confounding factors to protect the internal validity of the experiment, of course the cover story task itself (i.e., watching movies), is not something people typically do in a bar. This point, combined with the unavoidable fact that participants are aware that they are being tested, might have affected overall drinking behavior for all participants. Though the relative effectiveness of the posters on reducing alcohol consumption within this setting should be unaffected, ideally both limitations will be addressed in future research by examining the effects of the posters in a real-life setting, for example a bar or restaurant, on natural drinking behavior. By doing so, repeated exposure to the messages could be investigated as well to see possible influences

of long-term planned behavior (e.g., Gawronski & Bodenhausen, 2006; Glock, Müller, & Klapproth, 2015). Given that in the current study no effects on explicit measures were found, by doing so it would also be possible to test differential effects on more implicit and explicit measures.

Of more pressing concern, however, aiming to understand more about how the application of self-persuasion in media interventions is most effective to change behavior, future research should first focus on the effects of message elaboration. In Experiment 2 attention was not deliberately directed to the posters; however, they were visible to participants at all times during the drinking session. Participants therefore had ample opportunity to elaborate on the message, which should result in more generated thought (Clarkson, Tormala & Leone, 2011) and therefore more self-generated arguments. Based on research on attitude formation, more arguments should increase the persuasiveness of the message (Chaiken, 1980; Maddux & Rogers, 1980; Petty & Cacioppo, 1984; also see Briñol et al., 2012). In other words, self-persuasive media messages should be more effective under conditions of greater message elaboration, and therefore might not be effective in mass media, because message elaboration there is typically low. There are however, two reasons why these messages could very well be more effective under conditions of low message elaboration. First, research has shown that generating few arguments can actually be more persuasive than generating many (e.g., Müller, van Someren, Gloudemans, van Leeuwen, & Greifeneder, 2017). Generating few arguments is easier than generating many, resulting in feelings of fluency due to experienced ease of retrieval of the arguments, which in turn results in more persuasion. Second, under conditions of high message elaboration, it becomes increasingly likely that the message receivers will generate counter arguments for the behavior suggested in conjunction with arguments in line with the question (e.g., Clarkson et al., 2011; Petty, Cacioppo & Heesacker, 1981), effectively decreasing the persuasiveness of the message. Examining these two possibilities will provide insight into the optimal conditions for self-persuasive media interventions to be effective.

Finally, despite the fact that the goal of the current experiments was to examine whether self-persuasion could be applied in persuasive media messages, it is worth noting that self-persuasion strategies could be applied in other forms. An interesting possibility for example could be interventions on social media that ask users to generate and post arguments why certain behavior is bad or good. Such interventions might even be more persuasive because expressing the arguments online (i.e., publicly) should motivate the author to behave in line with the arguments to appear consistent to others (see the principle of commitment and consistency; Cialdini, 2009). Another possibility would be to incorporate argument generation as a behavioral change strategy in a more clinical

context, for example in conversations between patients and providers (e.g., motivational interviewing; Suarez & Mullins, 2008).

In sum, the current experiments provided compelling support that self-persuasion might be a viable and powerful persuasion strategy to be applied in health communication interventions. Not only did self-persuasive media messages appear to be more effective than conventionally used direct persuasion, they seem to produce lower reactance responses in Experiment 1 as well, potentially reducing, or even avoiding, boomerang effects of health communication interventions. Self-persuasion is likely not an applicable persuasion strategy for all types of behavior, however. Message receivers should have knowledge about potentially harmful effects of the behavior addressed to be able to generate arguments why they should not do it. If this is not possible, persuasion will not occur or might even backfire. Alongside educational interventions therefore, the specific self-persuasion method under investigation in the current research can be directly applied to media interventions aiming to reduce alcohol consumption among young adults, or be adopted and translated to target interventions targeting other behaviors in the domain of health communication and social marketing, such as promoting healthy eating, condom use, or energy conservation.

## REFERENCES

- Agostinelli, G., & Grube, J. (2002). Alcohol counter-advertising and the media. *Alcohol Research & Health*, 26(1), 15-21.
- Aronson, E. (1999). The Power of Self-Persuasion. *American Psychologist*, 54, 875-884. <http://dx.doi.org/10.1037/h0088188>
- Aronson, E. (2007). The evolution of cognitive dissonance theory: A personal appraisal. In A. R. Pratkanis (Ed.), *The science of social influence: Advances and future progress* (pp. 115-135). New York, NY: Psychology Press.
- Baek, Y. M. (2010). An integrative model of ambivalence. *The Social Science Journal*, 47, 609-629. <http://doi.org/10.1016/j.soscij.2010.02.003>
- Bernritter, S. F., van Ooien, I., & Müller, B. C. N. (2017). Self-persuasion as marketing technique” The role of consumers’ involvement. *European Journal of Marketing*, 51, 1075-1090.
- Blackwell, R. T., Galassi, J. P., Galassi, M. D., & Watson, T. E. (1985). Are cognitive assessment methods equal? A comparison of think aloud and thought listing. *Cognitive Therapy and Research*, 9, 399-413. <http://dx.doi.org/10.1007/BF01173089>
- Brehm, J. W. (1966). A theory of psychological reactance. New York: Academic Press.
- Briñol, P., McCaslin, M. J., & Petty, R. E. (2012). Self-generated persuasion: Effects of target and direction of arguments. *Journal of Personality and Social Psychology*, 102, 925-940. <http://dx.doi.org/10.1037/a0027231>
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Experimental Social Psychology*, 39, 752-766. <http://dx.doi.org/10.1037/0022-3514.39.5.752>
- Christiansen, M., Vik, P. W., & Jarchow, A. (2002). College student heavy drinking in social contexts versus alone. *Addictive Behaviors*, 27, 393-404. [http://dx.doi.org/10.1016/S0306-4603\(01\)00180-0](http://dx.doi.org/10.1016/S0306-4603(01)00180-0)
- Cialdini, R. B. (2009). *Influence: Science and Practice*. Boston: Pearson Education.
- Clarkson, J. J., Tormala, Z. L., & Leone, C. (2011). A self-validation perspective on the mere thought effect. *Journal of Experimental Psychology*, 47, 449-454. <http://dx.doi.org/10.1016/j.jesp.2010.12.003>
- Corrao, G., Bagnardi, V., Zambon, A., & Vecchia, C. (2004). A meta-analysis of alcohol consumption and the risk of 15 diseases. *Preventive Medicine*, 38, 613-619. <http://dx.doi.org/10.1016/j.ypmed.2003.11.027>
- Crawford, M. T., McConnell, A. R., Lewis, A. C., & Sherman, S. J. (2002). Reactance, compliance and anticipated regret. *Journal of Experimental Social Psychology*, 38, 56-63. <http://dx.doi.org/10.1006/jesp.2001.1481>
- Damen, T. G. E., Müller, B. C. N., van Baaren, R. B., & Dijksterhuis, A. (2015). Re-examining the agentic shift: The sense of agency influences the effectiveness of (self)persuasion. *PloS ONE*, 10(6): e0128635. <http://dx.doi.org/10.1371/journal.pone.0128635>
- De Visser, R. O., & Smith, J. A. (2007). Young men’s ambivalence towards alcohol. *Social Science & Medicine*, 64, 350-362. <http://doi.org/10.1016/j.socscimed.2006.09.010>
- Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs*, 72, 144-168. <http://dx.doi.org/10.1080/03637750500111815>
- Elms, A. C. (1966). Influence of fantasy ability on attitude change through role playing. *Journal of Personality and Social Psychology*, 4(1), 36-43. <http://dx.doi.org/10.1037/h0023509>
- Engels, R. C. M. E., & Knibbe, R. A. (2000). Alcohol use and intimate relationships in adolescence: When love comes to town. *Addictive Behaviors*, 25, 435-439. [http://dx.doi.org/10.1016/S0306-4603\(98\)00123-3](http://dx.doi.org/10.1016/S0306-4603(98)00123-3)
- Engels, R. C. M. E., Knibbe, R. A., & Drop, M. J. (1999). Visiting public drinking places: An explorative study into the functions of pub-going for late adolescents. *Substance Use and Misuse*, 34, 1261-1280. <http://dx.doi.org/10.3109/10826089909039408>
- Fazio, R. H., & Towles-Schwen, T. (1999). The MODE model of attitude-behavior processes. In S. Chaiken, & Y. Trope (Eds.), *Dual process theories in social psychology* (pp.97-116). New York: Guilford.
- Friedrich, J. (1990). Learning to view psychology as a science: Self-persuasion through writing. *Teaching of Psychology*, 17, 23-27. [http://dx.doi.org/10.1207/s15328023top1701\\_5](http://dx.doi.org/10.1207/s15328023top1701_5)
- Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin*, 132, 692-731. <http://doi.org/10.1037/0033-2909.132.5.692>
- Gawronski, B., Lebel, E. P., & Peters, K. R. (2007). What do implicit measures tell us? Scrutinizing the validity of three common assumptions. *Perspectives on Psychological Science*, 2, 181-193. <http://doi.org/10.1111/j.1745-6916.2007.00036.x>
- Glock, S., Klapproth, F., & Müller, B. C. N. (2015). Promoting responsible drinking? A mass media campaign affects implicit but not explicit alcohol-related cognitions and attitudes. *British Journal of Health Psychology*, 20, 482-497. <http://doi.org/10.1111/bjhp.12130>
- Glock, S., Müller, B. C. N., & Ritter, S. (2013). Warning labels formulated as questions positively influence smoking-related risk perception. *Journal of Health Psychology*, 18, 252-262. <http://dx.doi.org/10.1177/1359105312439734>
- Greenwald, A.G., & Albert, R. D. (1968). Acceptance and recall of improvised arguments. *Journal of Personality and Social Psychology*, 8(1), 31-34. <http://dx.doi.org/10.1037/h0021237>
- Janis, I. L., & King, B. T. (1954). The influence of role playing on opinion change. *Journal of Abnormal and Social Psychology*, 49, 211-218. <http://dx.doi.org/10.1037/h0056957>
- Keer, M., van den Putte, B., Neijens, P., & de Wit, J. (2013). The influence of affective and cognitive arguments on message judgement and attitude change: The moderating effects of meta-bases and structural bases. *Psychology & Health*, 28, 895-908. <http://dx.doi.org/10.1080/08870446.2013.764428>
- King, B. T., & Janis, I. L. (1956). Comparison of the effectiveness of improvised versus non-improvised role-playing in producing opinion changes. *Human relations*, 9, 177-186. <http://dx.doi.org/10.1177/001872675600900202>
- Krischler, M., & Glock, S. (2015). Alcohol warning labels formulated as questions change alcohol-related outcome expectancies: A pilot study. *Addiction Research & Theory*, 23, 343-349. <http://dx.doi.org/10.3109/16066359.2015.1009829>
- Liberman, A., & Chaiken, S. (1992). Defensive processing of personally relevant health messages. *Personality and Social Psychology Bulletin*, 18, 669-679. <http://dx.doi.org/10.1177/0146167292186002>
- Maddux, J. E., & Rogers, R. W. (1980). Effects of source expertness, physical attractiveness, and supporting arguments on persuasion: A case of brains over beauty. *Journal of Personality and Social Psychology*, 39, 235-244. <http://dx.doi.org/10.1037/0022-3514.39.2.235>
- Maio, G. R., & Thomas, G. (2007). The epistemic-teleologic model of deliberate self-persuasion. *Personality and Social Psychology Review*, 11, 46-67. <http://dx.doi.org/10.1177/1088868306294589>
- Müller, B. C. N., Ritter, S. M., Glock, S., Dijksterhuis, A., Engels, R. C. M. E., & van Baaren, R. B. (2016). Smoking-related warning messages formulated as questions positively influence short-term smoking behaviour. *Journal of Health Psychology*, 21, 60-68. <http://dx.doi.org/10.1177/1359105314522083>
- Müller, B. C. N., van Baaren, R. B., Ritter, S. M., Woud, M. L., Bergmann, H., ... Dijksterhuis, A. (2009). Tell me why... The influence of self-involvement on short term smoking behaviour. *Addictive Behaviors*, 34, 427-431. <http://dx.doi.org/10.1016/j.addbeh.2008.12.016>
- Müller, B. C. N., van Someren, D. H., Gloudemans, R. T. M., van Leeuwen, M. L., & Greifeneder, R. (2017). Helping made easy: Ease of argument generation enhances intentions to help. *Social Psychology*, 48, 113-121. <http://doi.org/10.1027/1864-9335/a000293>
- Muthén, L.K. and Muthén, B.O. (1998-2010). Mplus User’s Guide. Sixth Edition. Los Angeles, CA: Muthén & Muthén.

- Mussweiler, T., & Neumann, R. (2000). Sources of mental contamination: Comparing the effects of self-generated versus externally provided primes. *Journal of Experimental Social Psychology, 36*, 194–206. <http://dx.doi.org/10.1006/jesp.1999.1415>
- Petty, R. E., Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology, 46*, 69-81. <http://dx.doi.org/10.1037/0022-3514.46.1.69>
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (ed.), *Advances in experimental social psychology* (pp. 123-205). New York, NY: Academic Press.
- Petty, R. E., Cacioppo, J. T., & Heesacker, M. (1981). Effects of rhetorical questions on persuasion: A cognitive response analysis. *Journal of Personality and Social Psychology, 40*, 432-440. <http://dx.doi.org/10.1037/0022-3514.40.3.432>
- Rehm, J., Room, R., Monteiro, M., Gmel, G., Graham, K., Rehn, N., . . . Jernigan, D. (2003). Alcohol as a risk factor for global burden of disease. *European Addiction Research, 9*, 157-164. <http://dx.doi.org/10.1159/000072222>
- Ringold, D. J. (2002). Boomerang effects in response to public health interventions: Some unintended consequences in the alcoholic beverage market. *Journal of Consumer Policy, 25*, 27-63. <http://dx.doi.org/10.1023/A:1014588126336>
- Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory, 4*, 592-604. <http://dx.doi.org/10.1037/0278-7393.4.6.592>
- Slater, M. D., & Domenech, M.M. (1995). Alcohol warnings in TV beer advertisements. *Journal of Studies on Alcohol and Drugs, 56*, 361-367. <http://doi.org/10.15288/jsa.1995.56.361>
- Snyder, L. B., Hamilton, M. A., Mitchell, E. W., Kiwanuka-Tondo, J., Gleming-Milici, F., & Dwayne, P. (2004). A meta-analysis of the effects of mediated health communication campaigns on behavior change in the United States. *Journal of Health Communication, 9*, 71-96. <http://dx.doi.org/10.1080/10810730490271548>
- Suarez, M., & Mullins, S. (2008). Motivational interviewing and pediatric health behavior interventions. *Journal of Developmental and Behavioural Pediatrics, 29*, 417-428. <http://dx.doi.org/10.1097/DBP.0b013e31818888b4>
- Valkenburg, P. M., & Peter, J. (2013). The differential susceptibility to media effects model. *Journal of Communication, 63*, 221-243. <http://doi.org/10.1111/jcom.12024>
- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of media campaigns to change health behavior. *The Lancet, 376*, 1216-1217. [http://dx.doi.org/10.1016/S0140-6736\(10\)60809-4](http://dx.doi.org/10.1016/S0140-6736(10)60809-4)
- Watts, W. A. (1967). Relative persistence of opinion change induced by active compared to passive participation. *Journal of Personality and Social Psychology, 5*, 4-15. <http://dx.doi.org/10.1037/h0021196>
- Wilsnack, R. W., Vogelanz, N. D., Wilsnack, S. C., & Harris, T. R. (2000). Gender differences in alcohol consumption and adverse drinking consequences: cross-cultural patterns. *Addiction, 95*, 251-265. <http://dx.doi.org/10.1046/j.1360-0443.2000.95225112.x>
- Wilson, T. D., & Brekke, N. (1994). Mental contamination and mental correction: Unwanted influences on judgements and evaluations. *Psychological Bulletin, 116*, 117-142. <http://dx.doi.org/10.1037/0033-2909.116.1.117>
- World Health Organisation. (2014). *Global status report on alcohol and health*. Retrieved from: [apps.who.int/iris/bitstream/10665/112736/1/978924069276\\_3\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/112736/1/978924069276_3_eng.pdf)

# Chapter 3

## **Self-Persuasion on Facebook Increases Alcohol Risk Perception**

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## ABSTRACT

In this experiment, we examined if participating in a Facebook group by generating anti-alcohol arguments (self-persuasion) is more effective than reading anti-alcohol posts of others (direct-persuasion) in changing alcohol consumption, risk perception, and attitudes. Additionally, it was examined if submitting posts moderated these effects. Participants logged into their Facebook account and joined a group that contained posts with anti-alcohol arguments. They either generated their own arguments, with or without posting them, or read those present in the group, with or without posting that they had read them. Next, participants rated movie clips in a 30-minute ad libitum drinking session in dyads and their alcohol consumption was measured. Finally, measures of alcohol risk perception and attitudes were completed. Results show that generating anti-alcohol arguments—regardless of whether posting them or not—is effective in increasing alcohol risk perception but does not affect immediate alcohol consumption.

*Keywords:* self-persuasion, public commitment, Facebook, alcohol consumption, alcohol risk perception.

## INTRODUCTION

Alcohol content on Facebook can affect alcohol-related perceptions and behavior of the platform's users (Litt & Stock, 2011; McCreanor et al., 2013). Combined with Facebook's high popularity among adolescents and young adults (Facebook, 2017; Statista, 2017)—a high-risk group for consuming too much alcohol (McCreanor et al., 2013)—this makes the platform interesting for interventions aiming to reduce alcohol consumption (Westgate & Holliday, 2016; Ribout, 2016). Such interventions could reduce the detrimental effects of alcohol on health and society (Corrao, Bagnardi, Zambon, & Vacchia, 2004; Rehm et al., 2003).

The main challenge for interventions is that most Facebook accounts of adolescents and young adults are saturated with alcohol content (Beullens & Schepers, 2013; Fournier & Clarke, 2011; van Hoof, Bekkers, & van Vuuren, 2014) that mainly depicts the positive but not negative aspects of consumption (McCreanor et al., 2013; Beullens & Schepers, 2013). This shapes increased consumption of users because they create and maintain pro-drinking norms and positive alcohol-related outcome expectancies (Litt & Stock, 2011; Ali & Dwyers, 2010; Boyle, LaBrie, Froidevaux, & Witkovic, 2016; Huang et al., 2014; Jones, Corbin, & Fromme, 2001; Moreno, Briner, Williams, Walker, & Christakis, 2009; Nesi, Rothenberg, Hussong, & Jackson, 2017), and it also complicates anti-alcohol persuasion. Specifically, most people have ambivalent attitudes toward alcohol (De Visser & Smith, 2007). Consequently, individuals are motivated to use consensus information (i.e., positive alcohol content; Hodson, Maio, & Esses, 2001) and response amplification (i.e., amplifying attitudes in the direction of provided information; Bell & Esses, 2002) to reduce dissonance resulting from the ambivalence (Festinger, 1957). Combined therefore, positive attitudes about alcohol are salient in a Facebook environment, and users are likely to process pro-attitudinal rather than counter-attitudinal information (Clark, Wegener, & Fabrigar, 2008), thus increasing the difficulty of anti-alcohol persuasion.

In this article, we examine a persuasion strategy that is especially effective for counter-attitudinal advocacy (Briñol, McCaslin, & Petty, 2012) and fits with the user-generated nature of Facebook content: self-persuasion (Aronson, 1999; Loman, Müller, Oude Groote Beverborg, van Baaren, & Buijzen, 2018). Self-persuasion differs from other forms of persuasion because the means of influence are self-generated instead of externally provided (Briñol et al., 2012; Loman et al., 2018; Maio & Thomas, 2007). On Facebook this could be applied by asking users to post reasons why they should not drink alcohol. Such interventions could kill two birds with one stone: The created messages highlight the currently underrepresented negative outcomes of alcohol consumption, and the act of generating the messages should result in self-persuasion, changing the alcohol perceptions, attitudes, and behavior of the message author.



## Self-Persuasion

Compared to direct-persuasion, self-persuasion has three advantages. First, individuals mentally detect and correct internally generated information less than externally provided information (Mussweiler & Neumann, 2000; Wilson & Brekke, 1994). Second, psychological reactance is not activated in response to self-generated arguments because they do not restrict freedom of choice, whereas it is activated in direct-persuasion. Third, when individuals generate arguments, they come up with reasons they find most compelling (Briñol et al., 2012; Greenwald & Albert, 1968; Slamecka & Graf, 1978).

In traditional media messages, self-persuasion has shown to be more effective than direct-persuasion to change health-related cognitions and behavior (Loman et al., 2018; Glock, Müller, & Ritter, 2013; Krischler & Glock, 2015; Müller, Ritter, Glock, Dijksterhuis, Engels & van Baaren, 2016). Self-persuasion effects also have been found in social media in the form of expression effects, in which expressing a message can affect the expresser (Pingree, 2007; Valkenburg, Peter, & Walther, 2016). To date, however, no experimental studies have examined the application of self-persuasion techniques on social media to reduce alcohol consumption. The first aim in this study is to address this by examining if generating anti-alcohol arguments (self-persuasion) in an anti-alcohol Facebook group is more effective than joining this group and only reading others' anti-alcohol posts (direct-persuasion) to reduce alcohol consumption and to increase alcohol risk perception and attitudes toward limiting alcohol consumption.

## Public Commitment

User-generated content on social media typically is visible to other users. Expressing a position publicly can change subsequent behavior via the principle of commitment and consistency (Cialdini, 2009). Specifically, when an individual expresses a position publicly, he/she will change subsequent behavior and attitudes to be in accordance with the expression. On Facebook, self-persuasion effects resulting from generating anti-alcohol arguments might therefore be enhanced by posting them online. As a second aim, therefore, this experiment examines if generating and posting (public commitment) anti-alcohol arguments in a Facebook group increases self-persuasion effects compared to generating but not posting (private commitment) the arguments.

## METHOD

### Participants and Design

From 122 tested participants, 11 were removed due to procedural issues during testing. The remaining participants (83 female, 28 male, age range 18 to 53 years,  $M=21.20$ ,  $SD=3.83$ ) participated for course credit or a €10 reward. Participants were recruited at [University], and randomly assigned to one of four conditions in a 2(persuasion-technique: self-persuasion vs. direct-persuasion) $\times$ 2(commitment: public vs. private) between-subjects design. The dependent variables were alcohol consumed, alcohol risk perception, attitude toward alcohol, and intentions to limit alcohol consumption.

### Procedure and Materials

Participants signed up for the experiment in dyads. They were told they would participate in two unrelated experiments, and that they would use their own Facebook account. The researcher asked for their Facebook names so they could be invited to join a private Facebook group.

They completed a paper-and-pencil questionnaire assessing control variables separately in cubicles. First, alcohol identity was measured using five items rated on a 7-point scale (1=*strongly disagree*, 7=*strongly agree*), adopted from Conner, Warren, Close, and Sparks (1999; Cronbach's  $\alpha=.79$ ). Second, alcohol consumption frequency was assessed with four open-ended questions, one for each of the preceding four weeks, adopted from Engels and Knibbe (2000; Cronbach's  $\alpha=.85$ ). Third, alcohol consumption intensity was measured with four open-ended questions about alcohol consumption during the previous week, adopted from Engels, Knibbe and Drop (1999).

Next, participants read printed instructions for the Facebook part. It explained that the researcher had sent them an invitation to join a private Facebook group with posts containing anti-alcohol arguments. Participants had to accept the invitation. Depending on the condition, participants read the arguments and then generated their own anti-alcohol arguments and post them (self-persuasion/public commitment), read and generate arguments without posting them (self-persuasion/private commitment), read those present in the group and post they had read them (direct-persuasion/public commitment), or read the arguments only (direct-persuasion/private commitment). For privacy reasons, a non-recording, hidden camera in the cubicle was used only to monitor if the participants followed the instructions (i.e., if they typed "something" in the relevant conditions).

Subsequently, participants jointly attended a 30-minute ad libitum drinking session in a bar laboratory, monitored via hidden camera. As cover story, they had to view and

rate three short films that did not display alcohol (15 minutes combined, with 5-minute breaks between clips), and answered bogus attitude questions (see Loman et al., 2018). They were free to take drinks from a refrigerator containing beer, wine, soda, and water. Participants' choice of drinks and total milliliters consumed were measured. As the first dependent variable, the total amount of pure alcohol consumed was calculated.

Next, researchers administered a final paper-and-pencil questionnaire, assessing the remaining dependent variables. First, alcohol risk perception was measured by assessing the perceived likelihood of contracting seven diseases due to alcohol consumption using 9-point scales (1=*not likely*, 9=*very likely*), adopted from Glock, Müller and Ritter (2013; Cronbach's  $\alpha=.91$ ). Next, attitudes to limit consumption was measured using three scales assessing the affective, cognitive, and general components of attitudes toward "drinking less alcohol during the coming month". Each scale consisted of three 7-point semantic-differential items, adopted from Keer, van den Putte, Neijens and de Wit (2013; Cronbach's  $\alpha=.91$ , .87, and .85). Then, intentions to limit alcohol consumption was measured with three statements for which participants indicated applicability on a 7-point scale (1=*completely not*, 7=*completely*), adapted from Keer et al., (2013; Cronbach's  $\alpha=.95$ ). Finally, participants were thanked, rewarded, and debriefed. See Figure 1 for an overview of the procedural steps.

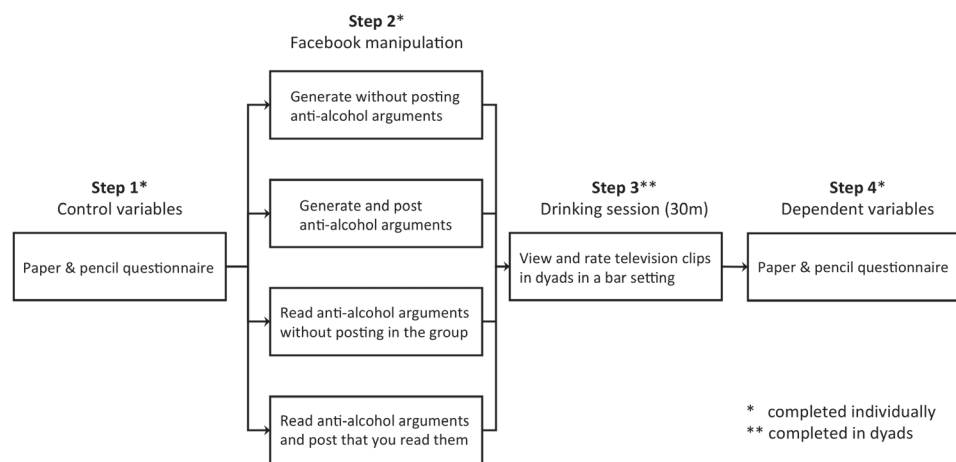


FIGURE 1. Flowchart describing the four steps of the experiment.

## RESULTS

Randomization checks indicated a significant difference between conditions for alcohol identity ( $F(3,107)=3.44$ ,  $p=.02$ ,  $\text{partial}\eta^2=.09$ ) and alcohol consumption frequency ( $F(3,107)=4.67$ ,  $p<.01$ ,  $\text{partial}\eta^2=.12$ ). Bonferroni post-hoc comparisons yielded significant differences between the self-persuasion public condition and the direct-persuasion private conditions ( $p<.01$ ), indicating participants reported higher alcohol identity and alcohol consumption frequency levels in the former condition (Table 1). Both variables were added as covariates in the main analyses. Randomization was successful for all other variables. The intraclass correlation for drinking within dyads was .72, indicating high similarity of alcohol consumption.

TABLE 1. Sample Means and Standard Deviations of All Variables by Condition.

Persuasion- technique	Self-persuasion		Direct-persuasion		Total <i>n</i> = 111 <i>M</i> ( <i>SD</i> )
	Public <i>n</i> = 29 <i>M</i> ( <i>SD</i> )	Private <i>n</i> = 26 <i>M</i> ( <i>SD</i> )	Public <i>n</i> = 27 <i>M</i> ( <i>SD</i> )	Private <i>n</i> = 29 <i>M</i> ( <i>SD</i> )	
Alcohol identity	3.92 (1.06)	3.44 (1.40)	3.78 (1.27)	3.00 (1.01)	3.53 (1.22)
Alcohol consumption frequency	2.31 (1.25)	1.66 (1.09)	1.77 (1.00)	1.27 (.93)	1.75 (1.12)
Alcohol consumption intensity	13.22 (9.57)	9.04 (8.50)	8.67 (6.96)	8.76 (13.78)	9.97 (10.16)
ml of pure alcohol consumed	11.15 (10.64)	4.73 (8.08)	10.78 (10.40)	6.64 (11.98)	8.38 (10.64)
Risk perception	3.91 (1.51)	3.57 (2.09)	3.05 (1.61)	2.76 (1.34)	3.32 (1.69)
Affective attitude	3.28 (1.17)	3.83 (1.42)	3.71 (1.43)	4.03 (.70)	3.71 (1.22)
Cognitive attitude	4.54 (1.34)	5.13 (1.30)	4.96 (1.40)	5.07 (1.06)	4.92 (1.29)
General attitude	4.32 (1.28)	5.22 (1.10)	5.05 (1.29)	4.87 (.91)	4.85 (1.19)
Behavioral intentions	2.76 (1.70)	2.97 (1.68)	3.48 (2.09)	3.15 (1.75)	3.09 (1.75)

Participants reported that alcohol was of "average" importance for their identity. This result is congruent with the reported 10 glasses of alcohol consumed per week on two days (similar to Loman et al., 2018). The overall risk associated with alcohol consumption was low, indicating that participants did not see alcohol consumption as a cause for concern. Attitudes toward limiting alcohol consumption generally were positive with regard to cognitive aspects and neutral to affect aspects. Overall intentions to reduce

consumption was somewhat negative, which is congruent with the reported low perceived risk associated with alcohol consumption.

## Main Analyses

### Alcohol consumption.

The effects of persuasion-technique and commitment on alcohol consumption had a nested structure because individuals were tested in dyads. Therefore, possible non-independence of the data had been corrected to avoid underestimation of the standard errors and to avoid type I error (Oude Groote Beverborg, Slegers, & van Veen, 2015). Dyad level variance needed to be separated from individual level variance, while testing effects on the individual level only. Therefore, multilevel regression analysis using the statistical software Mplus6.12 (Muthén & Muthén; 1998-2010) employing the TYPE=COMPLEX procedure, was used.

57 participants (51%) did not consume alcohol during the experiment. Milliliters of pure alcohol consumed, therefore contained a meaningful spike at zero, violating the assumption of a normal distribution. To correctly analyze the data, the original research question was separated into two sub-questions: (1) “Does persuasion-technique affect the choice to consume alcohol (yes vs. no)?” and (2) “Does persuasion-technique affect alcohol consumption for individuals who chose to consume alcohol?” (see Loman et al., 2018).

**TABLE 2.** Multilevel<sup>c</sup> Probit Regression Analysis: Standardized Regression Coefficients Predicting the Choice to Consume Alcohol (Yes vs. No).

Variable:	$\beta$	SE	R <sup>2</sup> change
Step 1			
Persuasion (0 = self; 1 = direct)	.01	.15	
Commitment (0 = private; 1 = public)	.34*	.14	.12
Step 2			
Persuasion (0 = self; 1 = direct)	.10	.14	
Commitment (0 = private; 1 = public)	.20	.13	
Alcohol identity	.13	.13	
Alcohol consumption frequency	.42***	.09	.22

Total R<sup>2</sup> = .34; N = 111; \*p < .05, \*\*\*p < .01

<sup>c</sup> Multilevel regression analysis was used to take the nested structure of the consumption data (i.e., drinking occurred in dyads) into account.

**Choice to drink alcohol.** The multilevel probit regression analysis of persuasion-technique and commitment on the choice to consume alcohol (1=yes; 0=no), with alcohol identity and alcohol consumption frequency as covariates, yielded a significant effect for alcohol consumption frequency. This finding indicates that habit has a strong effect on the choice to consume alcohol. Specifically, as participants drink more often, they were more likely to choose to drink alcohol in the experiment. The choice to consume alcohol, however, was unaffected by the manipulations (Table 2).

**Alcohol consumption for participants who chose to drink alcohol.** The multilevel regression analysis of persuasion-technique and commitment on alcohol consumption for participants who consumed alcohol, with alcohol identity and alcohol consumption frequency as covariates, yielded no significant effects. This indicates there were no differences in alcohol consumption for participants who chose to drink during the experiment (Table 3).

**TABLE 3.** Multilevel<sup>d</sup> Regression Analysis: Standardized Regression Coefficients Predicting Milliliters of Pure Alcohol Consumed for Participants Who Chose to Consume Alcohol (n = 54).

Variable	$\beta$	SE	R <sup>2</sup> change
Step 1			
Persuasion (0 = self; 1 = direct)	.09	.15	
Commitment (0 = private; 1 = public)	.06	.18	.01
Step 2			
Persuasion (0 = self; 1 = direct)	.13	.16	
Commitment (0 = private; 1 = public)	.03	.20	
Alcohol identity	.00	.13	
Alcohol consumption frequency	.16	.13	.02

Total R<sup>2</sup> = .03; n = 54; \*p < .05, \*\*\*p < .01

### Risk perception.

A 2(persuasion-technique)x2(commitment) between-subjects ANCOVA with alcohol identity and alcohol consumption frequency as covariates and risk perception as the dependent variable, indicated that alcohol identity was significantly related to risk perception ( $F(1,105)=4.20, p=.04, r=.31$ ) and alcohol consumption frequency was not ( $F(1,105)=.92, p=.34$ ). After controlling for the covariates, there was a significant main effect for persuasion-technique ( $F(1,105)=11.98, p=.04, \text{partial}\eta^2=.04$ ), indicating self-persuasion resulted in higher alcohol risk perception ( $M=3.75, SD=1.80$ ) compared to direct-persuasion ( $M=2.90, SD=1.47$ ; Figure 2). The main effect for commitment and

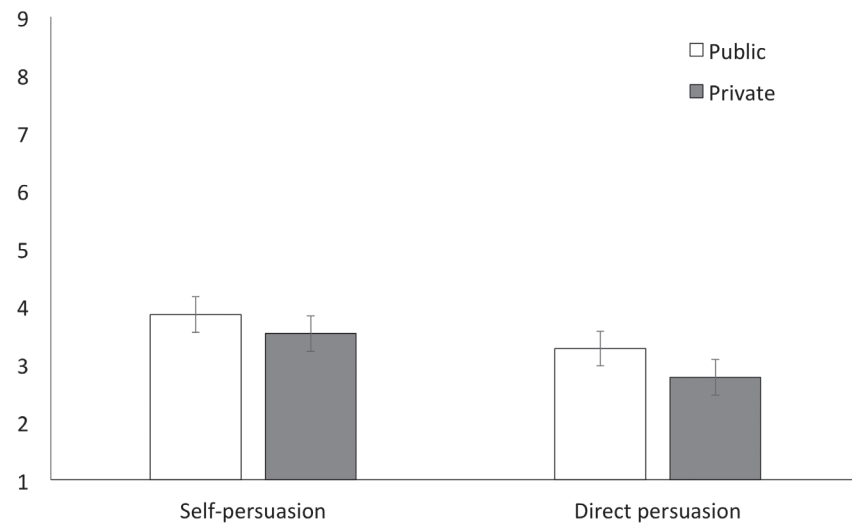


FIGURE 2. Alcohol risk perception by condition.

the interaction effect of persuasion-technique and commitment were nonsignificant ( $F(1,105)=.01, p=.93$  and  $F(1,105)=.04, p=.85$ , respectively).

#### Attitudes.

A 2(persuasion-technique)x2(commitment) between-subjects MANCOVA with alcohol identity and alcohol consumption frequency as covariates and affective, cognitive, and general attitudes toward limiting alcohol consumption as the dependent variables, indicated alcohol identity was significantly related to the dependent variables ( $F(3,103)=11.17, p<.01$ ) and alcohol consumption frequency was not ( $F(3,103)=1.71, p=.17$ ).

After controlling for the covariates, the main effects for persuasion-technique and commitment were both nonsignificant ( $F(3,103)=.08, p=.97$  and  $F(3,103)=.35, p=.76$ , respectively). The interaction of persuasion-technique and commitment was significant ( $F(3,103)=3.05, p=.03$ ).

The MANCOVA yielded a significant interaction of persuasion-technique and commitment for general attitude toward limiting alcohol consumption ( $F(1,105)=7.07, p<.01$ ). Figure 3 indicates that posting the generated arguments resulted in lower general attitudes toward limiting alcohol consumption compared to generating the arguments privately. The interaction for affective and cognitive attitudes toward alcohol consumption were non-significant ( $F(3,103)=.81, p=.37$  and  $F(3,103)=.93, p=.34$ ).

#### Intentions.

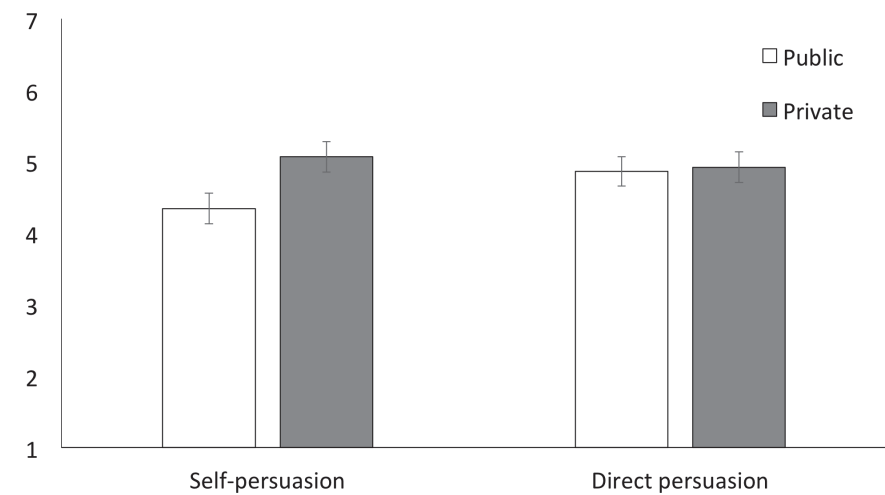


FIGURE 3. Interaction of persuasion-technique and commitment for general attitude toward limiting alcohol consumption.

A 2(persuasion-technique)x2(commitment) between-subjects ANCOVA, with alcohol identity and alcohol consumption frequency as covariates and behavioral intentions to limit alcohol consumption as the dependent variable, indicated alcohol identity was significantly related to the dependent variable ( $F(1,105)=7.33, p<.01, r=-.32$ ), but alcohol consumption frequency was not ( $F(1,105)=.64$ ).

After controlling for the covariates, the main effects for persuasion-technique and commitment as well as the interaction between persuasion-technique and commitment were non-significant ( $F(1,105)=.64, p=.43$ ;  $F(1,105)=1.53, p=.22$ ; and  $F(1,105)=1.06, p=.31$ ). The experimental manipulations, therefore, did not affect behavioral intentions to limit alcohol consumption.

## DISCUSSION

The current experiment tested if participating in a Facebook group by generating anti-alcohol arguments (self-persuasion) is more effective than joining a group and reading others' anti-alcohol arguments (direct-persuasion) to change alcohol-related behavior, cognitions, and attitudes. Additionally, we examined if posting the generated arguments increases the effectiveness of self-persuasion compared to generating arguments without posting them. Results indicate that generating anti-alcohol arguments is effective to increase alcohol risk perception regardless of whether the arguments are posted online. It

failed to change immediate alcohol consumption. Finally, expressing generated arguments publicly resulted in less positive general attitudes toward limiting alcohol consumption than generating the arguments without posting them.

For risk perception, the results are in line with previous studies. Specifically, cigarette warning labels formulated as questions resulted in higher smoking risk perception than statements (Glock et al., 2013). Related but distinct, alcohol warning labels formulated as questions increased negative alcohol outcome expectancies compared to statements (Krischler & Glock, 2015). The current findings add to this literature by showing that generating anti-alcohol arguments increases alcohol risk perception compared to reading the arguments of others, even when the argument generation is instructed. This result is promising when considering the application of self-persuasion interventions on Facebook: generating arguments will increase the accuracy of the perceived risk associated with alcohol consumption.

On a behavioral level, the fact that self-persuasion manipulations did not affect the choice to engage in the target behavior is in line with other studies (Loman et al., 2018; Müller, et al., 2016). In those experiments, however, self-persuasion did affect the extent to which the behavior was engaged in. In this experiment, similar—but stronger—behavioral effects were expected because the manipulation was more active (generating and posting arguments) than the relatively passive exposure manipulations in prior studies (Loman et al., 2018; Müller, et al., 2016).

Interestingly, a possible explanation for the ineffectiveness of self-persuasion to change alcohol consumption in this experiment springs from this very manipulation. Participants were instructed (“forced”) to generate their anti-alcohol arguments, whereas in other self-persuasion experiments they were “triggered” with questions in media messages (Loman et al., 2018; Müller, et al., 2016). This instruction could have reduced self-persuasion effects because participants felt their choice freedom was restricted, which could have resulted in reactance and therefore no behavioral change.

Similarly, “forcing” participants to generate anti-alcohol arguments might have resulted in attributing the reason for generating the arguments to the task instead of to themselves (as a reflection of their own ideas and attitudes), and therefore reduced self-persuasion effects. Future studies should examine if instructing individuals to generate arguments reduces subsequent self-persuasion by comparing it to manipulations that stimulate anti-alcohol argument generation, which is how Facebook interventions in real life work.

Finally, general attitudes toward limiting alcohol consumption were more positive when individuals could keep their arguments private, compared to posting them publicly on Facebook. Given the principle of commitment and consistency (Cialdini, 2009), this

finding was unexpected. It fits, however, with the previously described reactance effect: The self-persuasion manipulation might unintentionally have resulted in a reactance response due to “forcing” participants to generate and post their arguments online. As a result, participants’ attitudes were less positive because their freedom to choose was limited. This might have been less of an issue when participants were asked only to generate the arguments without posting them.

Alcohol identity was measured exploratorily to control for the subjective importance of alcohol for participants in addition to commonly used objective measures (i.e., alcohol consumption frequency and intensity). The fact that alcohol identity was related to all dependent variables except alcohol consumption fits with the idea that objective measures are more predictive of behavior (Conner et al., 1999; Bagozzi & Kimmel, 1995), but adds that subjective measures could be related more to cognitions, attitudes, and intentions. Future experiments about (self-)persuasion and alcohol, therefore, could benefit from including subjective measures in tandem with commonly used objective measures.

### Feedback to Posts

This experiment focused on the persuasive effects of creating anti-alcohol posts only. An important difference between this experimental setup and real-life Facebook interventions is that feedback to the postings was impossible in the experiment but probably would happen in real life. Given the strong positive social norms about alcohol on Facebook (McCreanor et al., 2013; Beullens & Schepers, 2013; Fournier & Clarke, 2011; van Hoof et al., 2014), participants may not have wanted their friends to see their self-persuasion postings. The anticipation of negative reactions to the postings, therefore, might have reduced self-persuasion effects. Future research should examine the role of anticipated and actual feedback to postings, for example, by manipulation expectations about the valence of reactions to the posts.

### Limitations

Two main limitations should be noted. The first is the absence of a control condition. Although the relative effectiveness of self-persuasion versus direct-persuasion can be derived from the current design, it would have been interesting to learn if direct-persuasion affects alcohol-related behaviors, attitudes, and cognitions relative to no persuasion or even to positive posts about alcohol, which are a more accurate reflection of Facebook. Future research could aim to compare self- and direct anti-alcohol persuasion on Facebook with a control condition and, ideally, positive messages about alcohol consumption.

Second is the low number of participants. The absence of hypothesized differences in alcohol consumption and attitudes could have been a result of insufficient power due to under-sampling. If so, such effects are likely very small. Nonetheless, even small effects could be interesting, especially when considering the large audience self-persuasion interventions on Facebook could reach. Future experiments should be more conservative in estimating self-persuasion effect sizes.

## Conclusion

In conclusion, the combined results from the experiment show that interventions on Facebook aiming to get users to generate anti-alcohol arguments and post them is an effective way to increase awareness of the health risks of alcohol consumption. Beyond the results obtained, self-persuasion interventions on Facebook could affect not only the user creating anti-alcohol posts, but also other users, creating content showing the downside of alcohol consumption, at the very least working toward creating balance with the overrepresented positive alcohol content on Facebook.

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## REFERENCES

- Ali, M. M., & Dwyers, D. S. (2010). Social network effects in alcohol consumption among adolescents. *Addictive Behaviors*, 35, 337-342. <https://doi.org/10.1016/j.addbeh.2009.12.002>
- Aronson, E. (1999). The Power of Self-Persuasion. *American Psychologist*, 54, 875-884. <http://dx.doi.org/10.1037/h0088188>
- Bagozzi, R. P., & Kimmel, S. K. A comparison of leading theories for the prediction of goal-directed behaviours. *British Journal of Social Psychology*, 34, 437-461. <https://doi.org/10.1111/j.2044-8309.1995.tb01076.x>
- Bell, D. V., & Esses, V. M. (2002). Ambivalence and response amplification: A motivational perspective. *Personality and Social Psychology Bulletin*, 28, 1143-1152. <https://doi.org/10.1177/01461672022811012>
- Beullens, K., & Schepers, A. (2013). Display of alcohol use on Facebook: A content analysis. *Cyberpsychology, Behavior, and Networking*, 16, 497-503. <https://doi.org/10.1089/cyber.2013.0044>
- Boyle, S. C., LaBrie, J. W., Froidevaux, N. M., & Witkovic, Y. D. (2016). Different digital paths to the keg? How exposure to peers' alcohol-related social media content influences drinking among male and female first-year college students. *Addictive Behaviors*, 57, 21-29. <https://doi.org/10.1016/j.addbeh.2016.01.011>
- Briñol, P., McCaslin, M. J., & Petty, R. E. (2012). Self-generated persuasion: Effects of target and direction of arguments. *Journal of Personality and Social Psychology*, 102, 925-940. <http://dx.doi.org/10.1037/a0027231>
- Cialdini, R. B. (2009). *Influence: Science and Practice*. Boston: Pearson Education.
- Clark, J. K., Wegener, D. T., & Fabrigar, L. R. (2008). Attitudinal ambivalence and message-based persuasion: Motivated processing of proattitudinal information and avoidance of counterattitudinal information. *Personality and Social Psychology Bulletin*, 34, 565-577. <https://doi.org/10.1177/0146167207312527>
- Conner, M., Warren, R., Close, S., & Sparks, P. (1999). Alcohol consumption and the theory of planned behavior: An examination of the cognitive mediation of past behavior. *Journal of Applied Social Psychology*, 29, 1676-1704. <https://doi.org/10.1111/j.1559-1816.1999.tb02046.x>
- Corrao, G., Bagnardi, V., Zambon, A., & Vacchia, C. (2004). A meta-analysis of alcohol consumption and the risk of 15 diseases. *Preventive Medicine*, 38, 613-619. <http://doi.org/10.1016/j.ypmed.2003.11.027>
- De Visser, R. O., & Smith, J. A. (2007). Young men's ambivalence towards alcohol. *Social Science & Medicine*, 64, 350-362. <https://doi.org/10.1016/j.socscimed.2006.09.010>
- Dickerson, C. A., Thibodeau, R., Aronson, E., & Miller, D. (1992). Using cognitive dissonance to encourage water conservation. *Journal of Applied and Social Psychology*, 22, 841-854. <https://doi.org/10.1111/j.1559-1816.1992.tb00928.x>
- Engels, R. C. M. E., & Knibbe, R. A. (2000). Alcohol use and intimate relationships in adolescence: When love comes to town. *Addictive Behaviors*, 25, 435-439. [http://dx.doi.org/10.1016/S0306-4603\(98\)00123-3](http://dx.doi.org/10.1016/S0306-4603(98)00123-3)
- Engels, R. C. M. E., Knibbe, R. A., & Drop, M. J. (1999). Visiting public drinking places: An explorative study into the functions of pub-going for late adolescents. *Substance Use and Misuse*, 34, 1261-1280. <http://dx.doi.org/10.3109/10826089909039408>
- Facebook (2017, September) Facebook statistics. *Facebook*. <https://newsroom.fb.com/company-info/> (accessed Sep. 7, 2017).
- Festinger, L. (1957) *A theory of cognitive dissonance*. Evanston, IL: Row & Peterson.
- Fournier, A. K., & Clarke, S. W. (2011). Do college students use Facebook to communicate about alcohol? An analysis of student profile pages. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 5, (2), article 2. Retrieved from <https://cyberpsychology.eu/article/view/4246/3292>
- Glock, S., Müller, B. C. N., & Ritter, S. (2013). Warning labels formulated as questions positively influence smoking-related risk perception. *Journal of Health Psychology*, 18, 252-262. <http://dx.doi.org/10.1177/1359105312439734>
- Greenwald, A.G., & Albert, R. D. (1968). Acceptance and recall of improvised arguments. *Journal of Personality and Social Psychology*, 8(1), 31-34. <http://dx.doi.org/10.1037/h0021237>

- Hodson, G., Maio, G. R., & Esses, V. M. (2001). The role of attitudinal ambivalence in susceptibility to consensus information. *Basic and Applied Social Psychology*, 23, 197-205. [http://doi.org/10.1207/S15324834BASP2303\\_6](http://doi.org/10.1207/S15324834BASP2303_6)
- Huang, G. C., Unger, J. B., Soto, D., Fujimoto, K., Pentz, M. A., Jorden-Marsh, & Valente, W. V. (2014). Peer influences: The impact of online and offline friendship networks on adolescent smoking and alcohol use. *Journal of Adolescent Health*, 54, 508-514. <http://doi.org/10.1016/j.jadohealth.2013.07.001>
- Jones, B. T., Corbin, W., & Fromme, K. (2001). A review of expectancy theory and alcohol consumption. *Addiction*, 96, 57-72. <https://doi.org/10.1046/j.1360-0443.2001.961575.x>
- Keer, M., van den Putte, B., Neijens, P., & de Wit, J. (2013). The influence of affective and cognitive arguments on message judgement and attitude change: The moderating effects of meta-bases and structural bases. *Psychology & Health*, 28, 895-908. <http://dx.doi.org/10.1080/08870446.2013.764428>
- Krischler, M., & Glock, S. (2015). Alcohol warning labels formulated as questions change alcohol-related outcome expectancies: A pilot study. *Addiction Research & Theory*, 23, 343-349. <http://dx.doi.org/10.3109/16066359.2015.1009829>
- Litt, D. M., & Stock, M. L., (2011). Adolescent alcohol-related risk cognitions: The roles of social norms and social networking sites. *Psychology of Addictive Behaviors*, 25, 708-713. <https://dx.doi.org/10.1037/a0024226>
- Loman, J. G. B., Müller, B. C. N., Oude Groote Beverborg, A., van Baaren, R. B., Buijzen, M. (2018). Self-persuasion in media messages: Reducing alcohol consumption among students with open-ended questions. *Journal of Experimental Psychology: Applied*, 24, 81-91. <https://dx.doi.org/10.1037/xap0000162>
- Maio, G. R., & Thomas, G. (2007). The epistemic-teleologic model of deliberate self-persuasion. *Personality and Social Psychology Review*, 11, 46-67. <http://dx.doi.org/10.1177/1088868306294589>
- McCreanor, T., Lyons, A., Griffin, C., Goodwin, I., Moewaka Barnes, H., & Hutton, F. (2013). Youth drinking cultures, social networking and alcohol marketing: Implications for public health. *Critical Public Health*, 23, 110-120. <https://doi.org/10.1080/09581596.2012.748883>
- Moreno, M. A., Briner, L. R., Williams, A., Walker, L., & Christakis, D. A. (2009). Real use or "real cool": Adolescents speak out about displayed alcohol references on social networking websites. *Journal of Adolescents Health*, 45, 420-422. <https://doi.org/10.1016/j.jadohealth.2009.04.015>
- Müller, B. C. N., Ritter, S. M., Glock, S., Dijksterhuis, A., Engels, R. C. M. E., & van Baaren, R. B. (2016). Smoking-related warning messages formulated as questions positively influence short-term smoking behaviour. *Journal of Health Psychology*, 21, 60-68. <http://dx.doi.org/10.1177/1359105314522083>
- Mussweiler, T., & Neumann, R. (2000). Sources of mental contamination: Comparing the effects of self-generated versus externally provided primes. *Journal of Experimental Social Psychology*, 36, 194-206. <http://dx.doi.org/10.1006/jesp.1999.1415>
- Muthén, L. K., & Muthén, B. O. (1998-2010) *Mplus user's guide (6th ed.)*. Los Angeles, CA: Author.
- Nesi, J., Rothenberg, W. A., Hussong, A. M., & Jackson, K.M. (2017). Friends alcohol-related social networking site activity predicts escalation in adolescents drinking: Mediation by peer norms. *Journal of Adolescent Health*, 60, 641-647. <https://doi.org/10.1016/j.jadohealth.2017.01.009>
- Oude Groote Beverborg, A., Slegers, P. J. C., & van Veen, K. (2015). Fostering teacher learning in VET colleges: Do leadership and teamwork matter? *Teaching and Teacher Education*, 48, 22-33. <https://doi.org/10.1016/j.tate.2015.01.015>
- Pingree, R. (2007). How messages affect their senders: A more general model of message effects and implications for deliberation. *Communication Theory*, 17, 439-461. <https://doi.org/10.1111/j.1468-2885.2007.00306.x>
- Rehm, J., Room, R., Monteiro, M., Gmel, G., Graham, K., Rehn, N., . . . Jernigan, D. (2003). Alcohol as a risk factor for global burden of disease. *European Addiction Research*, 9, 157-164. <https://dx.doi.org/10.1159/000072222>
- Ribout, B. (2016). Facebook, social media and its application to problem drinking among college students. *Current opinion in Psychology*, 9, 83-87. <https://doi.org/10.1016/j.copsyc.2015.12.005>
- Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory*, 4, 592-604. <http://dx.doi.org/10.1037/0278-7393.4.6.592>
- Statista (2017, September) Distribution of Facebook users worldwide as of January 2017, by age and gender. *Statista*. <https://www.statista.com/statistics/376128/facebook-global-user-age-distribution/> (accessed Sep. 7, 2017).
- Valkenburg, P. M., Peter, J., & Walther, J. B. (2016). Media effects: Theory and research. *Annual Review of Psychology*, 67, 315-338. <https://doi.org/10.1146/annurev-psych-122414-033608>
- Van Hoof, J. J., Bekkers, J., & van Vuuren, M. (2014). Son, you're smoking on Facebook! College students' disclosures on social networking sites as indicators of real-life risk behaviors. *Computers in Human Behavior*, 34, 249-257. <https://doi.org/10.1016/j.chb.2014.02.008>
- Westgate, E., & Holliday, J. (2016). Identity, influence and intervention: The roles of social media in alcohol use. *Current opinion in Psychology*, 9, 27-32. <https://doi.org/10.1016/j.copsyc.2015.10.014>
- Wilson, T. D., & Brekke, N. (1994). Mental contamination and mental correction: Unwanted influences on judgements and evaluations. *Psychological Bulletin*, 116, 117-142. <http://dx.doi.org/10.1037/0033-2909.116.1.117>

# Chapter 4

## **Quick Question or Intensive Inquiry?: The Role of Message Elaboration in the Effectiveness of Self-Persuasive Anti-Alcohol Posters.**

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## ABSTRACT

Self-persuasion (i.e., generating your own arguments) is often more persuasive than direct persuasion (i.e., being provided with arguments), even when the technique is applied in media messages by framing the message as a question. It is unclear, however, if these messages are more persuasive when viewed for a long period to allow more elaboration about the message, or for a short period to reduce elaboration. In the current experiment, this is addressed by examining whether anti-alcohol posters framed as a statement (direct persuasion) or an open-ended question (self-persuasion) are more effective to reduce alcohol consumption under conditions of short- or long message exposure, compared to a control condition (no poster). Additionally, the potentially moderating roles of self-perceived alcohol identity and self-esteem on both types of persuasion are examined. Participants ( $N = 149$ ) were exposed to a self-persuasion or direct persuasion anti-alcohol poster, either briefly before or continuously during a bogus beer taste task. The amount of alcohol consumed was the covert dependent variable. Contrary to expectations, both posters failed to affect alcohol consumption, regardless of exposure length. No moderation effects for self-perceived alcohol identity and self-esteem of the participants were found. Possible explanations are discussed.

*Keywords:* self-persuasion, framing, message elaboration, alcohol.

## INTRODUCTION

Alcohol consumption is one of the major avoidable risk factors contributing to global disease and death (Rehm et al., 2003; Rehm et al., 2009; Wood et al., 2018). Despite numerous media interventions aiming to reduce consumption, in the majority of countries drinking levels remain stable or continue to rise (Stuckler, McKee, Ebrahim & Basu, 2012; World Health Organization, 2014). Research suggested that part of the reasons why media interventions have been largely unsuccessful is because anti-alcohol media messages typically consist of direct forms of persuasion (i.e., *providing* arguments or statements), which are rather ineffective (Loman, Müller, Oude Groote Beverborg, van Baaren, & Buijzen, 2018).

Instead, it was found that self-persuasion techniques (i.e., using open-ended questions to have individuals *generate* arguments themselves) are a more promising alternative (Glock, Müller, & Ritter, 2013; Krischler & Glock, 2015; Müller et al., 2016; also see Loman et al., 2018). When considering the application of self-persuasive media messages in real-life, it is important to know if persuasion occurs after long exposure, allowing message receivers to elaborate about the message, or after short exposure to reduce elaboration. This information could aid interventions to find suitable outlets for self-persuasive media messages, such as posters in bars (long exposure) versus commercials on television (short exposure). The current experiment answers this question by examining the role of message elaboration in relation to direct- and self-persuasive anti-alcohol posters that are designed to reduce alcohol consumption.

### Self-Persuasion

Self-persuasion techniques (see Aronson, 1999) rely on individuals to think of arguments to do (or not do) something, in order to persuade themselves. In other words, the targets of persuasion create the means of influence themselves (Briñol, McCaslin, & Petty, 2012; Maio & Thomas, 2007). This type of persuasion is highly effective and has been studied extensively. Notable examples include opinion change resulting from presenting a talk in favor of some topic (Janis & King, 1954), having people write essays (Friedrich, 1990), or arguments (Müller et al., 2009) to (not) do something (for a more detailed overview, see Loman et al., 2018). More recent studies show that self-persuasion can even be applied successfully in persuasive media messages by framing the message as a question, which triggers argument generation in the message receivers (Loman et al., 2018; Müller et al., 2016).

From a persuasive media standpoint, self-persuasion has three distinct advantages over more commonly used direct forms of persuasion in which information is provided. First, people mentally detect and correct information that is generated internally less

than information that is provided externally (Mussweiler & Neumann, 2000; Wilson & Brekke, 1994). Second, psychological reactance is not activated when people generate their own arguments, because their freedom to choose is not restricted. Third, people tend to come up with reasons that they find the most compelling when they generate arguments, which effectively results in self-tailoring the most persuasive message possible for themselves (Briñol et al., 2012; Greenwald & Albert, 1968; Slamecka & Graf, 1978).

Overall, the application of self-persuasion techniques in persuasive media messages seems promising. Not only do self-persuasion methods seem more effective to change attitudes and behavior than direct forms of persuasion, they are also easily applicable in mass media messages, which have the potential to reach very large audiences. Although self-persuasion is researched in different kinds of settings (e.g., giving speeches; King & Janis, 1956; listing arguments Damen, Müller, van Baaren & Dijksterhuis, 2015); or in conversations; Dickerson, Thibodeau, Aronson, & Miller, 1992), its application in media messages is still relatively new, which means important questions about the conditions in which self-persuasive media messages are most effective are yet to be addressed. To date, the most notable examples of self-persuasion in media messages have focused on whether or not the messages are effective to change attitudes, cognitions and behaviors (Loman et al., 2018; Glock et al., 2013; Krischler & Glock, 2015; Müller et al., 2016). In these experiments however, exposure to the messages was longer and more explicit than might be the case in real life where media messages are often seen briefly. As a result, participants in these experiments were likely to have thought more and longer about the messages than they would have in a real-life situation, which could have affected self-persuasion effects. To better understand whether the application of self-persuasion in media interventions is viable in real life, a logical next step is to examine the effects of message elaboration on self-persuasion (Loman et al., 2018).

### Message Elaboration

Message elaboration is the extent to which people think consciously about a message (Petty & Cacioppo, 1986). For self-persuasive media messages this is important, because in order to persuade, some elaboration is required to generate arguments. However, it is unknown if persuasion increases when elaboration increases. On the one hand, high message elaboration will result in more generated thoughts (Clarkson, Tormala, & Leone, 2011) and therefore more self-generated arguments. Given that more arguments increase persuasion (Chaiken, 1980; Maddux & Rogers, 1980; Petty & Cacioppo, 1984; also see Briñol et al., 2012), one would expect self-persuasive media messages to be most effective when elaboration is high. There are two reasons to expect, however, that the messages might be more persuasive when message elaboration is low.

First, self-persuasion research has shown that generating a small number of arguments can be more persuasive than generating a large number of arguments (Müller, van Someren, Gloudemans, van Leeuwen, & Greifeneder, 2017). The explanation is that generating a small number of arguments is easier than generating many. In turn, this feeling of ease is more important than the number of produced arguments, because it feels more 'fluent' (Wänke, Bless, & Biller, 1996), which renders the message more persuasive.

Second, when individuals see a self-persuasive message briefly, they are likely to automatically generate arguments in response to the question in the message (Loman et al., 2018). As message elaboration increases, however, it becomes more likely that message receivers will start to generate counter-arguments for the target behavior (Clarkson et al., 2011; Buijzen, van Reijmersdal, & Owen, 2010; Petty, Cacioppo & Heesacker, 1981), which could render the messages less persuasive or even ineffective. Therefore, conditions of low message elaboration should increase the persuasiveness of self-persuasive media messages. For direct persuasion, similar effects are expected.

### The Moderating Role of Message Receiver Characteristics

Message receiver characteristics could moderate the effectiveness of self- and direct persuasion. Two characteristics pertaining to the strength and relevance of anti-alcohol appeals are considered here. The first is self-esteem (Rosenberg, 1979). Because self-persuasion relies on message receivers to generate arguments to convince themselves, higher levels of self-esteem might result in increased confidence in the validity of the arguments, which in turn increases self-persuasion (Petty, Briñol, & Tormala, 2002). Conversely, for direct persuasion higher levels of self-esteem are likely to decrease external persuasion (Janis, 1954) and increase reactance responses (Brockner & Elkind, 1985). The second receiver characteristic is alcohol identity (i.e., the extent to which someone considers alcohol as important for their identity; Conner, Warren, Close, & Sparks, 1999). The more important alcohol is for an individual, the more relevant anti-alcohol messages are, which increases message relevant thought and decreases the likelihood the messages will be ignored (Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo, & Schumann, 1983), possibly increasing self-persuasion due to argument generation and decreasing direct persuasion due to defensive responses.

### The Current Experiment

The current experiment aims to test the effectiveness of anti-alcohol posters framed as open-ended questions (self-persuasion) or statements (direct persuasion) to reduce alcohol consumption in a beer taste test, under conditions of short- (to manipulate low message elaboration) and long- (to allow high message elaboration) message exposure,

compared to a control condition without a poster. Additionally, the moderating roles of self-perceived alcohol identity and self-esteem of the participants on both types of persuasion will be examined.

It is hypothesized that self-persuasion will be more effective to reduce alcohol consumption compared to direct persuasion and no persuasion. Additionally, both self- and direct persuasion are expected to decrease alcohol consumption more under conditions of low message elaboration compared to high message elaboration. Differential effects for both persuasion techniques are expected based on the message receiver characteristics self-esteem and self-perceived alcohol identity. Specifically, self-persuasion is hypothesized to be more effective for individuals with higher levels of alcohol identity and self-esteem. Direct persuasion is hypothesized to be less effective for individuals with higher levels of alcohol identity and self-esteem.

## METHOD

### Participants and Design

Based on an a priori estimation of statistical power of  $(1-\beta) = .8$  and an estimated effect size Cohen's  $f^2 = .15$  (derived from Loman et al., 2018), a minimum of 150 participants was required for this experiment. Due to practical restraints one hundred and forty-nine participants were tested (97 women; 52 men) ranging in age from 18 to 34 years ( $M = 21.87$ ,  $SD = 2.90$ ). They participated in the experiment for course credit or a monetary reward of 5 euros. Participants were recruited at the Radboud University, the Netherlands, and were randomly assigned to one of five conditions in a 2 (persuasion-technique: self-persuasion vs. direct persuasion) x 2 (message exposure: long vs. short) between-subjects design with a control group (no persuasion). The dependent variable was grams of alcohol consumed during a fifteen-minute alcohol tasting task. The experiment was approved by the university ethics committee and written informed consent was obtained prior to the experiment

### Procedure

The experiment consisted of two parts: (1) an online questionnaire and (2) a beer tasting session in a bar laboratory. Participants were recruited via the university's research participation system and were eligible to participate if they were over 18 years old (the legal drinking age in the Netherlands) who indicated on the systems prescreen that they had consumed alcohol before (to exclude non-drinkers who would not be the target group of the intervention) and had a good understanding of the Dutch language. As a cover story they were told that the experiment was about taste perception. Participants were

required to fill out an online questionnaire assessing self-esteem, alcohol identity and previous alcohol consumption frequency and intensity, a minimum of 24 hours before the beer taste test would take place.

The second part took place in an interaction room outfitted as a bar. Depending on the condition, either a self-persuasion or a direct persuasion anti-alcohol poster was displayed on one of the walls (posters adopted from Loman et al., 2018). In the long message exposure conditions, the posters were displayed on the wall behind the bar, directly in view of the participants during the beer taste task. In the short message exposure conditions, the poster was displayed on the wall opposite the bar (i.e., out of view, behind participants). In order to ensure successful exposure in the short message exposure conditions, all participants were asked to fill in demographic information (i.e., age, sex and education level) on a computer underneath the short message exposure poster location.

Then, participants were asked to sit on a stool in front of the bar for the beer taste test. They were told that they would be tasting different brands of beer, and that they were required to fill out a (bogus) beer taste questionnaire. The real goal of the task was to measure how much alcohol they consumed during the test (George, Phillips, & Skinner, 1988). This taste-rating task was selected over a free-choice ad libitum drinking paradigm (as in Loman et al., 2018), because it does not influence normal consumption (George, Phillips, & Skinner, 1988; also see Kuendig & Kuntsche; 2012) but does ensure that all participants drink alcohol, thereby, increasing variance in the consumption data. Participants were asked to blindly taste three different popular brands of Dutch beer (i.e., Amstel, Grolsch, and Heineken, always in this order) served in 200 milliliter glasses (as in Steele, Southwick, & Crichlow, 1981). Participants were not told how many beers they would be tasting until they finished tasting the last one. After tasting each beer, participants were asked if they could guess the brand of the beer to further mask the real goal of the experiment. Finally, participants were thanked, rewarded, debriefed using a funnel procedure to check the poster exposure manipulations, and dismissed.

### Materials and Measures

#### Stimulus materials.

Participants were exposed to one of two anti-alcohol posters varying in persuasion-technique: (1) a self-persuasion version with the question "Why do you have to drink less alcohol?" or (2) a direct-persuasion version with the statement "You have to drink less alcohol!" (both translated from Dutch; see Fig 1; adopted from Loman et al., 2018). Both posters had an identical layout: A black frame against a white background with the message text centered both vertically and horizontally. The size of the posters was A2.



FIGURE 1. Stimulus materials in the experiment.

Left is self-persuasion: “Why do you have to drink less alcohol?”; right is direct persuasion: “You have to drink less alcohol!”.

#### Alcohol consumption.

The main outcome measure in this experiment was total alcohol consumption during the beer taste test in the bar lab. Participants tasted three 200 milliliter glasses of different beers with the same alcohol content (5%). The amount of beer consumed was calculated by subtracting the weight of the glass (in grams) after tasting from the weight before tasting. A total score for each participant was calculated by adding up the three weight differences ( $M = 168.32$ ,  $SD = 119.48$ ).

#### Self-esteem.

Self-esteem was measured with the Rosenberg Self-Esteem Scale (Rosenberg, 1965). The scale consists of ten statements (e.g., “On the whole, I am satisfied with myself”) to which participants indicated their agreement on a five-point scale ranging from 1 (*not at all agreed*) to 5 (*completely agreed*). For each participant, the mean over these ten items was calculated as an indication of general self-esteem, (Cronbach’s  $\alpha = .89$ ,  $M = 3.27$ ,  $SD = .52$ ). Appropriate items were reverse coded (see Rosenberg, 1965) so that higher average scores reflect higher levels of self-esteem.

#### Alcohol identity.

Alcohol identity was measured with five statements (e.g., “Drinking alcohol is an important part of who I am”) rated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), adopted from Conner et al. (1999). For each participant, the mean over these five items was calculated as an indication of self-perceived alcohol

identity (Cronbach’s  $\alpha = .68$ ,  $M = 3.61$ ,  $SD = .99$ ). Higher scores indicate a higher self-perceived alcohol identity.

#### Alcohol consumption frequency.

In order to control for the effects of previous alcohol consumption behavior, frequency of alcohol consumption over the past four weeks was measured using four questions (one for each of the preceding four weeks; e.g., “On how many days did you drink alcohol in the past week?”; adopted from Engels & Knibbe, 2000). For each participant, the mean over these four items was calculated as an indication of the frequency of previous alcohol consumption (Cronbach’s  $\alpha = .79$ ,  $M = 3.35$ ,  $SD = 1.09$ ).

#### Alcohol consumption intensity.

In order to control for the effects of intensity of previous alcohol consumption behavior, amount of alcohol consumed in the previous week was measured using four questions: during weekdays and in the weekend, inside and outside the home (e.g., “How many glasses of alcohol did you consume in the past week, during weekdays, at home?”; adopted from Engels, Knibbe, & Drop, 1999]). For each participant, the sum of these four items was calculated as an indication of intensity of previous alcohol consumption ( $M = 11.19$ ,  $SD = 11.31$ ).

#### Manipulation checks.

After the beer tasting task, participants were debriefed via a funnel procedure to check the poster exposure manipulation. They were asked whether they saw a poster in the room, whether they recalled the topic of the poster, and whether they could reproduce the exact wording of the poster. The number of people that had seen the poster differed significantly between the long- ( $n = 38$  out of 59) and short-exposure ( $n = 19$  out of 59) conditions ( $\chi^2 = 11.00$ ,  $p < .001$ ,  $BF_{10} = 104$ ).

#### Strategy of Analysis.

Before the main analyses, the randomization was checked and correlations between the control variables and alcohol consumption during the experiment were calculated. Then, to test if participants consumed more alcohol in the experimental conditions compared to the control condition an ANOVA was calculated with alcohol consumption as the dependent variable and the five condition as the between subject-factor. Next, to test the main effects of persuasion type and exposure length and their interaction, a linear regression was calculated with alcohol consumption as the dependent variable, persuasion type and exposure length as between-subject factors and sex, alcohol consumption frequency- and intensity as control variables. Factors were coded using sum-to-zero

contrasts and covariates were centered to reduce collinearity. The control condition was not included in this model, because it could not be scored on persuasion type or exposure length. Finally, to test for moderation of self-esteem and alcohol identity, the regression was repeated including both variables (also centered) as covariates and as interactions with persuasion type and message exposure. All frequentist analyses were conducted with R statistical software (R Core Team, 2013).

### Bayes Factors

In addition to *p*-values, Bayes Factors (BFs; Jeffreysm 1961; Rouder, Speckman, Sun, Morey, & Iverson, 2009) are reported. BFs are the ratio between the likelihood of the data given one hypothesis (typically H1), and the likelihood of the data given another hypothesis (typically H0). For example,  $BF_{10} = 5$  (or  $BF_{01} = 0.2$ ) indicates that the data are five times as likely to occur under H1 than under H0. One of the advantages of using Bayes Factors is that they allow to distinguish between inconclusive data (e.g.,  $BF_{01} = 1$ ), and support for H0 (e.g.,  $BF_{01} = 10$ ). All Bayes Factors were calculated using JASP (2017), using default priors (i.e., a Cauchy distribution with width .707 for the Bayesian ANOVAs and the Bayesian t-test, and *r* scale covariates of .354 for the linear regression). The decision to report BFs was made post hoc.

## RESULTS

### Randomization Checks and Descriptive Statistics

Before conducting the main analysis, it was examined whether all non-experimental measures differed across conditions. Previous alcohol consumption frequency and intensity, sex, self-esteem, and alcohol identity did not significantly differ across conditions, indicating that the randomization procedure was successful (all  $p > .16$ ). Table 1 depicts the means of these variables per condition.

There was a significant correlation between prior alcohol consumption frequency and alcohol consumption ( $r = .37, p < .001, BF_{10} = 1765$ ), indicating that those who drank more frequently consumed more alcohol during the experiment (see table 2 for corresponding statistics). Similarly, prior alcohol consumption intensity was positively correlated with alcohol consumption ( $r = .30, p < .001, BF_{10} = 48$ ). Sex also had an effect on drinking behavior, Welch's  $t(90.20) = -5.50, p < .001, BF_{10} > 10,000$ , indicating that men ( $M = 238.41, SD = 118.00$ ) consumed more alcohol than women ( $M = 130.29, SD = 102.00$ ). Because the three control variables were significantly related to the main outcome variable alcohol consumption, they are included in the regression analysis to reduce unexplained error variance, allowing to more accurately assess the effects of the independent variables (Field, 2005). A significant effect of experiment leader on alcohol consumption was found,

TABLE 1 Sample Means and Standard Deviations by Condition.

Persuasion type Exposure length	Self-persuasion		Direct persuasion		Control <i>n</i> = 31	Total <i>N</i> = 149
	Short <i>n</i> = 29	Long <i>n</i> = 29	Short <i>n</i> = 30	Long <i>n</i> = 30		
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )
Alcohol consumed (g)	158.79 (110.30)	200.41 (140.06)	170.13 (105.75)	162.48 (121.38)	149.41 (119.13)	168.32 (119.48)
Alcohol c. frequency	3.64 (1.21)	3.49 (1.27)	3.50 (1.09)	3.04 (.91)	3.13 (.93)	3.35 (1.09)
Alcohol c. intensity	12.22 (13.60)	11.00 (7.05)	12.43 (13.28)	9.89 (8.90)	10.13 (12.38)	11.13 (11.34)
Alcohol identity	3.43 (.81)	3.58 (1.00)	3.81 (1.07)	3.48 (1.10)	3.72 (.93)	3.61 (.99)
Self-esteem	3.20 (.48)	3.34 (.58)	3.39 (.55)	3.26 (.42)	3.15 (.55)	3.27 (.52)

$F(2, 142) = 3.61, p = .03$ , however  $BF_{01} = 1.757$ , suggesting that alcohol consumption might differ depending on who lead the experiment ( $M1 = 134.41, SD = 100.48; M2 = 189.67, SD = 130.76; M3 = 183.84, SD = 107.27$ ). Adding experiment leader in the analyses does not change the results and was therefore omitted.

### Alcohol Consumption

First, a one-way ANOVA with alcohol consumption as the dependent variable and condition (control, self-persuasion short, self-persuasion long, direct persuasion short, and direct persuasion long) as the independent variable was conducted using traditional dummy coding with the control condition as the reference group. There was no significant effect of condition on drinking behavior  $F(4, 140) = .76, p = .55, BF_{01} = 14.31$ , indicating that none of the experimental conditions differed significantly from the control condition in terms of alcohol consumption.

Next, the linear regression with alcohol consumption as the dependent variable, persuasion type, exposure length and their interactions, as well as sex and previous alcohol consumption frequency and intensity as independent variables yielded no significant effects for the experimental manipulations nor their interaction (see Table 2). This indicates that participants' alcohol consumption was unaffected by the posters, regardless of exposure length. Significant effects for sex and previous alcohol consumption frequency were found, indicating that (1) men consumed more alcohol than women, and (2) participants who consumed alcohol more often, consumed more alcohol during the experiment.

Finally, repeating the regression including the moderators self-esteem and alcohol identity yielded a significant effect for sex only, and no main or interaction effects for self-esteem and alcohol identity. The previously significant effect for alcohol consumption frequency was no longer significant in this model.

**TABLE 2** Linear Regression Analysis: Standardized Regression Coefficients Predicting Grams of Alcohol Consumed.

Variable	<i>b</i>	<i>SE</i>	<i>R</i> <sup>2</sup>	<i>p</i>	<i>BF</i> <sub>01</sub> *
Step 1			.31		
Persuasion type	2.53	8.35		.76	4.16
Exposure length	3.94	8.42		.64	4.11
Persuasion type x exposure length	-10.80	8.26		.19	15.12
Sex	<b>107.27</b>	<b>18.71</b>		<.001*	
Alcohol c. frequency	<b>20.07</b>	<b>9.27</b>		.03*	
Alcohol c. intensity	-.26	.95		.78	
Step 2			.29		
Persuasion type	-1.56	10.41		.88	4.16
Exposure length	9.84	10.53		.35	4.11
Persuasion type x exposure length	-7.74	9.11		.40	15.12
Sex	<b>100.44</b>	<b>20.51</b>		<.001*	
Alcohol c. frequency	13.22	10.30		.20	
Alcohol c. intensity	-.81	1.13		.48	
Self-esteem	14.84	19.04		.44	4.16
Alcohol identity	20.66	12.10		.09	1.03
Persuasion type x self-esteem	12.60	21.09		.55	15.39
Persuasion type x alcohol identity	-.13	10.74		.99	4.09
Exposure length x self-esteem	-8.00	20.98		.70	15.09
Exposure length x alcohol identity	-5.93	10.74		.58	3.86
Self-esteem x alcohol identity	.81	22.11		.97	2.81
Persuasion type x exposure length x self-esteem	-5.12	19.99		.80	50.63
Persuasion type x exposure length x alcohol identity	-3.82	10.68		.72	13.89
Persuasion type x self-esteem x alcohol identity	7.68	22.89		.74	10.28
Exposure length x self-esteem x alcohol identity	31.06	21.87		.16	9.94

Significant results in bold. \*  $p < .001$ . BFs represent the added explanatory value of a model including that effect calculated against a null-model including only alcohol consumption frequency, alcohol consumption intensity, and sex.

## DISCUSSION

The primary aim of the current experiment was to test the effectiveness of anti-alcohol posters framed as statements (direct persuasion) or open-ended questions (self-persuasion) to reduce alcohol consumption in a beer taste test, under conditions of short- (low message elaboration) or long (high message elaboration) message exposure, compared to a control condition without a poster. Results indicated that both posters failed to affect alcohol consumption in a beer taste test, regardless of exposure length, and that this was independent of participant's self-perceived alcohol identity and self-esteem.

In line with previous work, direct persuasive anti-alcohol posters did not affect alcohol consumption. Similarly, experiments on self-persuasion in media messages specifically (Loman et al., 2018) and media effects research for alcohol in general (Wakefield, Loken, & Hornik, 2010) yielded little or no support for effectiveness of direct persuasion. However, the finding that the self-persuasive anti-alcohol posters failed to change consumption behavior is not in line with previous self-persuasion research. That is, recent experiments on self-persuasion in media messages showed positive (albeit small) behavioral change effects (Loman et al., 2018; Müller et al., 2016). In the current experiment neither poster had a significant effect on the drinking behavior of the participants.

Two related, yet distinct, explanations seem most appropriate for the unexpected null findings in the experiment. Both spring from methodological choice for a beer-taste test paradigm in the current experiment, which *requires* participants to drink, versus a free choice paradigm used in other studies. Specifically, when individuals could choose to drink (Loman et al., 2018) or smoke (Müller et al., 2016) consumption was reduced after being exposed to a self-persuasive media message. In the current experiment this freedom to choose was not possible: all participants committed to consume alcohol by enrolling in the study. As a direct consequence, participants might (1) have considered the anti-alcohol posters to not be applicable to them in this particular setting, because after all they were required to drink alcohol for the experiment. The individuals could therefore have thought that the poster was irrelevant for them instead of thinking of reasons why they should drink less alcohol, rendering it ineffective regardless of exposure length.

Alternatively (2), the participants' sense of agency over their alcohol consumption might have been reduced, which has been shown to decrease the effectiveness of self-persuasion techniques (Damen et al., 2015). In other words, because participants did not feel they could control their alcohol consumption behavior (they already agreed to drinking), self-persuasion did not occur. Notably, the study by Damen and colleagues also showed increased effectiveness of direct persuasion techniques under conditions of a reduced sense of agency. This effect was not found in the current experiment. The role of perceived agency over the target behavior in self-persuasion media interventions

therefore, is unclear at this point and should be taken into account in future self-persuasion experimentations.

The finding that exposure length did not influence the effectiveness of either persuasion type to change alcohol consumption was unexpected in light of elaboration research (Carpenter, 2015; Petty & Cacioppo, 1986). It does make sense, however, if both posters are unable to affect alcohol consumption because they were perceived as irrelevant or due to reduced experienced agency of the participants over their alcohol consumption as described above.

Two limitations pertaining to the poster exposure manipulation should be noted. First, it was assumed that longer message exposure would increase message elaboration and, thus, would result in more generated arguments ‘why to drink less alcohol’ in the self-persuasion conditions. However, this assumption was not explicitly measured. Future research would do well to address this for example with a think-aloud or thought-listing task (Blackwell, Galassi, Galassi, & Watson, 1985) respectively during or following a short versus long self-persuasion poster exposure. Second, it is conceivable that participants in the short exposure conditions did not see the posters. Indeed, a large number of participants could not reproduce the poster text in the exit interview. Even though bad recall was expected under conditions of short message exposure even if the manipulation was successful, it could be addressed in future experiments by registering whether and how long participants actually look at the posters for example using hidden cameras.

A noteworthy difference of the current experiment compared to previous studies is that during recruitment participants were told that they would be drinking alcohol for the experiment. This could have resulted in a selection bias, attracting individuals that were interested in alcohol. Even though this concern is not really evident in the alcohol identity measures in the experiment, which reflect ‘average’ importance of alcohol for the participants (see Table 1), future research could address this by briefing participants about the contents of the experiment after recruiting (but before the experiment starts to allow participants to withdraw from participating). This way possible selection bias could be diminished or at the very least percentages of withdrawal could be given as an indication of the size of the bias.

### Implications

The current findings might have important implications for self-persuasion research. Specifically, it is possible that ‘no-choice’ paradigms lead to systematic underestimation of the effectiveness of self-persuasion in media messages to change behavior. The limited number of studies to date indeed have shown significant differences in free-choice paradigms for alcohol consumption (Loman et al., 2018) and smoking (Müller et al.,

2016), but are not found when the freedom to choose is diminished in the measurement task, as happened in the current experiment. Future research should prioritize testing the impact of (reduced) freedom to choose on the effectiveness of self-persuasive media messages, for example by directly comparing the effects of direct- and self-persuasion posters in an ad libitum drinking task with the effects in a forced drinking task such as the beer taste test used in the current experiment.

If indeed self-persuasion is only effective when individuals experience full freedom to choose their behavior, this should not be a problem for real life interventions because choice freedom is generally untampered with there (as opposed to laboratory tasks). However, the finding might have important consequences for how self-persuasion effects are researched. Specifically, forced-choice measurement tasks should be avoided.

Concerning self-persuasion techniques to reduce alcohol consumption on a global scale, the current findings add that behavioral self-persuasion effects triggered by media messages are likely very small. This raises the question if it is really helpful to use self-persuasion strategies in mass media. Realistically, it will not reduce consumption even close to what is needed to put a dent in alcohol’s contribution to global disease and mortality. Still it should be noted that positive effects in certain situations are found in a relatively new and growing line of experimentation (Loman et al., 2018; Glock et al., 2013; Kruschler & Glock, 2015; Müller et al., 2016; Müller et al., 2009; Bernitter, van Ooien, & Müller, 2017). In these studies self-persuasion has consistently outperformed direct persuasion counterparts and no persuasion controls. Large-scale application, therefore, might still yield tangible benefits, and at the very least self-persuasion seems more effective than direct persuasion. Further testing seems appropriate.

### Conclusion

In sum, the current experiment shows that alcohol consumption in a beer taste test is not affected by anti-alcohol posters using self-persuasion- or direct persuasion techniques under conditions of both high- and low message elaboration. Although these findings are surprising in the light of previous self-persuasion research, they point towards an important possible mediator for self-persuasive media messages to be effective: the role of freedom to choose or perceived agency over the target behavior. Specifically, it is possible that self-persuasion only occurs when individuals can freely choose to engage in the target behavior. Future research should prioritize examining this idea, as it could have important consequences for the way self-persuasion is researched.

## COMPETING INTERESTS

The authors declare they have no competing interests.

## DATA ACCESSIBILITY STATEMENT

The participant data and analysis scripts can be found via: [https://osf.io/hdjbg/?view\\_only=b2e9915e2756457bb2b93f9f2e26df73](https://osf.io/hdjbg/?view_only=b2e9915e2756457bb2b93f9f2e26df73)

## REFERENCES

- Aronson, E. (1999). The Power of Self-Persuasion. *American Psychologist*, 54, 875–884. <http://dx.doi.org/10.1037/h0088188>
- Bernritter, S. F., van Ooien, I., & Müller, B. C. N. (2017). Self-persuasion as marketing technique: The role of consumers' involvement. *European Journal of Marketing*, 51, 1075-1090. <http://doi.org/10.1108/EJM-04-2015-0213>
- Blackwell, R. T., Galassi, J. P., Galassi, M.D., & Watson, T.E. (1985). Are cognitive assessment methods equal? A comparison of think aloud and thought listing. *Cognitive Therapy and Research*, 9, 399-413. <https://doi.org/10.1007/BF01173089>
- Briñol, P., McCaslin, M. J., & Petty, R. E. (2012). Self-generated persuasion: Effects of target and direction of arguments. *Journal of Personality and Social Psychology*, 102, 925–940. <http://dx.doi.org/10.1037/a0027231>
- Brockner, J., & Elkind, M. (1985). Self-esteem and reactance: Further evidence of attitudinal and motivational consequences. *Journal of Experimental Social Psychology*, 21, 346-361. [https://doi.org/10.1016/0022-1031\(85\)90035-6](https://doi.org/10.1016/0022-1031(85)90035-6)
- Buijzen, M., Van Reijmersdal, E. A., Owen, L. H. (2010). Introducing the PCMC Model: An investigative framework for young people's processing of commercialized media content. *Communication Theory*, 20, 427-450. <https://doi.org/10.1111/j.1468-2885.2010.01370.x>
- Carpenter, C. J. (2015). A Meta-analysis of the ELM's argument quality x processing type predictions. *Human Communication Research*, 41, 501-534. <https://doi.org/10.1111/hcre.12054>
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Experimental Social Psychology*, 39, 752-766. <http://dx.doi.org/10.1037/0022-3514.39.5.752>
- Clarkson, J. J., Tormala, Z. L., & Leone, C. (2011). A self-validation perspective on the mere thought effect. *Journal of Experimental Psychology*, 47, 449-454. <http://dx.doi.org/10.1016/j.jesp.2010.12.003>
- Conner, M., Warren, R., Close, S., & Sparks, P. (1999). Alcohol consumption and the theory of planned behavior: An examination of the cognitive mediation of past behavior. *Journal of Applied Social Psychology*, 29, 1676-1704. <http://doi.org/10.1111/j.1559-1816.1999.tb02046.x>
- Damen, T. G. E., Müller, B. C. N., van Baaren, R. B., & Dijksterhuis, A. (2015). Re-examining the agentic shift: The sense of agency influences the effectiveness of (self)persuasion. *PLoS ONE*, 10(6): e0128635. <http://dx.doi.org/10.1371/journal.pone.0128635>
- Dickerson, C. A., Thibodeau, R., Aronson, E., Miller, D. (1992). Using cognitive dissonance to encourage water conservation. *Journal of Applied and Social Psychology*, 22, 841-854. <http://doi.org/10.1111/j.1559-1816.1992.tb00928.x>
- Engels, R. C. M. E., & Knibbe, R. A. (2000). Alcohol use and intimate relationships in adolescence: When love comes to town. *Addictive Behaviors*, 25, 435-439. [http://dx.doi.org/10.1016/S0306-4603\(98\)00123-3](http://dx.doi.org/10.1016/S0306-4603(98)00123-3)
- Engels, R. C. M. E., Knibbe, R. A., & Drop, M. J. (1999). Visiting public drinking places: An explorative study into the functions of pub-going for late adolescents. *Substance Use and Misuse*, 34, 1261-1280. <http://dx.doi.org/10.3109/10826089909039408>
- Field, A. P. (2005). *Discovering statistics using SPSS* (2nd ed.). London: Sage.
- Friedrich, J. (1990). Learning to view psychology as a science: Self-persuasion through writing. *Teaching of Psychology*, 17, 23-27. [http://dx.doi.org/10.1207/s15328023top1701\\_5](http://dx.doi.org/10.1207/s15328023top1701_5)
- George, W. H., Phillips, S.M., & Skinner, J. B. (1988). Analogue measurements of alcohol consumption: Effects for task type and correspondence with self-report measurement. *Journal of Studies on Alcohol*, 49, 450-455. <https://doi.org/10.15288/jsa.1988.49.450>
- Glock, S., Müller, B. C. N., & Ritter, S. (2013). Warning labels formulated as questions positively influence smoking-related risk perception. *Journal of Health Psychology*, 18, 252–262. <http://dx.doi.org/10.1177/1359105312439734>



- Greenwald, A. G., & Albert, R. D. (1968). Acceptance and recall of improvised arguments. *Journal of Personality and Social Psychology*, 8(1), 31-34. <http://dx.doi.org/10.1037/h0021237>
- Janis, I. L. Personality correlates of susceptibility to persuasion. *Journal of Personality*, 22, 504-518. <http://doi.org/10.1111/j.1467-6494.1954.tb01870.x>
- Janis, I. L., & King, B. T. (1954). The influence of role playing on opinion change. *Journal of Abnormal and Social Psychology*, 49, 211-218. <http://dx.doi.org/10.1037/h0056957>
- Jeffreys H. (1961). *Theory of probability* (3<sup>rd</sup> ed.). Oxford: Oxford University Press. Clarendon Press.
- King, B. T., & Janis, I. L. (1956). Comparison of the effectiveness of improvised versus non-improvised role-playing in producing opinion changes. *Human relations*, 9, 177-186. <http://dx.doi.org/10.1177/001872675600900202>
- Krischler, M., & Glock, S. (2015). Alcohol warning labels formulated as questions change alcohol-related outcome expectancies: A pilot study. *Addiction Research & Theory*, 23, 343-349. <http://dx.doi.org/10.3109/16066359.2015.1009829>
- Kuendig, H., & Kuntsche, E. (2012). Solitary versus social drinking: An experimental study on effects of social exposures on in situ alcohol consumption. *Alcoholism: Clinical and Experimental Research*, 36, 732-738. <https://doi.org/10.1111/j.1530-0277.2011.01663.x>
- Loman, J. G. B., Müller, B. C. N., Oude Groote Beverborg, A., van Baaren, R. B., & Buijzen, M. (2018a). Self-persuasion in media messages: Reducing alcohol consumption among students with open-ended questions. *Journal of Experimental Psychology: Applied*, 24, 81-91 <http://dx.doi.org/10.1037/xap0000162>
- Maddux, J. E., & Rogers, R. W. (1980). Effects of source expertness, physical attractiveness, and supporting arguments on persuasion: A case of brains over beauty. *Journal of Personality and Social Psychology*, 39, 235-244. <http://dx.doi.org/10.1037/0022-3514.39.2.235>
- Maio, G. R., & Thomas, G. (2007). The epistemic-teleologic model of deliberate self-persuasion. *Personality and Social Psychology Review*, 11, 46-67. <http://dx.doi.org/10.1177/1088868306294589>
- Müller, B. C. N., Ritter, S. M., Glock, S., Dijksterhuis, A., Engels, R. C. M. E., & van Baaren, R. B. (2016). Smoking-related warning messages formulated as questions positively influence short-term smoking behaviour. *Journal of Health Psychology*, 21, 60-68. <http://dx.doi.org/10.1177/1359105314522083>
- Müller, B. C. N., van Someren, D. H., Gloudemans, R. T. M., van Leeuwen, M. L., & Greifeneder, R. (2017). Helping made easy: Ease of argument generation enhances intentions to help. *Social Psychology*, 48, 113-121. <http://doi.org/10.1027/1864-9335/a000293>
- Müller, B. C. N., van Baaren, R. B., Ritter, S. M., Woud, M. L., Bergmann, H., ... Dijksterhuis, A. (2009). Tell me why... The influence of self-involvement on short term smoking behaviour. *Addictive Behaviors*, 34, 427-431. <http://dx.doi.org/10.1016/j.addbeh.2008.12.016>
- Mussweiler, T., & Neumann, R. (2000). Sources of mental contamination: Comparing the effects of self-generated versus externally provided primes. *Journal of Experimental Social Psychology*, 36, 194-206. <http://dx.doi.org/10.1006/jesp.1999.1415>
- Petty, R. E., Briñol, P., & Tormala, Z. L. (2002). Thought confidence as a determinant of persuasion: The self-validation hypothesis. *Journal of Personality and Social Psychology*, 82, 722-741. <https://doi.org/10.1037/0022-3514.82.5.722>
- Petty, R. E., Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, 46, 69-81. <http://dx.doi.org/10.1037/0022-3514.46.1.69>
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology*, 19, 123-205. [https://doi.org/10.1016/S0065-2601\(08\)60214-2](https://doi.org/10.1016/S0065-2601(08)60214-2)
- Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality and Social Psychology*, 41, 847-855. <http://doi.org/10.1037/0022-3514.41.5.847>
- Petty, R. E., Cacioppo, J. T., & Heesacker, M. (1981). Effects of rhetorical questions on persuasion: A cognitive response analysis. *Journal of Personality and Social Psychology*, 40, 432-440. <http://dx.doi.org/10.1037/0022-3514.40.3.432>
- Petty, R. E., Cacioppo, J. T., & Schumann, J. T. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, 10, 135-146. <https://doi.org/10.1086/208954>
- R Core Team. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria; 2013. <http://www.R-project.org/>.
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet*, 373, 2223-2233. [https://doi.org/10.1016/S0140-6736\(09\)60746-7](https://doi.org/10.1016/S0140-6736(09)60746-7)
- Rehm, J., Gmel, G. E., Gmel, G., Hasan, O. S. M., Imtiaz, S., Popova, S., ... Shuper, P. A. (2017). The relationship between different dimensions of alcohol use and the burden of disease-an update. *Addiction*, 112, 968-1001. <https://doi.org/10.1111/add.13757>
- Rouder, J. N., Speckman, P. L., Sun, D., Morey, R. D., & Iverson, G. (2009). Bayesian *t* test for accepting and rejecting the null hypothesis. *Psychonomic Bulletin & Review*, 16, 225-237.
- Rosenberg, M. (1965). *Rosenberg Self-Esteem Scale*. Princeton: Princeton University Press.
- Rosenberg, M. (1979). *Conceiving the self*. New-York: Basic Books.
- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of media campaigns to change health behavior. *The Lancet*, 376, 1216-1217. [http://dx.doi.org/10.1016/S0140-6736\(10\)60809-4](http://dx.doi.org/10.1016/S0140-6736(10)60809-4)
- Wänke, M., Bless, H., & Biller, B. (1996). Subjective experience versus content of information in the construction of attitude judgments. *Personality and Social Psychology Bulletin*, 22, 1105-1113. <https://doi.org/10.1177/01461672962211002>
- Wilson, T. D., & Brekke, N. (1994). Mental contamination and mental correction: Unwanted influences on judgements and evaluations. *Psychological Bulletin*, 116, 117-142. <http://dx.doi.org/10.1037/0033-2909.116.1.117>
- Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning and Memory*, 4, 592-604. <http://dx.doi.org/10.1037/0278-7393.4.6.592>
- Steele, C. M., Southwick, L. L., & Crichlow, B. (1981). Dissonance and alcohol: Drinking your troubles away. *Journal of Personality and Social Psychology*, 41, 831-846. <https://doi.org/10.1037/0022-3514.41.5.831>
- Stuckler, D., McKee, M., Ebrahim, S., Basu, S. (2012). Manufacturing epidemics: The role of global producers in increased consumption of unhealthy commodities including processed foods, alcohol and tobacco. *PLoS medicine*, 9. <https://doi.org/10.1371/journal.pmed.1001235>
- Wood, A. M., Kaptoge, S., Butterworth, A.S., Willeit, P., Warnakula, S., Bolton, T., ... Danesh, J. (2018). Risk thresholds for alcohol consumption: Combined analysis of individual-participant data for 599912 current drinkers in 83 prospective studies. *The Lancet*, 391, 1513-1523. [https://doi.org/10.1016/S0140-6736\(18\)30134-X](https://doi.org/10.1016/S0140-6736(18)30134-X)
- World Health Organization. Global status report on alcohol and health 2014. Available at: [apps.who.int/iris/bitstream/10665/112736/1/978924069276\\_3\\_eng.pdf](https://apps.who.int/iris/bitstream/10665/112736/1/978924069276_3_eng.pdf) Accessed July 16<sup>th</sup>, 2018.

# Samenvatting in het Nederlands

**Summary in Dutch**

Alcoholconsumptie is causaal verbonden aan meer dan zestig verschillende soorten ziekte en trauma. Het is de op twee na hoogste factor die bijdraagt aan wereldwijde sterfte en een van de voornaamste vermijdbare risicofactoren die bijdragen aan ziekte en sterfte.

Om deze redenen moeten stappen genomen worden om alcoholconsumptie te verminderen. De meest effectieve en kosteneffectieve interventies zijn het invoeren van wetten die alcohol duurder maken en de beschikbaarheid ervan verminderen, het verminderen of verbieden van alcoholreclames, maatregelen die beschonken autorijden aanpakken en individuele interventies voor personen met een verhoogd risico om te veel alcohol te drinken. Er is weinig en niet-eenduidig bewijs voor de effectiviteit van persuasieve anti-alcohol media-interventies.

Een belangrijk onderdeel van het probleem is dat media-interventies die verantwoordelijk drinkgedrag promoten niet effectief zijn vergeleken met het veel hogere aantal pro-alcoholreclames van betere kwaliteit. In het licht van deze bevindingen en vanuit het perspectief van persuasieve communicatie, is het van belang om alternatieve en innovatieve beïnvloedingsstrategieën te testen om daarmee de effectiviteit van anti-alcohol media-interventies te vergroten. In deze dissertatie staat een nieuwe en veelbelovende beïnvloedingsstrategie centraal: zelfovertuiging. Het hoofddoel is om te testen of zelfovertuiging kan worden ingezet als beïnvloedingsstrategie in anti-alcohol mediaberichten om alcoholconsumptie te reduceren.

## ZELFOVERTUIGING

Zelfovertuiging in brede zin refereert aan alle manieren van beïnvloeding die gecreëerd zijn door een persoon zelf en resulteren in gedragsverandering. In deze dissertatie wordt zelfovertuiging specifiek bekeken als een beïnvloedingstechniek waarin mensen aangezet worden om zelf argumenten te verzinnen en daardoor hun eigen gedrag veranderen.

De redenen waarom zelfovertuigingstechnieken effectief zijn kunnen het beste begrepen worden door een vergelijking te maken met reguliere directe vormen van beïnvloeding waarin bijvoorbeeld argumenten om iets wel of niet te doen worden aangeboden. Simpel gezegd houden mensen er niet van om beïnvloed te worden en een groot nadeel van directe beïnvloeding is dat het persuasieve doel duidelijk herkenbaar is. Dit geeft mensen het idee dat hun keuzevrijheid beperkt wordt, waardoor zij zich zullen verzetten tegen de beïnvloeding om zo hun keuzevrijheid te bewaken, wat de kracht van de directe beïnvloeding reduceert of teniet doet.

In termen van effectiviteit heeft zelfovertuiging drie voordelen ten opzichte van directe beïnvloedingsvormen. Ten eerste is het minder waarschijnlijk dat zelfverdedigingsstrategieën worden geactiveerd bij zelfovertuiging. De belangrijkste reden hiervoor is dat mensen informatie die ze zelf genereren mentaal minder controleren en

corrigeren dan informatie die hun extern wordt aangeboden. Ten tweede wordt *reactance* – een motivationele reactie om beïnvloeding te weerstaan die de keuzevrijheid beperkt – niet geactiveerd bij zelf gegenereerde argumenten omdat deze de eigen keuzevrijheid niet beperken. Ten derde hebben mensen wanneer zij argumenten verzinnen de neiging om met argumenten te komen die voor henzelf het meest belangrijk en overtuigend zijn.

Om deze redenen lijkt zelfovertuiging een veelbelovende beïnvloedingsstrategie om toe te passen in media-interventies. Zelf-overtuigende berichten hebben niet alleen de potentie om mentale correcties en reactance reacties te voorkomen, maar door individuen zelf argumenten te laten verzinnen creëren ze het meest effectieve bericht voor henzelf. Een belangrijke vraag die hieruit voortvloeit is: hoe kunnen zelfovertuigingsstrategieën worden toegepast in mediaberichten?

### Zelfovertuiging in Mediaberichten

Recent onderzoek is met het innovatieve idee gekomen om zelfovertuiging toe te passen in mediaberichten met open vragen. De achterliggende gedachte is dat blootstelling aan een open vraag ervoor zorgt dat mensen zelf argumenten gaan verzinnen als reactie op de vraag, waardoor zij zichzelf overtuigen in de richting van de vraag.

Een drietal onderzoeken heeft positieve resultaten opgeleverd ter ondersteuning van het idee dat vragen kunnen fungeren als trigger voor zelfovertuiging. Het gebruik van vragen was effectiever dan stellingen of argumenten om cognities over roken en drinken en zelfs daadwerkelijk rookgedrag te veranderen. Hoewel veelbelovend, roepen deze resultaten verschillende nieuwe vragen op die centraal zullen staan in dit proefschrift. Is het inderdaad zo dat mensen argumenten verzinnen als reactie op het zien van een open vraag? Verzinnen ze ook tegenargumenten? Is het mogelijk om alcoholconsumptie te veranderen met open vragen in traditionele mediaberichten zoals posters? Kan zelfovertuiging worden toegepast op sociale media platforms en maakt het dan uit of de gegenereerde argumenten zichtbaar zijn voor andere gebruikers? Maakt het uit of iemand zelf-overtuigende berichten kort of lang ziet?

### Bewijs van het Principe

De eerdere studies waarin zelfovertuiging succesvol is toegepast met vragen in mediaberichten veronderstelden dat het genereren van eigen argumenten (als reactie op het zien van de vraag) het onderliggende mechanisme was voor de gevonden cognitieve- en gedragsverandering. Dit was echter niet empirisch onderzocht. In de huidige dissertatie laten de resultaten van het eerste experiment in hoofdstuk 2 zien dat mensen inderdaad argumenten voor (en niet tegen) verzinnen wanneer zij worden blootgesteld aan een poster met de open vraag “Waarom moet jij minder alcohol drinken?”. Daarnaast werden de posters met vragen positiever beoordeeld en minder herkend als een poging tot

beïnvloeding vergeleken met gelijksoortige posters met stellingen.

Het tweede experiment in hoofdstuk 2 bouwt voort op de bevindingen van het eerste experiment door te testen of de posters met vragen gebruikt kunnen worden om daadwerkelijk alcoholconsumptie te reduceren. Deelnemers konden zich in tweetallen (samen met iemand die ze kennen) inschrijven om mee te doen aan een experiment in een interactieruimte aangekleed als bar. Gedurende een uur moesten zij samen filmpjes kijken en mochten ze vrij drankjes naar keuze (bier, wijn, water of frisdrank) pakken en drinken. Afhankelijk van de conditie hing er naast de televisie de anti-alcohol poster met een vraag, de anti-alcohol poster met een stelling of geen poster. De resultaten van het experiment lieten zien dat de posters geen effect hebben op de keuze om wel of niet te drinken, maar participanten die ervoor kozen om alcohol te drinken, dronken minder wanneer de zelf-overtuigende poster in de ruimte hing dan wanneer de poster met stelling of geen poster in de ruimte hing.

Bij elkaar laten de experimenten in hoofdstuk 2 zien dat zelf-overtuigende anti-alcohol posters mensen succesvol aanzetten om eigen argumenten te verzinnen “waarom ze minder moeten drinken”, dat de posters minder weerstand oproepen dan gelijksoortige posters met stellingen, en dat de vragen effectief zijn om daadwerkelijke alcoholconsumptie te verminderen voor mensen die ervoor kiezen om alcohol te nuttigen. Hoofdstuk twee fungeert hiermee als een ‘bewijs van principe’ dat de potentie van het toepassen van zelfovertuigingstechnieken in traditionele mediaberichten laat zien.

### Zelfovertuiging op Facebook

In hoofdstuk 3 werd onderzocht of zelfovertuigingsstrategieën kunnen worden toegepast op Facebook om alcoholconsumptie te reduceren. Sociale media platforms zijn interessant voor zelfovertuigingsinterventies omdat berichten die gebruikers online zetten zichtbaar zijn voor andere gebruikers. Via het principe van *commitment and consistency* werd verwacht dat wanneer mensen niet alleen hun eigen argumenten om minder te drinken verzinnen, maar die argumenten ook online plaatsen, de gedragsveranderingseffecten worden versterkt omdat de berichten zichtbaar zijn voor anderen. Dit zou ervoor moeten zorgen dat mensen zich committeren aan de geplaatste argumenten en daarom extra druk voelen om hun gedrag aan te passen.

Het experiment volgde grotendeels de procedure beschreven bij experiment 2 in hoofdstuk 2. Participanten konden wederom in tweetallen (samen met iemand die ze kennen) meedoen aan een experiment in het bar lab. Alvorens samen filmpjes te kijken waarbij ze vrij mochten drinken, werd de participanten gevraagd om in te loggen met hun eigen Facebookaccount om verschillende anti-alcohol berichten in een privé-groep te lezen. Afhankelijk van de conditie moesten zij of wel of niet een bericht plaatsen dat

ze de comments gelezen hebben, of hun eigen argumenten verzinnen ‘waarom ze minder alcohol moeten drinken’ en die wel of niet daadwerkelijk online zetten.

De resultaten van het experiment laten zien dat het verzinnen van eigen anti-alcohol argumenten op Facebook effectief is om de risicoperceptie van alcoholconsumptie te verhogen, ongeacht of deze argumenten daadwerkelijk online geplaatst worden. Er werden geen effecten van de manipulaties op alcoholconsumptie gevonden. Deze nulresultaten zijn onverwacht maar hebben mogelijk te maken met de instructie om anti-alcohol argumenten te verzinnen voor Facebook. Mogelijk is zelfovertuiging niet effectief op het moment dat mensen het gevoel hebben dat ze deze argumenten niet uit eigen overweging verzinnen.

### Effecten van Elaboratie

In het experiment in hoofdstuk 4 is onderzocht wat de effecten zijn van korte vergeleken met lange blootstelling aan anti-alcohol posters geframed als vragen (zelfovertuiging) of stellingen (directe overtuiging). Het achterliggende idee is dat wanneer mensen langer worden blootgesteld aan een poster, zij meer gelegenheid hebben om na te denken over de poster en dus (in het geval van een open vraag) meer argumenten verzinnen. Hierdoor zou de poster met vraag effectiever kunnen zijn bij langere blootstelling vergeleken met korte blootstelling. Anderzijds is het ook goed mogelijk dat korte blootstelling effectiever is. Bij kortere blootstelling verzinnen mensen waarschijnlijk minder argumenten, maar omdat het genereren van de argumenten ervaren wordt als ‘gemakkelijk’ (omdat het er weinig zijn), heeft dit een positief effect op overtuiging. Bij kortere blootstelling is de kans op het genereren van tegenargumenten ook kleiner. Om deze redenen werd verwacht dat korte blootstelling aan de posters effectiever zou zijn dan lange blootstelling.

De experimentele posters uit experiment 2 in hoofdstuk 2 werden ook gebruikt in dit experiment. Participanten werden uitgenodigd in het bar lab om mee te doen aan een bierproeftest. Ze moesten drie biertjes proeven en beoordelen. Participanten zagen een van de experimentele posters (met een vraag of een stelling) kort bij binnenkomst of gedurende het hele experiment achter de bar waaraan het proeven plaatsvond. Tegen de verwachtingen in zijn er geen effecten gevonden van de posters noch de blootstellingsduur op alcoholconsumptie in het experiment. Mogelijk heeft dit te maken met het feit dat participanten wisten dat ze mee zouden doen aan een experiment waarin ze bier zouden gaan proeven. Doordat ze akkoord zijn gegaan met het consumeren van alcohol voor aanvang van het experiment is het mogelijk dat de posters niet effectief waren omdat deze werden gezien als ‘irrelevant’ voor hen in die situatie. Ze hadden immers al toegezegd om alcohol te consumeren en hadden tijdens het experiment niet de keuze om dat niet te doen.

## DISCUSSIE

De experimenten in deze dissertatie hebben gemengde resultaten opgeleverd betreffende de effectiviteit van zelfovertuigingstechnieken toegepast in mediaberichten om alcoholconsumptie te reduceren. Aan de ene kant blijkt dat zelfovertuiging kan worden bewerkstelligd door anti-alcohol berichten te formuleren als open vragen, wat resulteert in het verzinnen van anti-alcohol argumenten. Hierdoor consumeren mensen minder alcohol na het zien van de poster met vraag wanneer ze ervoor kiezen om alcohol te drinken. Zelfovertuiging kan ook succesvol worden toegepast op Facebook om alcohol risicoperceptie te verhogen door gebruikers anti-alcohol argumenten te laten verzinnen. Aan de andere kant is het in twee van de drie experimenten niet gelukt om daadwerkelijk alcoholconsumptie te beïnvloeden.

Dit patroon van resultaten kan verschillende dingen betekenen. Ten eerste is het mogelijk dat de gedragsverandering in experiment 2 in hoofdstuk 2 door toeval is gevonden. Vervolgonderzoek zou er om deze reden goed aan doen om gebruik te maken van pre-registraties (om een publicatie bias te vermijden) en eventueel een meta-analyse op het moment dat een groter aantal studies naar zelfovertuiging in media-interventies beschikbaar is.

Ten tweede is het mogelijk dat gedragsveranderingseffecten van zelf-overtuigende media-interventies dusdanig klein zijn, dat ze niet gevonden werden in het relatief kleine aantal participanten in de experimenten in hoofdstuk 3 en 4. Voor vervolgonderzoek is het daarom aan te raden om een meer conservatieve effectgrootte te schatten bij het berekenen van het minimum aantal participanten voor een experiment.

Ten derde is het mogelijk dat zelfovertuigingstechnieken effectief zijn om cognities te veranderen, maar dat onmiddellijk gedrag (nagenoeg) niet beïnvloed wordt. Als dat zo is wordt gedragsverandering mogelijk pas zichtbaar na herhaalde blootstelling aan dergelijke berichten op een langere termijn.

Tot slot is het mogelijk dat er een andere factor in het spel is waar eerder nog geen rekening mee is gehouden: keuzevrijheid.

### Keuzevrijheid

Een van de voornaamste voordelen van zelfovertuiging vergeleken met directe vormen van overtuiging is dat keuzevrijheid niet beperkt lijkt te worden, waardoor defensieve reacties en reactance minder waarschijnlijk optreden. Bij zelfovertuiging denkt men namelijk dat de motivatie om te veranderen vanuit henzelf komt. Om deze reden is het niet alleen belangrijk om zelfovertuigingstechnieken zelf correct in te zetten, het is ook belangrijk om de setting waarin de beïnvloeding plaats zal vinden in acht te nemen.

Specifiek is het mogelijk dat de gedragsverandering in hoofdstuk 2 plaatsvond omdat de vraag op de posters het verzinnen van argumenten stimuleerde en men volledig vrij was om wel of geen alcohol te drinken. Met andere woorden: keuzevrijheid was volledig onbeperkt. In hoofdstuk 3 echter werden participanten ‘gedwongen’ om anti-alcohol argumenten te verzinnen. Het is mogelijk dat de opdracht om dit te doen werd gezien als een beperking van de keuzevrijheid waardoor zelfovertuigingseffecten niet optraden.

In hoofdstuk 4 werd, net als in hoofdstuk 2, het verzinnen van argumenten gestimuleerd met posters. In dit experiment was het consumeren van alcohol echter niet optioneel: participanten konden alleen meedoen aan het experiment als ze van te voren instemden met het drinken van alcohol tijdens het experiment. Het is mogelijk dat zelfovertuiging in deze situatie niet optrad, ofwel omdat men geen gevoel van controle had over het eigen drinkgedrag (wat zelfovertuiging ondermijnt), ofwel omdat men de posters als niet-relevant beschouwde in die situatie (ook omdat ze geen invloed dachten te hebben op hun consumptiegedrag) waardoor geen zelfovertuiging plaatsvond.

Het onderzoeken van de rol van keuzevrijheid in zelfovertuigingsinterventies in toekomstige experimenten, zou interessante inzichten kunnen opleveren. Dat kan bijvoorbeeld door manipulaties op instructiebasis te vergelijken met manipulaties die het genereren van argumenten proberen te stimuleren. Een alternatief is om de effectiviteit van zelfovertuigingsinterventies te vergelijken tussen gedwongen en vrije keuze paradigma's in de meettaak (bijvoorbeeld het gebruik van ad libitum drinksessies versus gedwongen drinktaken zoals de bierproeftest).

### Conclusie

Als geheel toont het onderzoek in deze dissertatie aan dat het zeker mogelijk is om zelfovertuigingstechnieken toe te passen in media-interventies, maar de effectiviteit van die berichten is niet veel groter dan directe vormen van beïnvloeding. Toch zijn er geen experimenten die laten zien dat zelfovertuiging minder effectief is dan directe of geen beïnvloeding. Toepassing van zelfovertuiging op grote schaal in media-interventies zou daarom tastbare positieve effecten kunnen hebben op de reductie van alcoholconsumptie. Daarvoor is het wel belangrijk om de rol van keuzevrijheid bij zelfovertuigingsinterventies verder te onderzoeken.

# Data Management

The Radboud University has set strict conditions for the management of research data (Radboud University, 2018). The data from the studies conducted for this dissertation will be treated in accordance with the research data management protocol ([www.ru.nl/rdm/](http://www.ru.nl/rdm/)).

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*“Now, bring me that horizon.”*

# Curriculum Vitae

Jeroen Loman was born on the 6<sup>th</sup> of January 1988 in Naarden, The Netherlands. He grew up in Blaricum with his parents and younger brother. He attended secondary education at the Scholengemeenschap Huizermaat in Huizen, from which he graduated in 2006. In 2011, he received his Bachelor's degree in Social Psychology at the University of Amsterdam, and in 2012 he received his Master's degree in Social Psychology (Mechanisms of Social Influence and Intervention; with merit) at the University of Amsterdam. He started working on a PhD project aiming to integrate principles of the psychology of time into persuasive communication interventions in 2012 at the Behavioural Science Institute (BSI) at the Radboud University, Nijmegen. After a year he decided to change topics and started working on his project entitled "Self-Persuasion in Media Messages", which resulted in the current dissertation.