

**Lowering Defensiveness Toward a Persuasive Message Concerning
Alcohol Consumption: Alcohol-related Identity as a Moderator**

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Master Thesis

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June 27th, 2024

Abstract

This study aimed to investigate the effectiveness of induced eye movements (EMi) in enhancing persuasion through the cognitive burden on working memory. Specifically, it examines how EMi influences negative emotions, intentions to reduce drinking behavior, and actual reductions in drinking. Drinker identity was explored as a moderator, with a hypothesis that individuals strongly identifying as drinkers will experience reduced defensiveness and therefore greater benefits from EMi. In this experimental design, volunteer participants were randomly allocated to one of the two conditions. The intervention involved a persuasive audio health message about the negative outcomes of alcohol consumption accompanied by a red square moving from side to side of their device to induce eye movements. Participants in the control condition only listened to the audio message. Results revealed an unexpected direction: those scoring low on identity measures exhibited larger increases in intention to reduce alcohol consumption, fear, and negative self-evaluation. EMi increased irritation in participants with high drinker identity scores, while it decreased irritation in those with low drinker identity scores. The findings suggest that participants may have disidentified from drinking while responding to the questionnaire. Openness seems to have played a role in prohibiting the expected effects in highly identified drinkers. Further research addressing measurement issues is recommended to better interpret these findings. Implementing EMi may be effective in cultures tied to drinking habits but less so for individuals open to seeking help.

Keywords: induced eye movements *or* EMi, defensiveness, working memory approach of persuasion, alcohol consumption.

Lowering Defensiveness Toward a Persuasive Message Concerning Alcohol Consumption: Alcohol-related Identity as a Moderator

Alcohol consumption has numerous downsides for both the body and mind. It weakens the immune system and can lead to cardiac problems, liver damage, pancreatitis, and cancer (CDC, 2021). Nevertheless, it increases the risk of unsafe sexual behavior, injuries, and even death. According to WHO (2022), 3 million deaths every year are attributable to harmful alcohol use. Finally, alcohol use can develop into dependence, ranging from mild to severe, which controls one's thoughts, moods, and actions through negative affect networks (Baker et al., 2004). However, the risks are not limited to excessive drinking. Recently, the WHO stated that no amount of alcohol is considered safe (World Health Organization, 2023). Therefore, lowering consumption should be a matter of concern to everyone. One effective tool to reduce alcohol consumption is persuasion (Churchill et al., 2016). Health communication employs persuasive strategies to promote healthy behaviors and well-being by influencing psychological determinants related to health actions. Oftentimes, however, information or persuasion is thwarted by defensive reactions.

Working memory account.

According to the working memory approach of persuasion, during exposure to a persuasive message, persuasive and regulatory processes take place in the working memory (Dijkstra & Elbert, 2019). Working memory is where the persuasive message content activates knowledge of the long-term memory - it becomes noticed and regulated (Baddeley, 1986, 2012). Both processes, mental representation building, and inhibiting or facilitative self-regulation are happening simultaneously in the same place. In health persuasion, produced mental images in the working memory will be about the consequences of health behaviors. When the mental image is assessed against a benchmark linked to values and objectives, it could evoke a sense of threat that causes aversive feelings, such as fear (Witte,

1992), and negative self-evaluative emotions (Dijkstra and Buunk, 2008). The discrepancy between behavior and internal beliefs, as explained by self-affirmation theory (Steele, 1988), can lead to dissatisfaction with self (Higgins, 1987). These feelings and unpleasant experiences require management so the cognitive self-regulation begins to diminish the threat. Individuals may attempt to reconcile these feelings through disengagement beliefs to maintain their behavior or by modifying their behaviors (Dijkstra & Buunk, 2008). Nevertheless, working memory having a limited capacity can only hold so much information at the same time. Therefore, cognitive processes, such as mental representation development and self-regulatory coping, compete for space. Additional tasks can sidestep these processes by taxing the working memory. One way to stop either clear mental image formation or defensive self-regulation - is taxing working memory by inducing eye movements (EMi; Dijkstra & van Asten, 2014; Dijkstra & Elbert, 2019, 2020).

Induced eye movements or EMi.

Induced eye movements have been first found to alleviate symptoms of post-traumatic stress disorder (PTSD; Shapiro, 1995). Eye Movement Desensitization and Reprocessing (EMDR) therapy has been therefore introduced as a structured method to treat PTSD allowing for successful desensitization to traumatic memories. EMDR treatment is now shown to also aid other mental health issues with trauma-related symptoms (Grainer et al., 2020).

Psychiatric conditions that showed improvement were bipolar, depression, generalized anxiety, and substance use disorders. The benefits of induced eye movements have now been demonstrated to translate to other health issues, unrelated to traumatic symptoms (Dijkstra & van Assen, 2014; Dijkstra & Elbert, 2019, 2020; Dijkstra & Bodamer, 2023). Currently, the evidence is building for a working memory account as an explanation for the effectiveness of the tool (Muris & Merckelbach, 1995; Schubert et al., 2011; Van Den Hout et al., 2001, 2011). Induced eye movements are hypothesized to tax the working memory this way letting the

person process information without interruption of cognitive mechanisms protecting the self. The studies by Dijkstra & van Assen (2014), and Dijkstra & Elbert (2019, 2020) showed that induced eye movements (EMi) lead to increased health persuasion. Those that exhibit defensive self-regulation, left without their defensive mechanisms against the message must adapt in other ways, such as behavior change. In the study by Dijkstra & van Assen (2014), it has been shown how EMi can be used to prohibit defensive reactions when listening to persuasive messages on fruit and vegetable consumption. EMi exhibited a similar effect as the self-affirmation procedure after which EMi had no effect (no defensive processes left to diminish). Thus, it led to an increased intention to consume more fruits and vegetables. It was then investigated whether increased persuasiveness led to actual behavior change (Dijkstra & Elbert, 2019). The results revealed increased persuasion and self-reported vegetable and fruit consumption, yet not in all.

Individual differences in defensiveness.

Not everyone becomes defensive in response to health information. For example, people differ in tendencies to use positive self-images during threatening experiences (Pietersma & Dijkstra, 2011) leading to open-mindedness towards the message. They do not tend to react in a defensive manner to discrepancies as the information is not a threat to a stable and integrated self (Dijkstra & Elbert, 2019). Instead, they remain rooted in their values and respond with behavior change or a facilitative self-regulation process. However, when individuals score high on a measure of cognitive self-affirmation inclination measure (CSAI, Pietersma & Dijkstra, 2011) predicting defensive reactions, EMi may inadvertently counter its intended effects of reducing defensiveness. Research indicates reduced persuasiveness among individuals scoring high on CSAI when their working memory is taxed, possibly due to diminished positive cognitive reactions to the message or the erosion of mental images of

negative consequences. This lack of threat detection precludes self-regulation processes and leads to no behavior change.

Furthermore, low self-esteem correlated with CSAI and was also observed to lead to more defensiveness and therefore, EMI effectiveness in health persuasion (Dijkstra & van Asten, 2014). Other individual differences in defensiveness include working memory capacity (Dijkstra & Schmidberger, 2022), strong health value (Dijkstra & van Asten, 2014), and gender (Dijkstra & Elbert, 2019; 2021; Dijkstra & Bodamer, 2021). Additionally, broadening our inquiry to behaviors like alcohol consumption, defensive processes become apparent during the engagement with health-related information concerning alcohol. Quantity of alcohol consumption positively correlated with defensive processes while engaging with an infographic on the harmful effects of alcohol (Morris et al., 2023). Authors found a linear association between the amounts of alcohol and the defensive processes such as message derogation, defense avoidance, inverse threat/susceptibility, or “othering”. The research reveals a trend: those with the highest alcohol consumption also reported feeling the most discomfort, exhibited lower self-efficacy, and frequently relied on optimistic biases. Nevertheless, attributing defensiveness solely to alcohol overlooks the role of underlying psychological factors, such as identity. In our investigation, we aim to explore whether a strong identification with drinking fosters greater defensiveness and whether employing EMI techniques enhances persuasive outcomes.

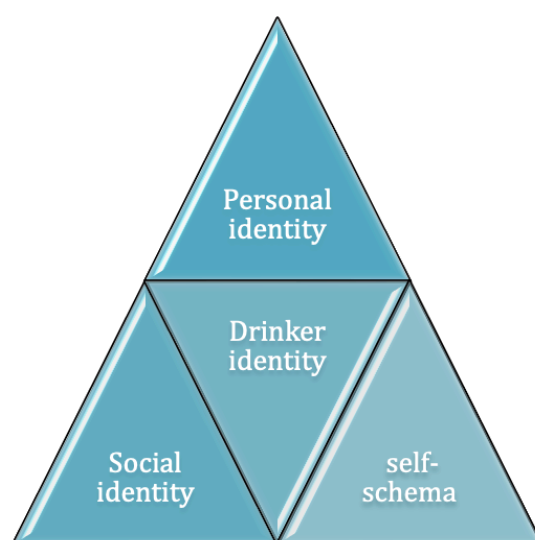
Drinker identity and its threats.

Given that defensive reactions are a commonplace of identity threats (De Hoog, 2013), especially if they identify strongly with the group (Branscombe, 1999), considering the influence of identity in responses to persuasive messages, becomes imperative. It is another potential individual difference moderating defensiveness when encountering a health message. Drinker identity is a robust predictor of drinking behavior and later alcohol-related

problems (for example, DiBello, 2018, Cummins et al., 2021; Lindgren et al., 2013, 2016). Such studies recommend targeting identities when treating addiction, as it is an established mechanism in addiction formation. Identity is a multidimensional and broad concept of the self and is referred to differently by different theorists. For example, social identity theory (Tajfel & Turner, 1979) and identity theory (McCall & Simmons, 1978) diverge in their emphasis as to what defines identity. Social identity theory focuses on identity in terms of the characteristics of the group one belongs to, while identity theory emphasizes individual behaviors one engages in. We will consider a drinker identity holistically: taking together explicit identity or social (drinker) identity, (hedonistic) values that integrate roles into a personal identity as well as a self-schema related to (drinking) behaviors that can be activated temporarily (Figure 1).

Figure 1.

Elements of a drinker identity



Note. 3 components of identity: Social identity - the group one identifies with; Self-schema - roles that guide behaviors; Personal identity - authentic self that is comprised of different roles able to coexist due to core values.

As a first element of identity, we will consider a drinker identity as a person perceiving a fit between oneself and the group of people who drink and dissociates oneself from the non-drinker group. Social identity theory (Tajfel & Turner, 1979) refers to the self-concept as formed through the categorization of people or group membership informing them about their attributes. The group one identifies with influences their sense of belonging and esteem. Social identities play an important role in addiction development and recovery (Dingle et al., 2015). Dingle et al. (2015) introduce a model of two pathways to and out of addiction. Some individuals may abandon their positive identities, acquiring new, potentially adverse ones such as 'addict' or 'drinker', while those confronting social isolation might attain belonging by embracing a user identity. When people's social identity is threatened, they tend to process threatening information more critically (Dietz-Uhler, 1999; Cadinu & Cerchioni, 2001). High identifiers are in general more attentive to negative information about the group, perceive more threat, become more defensive, and evaluate negative information about the group more negatively than positive information (de Hoog, 2013). Therefore, individuals who strongly associate themselves with a group of drinkers will be more prone to defensiveness in the face of negative information about those who drink.

Second, identity theory (Burke & Tully, 1977; McCall & Simmons, 1978; Stryker, 1980; Thoits, 1986) emphasizes identity formation through the adoption and enactment of various roles. When individuals assume identity, they embrace self-perceptions, meanings, and anticipations associated with that role. They subsequently engage in actions that reflect and uphold these expectations (Thoits & Virshup, 1997). This notion corresponds with self-schemas (Markus, 1977), which serve as cognitive frameworks guiding meaning-making, and behaviors based on expectations and prior experiences (Stein, 1995). They organize and interpret self-relevant information and guide how individuals perceive, process, and respond to different contexts and situations. Therefore, different roles or behaviors can be activated

more or less at certain time points depending on the environmental and internal cues. Drinkers own a drinking-related self-schema (Corte & Stein, 2007). Self-schema (SS) model identifies a pathway to alcohol dependence through identity establishment due to drinking behavior. Activated drinker SS leads one to drink and therefore preserve this self-concept, making it more stable over time. Self-schemas allow one to regulate affect and behavior. In the case of activating negative self-schemas, negative feelings arise leading to avoidance and inhibition in the domain of concern. Drinkers will try to suppress negative feelings about their drinking to protect themselves and their emotional well-being. In other words, drinkers will become defensive in response to negative feelings concerning their behaviors aimed at maintaining their existing beliefs or behaviors related to alcohol use.

Still, Stets & Burke (2000) suggest that being and doing are both fundamental aspects of identity and propose a merger of identity theory and social identity theory. Hitlin (2003) bridged these theories by linking personal (core) identity with values. Therefore, the current study adopts personal identity as the third conceptualization of identity. Values can be understood as stable motivational forces guiding choices in end-states or goals and thus, behaviors. While they are personal and not enforced, they form in social contexts and are culturally resonant ideals. The authentic self is shaped by transsituational value structures, highlighting the pivotal importance of these commitments in identity formation (Hitlin, 2003). They aid with the integration of the different roles and produce a coherent sense of self. Individuals possessing specific value systems are more inclined to choose circumstances where they can express them and their identities with the situations reinforcing their held values. Hitlin (2003) examined volunteer identity adoption as predicted by self-transcendence values from Schwartz's 10-value model (Schwartz 1992; Prince-Gibson & Schwartz 1998). Among the values in the model is hedonism, associated with the pursuit of sensuous gratification and self-indulgence. Drinking alcohol is often associated with pleasurable

feelings and social interactions. In this sense, drinking can be viewed as a pursuit of immediate pleasure and sensory satisfaction, which aligns with the hedonistic value of seeking out enjoyable experiences. Embracing hedonistic values was shown to be associated with more alcohol consumption and less abstinence (Nordfjaern & Brunborg, 2015). Therefore, in this research, we tie hedonistic values to that of a drinker identity. People embracing these values will adopt a defensive stance to cope with the perceived threat of negative effects of their lifestyle, resulting in the rejection of health information.

Self-concept in every layer (grasping of the self in relation to others, behaviors, and values) is crucial for social functioning as it regulates attention, perception, motivation, affect, and behavior, while also organizing current and new self-knowledge (Oyserman, 2001). It serves self-promotional functions yet also fosters a sense of security by providing a coherent and stable understanding of the self, enabling predictability in one's surroundings. Given individuals' preference for feeling good and consistent about themselves, they are unlikely to appreciate threats to their cognitive structures of the self. We posit that encountering threatening information associated with the identity (social, schematic, and personal) of concern can trigger a threat that elicits self-regulatory processes. Strongly identified drinkers (in either element) will react more defensively to the information about negative consequences associated with their group, behaviors, and values compared with less identified individuals.

The present study.

The objective of this study is to add to the evidence on the effectiveness of induced eye movements to increase persuasion by burdening the working memory. Furthermore, we aim to demonstrate how the theory extends to the defensiveness that is caused by identity threats. In this study, we will focus on a drinker's identity and seek to decrease drinking behavior by using persuasion aided by the tool of EMI. In this context, the conceptualization of drinker

identity encompasses individuals who perceive alcohol consumption as integral to the group they belong to or to their social identity; anticipate positive outcomes of drinking or have a drinker self-schema; and embrace hedonistic values leading to uptake of a drinker role.

We expect that a health message about the negative consequences of alcohol consumption will elicit high defense in people with strong drinker identities. We expect manifestations of threat to include defensiveness and emotions such as irritation, negative self-evaluation, and fear. In these individuals, induced eye movements, therefore, will prompt the most effective persuasion. Consequently, they are then predicted to intend and actually lower their alcohol consumption in the two weeks post-intervention due to deeper threat processing. On the other hand, we suppose that people with weak alcohol-related identities will not be persuaded well. They are regarded as the ones who will not have a defensive reaction toward the audio message, as the content will not be as threatening. Therefore, one of the two mental processes possibly leading to behavior change might be abolished by the loaded working memory space leading to no or even negative effects. So, the intervention of a persuasive health message with EMI or no EMI is the independent variable. The outcome variables are the intention to lower alcohol consumption, lowering it in two weeks after the manipulation, irritation, fear, and negative self-evaluative emotions. The three types of drinker identities will serve as moderators providing answers to who can benefit the most from EMI interventions. Individual differences in alcohol consumption at the pretest will be added to the model as a covariate to control for its influence on the results.

Method

Recruitment.

Participants were recruited via a call for research participation facilitated by the University of Groningen, and disseminated on social media platforms including Facebook, Instagram, and Reddit. The call incorporated a prompt: ‘What is your opinion about alcohol? Do you enjoy alcohol?’. The sample comprised individuals representative of the broader Dutch population. Previous research on EMI (Dijkstra & van Asten, 2014; Dijkstra & Elbert, 2019, 2020) yielded effect sizes of $f \approx 0.217$. To achieve the desired power of 0.80 at an α level of 0.05, our target sample size was 169, after attrition (G power; Faul et al., 2009).

Procedure and design.

All of the subjects participated voluntarily and were informed about the opportunity to win 50 euros by taking part in this study. The survey was held online in the Qualtrics (2023) platform. Upon entering the survey, participants read and signed informed consent after which they engaged in pre-measurement and were instructed to maximize the screen size and use speakers or headphones/earphones to listen to the audio message. In this experimental (longitudinal) design, participants were randomly assigned to one of two conditions: either to listen to an audio message about the negative consequences of alcohol consumption combined with induced eye movements (EMI; see below) or to listen to the same message without EMI. After the message, they responded to a post-measurement questionnaire. Most of the participants (83) indicated completing the survey with their smartphones, 10 with a PC, 5 on a laptop, and 2 on a tablet. After completing the study, participants were invited to participate in the second part in two weeks. Those who did not provide their emails were debriefed. Those who expressed interest in continuing participation provided their email addresses. Following the two-week intervention period, participants were requested to complete a follow-up survey

assessing their drinking behavior over the preceding two weeks, after which they were debriefed.

EMi manipulation. As mentioned above, half of the participants were randomly allocated to the EMi condition. They were instructed to follow a moving red square on the screen at the same time as listening to the audio message, to induce eye movements (EMi). The square was 20 mm² and was moving from one side of the screen to the other, so 30 cm distance, in 2 seconds. Eye movement induction lasted for the time of the auditory message. These participants were asked if they managed to keep their eyes moving with the square (on a scale from not at all (1) to very well (7)). In the control condition, participants were provided with the same auditory message alone. All of the subjects were inquired about how successful they were in listening to the text (on a scale from not at all (1) to very well (7)).

Materials and measures.

The sound recording of a persuasive message that was used was recorded in a semi-professional studio. The Dutch audio message on the negative consequences of alcohol use consisted of 360 words and was 3 minutes and 38 seconds long. See Appendix A to read the written message that was presented to the participants during the study, both in English and Dutch. Additionally, there was a 22-second long instructive introduction for the control condition and a 34-second introduction for the EMi condition. The presenter was male and was speaking at a normal rate in the Dutch language.

Pre-measurement. Before the intervention, participants were evaluated for their average daily alcohol consumption over the preceding 3 months. Additionally, three metrics were employed to gauge alcohol-related identity. The answers could range from totally disagree (1) to totally agree (5) for all of these identity measures with higher scores indicating stronger identity. First, was the Alcohol Self-Concept scale (ASCS; Lindgren et al.,

2013; adapted from Shadel & Mermelstein, 1996). An instance of ASCS (5-item scale; $\alpha = .89$) is “Drinking alcohol is a regular part of my life”.

Second, a 6-item scale on hedonistic value ($\alpha = .54$) reflecting tendencies towards a personal drinker identity was included. The question was “This is what I think is important in life”. The items included being together, enjoying life, not being afraid to live, letting myself go, enjoying alcoholic drinks, and having good relationships with others.

Lastly, positive outcome expectations of alcohol use were part of measurements pertaining to schematic drinker identity. Positive outcome expectations of drinking consisted of 15 items ($\alpha = .96$) such as being confident or finding everything more enjoyable when under the influence of alcohol. Other individual difference measures were administered but will not be discussed in this study as they are unrelated to the current research focus. Full questionnaires of the pre-measurement can be found in Appendix B.

Post-measurement and follow-up survey. Right after the manipulation, the post-measurement was provided that consisted of single-item questions on self-evaluative emotions (“Are you satisfied with yourself when you think about the consequences of alcohol consumption?”), fear (“Do you feel fear when you think about the consequences of alcohol consumption?”) and the intention to lower alcohol consumption (“Are you likely to drink less alcohol in the next 3 months?”). Subjects had to rate these on a 7-point scale (completely satisfied with myself/no fear at all (1) to completely dissatisfied with myself/extremely fearful (7)), while the intention was rated on a 5-point scale (from not likely at all (1) to very likely (7)), (see Appendix C). Two weeks later subjects responded to a follow-up survey about their average daily alcohol consumption over the past two weeks (Appendix D).

Results

Preliminary analysis

Selection and attrition analysis. 153 individuals enrolled in the survey but 47 people did not complete the pre-measurement. Following the manipulation, 8 more people dropped out. Participants' exposure to the persuasive message was measured by the time spent on the condition page, with exclusions for those spending less than 180 seconds or reporting a success score of 3 or lower (on a 7-point scale) on following the square. This criterion was based on prior EMI studies (Dijkstra & Bodarmer, 2023; Dijkstra & Elbert, 2020). After applying these criteria, 84 participants remained for analysis, with 43 in the EMI condition and 41 in the no EMI condition. No statistically significant differences were observed between the 69 participants (45.1%), who were excluded, and those included in the analyses, concerning the four key variables: social drinker identity, hedonistic value, positive outcome expectations, and alcohol use. Of the 52 people who followed up on their alcohol-consuming behavior after 2 weeks, only 45 people had complete data.

Manipulation check. Self-reported complete success (7 out of 7) of listening to the audio message was 68.7%. There was a significant difference ($t(81) = 3.61, p < .001, d = .78$) between the manipulation ($M = 6.83, SD = 0.54$) and control ($M = 6.21, SD = 0.95$) groups in the self-reported success of listening to the message. In addition, 46.5% of participants in the EMI condition managed to follow the square during the whole manipulation, the other 53.5% of participants evaluated their success between 6 and 4 (out of 7).

Randomization check. Independent samples t-tests showed no significant differences between the two groups for the three moderators (social drinker identity, positive outcome expectations of drinking, and hedonistic values) and two covariates (alcohol use at pretest and intention at pretest). It can be said that randomization was successful.

Assumption checks. Normal P-P plots indicate approximately normal residuals for the five dependent variables. All residual means were 0 with varying standard deviations: 1.61 for irritation, 1.45 for intention to lower alcohol consumption, fear, and satisfaction with oneself, and 0.84 for behavior. Accordingly, the normality assumption was sufficiently met for these dependent variables. Residuals for alcohol consumption post-intervention showed heteroscedasticity. Therefore, linearity was confirmed for the four dependent variables except behavior. Homogeneity of variances was confirmed by non-significant Levene's statistic ($\alpha > .05$) for variables intention, irritation, fear, negative self-evaluation, and behavior. No issues with multicollinearity were detected.

Preparatory analyses.

To be able to decide on the variable inclusion in the models, correlations between the main variables and with dependent variables were checked. Alcohol use at the pretest correlated significantly with social drinker identity. Social drinker identity also positively correlated with positive outcome expectations of drinking alcohol (Table 1 displays means, standard deviations, and correlations of these 4 variables). Furthermore, social drinker identity significantly correlated with dependent variables fear ($r(84) = .34, p = .002$), negative self-evaluation ($r(84) = .38, p < .001$), and alcohol consumption in 2 weeks ($r(46) = .31, p = .036$). Alcohol use at pretest correlated significantly with negative self-evaluation ($r(84) = .46, p < .001$) and alcohol use after 2 weeks ($r(46) = .92, p < .001$). Based on these significant correlations, 3 moderators and pretest alcohol use covariate were included in all of the models, to avoid confounding results (Yzerbyt et al. 2004). Not to miss any main effects, the effects of EMI were tested for the five dependent variables (intention, fear, irritation, negative self-evaluation, and behavior) without moderators but with a covariate - alcohol use at the pretest. Participants reported significantly ($F(1, 81) = 4.86, p = .030, \eta_p^2 = .057$) increased

intention to consume less alcohol in the EMi condition ($M = 3.29$), compared to the no EMi condition ($M = 2.57$).

Table 1

Means and SDs and correlations of the main independent variables

	Mean (Std. deviation)	Positive outcome expectations	Hedonistic value	Social drinker identity	Alcohol use at pretest
Positive outcome expectations	3.18 (0.52)				
Hedonistic value	4.0 (0.85)	.05			
Social drinker identity	1.84 (1.00)	.24*	.20		
Alcohol use at pretest	2.62 (2.10)	.14	.11	.47**	

Note. The * mark notes a significant correlation at the $\alpha = 0.05$ level; The ** mark notes a significant correlation at the $\alpha = 0.01$ level.

Main Analysis: moderation effects.

We anticipated that combining persuasive audio with EMi would heighten the intention to reduce alcohol consumption, elicit negative emotions, and decrease consumption post-intervention, particularly in strongly identified drinkers. Two-way ANCOVA models included EMi, a covariate, moderator variables, namely, social drinker identity, positive outcome expectations, and hedonistic values, as well as four interaction terms (EMi \times hedonistic value, EMi \times social drinker identity, EMi \times positive outcome expectations, EMi \times alcohol use at pretest). To then explore the effects of EMi across varying levels of identity, the dataset was adjusted by one standard deviation above and below the original z-scores of the moderator variables (Siero et al., 2009). Estimated means were computed with parameters

from the original model, and correlations within conditions were analyzed. To enhance comprehension, significant findings are depicted visually. Data analysis was conducted using *IBM SPSS Statistics* (Version 28.0.1.1 [15]) software.

Intention to lower alcohol use. The model included the aforementioned variables and interactions, however pretest intention was also incorporated as a covariate to support statistical power. No significant interaction terms were observed (see Table E1).

Moderators' z-scores were modeled ± 1 SD. Modeling both low and high levels of positive outcome expectations of drinking resulted in a non-significant EMI effect. Modeling low social drinker identity revealed a significant increase in intention in the EMI condition ($F(1, 72) = 4.22, p = .044, \eta^2_p = .055; M = 3.16$), compared to the control condition ($M = 2.34$). No significant differences were found in high-modeled social drinker identity. Similarly, modeling low hedonistic values exhibited significantly higher intention in the EMI condition ($F(1, 72) = 4.75, p = .033, \eta^2_p = .062; M = 3.40$) compared to the no EMI condition ($M = 2.60$), with no significant effect of EMI with high-modeled hedonistic values.

All means were estimated with parameters from the original model and can be found in Table 2. Correlations within conditions between intention and moderators yielded non-significant results. Graphical representations of EMI interactions with social drinker identity and hedonistic values on intention are shown in Figure 1 with means from Table 2.

Table 2.

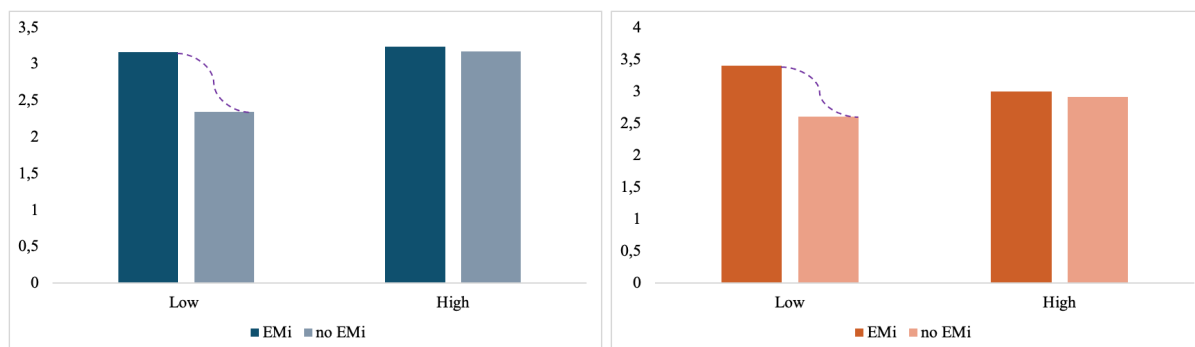
Estimated means of intention per moderator levels, DV-moderator correlations within conditions, and main effect significance and effect sizes.

	EMi			No EMi			p low (η^2_p)	p high (η^2_p)
	Low Mean	High Mean	r	Low Mean	High Mean	r		
Positive outcome expectations	3.34	3.35	.00	2.96	2.43	.16	.402 (.010)	.132 (.031)
Social identity	3.16	3.23	.01	2.34	3.17	.19	.044* (.055)	.877 (.000)
Hedonistic values	3.40	2.98	-.06	2.60	2.91	.32	.033* (.062)	.827 (.001)

Note. The * marks significant differences between conditions at the $\alpha = 0.05$ level.

Figure 1

Interactions between EMi and social drinker identity (left) and hedonistic values (right) on intention to lower alcohol consumption.



Note. The dashed line indicates a significant difference.

Irritation. The model incorporated EMi, the three moderators, a covariate, and their interactions with EMi. EMi \times positive outcome expectations of drinking demonstrated

significance ($F(1, 72) = 12.54, p < 0.001, \eta^2_p = 0.148$), while no other interaction terms reached statistical significance (see Table E2).

Original z-scores were modeled ± 1 SD for low and high levels of identity moderators. EMI significantly influenced both low ($F(1, 72) = 5.17, p = .026, \eta^2_p = .067$) and high ($F(1, 72) = 9.52, p = .003, \eta^2_p = .117$) levels of positive outcome expectations. However, no significant EMI effect on irritation was observed with the other two moderators at either level.

The estimated means are available in Table 3. Notably, the effect of EMI resulted in lower irritation ($M = 1.93$) compared with no EMI condition ($M = 3.27$) with low-modeled positive outcome expectations. When they were modeled as high, EMI led to more irritation ($M = 3.18$), than in the no EMI condition ($M = 1.57$; see Figure 2). In the EMI condition, positive outcome expectations were significantly associated with irritation ($r(42) = .44, p = .004$). Within the control condition, positive outcome expectations of drinking were negatively correlated with irritation ($r(40) = -.37, p = .020$). Social identity and hedonistic values did not correlate significantly with irritation, in either condition.

Table 3.

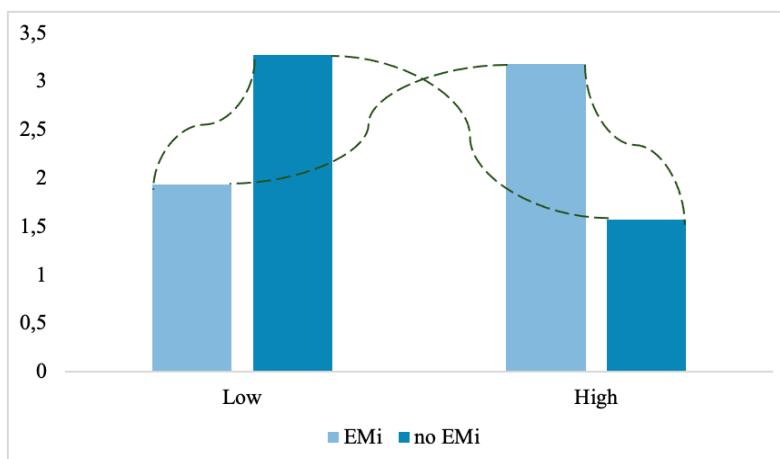
Estimated means of irritation per low/high moderator levels, DV-moderator correlations within conditions, and main effect significance with effect sizes.

	EMi			No EMi			p low (η^2_p)	p high (η^2_p)
	Low Mean	High Mean	r	Low Mean	High Mean	r		
Positive outcome expectations	1.93	3.18	.44**	3.27	1.57	-.37*	.026* (.067)	.003* (.117)
Social identity	2.35	2.76	.25	1.80	3.05	.16	.351 (.012)	.609 (.004)
Hedonistic values	2.83	2.29	-.06	2.84	2.00	-.17	.974 (.000)	.581 (.004)

Note. The * mark notes a significant correlation at the $\alpha = 0.05$ level; The ** mark notes a significant correlation at the $\alpha = 0.01$ level.

Figure 2.

Interaction effect between EMi and positive outcome expectations of drinking on irritation.



Note. The dashed lines indicate significant differences.

Fear. For fear regarding the consequences of alcohol use, the model included EMi, three identity moderators, alcohol use at the pretest as a covariate, and their interactions with

EMi (see Table E3). The interaction between condition and alcohol use at pretest was significant ($F(1,73) = 5.54, p = .021, \eta^2_p = .071$), while no moderator interactions exhibited significance.

Modeling the levels (± 1 SD of original z-scores) of all moderators and adjusting the models for each one did not reveal significant EMi effects. However, EMi approached significance with low-modeled social drinker identity in the model ($F(1, 73) = 3.81, p = .055, \eta^2_p = .050$). All means were estimated with parameter estimates from the original model (see Table 4, also for within-condition correlations). The only significant correlation was between fear and social drinker identity (no EMi condition: $r(41) = .37, p = .018$; EMi condition: $r(43) = .33, p = .032$). This effect is presented in Figure 3 with the estimated means.

Table 4.

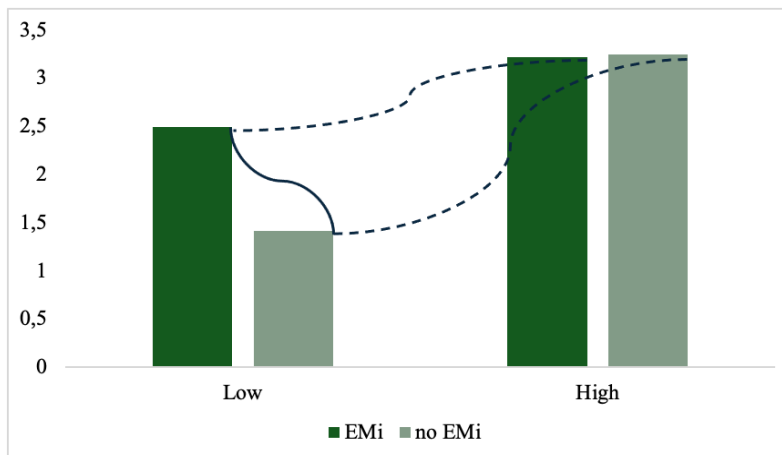
Estimated means of fear per low/high moderator levels, DV-moderator correlations within conditions, and main effect significance with effect sizes.

	EMi			No EMi			p low (η^2_p)	p high (η^2_p)
	Low Mean	High Mean	r	Low Mean	High Mean	r		
Positive outcome expectations	2.72	2.98	.18	2.07	2.59	.09	.242 (.019)	.425 (.009)
Social identity	2.49	3.1	.33*	1.41	3.24	.37*,	.055 (.050)	.949 (.000)
Hedonistic values	2.82	2.88	.09	2.08	2.58	.15	.151 (.028)	.525 (.006)

Note. The * mark notes significance at the $\alpha = 0.05$ level.

Figure 3

Interaction effect between EMi and social drinker identity on fear.

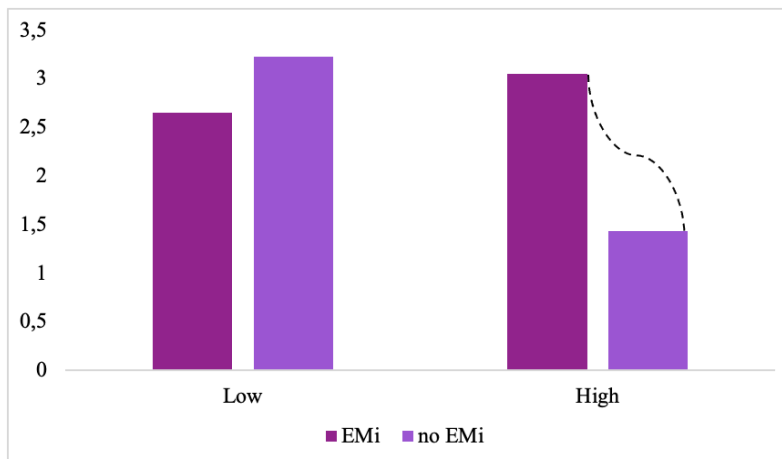


Note. The dashed lines indicate significant differences and the solid line marks near significance.

Exploratory analyses. Since alcohol at pretest \times EMi interaction was significant, this effect was analyzed with the modeled levels (\pm 1SD of original z-scores) of pretest alcohol use. With low-modeled alcohol use, the difference between conditions was nonsignificant ($F(1, 73) = 1.06, p = .307, \eta^2_p = .014$; EMi: $M = 2.65$, No EMi: $M = 3.22$). However, when high alcohol use was modeled, fear was significantly higher in the EMi condition ($F(1, 73) = 7.22, p = .009, \eta^2_p = .090$; $M = 3.05$), compared to the no EMi condition ($M = 1.44$). Within-condition correlations between fear and alcohol were non-significant (EMi: $r(43) = .25, p = .105$, no EMi: ($r(41) = -.04, p = .821$). Figure 4 illustrates this interaction effect.

Figure 4.

Interaction effect between EMI and pretest alcohol use on fear.



Note. The dashed lines indicate significant differences.

Self-evaluation. For satisfaction with oneself when thinking about the consequences of alcohol, the model included EMI, three identity moderators, and alcohol use at the pretest as a covariate and their interactions with EMI. As can be seen in Table E4, no interactions reached significance.

Modifying the model by adjusting each moderator individually to both low and high levels (± 1 SD of the original z-scores) did not result in significant outcomes for EMI. Estimated means that were calculated with parameter estimates from the original model are presented in Table 5 together with within-condition correlations. The only significant correlation was between self-evaluation and social identity in the no EMI condition ($r(41) = .57, p < .001$).

Table 5

Estimated means of self-evaluation per low/high moderator levels, DV-moderator correlations within the condition, and main effect significance with effect size.

	EMi			No EMi			p low (η^2_p)	p high (η^2_p)
	Low Mean	High Mean	r	Low Mean	High Mean	r		
Positive outcome expectations	3.05	2.97	.07	2.13	2.91	.31	.104 (.036)	.898 (.000)
Social identity	2.84	3.18	.27	1.89	3.15	.57**	.093 (.038)	.952 (.000)
Hedonistic values	2.80	3.22	.12	2.37	2.66	.24	.412 (.009)	.255 (.018)

Note. The * mark notes a significant correlation at the $\alpha = 0.05$ level; The ** mark notes a significant correlation at the $\alpha = 0.01$ level.

Behavior. The model consisted of EMi, three moderator variables, alcohol use at the pretest, and their interactions with EMi. Alcohol use at pretest \times EMi exhibited significance ($F(1, 35) = 9.85, p = .003, \eta^2_p = .220$). Yet no moderator interactions were significant (see Table E5).

The three moderators were tested by adjusting the models with their respective low and high levels, each modeled with ± 1 SD from the original z-scores. No significant effects of EMi were observed at either low or high levels of each moderator. None of the correlations within conditions, between alcohol use after two weeks and moderators, were significant except for social drinker identity in the no EMi condition ($r(22) = .47, p = .028$).

Exploratory analyses. Because of significant pretest alcohol use \times EMi, this effect was analyzed further. Modeling data ± 1 SD from the original z-scores for alcohol use at pretest revealed significant condition effect at both levels, low ($F(1, 35) = 6.41, p = .016, \eta^2_p =$

.155), and high ($F(1, 35) = 6.08, p = .019, \eta^2_p = .148$). When alcohol use was modeled as high, EMI led to more use of alcohol ($M = 4.39$), compared to no EMI ($M = 3.25$). When alcohol use was modeled as low, EMI resulted in lower alcohol use after two weeks ($M = 0.23$), compared to the no EMI condition ($M = 1.39$). Additionally, alcohol use at the pretest and post-test significantly correlated in both conditions (EMI: $r(24) = .97, p < .001$, control condition: $r(22) = .71, p < .001$).

Discussion

The study explored how identity moderates the effectiveness of a persuasive health message when combined with EMI. Acknowledging very different measures of different parts of identity utilized in our study is crucial for a comprehensive discussion. These measures encompassed hedonistic values to gauge personal drinker identity, explicit self-concept assessment to evaluate social drinker identity, and positive outcome expectations of drinking to measure the prominence of a drinker role. They differently moderated (or not at all) the relationship between EMI and outcome variables. By employing these diverse measures, we aimed to capture the multifaceted nature of identity and its potential implications for defensive reactions to health messages about alcohol consumption. The discussion is organized around the outcome variables and is followed by limitations, suggestions, and a general conclusion.

Intention.

Initial analyses unveiled a medium effect of EMI on the intention to reduce alcohol consumption, showing an increase within the EMI condition. Subsequent examination revealed that EMI's impact was predominantly driven by individuals with weak social drinker identities or low adherence to hedonistic values. Conversely, those with high scores on these measures displayed no apparent effect from EMI, contradicting our initial hypothesis of a stronger influence among those with a robust identity. Positive outcome expectations of drinking did not significantly moderate the relationship between EMI and intention.

One explanation for these findings could be that individuals with low scores on these identity measures may have been reluctant to acknowledge their identities when responding to the questionnaire. They may have temporarily disengaged from the domain of drinking through 'disidentification' (Steele 1997; Major et al., 1998; Nussbaum & Steele, 2007; Verkuyten & Thijs, 2010). Similarly, social desirability bias, a well-documented phenomenon

in self-report measures (Fisher, 1993; Latkin et al., 2017), may have influenced their responses, leading individuals to downplay socially undesirable attitudes and behaviors. According to Brenner & DeLamater (2016), this bias is intricately linked to identity processes. They argue that explicit survey questions may evoke the reflection of respondents not only on their actual self but also on the person they aspire to be (ideal self) or believe they should be (ought self). If participants in our sample, or their culture hold a negative affective evaluation of drinking (McCall & Simmons, 1978), the questionnaire may have already threatened their self-concept. It could have prompted them to disassociate from the label of “drinkers”, as to cope with the threat. Rejecting their drinker identity may predispose individuals to defensiveness when confronted with health messages on the matter (Cooper & Fazio, 1984).

For individuals identifying with drinkers, EMI neither increased nor decreased intention to reduce alcohol consumption, suggesting that the message did not elicit defensiveness. These participants might have already been sufficiently receptive to listening and contemplating the consequences of alcohol use. This implies a ceiling effect regarding the intervention (Garin, 2014), where additional exposure to EMI might not yield further alterations in intention. Our data indicates that this phenomenon is particularly notable among individuals exhibiting specific characteristics, such as a candid acknowledgment of their drinking habits. However, EMI also did not backfire, meaning that mental images about the aversive consequences of their behavior were undisturbed. Their significant working memory capacity might have allowed induced eye movements and mental images to coincide (Dijkstra & Schmidberger, 2022). Consequently, the hypothesis that EMI would significantly increase the intention to reduce alcohol consumption among those with a strong identity was not supported.

Irritation.

Social identity and hedonistic value did not significantly moderate the relationship between EMI and irritation. However, positive outcome expectations did support one of the hypotheses, provided that irritation is acknowledged as an emotion (Barata et al., 2015). In this regard, EMI decreased defensiveness in those with high positive outcome expectations having to face irritation due to a threat with a medium to large effect size. It also moderately decreased irritation in those with low positive outcome expectations by taking away their ability to mentalize the message content.

On the other hand, irritation can also be a sign of defensiveness. Baker (1980) defines defensiveness as a hostile emotional state that leads to rejection of presented information. Hence, irritability might just be the emotion responsible for creating barriers between the self and the message. In this light, EMI decreased defensiveness in those scoring low on positive outcome expectations. This would align with previously discussed findings that people scoring low on drinker identity measures did so because of the initial defensiveness.

From this angle, EMI led to increased defensiveness in those scoring high on positive outcome expectations. If participants were open enough to face their identity, EMI's facilitation of even deeper message processing could have resulted in an overwhelming irritability leading to message rejection. The overload of threat may have resulted in compensation for engaging in more defensive self-regulation. Such overload was documented in a previous persuasive study by Dijkstra (2014). In this study, a combination of self-affirmation procedure and frequent name-mentioning (12 times in a smoking cessation message) backfired when the message was already personally relevant. Combining persuasion-enhancing techniques, particularly when individuals are already open to change could inadvertently lead to unintended effects, like message rejection (Pietersma & Dijkstra, 2011; Dijkstra & van Asten, 2014). However, even without additional message strengthening, the threat might have been significant enough if the level of openness was high.

So, while statistical evidence supports EMI's ability to heighten irritation in highly positive outcome-expecting individuals and decrease for those scoring low on this measure, this particular negative emotion did not promote facilitative self-regulation. This points to irritability as an emotion of defensiveness.

Fear.

EMi did not increase fear at any level of either moderator, providing no support for the hypothesis that EMI would increase fear more significantly in highly identified drinkers. However, EMI approached a significant medium effect of increased fear for those with a low social drinker identity, again, indicating defensiveness that was abolished. As the measure of social drinker identity is an explicit measure of self-concept, responses render for easy manipulation by the respondent's will (and level of honesty with oneself; Brenner & DeLamater, 2016). Vulnerability to manipulation is even more pronounced in sensitive topics, where social desirability bias may come into play (Höglinger et al., 2016). Overall, the fear was higher in those highly socially identified, compared to those scoring low, independent of EMI. Again, it might mean that the people who admit to having a social drinker identity, are readily open enough to experience fear. Yet people in the EMI condition also did not show disrupted mentalization of health consequences. Possible explanations include unreliable data from those claiming to have attended to the red square, self-affirming tendencies (Pietersma & Dijkstra, 2011), and high openness or working memory capacity.

Nevertheless, exploratory analyses revealed that participants whose self-reported alcohol intake was higher experienced more fear in the EMI condition suggesting defensiveness that was taken away. This finding is in line with Harris & Napper (2005) and Morris et al. (2023) who found more defensive self-regulation in those drinking more. High alcohol use might have reflected unaccounted-for psychological constructs such as high-risk perceptions or personal relevance of the message (Dijkstra & Rotelli, 2022; Harris & Napper,

2005; Dijkstra & van Asten, 2014). The presented information can be argued to be the most personally relevant to the ones drinking the most, as they would perceive the most risk to their health or the least control over their behavior.

Self-evaluation.

No significant mean differences were found in negative self-evaluation in weakly and strongly alcohol-identified participants across conditions. Among those scoring low on social drinker identity, the mean differences between conditions were close to approaching significance, mirroring the patterns observed in intention, and fear. When self-evaluating against the provided benchmark, EMI increased dissatisfaction. Additionally, highly identified social drinkers were generally more negatively affected by the message, independent of EMI. So, the hypothesis that negative self-evaluation would increase due to a combination of a persuasive message and EMI in stronger drinker identifiers was not supported. This outcome can be explained by the same factors discussed earlier.

Behavior.

Due to our extremely limited statistical power, no firm conclusions can be drawn regarding the comparison of means for this outcome variable. Our analysis revealed no significant moderation effects, even among participants with weak identification with drinking. However, alcohol use at the pretest significantly moderated consumption after two weeks. EMI largely reduced alcohol use among participants who initially consumed less, but also markedly increased it among those with higher pretest consumption levels. These findings suggest that EMI may have increased persuasiveness among individuals with low alcohol consumption, indicating defensiveness revealing a tendency to downplay alcohol consumption due to social desirability concerns in this sample (Davis et al., 2010). Furthermore, the observed increase in alcohol consumption among participants with higher pretest levels in the EMI condition can be seen as an unintended effect, such as disrupted

perceptions of health consequences. This underscores the importance of investigating unintended negative effects, or 'persuasive backfiring,' for effective intervention implementation, as emphasized by Stibe & Cugelman (2016).

However, it is important to interpret these findings cautiously, considering the low positive predictive value (PPV) associated with our study's low statistical power. As Button et al. (2013) highlight, low power not only reduces the likelihood of detecting true effects but also increases the risk of false positives, particularly in small samples like ours. Therefore, while our results offer valuable insights, they should be interpreted within the context of our study's limitations. In conclusion, the hypothesis of decreased alcohol use among individuals with high drinker identities due to EMI is not supported by our findings.

Limitations and future directions.

The current study is limited, most notably by the small sample size and the absence of demographic data, which hinder the ability to generalize the findings. Additionally, measurement limitations warrant caution. Adopting an integrated approach to identity may help observe different emotional reactions to a message, potentially leading to behavior change or at least increased intention. In this study, low social drinker identity emerged as the most prominent factor, leading to fear and negative self-evaluation, which translated into a desire to lower alcohol consumption. However, results raise questions about the reliability of direct measures on a generally negative concept, such as drinker identity. Our findings point to a measurement error associated with affective identity evaluation (McCall & Simmons, 1978; Brenner & DeLamater, 2016). Future studies should develop more robust measurement methods. This focus could lead to more accurate assessments and a better understanding of how identity influences behavior change.

Comparing implicit and explicit measures of drinking-related self-identity has led to recommendations favoring the Alcohol Self-Concept Scale (ASCS) over implicit measures

(Cummins et al., 2020). However, list experiments have been shown to provide more accurate responses to sensitive questions compared to direct questioning (Blair et al., 2020; Ehler et al., 2021; Li & Van Den Noortgate, 2022; Ahmed et al., 2023). In this method, respondents indicate how many items on a list they agree with without specifying which ones. This approach has been used across various disciplines (Redlawsk et al., 2010; Janus, 2010; Biemer et al., 2005) and could be adapted to test self-concept. Furthermore, Latkin et al. (2017) suggest reducing social desirability bias by clearly defining the participant's role, outlining their responsibilities, fostering honesty in their responses, and identifying and mitigating motivations for socially desirable responses. Fundamentally, adjusting self-reported scores based on assessments of defensiveness (Arneklev, 1970) or social desirability tendencies (Egloff & Schmukle, 2003) should be practiced to enhance the quality of identity research.

Investigating the link between irritability and defensiveness, as well as incorporating physiological measures of these constructs, could aid in the interpretation of outcomes of EMI studies. Using such tools for control in studies with explicit questionnaires would enhance statistical power. Additionally, further exploring the interactions between EMI and psychological determinants is essential. Future studies should also consider including aversive social consequences in the message to induce stronger identity threats, which would help in understanding the current results better.

Due to the inherent limitations of this study, drawing practical implications for the application of EMI proves challenging. While it may be effective for individuals culturally inclined towards habits like drinking, its efficacy may plateau or even backfire when addressing more severe issues, especially for those openly seeking help. Therefore, caution should be exercised in its application until further research elucidates any potential unintended consequences.

Conclusion.

The findings of this study challenge the initial hypotheses, revealing an unexpected increase in the intention to lower alcohol consumption and negative emotions among individuals with weak drinker identities. Several factors may explain these results, including a small sample size and potential measurement error. The lack of effect among those with a strong alcohol-related identity could be attributed to other individual differences, such as openness, and self-affirming tendencies. These outcomes prompt a deeper consideration of identity acceptance and rejection. Individuals with a strong but unaccepted identity may be more susceptible to the influence of EMI due to defensiveness, presenting an opportunity for targeted persuasion using this tool. Furthermore, the results underscore the importance of accounting for defensiveness and adjusting self-reported scores on self-concept measures that might be negatively perceived by society. Ultimately, the inconclusive nature of these results highlights the complexity of persuasive messaging and the nuanced interplay of various techniques. Further research to develop and refine this intervention for specific populations, ensuring the most effective and precise implementation is needed.

References

- Ahmad, S., Lensink, R., & Mueller, A. (2023). Religion, social desirability bias and financial inclusion: Evidence from a list experiment on Islamic (micro-)finance. *Journal of Behavioural and Experimental Finance*, 38, 100795.
<https://doi.org/10.1016/j.jbef.2023.100795>
- Arneklev, B. L. (1970). *The use of defensiveness as a covariate of self-report in the assessment of self-concept among Navajo adolescents* (Publication No. 5777) [Master's thesis, Utah State University]. Digital Commons.
<https://doi.org/10.26076/b18b-05ed>
- Baddeley, A. D. (1986). *Working memory*. Oxford University Press.
- Baddeley, A. D. (2012). Working memory: Theories, models, and controversies. *Annual Review of Psychology*, 63, 1–29.
<https://doi.org/10.1146/annurev-psych-120710-100422>
- Baker, T. B., Piper, M. E., McCarthy, D. E., Majeskie, M. R., & Fiore, M. C. (2004). Addiction motivation reformulated: An affective processing model of negative reinforcement. *Psychological Review*, 111(1), 33-51.
<https://doi.org/10.1037/0033-295X.111.1.33>
- Baker, W. H. (1980). Defensiveness in Communication: Its causes, effects, and cures. *Journal of Business Communication/Journal of Business Communication*, 17(3), 33–43.
<https://doi.org/10.1177/002194368001700304>
- Barata, P. C., Holtzman, S., Cunningham, S., O'Connor, B. P., & Stewart, D. E. (2015). Building a definition of irritability from academic definitions and lay descriptions. *Emotion Review*, 8(2), 164–172. <https://doi.org/10.1177/1754073915576228>
- Biemer, P. P., Jordan, B. K., Hubbard, M., & Wright, D. (2005). A test of the item count methodology for estimating cocaine use prevalence. In J. Kennet & J. Gfroerer (Eds.),

- Evaluating and improving methods used in the National Survey on Drug Use and Health* (pp. 149–174). Substance Abuse and Mental Health Services Administration, Office of Applied Studies.
- Blair, G., Coppock, A., & Moor, M. (2020). When to Worry about Sensitivity Bias: A Social Reference Theory and Evidence from 30 Years of List Experiments. *American Political Science Review*, 114(4), 1297–1315.
<https://doi.org/10.1017/s0003055420000374>
- Branscombe, N., Ellemers, N., Spears, R., & Doosje, E. (1999). The context and content of social identity threat. *Blackwell Science*, 35–55.
<http://psycnet.apa.org/record/1999-02942-001>
- Brenner, P. S., & DeLamater, J. (2016). Lies, damned lies, and Survey Self-Reports? Identity as a cause of measurement bias. *Social Psychology Quarterly*, 79(4), 333–354.
<https://doi.org/10.1177/0190272516628298>
- Burke, P. J., & Tully, J. C. (1977). The measurement of role identity. *Social Forces*, 55(4), 881–897. <https://doi.org/10.1093/sf/55.4.881>
- Button, K. S., Ioannidis, J. P. A., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S. J., & Munafò, M. R. (2013). Power failure: why small sample size undermines the reliability of neuroscience. *Nature Reviews. Neuroscience*, 14(5), 365–376.
<https://doi.org/10.1038/nrn3475>
- Cadinu, M. R., & Cerchioni, M. (2001). Compensatory biases after ingroup threat: ‘yeah, but we have a good personality.’ *European Journal of Social Psychology*, 31(4), 353–367.
<https://doi.org/10.1002/ejsp.46>
- Churchill, S., Pavey, L., Jessop, D. C., & Sparks, P. (2016). Persuading people to drink less alcohol: the role of message framing, temporal focus and autonomy. *Alcohol and Alcoholism*, 51(6), 727–733. <https://doi.org/10.1093/alcalc/agw033>

- Cooper, J., & Fazio, R. H. (1984). A new look at dissonance theory. In *Advances in experimental social psychology* (pp. 229–266).
[https://doi.org/10.1016/s0065-2601\(08\)60121-5](https://doi.org/10.1016/s0065-2601(08)60121-5)
- Corte, C., & Stein, K. (2007). Self-Cognitions in Antisocial alcohol dependence and Recovery. *Western Journal of Nursing Research*, 29(1), 80–99.
<https://doi.org/10.1177/0193945906295480>
- Cummins, J., Lindgren, K. P., & De Houwer, J. (2021, June). On the role of (implicit) drinking self-identity in alcohol use and problematic drinking: A comparison of five measures. *Psychology of Addictive Behaviors*, 35(4), 458–471.
<https://doi.org/10.1037/adb0000643>
- Davis, C. G., Thake, J., & Vilhena, N. (2010). Social desirability biases in self-reported alcohol consumption and harms. *Addictive Behaviors*, 35(4), 302–311.
<https://doi.org/10.1016/j.addbeh.2009.11.001>
- De Hoog, N. (2013). Processing of social identity threats. *Social Psychology*, 44(6), 361–372.
<https://doi.org/10.1027/1864-9335/a000133>
- DiBello, A. M., Miller, M. B., Young, C. M., Neighbors, C., & Lindgren, K. P. (2018). Explicit drinking identity and alcohol problems: The mediating role of drinking to cope. *Addictive Behaviors*, 76, 88–94. <https://doi.org/10.1016/j.addbeh.2017.07.031>
- Dietz-Uhler, B. (1999). Defensive reactions to Group-Relevant information. *Group Processes & Intergroup Relations/Group Processes and Intergroup Relations*, 2(1), 17–29.
<https://doi.org/10.1177/1368430299021002>
- Dijkstra, A. (2014). The persuasive effects of personalization through: name mentioning in a smoking cessation message. *User Modeling and User-adapted Interaction*, 24(5), 393–411. <https://doi.org/10.1007/s11257-014-9147-x>

- Dijkstra, A., & Bodamer, W. (2023). The working memory approach of persuasion: Induced eye movements lead to more social media self-control behaviours. *British Journal of Social Psychology*, *63*(1), 170–185. <https://doi.org/10.1111/bjso.12672>
- Dijkstra, A., & Buunk, A. P. (2008). Self-evaluative emotions and expectations about self-evaluative emotions in health-behaviour change. *British Journal of Social Psychology*, *47*(1), 119–137. <https://doi.org/10.1348/014466607x216133>
- Dijkstra, A., & Elbert, S. (2019). Eye movement inductions influence health behaviour: the working memory account of persuasion. *Psychology & Health*, *34*(11), 1378–1394. <https://doi.org/10.1080/08870446.2019.1609678>
- Dijkstra, A., & Elbert, S. (2021). Detecting and preventing defensive reactions toward persuasive information on fruit and vegetable consumption using induced eye movements. *Frontiers in Psychology*, *11*. <https://doi.org/10.3389/fpsyg.2020.578287>
- Dijkstra, A., & Rotelli, V. (2022). Lowering red meat and processed meat consumption with environmental, animal welfare, and health arguments in Italy: an online experiment. *Frontiers in Psychology*, *13*. <https://doi.org/10.3389/fpsyg.2022.877911>
- Dijkstra, A., & Schmidberger, H. (2022). Individual differences in working memory capacity predict the behavioural effects of induced eye-movements in persuasion. [Manuscript in preparation]. Department of Psychology, University of Groningen.
- Dijkstra, A., & Van Asten, R. (2014). The eye movement desensitization and reprocessing procedure prevents defensive processing in health persuasion. *Health Communication*, *29*(6), 542–551. <https://doi.org/10.1080/10410236.2013.779558>
- Dingle, G. A., Cruwys, T., & Frings, D. (2015). Social Identities as Pathways into and out of Addiction. *Frontiers in Psychology*, *6*. <https://doi.org/10.3389/fpsyg.2015.01795>
- Drinking too much alcohol can harm your health. Learn the facts* | CDC. (n.d.). <https://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm>

- Egloff, B., & Schmukle, S. C. (2003). Does social desirability moderate the relationship between implicit and explicit anxiety measures? *Personality and Individual Differences, 35*(7), 1697–1706. [https://doi.org/10.1016/s0191-8869\(02\)00391-4](https://doi.org/10.1016/s0191-8869(02)00391-4)
- Ehler, I., Wolter, F., & Junkermann, J. (2021). SENSITIVE QUESTIONS IN SURVEYS. *Public Opinion Quarterly*. <https://doi.org/10.1093/poq/nfab002>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149–1160. <https://doi.org/10.3758/BRM.41.4.1149>
- Fisher, R. J. (1993). Social desirability bias and the validity of indirect questioning. *Journal of Consumer Research, 20*(2), 303. <https://doi.org/10.1086/209351>
- Gainer, D., Alam, S., Alam, H., & Redding, H. (2020, July 1). A FLASH OF HOPE: Eye Movement Desensitization and Reprocessing (EMDR) Therapy. *Innovations in Clinical Neuroscience, 17*(7-9), 12–20. PMID: 33520399; PMCID: PMC7839656.
- Garin, M. (2014). Ceiling effect. In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research*. Springer. https://doi.org/10.1007/978-94-007-0753-5_296
- Harris, P. R., & Napper, L. (2005). Self-Affirmation and the biased processing of threatening Health-Risk information. *Personality & Social Psychology Bulletin, 31*(9), 1250–1263. <https://doi.org/10.1177/0146167205274694>
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*(3), 319–340. <https://doi.org/10.1037/0033-295x.94.3.319>
- Hitlin, S. (2003). Values as the core of personal identity: Drawing links between two theories of self. *Social Psychology Quarterly, 66*(2), 118–137. <https://doi.org/10.2307/1519843>
- Höglinger, M., Jann, B., & Diekmann, A. (2016). Sensitive questions in online surveys : an experimental evaluation of different implementations of the randomized response

- technique and the crosswise model. *Survey Research Methods*, 10(3), 171–187.
<https://doi.org/10.18148/srm/2016.v10i3.6703>
- Iosifyan, M., & Arina, G. (2024). Perceived value threats are related to fear of health impairments. *The Journal of Social Psychology*, 164(1), 92-111.
<https://doi.org/10.1080/00224545.2021.1979453>
- Janus, A. L. (2010). The influence of social desirability pressures on expressed immigration attitudes. *Social Science Quarterly*, 91(4), 928–946.
<https://doi.org/10.1111/j.1540-6237.2010.00742.x>
- Jessop, D. C., & Wade, J. (2008). Fear appeals and binge drinking: A terror management theory perspective. *British Journal of Health Psychology*, 13(4), 773–788. <https://doi.org/10.1348/135910707X272790>
- Koob, G. F., & Volkow, N. D. (2016). Neurobiology of addiction: a neurocircuitry analysis. *The Lancet Psychiatry*, 3(8), 760–773. [https://doi.org/10.1016/s2215-0366\(16\)00104-8](https://doi.org/10.1016/s2215-0366(16)00104-8)
- Latkin, C. A., Edwards, C., Davey-Rothwell, M. A., & Tobin, K. E. (2017). The relationship between social desirability bias and self-reports of health, substance use, and social network factors among urban substance users in Baltimore, Maryland. *Addictive Behaviors*, 73, 133–136. <https://doi.org/10.1016/j.addbeh.2017.05.005>
- Li, J., & Van Den Noortgate, W. (2022). A meta-analysis of the relative effectiveness of the item count technique compared to direct questioning. *Sociological Methods & Research*, 51(2), 760–799. <https://doi.org/10.1177/0049124119882468>
- Lindgren, K. P., Foster, D. W., Westgate, E. C., & Neighbors, C. (2013, May). Implicit drinking identity: Drinker+me associations predict college student drinking consistently. *Addictive Behaviors*, 38(5), 2163–2166.
<https://doi.org/10.1016/j.addbeh.2013.01.026>

- Lindgren, K. P., Ramirez, J. J., Olin, C. C., & Neighbors, C. (2016, September). Not the same old thing: Establishing the unique contribution of drinking identity as a predictor of alcohol consumption and problems over time. *Psychology of Addictive Behaviors, 30*(6), 659–671. <https://doi.org/10.1037/adb0000195>
- Major, B., Spencer, S., Schmader, T., Wolfe, C., & Crocker, J. (1998). Coping with negative stereotypes about intellectual performance: The role of psychological disengagement. *Personality and Social Psychology Bulletin, 24*(1), 34-50. <https://doi.org/10.1177/0146167298241003>
- Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology, 35*(2), 63–78. <https://doi.org/10.1037/0022-3514.35.2.63>
- Mayo Clinic. (2022, May 18). *Alcohol use disorder - Symptoms and causes*. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/alcohol-use-disorder/symptoms-causes/syc-20369243>
- McCall, G. J., & Simmons, J. L. (1978). *Identities and interactions*. New York: Free Press
- McLeod, S., PhD. (2023). Carl Rogers Humanistic Theory and Contribution to Psychology. *Simply Psychology*. Retrieved from <https://www.simplypsychology.org/carl-rogers.html#Positive-Regard-and-Self-Worth>
- Morris, J., Tattan-Birch, H., Albery, I. P., Heather, N., & Moss, A. C. (2024). Look away now! Defensive processing and unrealistic optimism by level of alcohol consumption. *Psychology & Health, 1–19*. <https://doi.org/10.1080/08870446.2024.2316681>
- Moss, A. C., Albery, I. P., Dyer, K. R., Frings, D., Humphreys, K., Inkelaar, T., Harding, E., & Speller, A. (2015). The effects of responsible drinking messages on attentional allocation and drinking behavior. *Addictive Behaviors, 44*, 94–101. <https://doi.org/10.1016/j.addbeh.2014.11.035>

- Muris, P., & Merckelbach, H. (1995). Treating spider phobia with eye- movement desensitization and reprocessing: Two case reports. *Journal of Anxiety Disorders, 9*, 439–449.
- Nordfjaern, T., & Brunborg, G. S. (2015). Associations between human values and alcohol consumption among Norwegians in the second half of life. *Substance Use & Misuse, 50*(10), 1284–1293. <https://doi.org/10.3109/10826084.2014.998237>
- Nussbaum, A. D., & Steele, C. M. (2007). Situational disengagement and persistence in the face of adversity. *Journal of Experimental Social Psychology, 43*(1), 127–134. <https://doi.org/10.1016/j.jesp.2005.12.007>
- Oyserman, D. (2001). Self-concept and identity. In A. Tesser & N. Schwarz (Eds.), *The Blackwell Handbook of Social Psychology* (pp. 499-517). Malden, MA: Blackwell.
- Pietersma, S., & Dijkstra, A. (2011). Cognitive self-affirmation inclination: An individual difference in dealing with self-threats. *British Journal of Social Psychology, 51*(1), 33–51. <https://doi.org/10.1348/014466610x533768>
- Prince-Gibson, E., & Schwartz, S. H. (1998). Value priorities and gender. *Social Psychology Quarterly, 61*(1), 49. <https://doi.org/10.2307/2787057>
- Redlawsk, D. P., Civettini, A. J. W., & Emmerson, K. M. (2010). The affective tipping point: Do motivated reasoners ever “Get it”? *Political Psychology, 31*(4), 563–593. <https://doi.org/10.1111/j.1467-9221.2010.00772.x>
- Qualtrics XM - experience management software*. Qualtrics. (2023, October 3). <https://www.qualtrics.com/>
- Schubert, S. J., Lee, C. W., & Drummond, P. D. (2011). The efficacy and psychophysiological correlates of dual-attention tasks in eye movement desensitization and reprocessing (EMDR). *Journal of Anxiety Disorders, 25*(1), 1–11. <https://doi.org/10.1016/j.janxdis.2010.06.024>

- Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 25, pp. 1-65). New York: Academic Press.
[http://dx.doi.org/10.1016/S0065-2601\(08\)60281-6](http://dx.doi.org/10.1016/S0065-2601(08)60281-6)
- Shadel, W. G., & Mermelstein, R. (1996). Individual differences in self-concept among smokers attempting to quit: Validation and predictive utility of measures of the smoker self-concept and abstainer self-concept. *Annals of Behavioral Medicine, 18*(3), 151–156. <https://doi.org/10.1007/BF02883391>
- Shapiro, F. (1995). Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures. *The Guilford Press*.
- Sherman, D. K., Lokhande, M., Müller, T., & Cohen, G. L. (2020). Self-affirmation interventions. In G. M. Walton & A. J. Crum (Eds.), *Handbook of wise interventions: How social psychology can help people change* (pp. 63–99). The Guilford Press.
- Siero, F. W., Huisman, M., & Kiers, H. A. L. (2009). *Voortgezette regressie en variantieanalyse [Advanced regression and variance analysis]*. Springer Media.
- Steele, C. M. (1988). The Psychology of Self-Affirmation: Sustaining the integrity of the self. In *Advances in experimental social psychology* (pp. 261–302).
[https://doi.org/10.1016/s0065-2601\(08\)60229-4](https://doi.org/10.1016/s0065-2601(08)60229-4)
- Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *The American Psychologist, 52*(6), 613–629.
<https://doi.org/10.1037/0003-066X.52.6.613>
- Stein, K. F. (1995). Schema model of the Self-Concept. *Image: The Journal of Nursing Scholarship, 27*(3), 187–193. <https://doi.org/10.1111/j.1547-5069.1995.tb00857.x>
- Stets, J. E., & Burke, P. J. (2000). Identity theory and social identity theory. *Social Psychology Quarterly, 63*(3), 224. <https://doi.org/10.2307/2695870>

- Stibe, A., & Cugelman, B. (2016). Persuasive backfiring: when behavior change interventions trigger unintended negative outcomes. *Lecture Notes in Computer Science*, 65–77. https://doi.org/10.1007/978-3-319-31510-2_6
- Stryker, S. (1980). *Symbolic Interactionism: a social Structural version*. <http://ci.nii.ac.jp/ncid/BA00338055>
- Swann, J., & William, B. (2012). Self-Verification Theory. In *SAGE Publications Ltd eBooks* (pp. 23–42). <https://doi.org/10.4135/9781446249222.n27>
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–48). Monterey, CA: Brooks/Cole.
- Thoits, P. A. (1986). Multiple Identities: Examining gender and marital status differences in distress. *American Sociological Review*, 51(2), 259. <https://doi.org/10.2307/2095520>
- Thoits, P. A., & Virshup, L. K. (1997). Me's and we's: Forms and functions of social identities. In R. D. Ashmore & L. J. Jussim (Eds.), *Self and identity: Fundamental issues* (pp. 106–133). Oxford University Press.
- Van Den Hout, M. A., Engelhard, I. M., Rijkeboer, M. M., Koekebakker, J., Hornsveld, H., Leer, A., Toffolo, M. B., & Akse, N. (2011). EMDR: Eye movements superior to beeps in taxing working memory and reducing vividness of recollections. *Behaviour Research and Therapy*, 49(2), 92–98. <https://doi.org/10.1016/j.brat.2010.11.003>
- Van Den Hout, M., Muris, P., Salemink, E., & Kindt, M. (2001). Autobiographical memories become less vivid and emotional after eye movements. *British Journal of Clinical Psychology*, 40(2), 121–130. <https://doi.org/10.1348/014466501163571>
- Verkuyten, M., & Thijs, J. (2010). Ethnic minority labeling, multiculturalism, and the attitude of majority group members. *Journal of Language and Social Psychology*, 29(4), 467–477. <https://doi.org/10.1177/0261927x10377992>

Walton, G. M., & Crum, A. J. (2020). *Handbook of Wise Interventions*. Guilford Publications.

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model.

Communication Monographs, 59(4), 329–349.

<https://doi.org/10.1080/03637759209376276>

World Health Organization: WHO. (2023, January 4). No level of alcohol consumption is safe for our health. *World Health Organization:*

WHO. <https://www.who.int/europe/news/item/04-01-2023-no-level-of-alcohol-consumption-is-safe-for-our-health>

World Health Organization: WHO. (2022).

Alcohol. *www.who.int*. <https://www.who.int/news-room/fact-sheets/detail/alcohol>

Yzerbyt, V. Y., Muller, D., & Judd, C. M. (2004). Adjusting researchers' approach to adjustment: On the use of covariates when testing interactions. *Journal of*

Experimental Social Psychology, 40(4), 424–431.

<https://doi.org/10.1016/j.jesp.2003.10.001>

Appendices

Appendix A

The persuasive message translated to English

A beer, a glass of wine, or a cocktail can be delightful. In our society, it is quite normal to consume alcohol, and the government permits it. However, that doesn't mean alcohol consumption is harmless. The government allows many things that can make people ill or lead to death, such as traffic or unhealthy food. People largely have the freedom to decide how they want to live their lives. But it's important to know the real facts. Here's what's happening with alcohol.

Extensive scientific research has been conducted on the negative effects of alcohol consumption. For instance, a compilation of ten major scientific studies revealed that individuals who consume three alcohol units a day – equivalent to one large glass of wine or three beers – have a significantly higher risk of, brace yourself, developing cancer in the lips, mouth, throat, esophagus, colon, rectum, liver, and breasts. Furthermore, they are more likely to experience high blood pressure, stroke, liver cirrhosis, and chronic pancreatitis.

Alcohol is, therefore, not an innocent substance. It is rapidly broken down in the body into acetaldehyde, which, along with the free radicals it produces, is responsible for causing damage to the body.

There are recommendations for alcohol consumption: women are advised to limit themselves to a maximum of one alcohol unit per day, equivalent to one glass of beer or a small glass of wine, while men should not exceed two units per day – nothing more. Recently, it has come to light that even consuming less than one glass per day increases the risk of cancer. Moreover, binge drinking appears to be especially harmful. Drinking more than six units in a single evening – six beers or 2 or 3 generous glasses of wine – is truly detrimental.

Additionally, alcohol contains a significant number of calories. Three glasses of beer or one large glass of wine contain as much energy as a hamburger or two slices of chocolate cake.

There is also the risk of addiction. If you eagerly anticipate drinking alcohol, start drinking earlier in the day, frequently experience mild or severe hangovers, you should be cautious. Before you know it, you may find it difficult to do without alcohol.

No matter what you choose to drink, try consuming less. Cutting out even a single glass of alcohol is better for your health and demonstrates that you are in control.

How can you go about it? Use a smaller glass, don't leave the bottle on the table, decide in advance how much you want to drink, ensure you hydrate beforehand with water or tea to avoid thirst, think about the hangover you don't want, slow down your drinking, remember that alcohol enters your bloodstream and can cause damage throughout your body, say a resolute no if offered, it's about your body. If you manage to drink less or not at all, celebrate that victory quietly, with yourself.

Of course, you are allowed to drink alcohol, but do you really want to? That's the question.

The original persuasive message in Dutch

Een biertje, een wijntje of een cocktail kan heerlijk zijn. In onze maatschappij is het dan ook heel normaal om alcohol te drinken en de overheid staat het toe. Maar dat wil niet zeggen dat alcoholconsumptie onschuldig is; de overheid accepteert wel meer dingen waar mensen ziek van worden of dood aan gaan, denk aan het verkeer, of ongezonde voeding. Mensen mogen grotendeels zelf weten hoe ze hun leven inrichten. Maar dan is het wel goed om te weten hoe het echt zit. En dit is er aan de hand met alcohol.

Er is heel veel wetenschappelijk onderzoek gedaan naar de negatieve effecten van alcoholconsumptie. Bijvoorbeeld, 10 grote wetenschappelijke studies werden op een rij gezet en die toonden aan dat mensen die drie eenheden alcohol per dag drinken, dat is 1 groot glas wijn of 3 glazen bier, een significant grotere kans hebben op, hou je vast, kanker aan de lippen, mond, keel, slokdarm, dikke darm, rectum, lever en borsten. Verder hadden ze vaker hoge bloeddruk, een beroerte, levercirrose, en chronische pancreatitis.

Alcohol is dus geen onschuldige stof. Alcohol wordt in het lichaam al snel afgebroken tot acetaldehyde. Samen met de vrije radicalen die daarbij vrijkomen is acetaldehyde verantwoordelijk voor schade aan het lichaam.

Het is niet voor niks dat er aanbevelingen zijn, voor vrouwen maximaal 1 alcoholleenheid per dag, dat is 1 glas bier of een klein glas wijn, en voor mannen maximaal 2 per dag, meer niet. Kortgeleden werd bekend dat ook minder dan 1 glas per dag de kans op kanker vergroot; zelfs elk glas met alcohol vergroot de kans op kanker. Verder lijkt het erop dat veel alcohol per keer drinken, extra slecht is. Zo is meer dan zes eenheden op een avond, zes biertjes of 2 of 3 flinke glazen wijn, echt niet goed.

Daarnaast bevat alcohol veel calorieën. Drie glazen bier of een groot glas wijn bevat net zoveel energie als een broodje hamburger of twee plakken chocoladecake

En dan is er nog de kans op verslaving. Kijk je er naar uit om alcohol te drinken, drink je al eerder op de dag of heb je daar zin in, heb je regelmatig een kleine of grotere kater, wees dan alert. Voor je het weet kun je niet zomaar meer zonder alcohol.

Wat je ook drinkt, probeer eens minder te drinken. Echt elk glas alcohol minder, is beter voor je gezondheid en het bewijst dat jij controle hebt.

Hoe pak je dat aan? Neem een kleiner glas, laat de fles niet op tafel staan, bepaal van te voren hoeveel te wilt drinken, zorg ook dat je van tevoren voldoende drinkt, zoals water of thee, zodat je geen dorst hebt, denk aan de kater die je niet wil, drink langzamer, denk aan de alcohol die in je bloed door je hele lichaam gaat en daar schade aan kan richten, als je iets aangeboden krijgt, zeg ijskoud nee, het gaat om jou lichaam, en als het gelukt is om wat minder of niet te drinken, vier die overwinning, stiekem, met jezelf.

Natuurlijk mag je alcohol drinken, maar wil je dat ook, dat is de vraag.

Appendix B

Pre-measurement questionnaire

Alcohol consumption.

Over the past three months, approximately how many alcoholic drinks (in units) did you consume per day?

Monday	(indicate number)
Tuesday	(indicate number)
Wednesday	(indicate number)
Thursday	(indicate number)
Friday	(indicate number)
Saturday	(indicate number)
Sunday	(indicate number)

Health.

How important is health to you?	Not very important 1	2	3	4	5	6	Very important 7
How positively does good health affect you?	A little positive 1	2	3	4	5	6	Very positive 7
Is health the most important thing to you?	Not the most important 1	2	3	4	5	6	Definitely the most important 7

Cognitive Self-affirmation Inclination (CSAI; Pietersma & Dijkstra, 2011).*How often does the following happen to you?*

	Never	Rarely	Some- times	Often	Very often
1. I notice that I have done some things very well.	1	2	3	4	5
2. When I feel bad about myself, I think about the things I do well.	1	2	3	4	5
3. I reflect on things I've done well in the past.	1	2	3	4	5
4. When I've done something that makes me dissatisfied, I tell myself that I don't do everything wrong.	1	2	3	4	5
5. I realize that alongside the 'foolish' things I do, I also do a few things very well.	1	2	3	4	5
6. I think about the things I have accomplished successfully.	1	2	3	4	5

Identity.**Hedonistic values.**

This is what I find important in life :

	Totally disagree	Slightly disagree	Neither agree nor disagree	Somewhat agree	Totally agree
Togetherness	1	2	3	4	5
Enjoying life	1	2	3	4	5
Not being afraid to live	1	2	3	4	5
Letting myself go	1	2	3	4	5
Enjoying alcoholic drinks	1	2	3	4	5
Having good relationships with others	1	2	3	4	5

Alcohol Self-Concept scale (ASCS; Lindgren et al., 2013; adapted from Shadel & Mermelstein, 1996).

Who are you?

	Totally disagree	Slightly disagree	Neither agree nor disagree	Somewhat agree	Totally agree
1. Drinking alcohol is part of my self-image	1	2	3	4	5
2. Drinking alcohol is part of "who I am"	1	2	3	4	5
3. Drinking alcohol is part of my personality	1	2	3	4	5
4. Drinking alcohol is a regular part of my life	1	2	3	4	5
5. Others think that drinking alcohol is part of me	1	2	3	4	5

Positive outcome expectations of drinking.*If I have drunk a few glasses of alcohol:*

	Totally disagree	Slightly disagree	Neither agree nor disagree	Somewhat agree	Totally agree
1. I feel wonderful	1	2	3	4	5
2. I like my life	1	2	3	4	5
3. I feel confident	1	2	3	4	5
4. I dare more	1	2	3	4	5
5. I am more social	1	2	3	4	5
6. I make easier contact	1	2	3	4	5
7. I do not worry as much	1	2	3	4	5
8. I want to have sex more	1	2	3	4	5
9. I do not feel tired anymore	1	2	3	4	5
10. I become nicer to others	1	2	3	4	5
11. I like everything more	1	2	3	4	5
12. I find life more delightful	1	2	3	4	5
13. I become more myself	1	2	3	4	5
14. I feel fantastic	1	2	3	4	5
15. I become free of worry	1	2	3	4	5

Preliminary measurement of intention.*How easy or difficult is it for you to drink less alcohol?*

	Very easy				Very difficult
During the week:	1	2	3	4	5
On the weekend:	1	2	3	4	5

What do you think?

Should you actually drink less alcohol?	Strongly disagree 1	2	3	4	5	6	Strongly agree 7
Do you plan to drink less alcohol in the coming month?	Certainly not 1	2	3	4	5	6	Certainly 7

Appendix C

Post-measurement questionnaire

Listening and following the square

Did you manage to listen to the audio?	Not at all 1	2	3	4	5	6	Completely 7
EMi = 1: Did you manage to keep following the moving square with your eyes the entire time?	Not at all 1	2	3	4	5	6	Completely 7

Emotions

Are you satisfied with yourself when you think about the possible consequences of your alcohol consumption?	Not at all satisfied 1	2	3	4	5	6	Very satisfied 7
Do you feel fear when you think about the possible consequences of your alcohol consumption?	No fear at all 1	2	3	4	5	6	Extreme amount of fear 7

Acceptance

How reliable do you find the audio text about alcohol consumption?	Not reliable at all 1	2	3	4	5	6	Very reliable 7
How strong is the link between alcohol consumption and developing diseases?	Not strong at all 1	2	3	4	5	6	Very strong 7
Did you feel irritation while listening to the audio about the consequences of alcohol consumption?	Absolutely no irritation 1	2	3	4	5	6	A lot of irritation 7
Compared to others of your age and gender, what are your chances of get sick from alcohol?	A lot smaller -3	Quite smaller -2	A little bit smaller -1	About the same 0	A little bigger 1	Quite bigger 2	A lot bigger 3

Intention

Do you plan to drink less alcohol in the next 3 months?	Certainly not planning on 1	2	3	4	Strongly planning on 5
Are you likely to drink less alcohol in the next 3 months?	Not likely at all 1	2	3	4	Very likely 5

Appendix D

Follow-up questionnaire

Alcohol consumption.

Over the past two weeks, approximately how many alcoholic drinks (in units) did you consume per day?

Monday	(indicate number)
Tuesday	(indicate number)
Wednesday	(indicate number)
Thursday	(indicate number)
Friday	(indicate number)
Saturday	(indicate number)
Sunday	(indicate number)

Since the last questionnaire (about two weeks ago), approximately how often have you had a hangover?

1	2	3	4	5	6	7	8	9	10	11	12	13	14
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How bad was the worst hangover you had (in the past two weeks)?	Not bad at all 1	2	3	4	5	6	Very bad 7
Since the last questionnaire (about two weeks ago), have you started drinking less alcohol?	Not at all 1	2	3	4	5	6	Completely 7

Appendix E
ANCOVA outputs

Table E1.

Results from the ANCOVA model on intention to lower alcohol use.

Effect source	F(1,73)	p	η^2_p
EMi	3.08	.084	.041
Alcohol use at pretest	5.06	.027	.066
Positive outcome expectations	0.03	.874	.000
Hedonistic value	0.04	.837	.001
Social drinker identity	2.19	.143	.030
Intention at pretest	75.97	<.001*	.513
Emi \times Alcohol use at pretest	0.75	.390	.010
EMi \times positive outcome expectations	0.13	.716	.002
EMi \times hedonistic value	2.02	.160	.027
EMi \times social drinker identity	1.62	.207	.022

Note. The * mark signifies significance at the $\alpha = .05$ level.

Table E2.*Results from the ANCOVA model on irritation.*

Effect source	F(1, 72)	p	η^2_p
EMi	0.13	.721	.002
Alcohol use at pretest	0.08	.782	.001
Positive outcome expectations	0.25	.617	.003
Hedonistic value	3.34	.072	.044
Social drinker identity	3.58	.063	.047
Emi \times Alcohol use at pretest	0.06	.808	.001
EMi \times positive outcome expectations	12.54	<.001*	.148
EMi \times hedonistic value	0.16	.692	.002
EMi \times social drinker identity	0.91	.342	.013

Note. The * mark signifies significance at the $\alpha = .05$ level.**Table E3***Results from the ANCOVA model on fear.*

Effect source	F(1,73)	p	η^2_p
EMi	2.28	.135	.030
Alcohol use at pretest	2.23	.140	.030
Positive outcome expectations	0.99	.324	.013
Hedonistic value	0.63	.430	.009
Social drinker identity	9.51	.003*	.115
Emi \times Alcohol use at pretest	5.54	.021*	.071
EMi \times positive outcome expectations	0.11	.744	.001
EMi \times hedonistic value	0.37	.545	.005
EMi \times social drinker identity	1.81	.183	.024

Note. The * mark signifies significance at the $\alpha = .05$ level.

Table E4

Summary of the results from the ANCOVA model on negative self-evaluation.

Effect source	F(1,73)	p	η^2_p
EMi	1.97	.164	.026
Alcohol use at pretest	5.85	.018*	.074
Positive outcome expectations	0.85	.361	.011
Hedonistic value	1.00	.320	.014
Social identity	3.66	.060	.048
Emi \times Alcohol use at pretest	0.05	.825	.001
EMi \times positive outcome expectations	1.17	.284	.016
EMi \times hedonistic value	0.03	.853	.000
EMi \times social drinker identity	1.21	.276	.016

Note. The * mark signifies significance at the $\alpha = .05$ level.

Table E5

Results from the ANCOVA model on alcohol use at follow-up.

Effect source	F(1, 35)	p	η^2_p
EMi	0.01	.930	.000
Alcohol use at pretest	70.19	<.001*	.667
Positive outcome expectations of drinking	1.29	.265	.035
Hedonistic value	0.05	.821	.001
Social identity	0.09	.762	.003
Emi \times Alcohol use at pretest	9.85	.003*	.220
EMi \times positive outcome expectations of drinking	1.15	.235	.040
EMi \times hedonistic value	0.04	.841	.001
EMi \times social drinker identity	0.03	.870	.001

Note. The * mark signifies significance at the $\alpha = .05$ level.