Let's talk about alcohol: The role of interpersonal communication and health campaigns
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Chapter 4

Changing the conversation:
The influence of emotions on conversational valence and alcohol consumption

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Abstract

Health campaign effects may be improved by taking interpersonal communication processes into account. The current study, which employed an experimental, pretest-posttest, randomized exposure design ($N = 208$), investigated whether the emotions induced by anti-alcohol messages influence conversational valence about alcohol and subsequent persuasion outcomes. The study produced three main findings. First, an increase in the emotion fear induced a negative conversational valence about alcohol. Second, fear was most strongly induced by a disgusting message, whereas a humorous appeal induced the least fear. Third, a negative conversational valence about alcohol elicited healthier binge drinking attitudes, subjective norms, perceived behavioral control, intentions, and behaviors. Thus, health campaign planners and health researchers should pay special attention to the emotional characteristics of health messages and should focus on inducing a healthy conversational valence.
Although health campaigns are frequently used to stimulate healthy conduct, they vary in their effectiveness and, at best, result in small behavioral changes (e.g., Hornik et al., 2008; Noar, 2006). These modest and inconsistent effects may be better understood if an important variable is taken into account: interpersonal communication. Several studies have demonstrated that conversational occurrence (i.e., whether people talk about a specific health topic) is important for the effects of health campaigns (e.g., Geary et al., 2007). For instance, Southwell and Yzer (2007) propose that whether people discuss health topics may alter, undermine, or reinforce the effects of mass-media health messages. Moreover, a few recent studies have shown that conversational valence (i.e., whether people talk negatively or positively about the subject at hand) also affects persuasion outcomes and may be more relevant than the mere frequency of conversations (Van den Putte et al., 2010).

A recent study on alcohol-related conversations and binge drinking intentions demonstrated that negative conversations (i.e., when the participants spoke unfavorably) about alcohol consumption decreased intentions to consume alcohol, whereas positive conversations (i.e., when the participants spoke favorably about alcohol consumption) increased such intentions (Hendriks, De Bruijn, & Van den Putte, 2012). Moreover, this study showed that exposure to a health message (versus no health message) influenced the valence of health conversations. This result raises the question of which types of health messages are especially relevant to conversational valence. There is some indication that emotional messages influence the valence of conversations (Dunlop et al., 2010); however, further research is needed to evaluate this claim. Furthermore, it is not yet known which message-induced emotions have the strongest influence on conversational valence. In the current study, we designed and tested different types of emotional anti-alcohol messages (i.e., fear, disgust, and humor appeals) to explore whether and, if so, which emotions are effective at inducing a desired conversational valence and subsequent healthy binge drink determinants. We focus on alcohol abuse and binge drinking because these problems are widespread in society and produce many negative consequences and because alcohol consumption is a frequent conversation topic (e.g., Dorsey et al., 1999). If our research shows that certain emotions, induced by certain emotional messages, elicit a desired conversational valence about alcohol and subsequently decrease binge drinking behaviors, then health promotion efforts should attempt to stimulate these emotions to reduce alcohol abuse.
Emotions and conversational valence

Research on the predictors of interpersonal communication points to a common message factor that predicts whether people talk: message-induced emotions (e.g., Hafstad & Aarø, 1997). For instance, messages that arouse disgust, anxiety, amusement, and happiness are more likely to be discussed than messages that induce feelings of sadness, guilt, or contentment (Brennan et al., 2010; Peters et al., 2009). Hence, discrete emotional appeals differ in their ability to spark conversations. However, it is important to note that conversational occurrence (i.e., whether people talk) differs from conversational valence (i.e., whether people converse negatively or positively about the subject at hand). The former describes the existence of a conversation, and the latter focuses on the content of a conversation. Although these concepts can be related, the fact that emotions affect conversational occurrence does not necessarily imply that emotions also affect conversational valence. Conversational valence is an important predictor of health determinants. Therefore, rather than focusing on whether particular emotional messages predict the occurrence of conversations, it may be even more important to investigate whether such emotional messages influence conversational valence.

To our knowledge, only one study has examined message characteristics as predictors of conversational valence. Dunlop and colleagues (2010) found some evidence that personal testimonies related to the HPV vaccine induced more favorable discussions about the vaccine than non-narratives. The authors claimed that this result occurred because the testimonials were emotionally engaging; however, they did not formally test this hypothesis. Moreover, they did not provide information about the specific emotions that are important for influencing the valence of conversations. Thus, although there is some evidence that message-induced emotions are relevant to conversational valence, further research is needed to support this assertion. Furthermore, which specific emotions are particularly important for conversational valence is currently unknown. The present study aims to address these two lacunae in previous research.

In line with a discrete emotion approach (e.g., Izard, 1977), we focus on the specific emotions elicited by fear, disgust, and humor appeals. We focus on these emotions and not others because these three emotions have been linked to conversational occurrence and are frequently the focus of health campaigns (e.g., Cohen et al., 2007).

Fear. Fear is an emotion of negative valence and is generally considered high in arousal (i.e., characterized by mobilization and activity; Berger &
Milkman, 2010; Gino, Brooks, & Schweitzer, 2012). Fear is often accompanied by a sense of danger and feelings of doom, which motivate people to deal with threatening events (Öhman, 2008).

**Disgust.** Disgust is elicited when a person is confronted with repulsive objects, such as infectious foods or bodily fluids. Disgust typically prompts certain bodily expressions, such as closed nostrils, and usually results in withdrawal and avoidance of the disgusting item (Krusemark & Li, 2011; Rozin, Haidt, & McCauley, 1999). Similar to fear, disgust is an emotion of negative valence and is relatively high in arousal; however, it has been argued that fear is more arousing than disgust (e.g., Russell & Feldman Barrett, 1999). For instance, fear increases physiological signs of activation such as heart rate and temperature, whereas disgust results in a lower heart rate and temperature (Ekman, Levenson, & Friesen, 1983).

**Humor.** Humor is related to distinct affective neural consequences (e.g., Goel & Dolan, 2001) and feelings of amusement. Amusement or exhilaration occur when a person experiences something funny or entertaining, and these emotions are frequently accompanied by laughter (Ruch, 1993). Humor-related emotions (henceforth referred to as “humor emotions”) have a positive valence and are generally high in arousal.

To develop hypotheses about whether these specific emotions induce conversations with a positive, neutral, or negative valence, we draw from research on the effects of emotions on knowledge accessibility. Studies have argued that emotions and emotional messages increase the mental accessibility of related knowledge (e.g., Nabi, 2003). For example, when a person feels anxious after watching a fear-inducing anti-alcohol campaign (i.e., a congruent emotional response), that person is more likely to think about the frightening accidents depicted in the ad and to remember fearful episodes in his or her past (such as being harassed while under the influence of alcohol). These effects were confirmed in a study by Goldstein, Wall, McKee, and Hinson (2004), which showed that induced mood states influenced the mental accessibility of alcohol-related beliefs. That is, when participants were in a positive mood, the belief that drinking alcohol would result in a good time was more accessible than it was for participants in a negative mood.

Research suggests that accessible (or top-of-mind) information serves an anchoring function for thought processes and decision making (e.g., Higgins,
Because of this “anchor”, people rely heavily on the information that is most easily accessible in their memory at a specific moment (Strack & Mussweiler, 1997). We argue that emotional content can serve as a conversational anchor, a piece of information that is accessible in working memory and strongly affects the conversation. Thus, when a person feels scared after viewing a scary anti-alcohol message, his or her conversation will focus on the frightful accidents in the ad or frightening drinking episodes in his or her past, thereby inducing a negative conversational valence about alcohol. When a person feels disgusted after viewing a disgusting anti-alcohol appeal, his or her conversation will focus on the disgusting, bloody images used in the ad or disgusting episodes in his or her past, thereby inducing a negative conversational valence about alcohol. When a person feels humor emotions after viewing a humorous anti-alcohol message, his or her conversation will focus on the jokes used in the ad or humorous drinking episodes in his or her past, thereby inducing a positive conversational valence.

Although both fear and disgust are negative and relatively arousing emotions, fear is more arousing than disgust (e.g., Ekman et al., 1983; Russell & Feldman Barrett, 1999). Given Berger and Milkman’s (2010) argument that activating and arousing emotions influence interpersonal communication processes more strongly than less arousing emotions, we expect that fear will induce a negative conversational valence more strongly than disgust.

The present study

The aim of this study was to investigate whether emotions induced by emotional anti-alcohol appeals influence conversational valence about alcohol and ultimately influence binge drinking attitudes, subjective norms, perceived behavioral control, intentions, and behaviors. This study concentrated on anti-alcohol messages and young adults, because alcohol abuse and binge drinking - defined as the consumption of four or more (for women) or six or more (for men) alcoholic drinks on one occasion - are widespread problems in society and are related to many detrimental consequences (Komro, Tobler, Maldonado-Molina, & Perry, 2010; Miller, Levy, Cohen, & Cox, 2006). Investigating interpersonal communication in the context of alcohol consumption may be especially relevant because young people are more likely to discuss alcohol consumption or alcohol-related messages compared with other health behaviors and messages (Dorsey et al., 1999). We focused on students because they binge drink considerably more frequently than non-students (Kypri et al., 2005). Investigating anti-alcohol
messages and focusing on young adults can produce insight into the best ways to encourage young people to refrain from binge drinking.

This study is based on the theory of planned behavior (Ajzen, 1991), which posits that attitudes (i.e., negative or positive evaluations of a specific behavior), subjective norms (i.e., perceptions of social pressure to perform or not perform a specific behavior), and perceived behavioral control (i.e., perceived control over and the ability to perform a specific behavior) predict intentions to perform a specific behavior. These behavioral intentions subsequently predict actual behaviors. The applicability of the theory of planned behavior has consistently been demonstrated for a wide range of behaviors (e.g., Armitage & Conner, 2001), and the theory has been applied in the context of alcohol consumption (Marcoux & Shope, 1997). In the present study, conversational valence was expected to influence attitudes, subjective norms, and perceived behavioral control. We expected that these constructs would subsequently predict intentions and behaviors.

Based on the above-mentioned issues, we formulated the following hypotheses (see Figure 4.1):

H1. Exposure to a specific emotional appeal (e.g., a disgust ad) elicits congruent emotions (e.g., disgust) more strongly than it elicits alternative emotions (e.g., fear or humor).

H2. Emotions are related to conversational valence such that
   H2a. An increase in the emotion fear is related to a negative conversational valence about alcohol.
   H2b. An increase in the emotion disgust is related to a negative conversational valence about alcohol
   H2c. An increase in the emotion humor is related to a positive conversational valence about alcohol.
   H2d. The emotion fear induces a negative conversational valence more strongly than the emotion disgust.

H3. A more negative (positive) conversational valence about alcohol elicits more negative (positive) binge drinking attitudes, subjective norms, and perceived behavioral control and decreases (increases) binge drinking intentions and behaviors.
Figure 4.1. Hypothesized model.
Although we hypothesize that emotional appeals induce congruent emotions most strongly (H1), emotional appeals may affect other emotions as well. In fact, certain emotions are often related. Specifically, the emotions disgust and fear have often been linked (Leshner, Vultee, Bolls, & Moore, 2010; Woody & Teachman, 2000), and humor emotions have frequently been (negatively) associated with feelings of fear (Ventis, Higbee, & Murdock, 2001). These connections are supported by previous research (Dillard et al., 1996) that demonstrated that 30 out of 31 fear appeals triggered changes in more than one emotion (other than fear). Therefore, this study examines the effects of emotional appeals not only on the congruent emotion but also on other emotions.

Method

Participants and design

The participants were 208 Dutch undergraduate students (37 males) from the University of Amsterdam who participated in all waves of an experimental study ($M_{\text{age}} = 20.23$, $SD_{\text{age}} = 2.06$). All of the binge drinking-related variables were measured twice (once before message exposure and once after message exposure). The participants registered voluntarily and enrolled in dyads. Most of the participants within a dyad were the same gender and were familiar with each other. These dyads were randomly assigned to one of four conditions (fear appeal, disgust appeal, humor appeal, or informational appeal). The participants in the same dyad viewed the same ad. Randomization was successful because there were no significant differences between the conditions in terms of age, gender, or nationality (all $F < 2.193$, all $p > .090$). The majority of the participants reported that they had engaged in binge drinking at least once during the 2-week periods between T0-T1 ($N = 142$; 73% of the males and 67% of the females) and T1-T2 ($N = 131$; 73% of the males and 61% of the females).

Materials and procedure

**Attitude.** Attitude toward binge drinking was assessed at baseline (T0) and after exposure to the message (T1; two weeks later) by calculating the mean of the responses to six statements measured on seven-point scales. Each statement began, “If I would binge drink during the next two weeks, this would be…”. The seven-point scales ranged from very harmful (1) to very harmless (7); very negative (1) to
very positive (7); very unsociable (1) to very sociable (7); very unwise (1) to very wise (7); very bad (1) to very good (7); and very unpleasant (1) to very pleasant (7) ($M_{T0} = 4.03, SD_{T0} = 1.16, \alpha_{T0} = .91; M_{T1} = 4.11, SD_{T1} = 1.00, \alpha_{T1} = .91$).

**Subjective norm.** The subjective norm related to binge drinking was assessed at baseline (T0) and after exposure to the message (T1) by calculating the mean of the responses to three statements measured on seven-point scales (“Most people who are important to me would [1 = not appreciate to 7 = appreciate] it if I would binge drink during the next two weeks”; “Most people who are important to me would be [1 = negative to 7 = positive] toward it if I would binge drink during the next two weeks”; and “Most people who are important to me would [1 = not accept to 7 = accept] it if I would binge drink during the next two weeks”) ($M_{T0} = 4.40, SD_{T0} = 1.15, \alpha_{T0} = .87; M_{T1} = 4.55, SD_{T1} = 1.08, \alpha_{T1} = .87$).

**Perceived behavioral control.** Perceived behavioral control concerning binge drinking (i.e., the perceived control over and ability to binge drink) was assessed at baseline (T0) and after exposure to the message (T1) by calculating the mean of the responses to three statements measured on seven-point scales (1 = disagree completely to 7 = agree completely). Each statement began, “If I would binge drink during the next two weeks…” The three statements were “I would succeed in doing so”, “I could do that”, and “This would be very easy for me” ($M_{T0} = 5.62, SD_{T0} = 1.57, \alpha_{T0} = .94; M_{T1} = 5.90, SD_{T1} = 1.13, \alpha_{T1} = .94$).

**Intention.** The intention to binge drink was assessed at baseline (T0) and after exposure to the message (T1) by calculating the mean response score for three statements (“I intend to binge drink during the next two weeks”; “I plan to binge drink during the next two weeks”; and “I will try to binge drink during the next two weeks”). The responses were given on seven-point scales (1 = very unlikely to 7 = very likely; $M_{T0} = 3.50, SD_{T0} = 1.90, \alpha_{T0} = .93; M_{T1} = 3.62, SD_{T1} = 1.76, \alpha_{T1} = .93$).

**Binge drinking behavior.** Binge drinking behavior during the previous two weeks was assessed directly after exposure to the message (T1) and two weeks after exposure to the message (T2) by asking the participants approximately how many alcoholic beverages they had consumed each day for the last fourteen days (“yesterday”, “the day before yesterday”, “three days ago”, “four days ago”, and so forth). Then, each day was coded dichotomously for binge drinking (0 was not a binge drinking day; 1 was a binge drinking day). In alignment with the Dutch
standards for alcohol consumption, when females consumed four or more alcoholic drinks, a binge drinking day was scored. For males, a binge drinking day was scored when six or more alcoholic beverages were consumed. These fourteen binge drinking scores (one per day) were summed so that this variable would represent the number of binge drinking days in the past two weeks ($M_{T1} = 1.58, SD_{T1} = 1.56; M_{T2} = 1.80, SD_{T2} = 1.94$).

Health message exposure. Two weeks after the baseline assessment, the participants arrived at the research lab in dyads. Individually (i.e., not seeing or hearing the other participant), each participant watched three short videos, resembling a short commercial break, on a PC in a cubicle. The videos were a sports commercial, a dental hygiene commercial, and a randomly assigned (i.e., one of four) anti-alcohol commercial. The four anti-alcohol messages (i.e., a fear, disgust, humor, and informational appeal) were created specifically for this study and were based on an extensive pilot study from which the most successful videos were chosen (i.e., the ads that most strongly induced the intended emotions). Although the four videos varied in emotional content (manipulated by images and music), they all addressed the same consequences of binge drinking.

Conversational valence. After watching the videos, the dyads were brought to another lab room that resembled a living room where they were instructed to discuss the topic of “alcohol and binge drinking” with each other. After discussing the topic for five minutes, the participants returned to their individual PCs to complete another questionnaire. Binge drinking attitudes (T1), subjective norms (T1), perceived behavioral control (T1), intentions (T1), and behaviors (T1) were assessed. Following the method used by Hendriks and colleagues (2012), conversational valence was measured with three questions: “How negative or positive have you spoken during the conversation about …” (a) “drinking alcohol”, (b) “binge drinking”, and (c) “being drunk”? The responses were given on seven-point scales ($1 = very negative$ to $7 = very positive$). The scores for these three questions were averaged so that the total score reflected a general measure of the conversational valence, with higher scores indicating more positive conversations about alcohol consumption and binge drinking (henceforth referred to as conversational valence about alcohol, $M = 4.08, SD = 1.14, \alpha = .82$). The members within each dyad generally agreed upon the valence of their conversations, $r = .42$ and Krippendorff’s alpha = .39 (Hayes & Krippendorff, 2007).
Emotions. At the end of the survey (T1), the participants were asked to rate the emotional content of the anti-alcohol message they had viewed by indicating their agreement with several statements about the ad (1 = disagree completely to 7 = agree completely). The emotion fear was measured by calculating the mean score for three statements: “I thought the video was …” (a) “scary”, (b) “frightening”, and (c) “alarming” (M = 4.00, SD = 1.49, α = .89). The emotion disgust was measured by calculating the mean score for three statements: “I thought the video was …” (a) “disgusting”, (b) “dirty”, and (c) “filthy” (M = 3.87, SD = 1.80, α = .94). The emotion humor was measured by calculating the mean score for three statements: “I thought the video was …” (a) “funny”, (b) “humorous”, and (c) “amusing” (M = 2.63, SD = 1.75, α = .94).

Data analysis

To investigate whether the emotional appeals elicited congruent emotions more than other emotions, we examined which emotion received the highest score within each ad condition by conducting paired t tests within each ad condition. To compare the different emotional appeals in terms of the emotions they induced, we conducted a multivariate ANOVA with the ad condition (fear, disgust, humor, or information) as the independent variable and the emotions fear, disgust, and humor as the dependent variables. The hypothesized model, depicted in Figure 4.1, was investigated by testing linear mixed-effects models to investigate the relationship between emotions and conversational valence, on the one hand, and the relationship between conversational valence and binge drinking variables, on the other hand. Multilevel models were used to account for the dependent nature of the data (i.e., individuals nested within dyads). The binge drinking behavior variable was log transformed before conducting the analyses because the distribution of the variable was highly skewed.

Results

Ad exposure and emotions

First, we examined which emotion received the highest score within each ad condition by conducting paired t tests. Among the participants who viewed the fear ad, the fear emotion items received higher scores (M = 4.24, SD = 1.38) than the disgust emotion items (M = 3.69, SD = 1.34, t[53] = 3.07, p = .003) or humor.
emotion items ($M = 2.08$, $SD = 1.00$, $t[53] = 8.79$, $p < .001$). The participants who viewed the disgusting ad reported more disgust ($M = 5.90$, $SD = 1.02$) than fear ($M = 4.80$, $SD = 1.20$, $t[51] = 7.48$, $p < .001$) or humor ($M = 1.60$, $SD = 0.73$, $t[51] = 23.88$, $p < .001$). Among the participants who viewed the humorous ad, the humor emotion items received higher scores ($M = 4.85$, $SD = 1.69$) than the fear emotion items ($M = 2.63$, $SD = 1.23$, $t[51] = 7.88$, $p < .001$) or the disgust emotion items ($M = 3.56$, $SD = 1.53$, $t[51] = 3.72$, $p < .001$). Thus, in line with H1, the emotional appeals most strongly induced the congruent emotions.

Although every emotional appeal induced the congruent emotion more strongly than other emotions, this does not mean that other emotional appeals did not induce this emotion. Thus, to compare the advertisements in terms of the emotions elicited, we conducted a multivariate ANOVA with the ad condition as the independent variable and the emotion fear, disgust, and humor as the dependent variables, which revealed that the ad conditions significantly differed with regard to all three emotions (all $F > 29.52$, all $p < .001$). Although the fear ad successfully evoked fear (i.e., the mean score was above mid-scale), there were no significant differences in the emotion fear produced by the fear ad compared with the informational ad ($t[102] = 0.36$, $p = .717$). Interestingly, the emotion of fear was most strongly elicited by the disgust ad (see Table 4.1). Participants who were exposed to the disgust ad reported significantly more fear than those who were exposed to the humor ad ($t[102] = 9.12$, $p < .001$) or the fear ad ($t[104] = 2.23$, $p = .028$) and marginally significantly more fear than those in the informational condition ($t[100] = 1.97$, $p = .052$). Furthermore, the emotion fear was lowest after viewing the humor ad (i.e., those who were exposed to the humor ad reported less fear than those in the other ad conditions, all $t > 6.35$, all $p < .001$). This result will be discussed later in this paper. As expected, the disgust ad elicited significantly more disgust than the other emotional appeals (all $t > 9.15$, all $p < .001$), and the humor ad elicited significantly more humor than the other ads (all $t > 10.14$, all $p < .001$).

**Emotions and conversational valence**

To investigate whether emotions were related to conversational valence, a (multilevel) linear mixed-effects model was tested with the emotions fear, disgust, and humor as predictors and conversational valence as the dependent variable. All of the variables were standardized prior to the analysis. An increase in the emotion fear was significantly related to a more negative conversational valence about alcohol ($\beta = -.17$, $p = .042$), thus supporting H2a. However, in contrast to H2b and
H2c, the emotions disgust (β = .09, p = .239) and humor (β = .04, p = .600) were not related to conversational valence. Thus, in line with H2d, the emotion fear affected conversational valence more strongly than disgust did.

Table 4.1

*Means and standard deviations of emotion scores across the four ad conditions.*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Fear ad</th>
<th>Disgust ad</th>
<th>Humor ad</th>
<th>Info ad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion fear</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>4.24a</td>
<td>1.38</td>
<td>4.80b</td>
<td>1.20</td>
</tr>
<tr>
<td>Emotion disgust</td>
<td>3.69b</td>
<td>1.34</td>
<td>5.90a</td>
<td>1.02</td>
</tr>
<tr>
<td>Emotion humor</td>
<td>2.08c</td>
<td>1.00</td>
<td>1.60c</td>
<td>0.73</td>
</tr>
</tbody>
</table>

*Note.* Contrasts are to be interpreted vertically (within conditions), with different letters indicating significant differences and identical letters indicating no significant differences.

**Conversational valence and binge drinking variables**

To explore whether conversational valence influenced attitudes, subjective norms, perceived behavioral control, intentions, and behaviors, five (multilevel) linear mixed-effects models were tested with conversational valence as the predictor and attitude, subjective norm, perceived behavioral control, intention, and behavior as the dependent variables. All of the analyses controlled for the dependent variables at baseline. Furthermore, all of the variables were standardized prior to the analyses. Significant effects on all outcome measures were revealed, supporting H3 (see Table 4.2). A more negative conversational valence about alcohol was significantly related to a more negative attitude toward binge drinking (β = .36, p < .001), a more negative subjective norm toward binge drinking (β = .26, p < .001), and a decrease in perceived behavioral control over binge drinking (β = .14, p = .008). Furthermore, a more negative conversational valence about alcohol was significantly related to a decrease in the intention to binge drink (β = .18, p < .001). This effect remained marginally significant after controlling for
attitudes, subjective norms, and perceived behavioral control at T1 ($\beta = .09$, $p = .058$). Finally, a more negative conversational valence about alcohol was significantly related to a decrease in binge drinking behaviors ($\beta = .12$, $p = .012$). This effect was insignificant when we controlled for intentions at T1 ($\beta = .07$, $p = .202$), suggesting that intentions play a mediating role.

Table 4.2

*Relationships between conversational valence and attitude, subjective norm, perceived behavioral control, intention, and behavior.*

<table>
<thead>
<tr>
<th>Binge drinking variables</th>
<th>$\beta$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>.36</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>.26</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>.14</td>
<td>.008</td>
</tr>
<tr>
<td>Intention</td>
<td>.18</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Behavior</td>
<td>.12</td>
<td>.012</td>
</tr>
</tbody>
</table>

*Note.* All analyses controlled for the dependent variable at T0.

**Discussion**

This study is the first to investigate whether and, if so, which specific emotions - induced by emotional appeals - influence conversational valence and subsequent persuasion outcomes using an experimental pretest-posttest randomized exposure design. Three important conclusions can be drawn based on our results. First, fear prompts a negative conversational valence about alcohol. Second, exposure to a disgust ad increases fear, whereas exposure to a humoristic message decreases fear. Third, a negative conversational valence elicits negative binge drinking attitudes, subjective norms, perceived behavioral control, and intentions and ultimately decreases binge drinking behaviors.

First and foremost, our results indicate that the emotion fear is particularly able to stimulate a desired valence of conversations. Previous research has demonstrated that feelings of fear can predict whether people will discuss health topics (e.g., Berger, 2011, Brennan et al., 2010). Our results extend these findings
by showing that fear also affects the valence of conversations about health issues. In contrast to the influence of fear, feelings of disgust and humor had no effect on conversational valence. Although multiple emotions have been shown to elicit discussions (e.g., Peters et al., 2009), it seems that fewer emotions can influence how negatively or positively people discuss a topic. One explanation may be that arousing emotions, such as fear, affect interpersonal communication processes more strongly than less arousing emotions (Berger & Milkman, 2010). Potentially, when people feel scared, they want to discuss a health message more actively and explore their emotions more thoroughly than when they experience relatively less arousing emotions, such as disgust. Although humor (or amusement) has been deemed an arousing emotion (Berger & Milkman, 2010), it is possible that negative arousing emotions stimulate action more strongly than positive ones. Additional research is needed to investigate this issue.

Second, our results indicate that emotional appeals can initiate both congruent and alternative emotions. That is, exposure to the disgust ad not only led to stronger disgust emotions but also induced fear. In fact, the disgust ad increased fear more than the other emotional appeals did. In contrast, our fear ad was unable to elicit more feelings of fear than the informational control message. Furthermore, the humor appeal increased humor emotions and also decreased the emotion fear. Thus, in line with Dillard and Nabi (2006), our findings show that emotional appeals not only stimulate congruent emotions but also have effects on other emotions. This result raises the question of whether it is possible to develop specific persuasive messages that solely elicit one specific emotion (such as disgust) but do not influence other emotions (such as fear). Given the strong correlations between certain discrete emotions, it seems difficult to create messages that induce only one emotion and not correlated emotions. The current study sheds some light on the intended and unintended affective consequences of emotional appeals. Further investigation of emotional messages and their congruent and incongruent emotional reactions would be a fruitful research endeavor for persuasive message theories and interventions.

Our findings reveal that disgusting images (such as bloody accidents) can elicit a strong sensation of fear. This result is in accordance with research that revealed a significant relationship between the emotions disgust and fear (e.g., Woody & Teachman, 2000). Another explanation may be that disgust appeals are employed less often than fear appeals and are therefore more surprising, shocking, and fear-inducing. This suggests that ads containing disgusting elements are especially effective in triggering fear and should be used more often to stimulate desired conversations (see also Morales, Wu, & Fitzsimons, 2012). Furthermore, in accordance with studies showing that humor is associated with reduced feelings of
fear (Ventis et al., 2001), we found that exposure to a humor ad induced less fear compared with the other ads. This result implies that although humor is frequently used as a campaign strategy (Cohen et al., 2007), health campaign planners should be careful about employing health messages with humorous elements. Although the use of humor has proven effective in commercial advertising contexts (e.g., Eisend, 2009), there is limited empirical evidence concerning the use of humor in health messages. The current findings suggest that it may be necessary to avoid the use of humorous health campaigns.

Third, our results show that conversational valence can influence the intention to binge drink, confirming previous research (Hendriks et al., 2012). The current study however, is the first to show that a negative conversational valence also induces more negative (and thus more desirable, in terms of health promotion) binge drinking attitudes, subjective norms, and perceived behavioral control. Most importantly, we extend previous findings by demonstrating that a negative conversational valence can reduce binge drinking behaviors. Thus, conversational valence affects a variety of health persuasion outcomes, ranging from health attitudes to health behaviors. This result has important implications for health promotion. For instance, the use of a confederate who talks about alcohol consumption in a negative way during health conversations may encourage other discussants to reduce their alcohol use. Given that the health issue of alcohol consumption is particularly common in social discussions, this effect of interpersonal communication on health determinants is particularly relevant for this health issue (Dorsey et al., 1999).

Interestingly, conversational valence, measured by asking how negatively or positively the participants themselves had spoken about alcohol and binge drinking, induced changes in binge drinking determinants. This result aligns with the notions of self-perception and self-persuasion (Bem, 1965), suggesting that people can change their attitudes and intentions based on perceptions of their own conduct. Future research should explore the role of the conversation partner in more detail (e.g., by investigating how the perceived conversational valence of the conversation partner affects individuals’ own attitudes).

Apparently, then, exposure to a specific emotional ad can lead to the experience of relevant emotions (i.e., fear), which, in turn, can influence conversational valence and determinants of binge drinking. This holds great promise for health promotion initiatives. Although binge drinking has been linked to severe negative consequences and many attempts have been made to reduce this behavior, the percentage of young adults who binge drink has remained constant (Wechsler et al., 2002) or has even increased in recent years (Geels et al., 2012; Naimi et al., 2003). Therefore, it is worthwhile to improve the effectiveness of
health promotion efforts targeting this particular health issue. Based on our findings, intervention designers who aim to decrease students’ alcohol consumption should employ persuasive messages with disgusting aspects and without humorous elements. These types of messages induce feelings of fear and lead to a desired conversational valence and desired health outcomes. Interestingly, research has shown that fear-inducing appeals are not always successful, and their effects may depend on several conditions (Witte & Allen, 2000). Our research shows that talking about a health topic after viewing a health message that elicits fear may increase the effectiveness of such fear appeals by inducing a negative conversational valence. Future research is needed to shed more light on this issue. Furthermore, given that health campaigns generally vary in their effectiveness (e.g., Noar, 2006), the present study reveals that interpersonal communication processes (particularly conversational valence) play a significant role in the process through which message exposure leads to behavioral change. Thus, health researchers would be well advised to consider such processes when studying the effects of health campaigns.

Some limitations must be noted with regard to the current research. First, given the high prevalence of binge drinking combined with its severe adverse consequences, we chose to focus on this important health issue. However, it is not certain that the same results would be found for different health behaviors. Although research has indicated that alcohol consumption is a recurring topic of conversation among students (Dorsey et al., 1999), it is unclear whether similar results could be obtained for behaviors that are discussed less frequently among the target group, such as healthy diets or physical activity. Moreover, given the fact that the emotion fear is of central importance in the current findings, it is possible that health behaviors that are less prone to fear (e.g., fruit consumption) are less influenced by messages that stimulate feelings of fear.

Second, although this study makes a significant contribution by including behavioral measures, we measured self-reported behaviors instead of actual behaviors. It is possible that the participants gave socially acceptable answers and did not truthfully indicate their alcohol consumption. Although it has been argued that self-reported alcohol consumption measures can be reliable and valid (Del Boca & Darkes, 2003), it is not certain that such measures accurately reflect actual alcohol consumption. Although it is challenging, future studies should attempt to focus on real-life assessments of alcohol consumption. Third, we chose to investigate students because they binge drink relatively often (Kypri et al., 2005). Furthermore, our sample was primarily female. It is unclear whether the same effects would be observed in a different research population (e.g., males, non-students, adolescents, older people, or people from a different country). Thus,
replication of our findings across additional behavioral domains and within different populations is needed to verify the robustness and generalizability of our results. Furthermore, we explored the effects of an anti-alcohol ad on conversations directly following message exposure. To translate our findings into more realistic settings and across a greater time span, it is advisable to conduct further studies focusing on real-life peer conversations that occur weeks or perhaps months after ad exposure.

Fourth, because we wanted to focus on the participants’ subjective experiences and perceptions of the conversation, we measured conversational valence through self-report. Although such self-reported measures of conversational valence align with the study by Dunlop et al. (2010), it is unknown whether these measures are related to more objective measures of conversational valence (e.g., those obtained from content analyses of conversations). Therefore, we recommend that future research should explore the relationship between objective and self-reported conversational valence measures. Finally, the current study focused on the valence of the conversation content; however, other aspects of conversation content may be relevant as well (e.g., Reimuller, Hussong, & Ennett, 2011). For instance, whether people express their emotions during health discussions, which could potentially affect the influence of the conversation (e.g., Rimé et al., 1991), is an interesting aspect that may be explored directly when conversations are coded for content.

Caveats aside, this research provides some important insights. The emotion fear, but not the emotion disgust or humor, induces a desired conversational valence about a health topic. Fear can be elicited by exposure to a disgust appeal and can be decreased by exposure to a humor ad. Finally, a desired conversational valence results in healthier attitudes, subjective norms, perceived behavioral control, intentions, and behaviors. Thus, health researchers and health campaign planners should pay special attention to the emotional features of their messages and should aim to stimulate a conversational valence that promotes public health.