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Predicting Health: The Interplay Between Interpersonal Communication and Health Campaigns

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The present study experimentally investigated the interplay between interpersonal communication and health message exposure in relation to alcohol consumption intentions. Participants were 174 students who took part in a study on the effects of an antialcohol message. At baseline, the authors assessed intention to refrain from binge drinking. At the second wave (2 weeks later), participants were assigned to the conditions of a 2 (antialcohol message or no-alcohol message) × 2 (alcohol conversation or control conversation) between-subjects design, after which intention was again assessed. Results showed that when participants talked about alcohol (instead of the control topic) and were not exposed to an antialcohol message, they were less inclined to refrain from binge drinking, an effect that was not visible when participants talked about alcohol after viewing an antialcohol message. These findings suggest that health campaign exposure moderates the influence of interpersonal communication on health variables.

Stimulating public health and discouraging unhealthy conduct is beneficial for the well-being of individuals and societies. Health behaviors can be influenced by a multitude of factors. For example, health campaigns are often used to stimulate healthy conduct. Furthermore, conversations about health can influence health attitudes, intentions, and behaviors. The studies that have investigated how the interplay between health messages and interpersonal communication affects health variables have mainly focused on the mediating or moderating role of interpersonal communication in health campaign effects. We argue, however, that interpersonal communication regarding health topics can also occur without health message exposure, a notion that has largely been ignored in previous studies. Therefore, we propose an additional possibility: Health campaigns may moderate the effects of interpersonal communication on health variables. In this study, we investigate these two potentially moderating roles (interpersonal communication as moderator of campaign effects and health campaign exposure as moderator of conversation effects).

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Health Campaigns and Interpersonal Communication as Correlates of Health Behaviors

Health campaigns are frequently used to raise awareness, inform about, and stimulate healthy behaviors. However, mixed effects of health campaigns have been reported, varying from detrimental boomerang effects (e.g., Snyder & Blood, 1992), to no effects (e.g., Hornik, Jacobsohn, Orwin, Piesse, & Kalton, 2008), to relatively small positive effects (Noar, 2006; Snyder & Hamilton, 2002) on health attitudes, intentions, and behaviors (hereafter referred to as *health variables*). These modest and inconsistent effects of health campaigns may point to the existence of moderating factors (i.e., variables that influence the effect of health campaign exposure on health variables). A potentially important moderating variable is interpersonal communication, given that people may discuss the content of the health message after being exposed to a health campaign. Such conversations may influence the effectiveness of health campaigns.

Interpersonal communication has frequently been directly linked to health intentions and behaviors (e.g., Noar, Carlyle, & Cole, 2006). For example, Real and Rimal (2007) demonstrated that discussions about alcohol had a direct effect on alcohol consumption intentions and behaviors. Several mechanisms have been proposed through which interpersonal communication influences these health variables such as by providing information regarding the social appropriateness of the health behavior (Lapinski & Rimal, 2005) or by improving the processing and learning of health information because of the interactive nature of conversations (Eveland & Thomson, 2006; Kohler, Behrman, & Watkins, 2007; Southwell, 2005). Thus, conversations about health are important to consider when studying health attitudes, intentions, and conduct.

Conversational Occurrence as a Mediator or Moderator for Health Campaign Effects

Considering the relevance of both health campaigns and interpersonal communication for health variables, as well as the potential moderating role of interpersonal communication within health campaign effects, it seems worthwhile to examine how the interplay between interpersonal communication and health message exposure affects health outcomes. Recently, some studies have started to examine this relation—mostly from the perspective of the effectiveness of health campaigns and specifically by examining the mediating or moderating role of interpersonal communication within health message effects.

Previous Studies on Mediation

The notion that the occurrence of interpersonal communication (whether people speak about a specific topic; from now on referred to as *conversational occurrence*) is important for the effects of mass mediated messages has been confirmed by decades of research, focusing on a mediating role of interpersonal communication. In this context, a mediational pathway entails that health campaigns influence the occurrence of health conversations, which subsequently influence health variables. This notion reflects the tenets of the two-step flow theory, which posits that messages flow from mass media to individuals who, in turn, spread the message further through the process of interpersonal communication (Katz, 1957; Lazarsfeld, Berelson, & Gaudet, 1944). Some studies have also confirmed this mediating role of conversational occurrence within the context of health campaigns (e.g., Geary et al, 2007; Hornik, 2006; Schuster et al., 2006). For example, a recent study on

smoking cessation showed that antismoking mass mediated messages elicited discussions about the campaign and topic which, in turn, increased the intention to quit smoking (van den Putte, Yzer, Southwell, de Bruijn, & Willemsen, 2011).

Previous Studies on Moderation

Although relatively many studies have investigated the mediating role of conversational occurrence within the relationship between health message exposure and health variables, only a few studies have examined a moderating role. In this context, a moderating relationship implies that health conversations influence the effects of health campaigns on health variables. Hardy and Scheufele (2005) and Southwell and Yzer (2007), for example, have suggested that conversations may alter, undermine, or reinforce the effects of mass-mediated (health) messages. However, the few studies that investigated this moderating role have often used correlational survey designs, which face significant problems when making causal attributions (e.g., does talking about the health topic actually impact the effectiveness of the health message on health intentions, or are those who intend to change their behavior just more inclined to talk about the health topic?) engendering it difficult to ascertain potential moderation effects (see also Weinstein, 2007). To our knowledge, the only experimental study that tested moderation of conversational occurrence was conducted by Dunlop, Kashima, and Wakefield (2010), showing that conversational occurrence moderated the effects of health messages on health variables. They demonstrated that a particular health message had a positive influence on healthy intentions, an effect that was especially apparent when participants had discussed the health ad. Unfortunately, this study compared two types of health messages, whereas a proper investigation of a moderating role of conversational occurrence entails a comparison of a health-message group versus a no-health-message group. That is, whether a conversation alters the effect of a health message should be examined by investigating whether the main effect of the message (i.e., the comparison between message exposure vs. no message exposure) differs between a conversation group and a no-conversation group. Thus, even though these aforementioned findings point to the relevance of interpersonal communication as a moderating variable, limitations in these studies make it difficult to delineate the exact causal role that interpersonal discussions play. We further investigated the moderating role of conversational occurrence by using a longitudinal experimental design to adequately assess causality and by comparing a health message condition with a no-health-message condition. On the basis of the aforementioned findings, we hypothesized the following:

Hypothesis 1a: Conversational occurrence moderates the influence of health message exposure on health intentions.

Health Campaign Exposure as a Moderator for the Effects of Conversational Occurrence

So far, studies on the interplay between interpersonal communication and health messages have mainly examined the effects of campaign induced conversations (i.e., conversations that occur after health campaign exposure). However, it is unlikely that, before health message exposure, people have been completely silent about the topic addressed. People may discuss health topics, regardless of (recent) exposure to a health message. Thus, it is possible that health campaign exposure affects already existing communication patterns, instead of solely triggering conversations. Exposure to a health message may affect the valence and content of the discussion (e.g., by

emphasizing the negative consequences of unhealthy conduct) and may consequently influence the effect the conversation has on health variables. Research designs that are currently in use have been unable to explore this potentially moderating influence of health campaigns. In the present experiment, we include a conversation group not exposed to a health message in order to investigate health message exposure as possible moderator. On the basis of the aforementioned findings, we hypothesized the following:

Hypothesis 1b: Health message exposure moderates the effects of conversational occurrence on health intentions.

The main purpose of the present study is to provide an integrative understanding of the interplay between health messages and interpersonal communication on relevant health variables. By using a longitudinal experimental design, consequently enabling us to infer causality with more certainty than previous studies, we investigate whether conversational occurrence moderates health message effects and whether health message exposure moderates the effects of conversational occurrence. We focus on an antialcohol message aimed at 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 beverages on one occasion—is a pervasive problem in society, especially for adolescents and young adults, and is related to many negative outcomes (e.g., Batel, Pessione, Maitre, & Rueff, 2006; Grant & Dawson, 1997; Naimi et al., 2003). By using an antialcohol message and by focusing on young adults, more insight can be gained into how young people can be stimulated to refrain from binge drinking. Furthermore, considering interpersonal communication for alcohol-related behaviors may be particularly important, given that young adults frequently consume alcohol in social contexts (Beck et al., 2008; Pavis, Cunningham-Burley, & Amos, 1997). Therefore, the chance that young people discuss alcohol consumption or alcohol-related messages may be greater than for other health behaviors and messages. The main dependent variable in this study is the intention to refrain from binge drinking.

Method

Pilot Study

To select a suitable antialcohol message for the main study, we conducted a pilot study. During the pilot study, 40 participants evaluated several antialcohol messages on measures of perceived effectiveness (e.g., “I thought this video was effective” and “I thought this video was convincing”; Dillard, Shen, & Vail, 2007; Fishbein, Hall-Jamieson, Zimmer, von Haefen, & Nabi, 2002). Then, the pairs of participants in the pilot study were requested to wait 5 min together before they were given the next task and therefore they had the opportunity to chat with each other (possibly about the antialcohol messages or the alcohol topic, but not necessarily). No other people were present, but the conversations were recorded. Participants were unaware that our real interest was in what they discussed in these 5 min. The chosen antialcohol message was discussed frequently, as compared with the other messages. This was an important requirement for selection because participants in the main study needed to be able and feel comfortable to discuss the antialcohol message and alcohol topic. Furthermore, the selected message was perceived as the most effective video. The specific message was part of the national “Know Your Limits” binge drinking campaign in the United Kingdom (2009–2010). The video depicts a young girl who, just before going out, rips her dress, smears her make-up, and vomits in her hair. After this, she seems to consider herself ready to go out and

walks out the door. The message contains no spoken words, but ends with the written message, “You wouldn’t start a night out like this, so why end it that way?”

Main Study

Participants and Design

In this two-wave study, 174 individuals were recruited, of which 10 were excluded because they had either already participated in the pilot study or because they indicated that they never consume alcohol. Thus, 164 participants (125 women, 39 men) were included ($M_{\text{age}} = 22.60$ years, $SD_{\text{age}} = 1.64$ years). All participants were undergraduate students at the University of Amsterdam who were enrolled in an obligatory course and who received credits for their cooperation. Participants registered in pairs and were randomly allocated to the cells of a 2 (antialcohol message exposure versus no-alcohol message exposure) \times 2 (conversation about alcohol versus conversation about control topic) between-subjects design.

Materials and Procedure

Questionnaire $T = 0$. Two weeks before the experiment took place in the lab, participants were asked to fill out an online questionnaire that was distributed by e-mail (T_0). The definition of binge drinking was provided at the beginning of the questionnaire. Intention to refrain from binge drinking was assessed using three statements (“I intend to not binge drink during the next two weeks,” “I plan to not binge drink during the next two weeks,” and “I will try to not binge drink during the next two weeks”), which could be answered on a 7-point scale ranging from 1 (*very unlikely*) to 7 (*very likely*). The scores on these three items were averaged, so that this mean score would reflect a general measure of intention to refrain from binge drinking ($M_{T_0} = 3.65$, $SD_{T_0} = 1.97$, $\alpha_{T_0} = .97$; $M_{T_1} = 3.60$, $SD_{T_1} = 1.96$, $\alpha_{T_1} = .98$). After finishing the first questionnaire, participants were informed that they would be expected to come to the research lab 2 weeks later to take part in the lab experiment.

Message Exposure. Once arrived at the research lab, each participant was led to a cubicle with a computer. Participants individually watched five short, unrelated videos, resembling a commercial break, on the computer screen: an iPod commercial, a control video, a chewing gum commercial, a do-it-yourself store commercial, and a telephone company commercial. The control video was a public service announcement that focused on the potential harmful consequences of publishing personal information on the internet. In addition, half of the participants were exposed to a health message about the negative effects of binge drinking, on the basis of the pilot study, which was placed as the fourth message in the reel (i.e., before the do-it-yourself store commercial). These participants represented the antialcohol message condition. The participants who did not view an antialcohol message represented the no-alcohol message condition.

Interpersonal Communication. After individually watching the videos, the two participants were led to a different room where couches were placed. Here, they were asked to discuss a topic with each other. Half of all participants were instructed to discuss the topic “alcohol and binge drinking” (i.e., the alcohol conversation condition). The other half of the participants were instructed to talk about the topic of the control video: “publishing personal information on the Internet” (i.e., the control conversation condition). In this manner, the two conversation groups differed only in the content of their discussion. Participants were monitored during the conversation to ensure that they stayed on topic. In some exceptional cases, the experimenter reentered the room to guide the participants back on topic.

Questionnaire T = 1. After 5 min of discussion, participants were separately led back to their cubicles and were requested to fill out a questionnaire (T1). In this survey, the intention to refrain from binge drinking was again assessed.

Data Analysis

To investigate the overall interaction effect between conversational occurrence and health message exposure on the intention to refrain from binge drinking, we conducted a 2 (control conversation vs. alcohol conversation) \times 2 (no-alcohol message exposure vs. antialcohol message exposure) repeated-measures analysis of variance, with intention (at T0 and T1) as the dependent variable.

Hypothesis 1a. To separate the effects of conversational occurrence and message exposure, we examined different subsamples. To examine whether conversational occurrence moderated the influence of message exposure on intention, we separately examined the effect of message exposure on intention for the two conversation conditions. When the influence of message condition (no-alcohol message versus antialcohol message) on intention differed between the two conversation groups, a moderating role of conversational occurrence would be revealed.

Hypothesis 1b. We investigated the potentially moderating role of message exposure in the same manner. That is, the effect of conversational occurrence was examined separately for the two message conditions. When the influence of conversation condition (control conversation vs. alcohol conversation) on intention differed between the two message groups, a moderating role of message exposure would be revealed.

Results

A 2 (control conversation versus alcohol conversation) \times 2 (no-alcohol message versus antialcohol message exposure) repeated measures analysis of variance, with intention (at T0 and T1) as the dependent variable, revealed a borderline significant conversational occurrence \times message exposure interaction effect on intention, $F(1, 160) = 2.88$, $p = .09$, $\eta^2 = .02$. The main effects of message exposure, $F(1, 160) = 0.02$, $p = .88$, $\eta^2 = .00$, and conversational occurrence, $F(1, 160) = 1.59$, $p = .21$, $\eta^2 = .01$, were not significant. Figure 1 shows the (change in) intention for each condition.

Hypothesis 1a

When participants spoke about the alcohol topic, the intention to refrain from binge drinking did not differ significantly between the antialcohol message condition and the no-alcohol message condition, $F(1, 82) = 1.47$, $p = .23$, $\eta^2 = .02$. When participants spoke about the control topic, this pattern was the same; the intention to refrain from binge drinking did not differ significantly between the antialcohol message condition and the no-alcohol message condition, $F(1, 78) = 1.45$, $p = .23$, $\eta^2 = .02$. Thereby, the results indicate that conversational occurrence was not a moderator of the effect of health message exposure on intention because the influence of message exposure did not depend on the conversational occurrence condition (thereby not supporting Hypothesis 1a).

Hypothesis 1b

However, the results do suggest that health message exposure moderated the effect of conversational occurrence on intention. That is, the influence of conversational

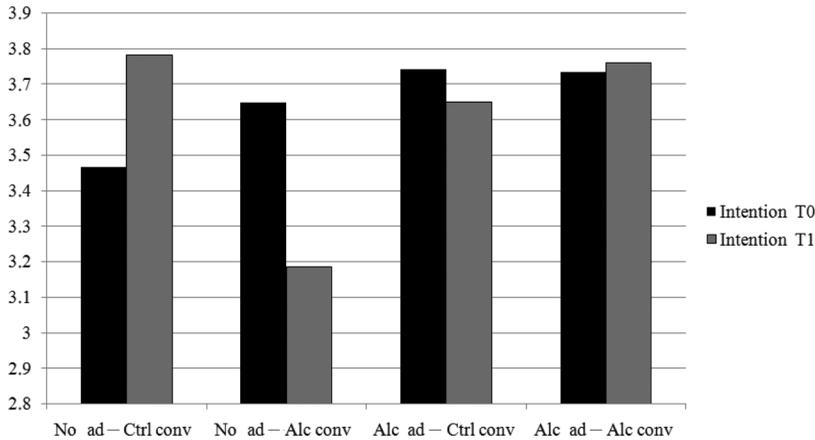


Figure 1. The change in intention to refrain from binge drinking across the four conditions. The exact mean scores and standard deviations were as follows: No ad - Ctrl conv, $M_{Int T_0} = 3.47$, $SD_{Int T_0} = 1.80$, $M_{Int T_1} = 3.78$, $SD_{Int T_1} = 1.90$; No ad - Alc conv, $M_{Int T_0} = 3.65$, $SD_{Int T_0} = 2.04$, $M_{Int T_1} = 3.19$, $SD_{Int T_1} = 1.88$; Alc ad - Ctrl conv, $M_{Int T_0} = 3.74$, $SD_{Int T_0} = 2.06$, $M_{Int T_1} = 3.65$, $SD_{Int T_1} = 2.00$; Alc ad - Alc conv, $M_{Int T_0} = 3.74$, $SD_{Int T_0} = 2.02$, $M_{Int T_1} = 3.76$, $SD_{Int T_1} = 2.04$.

occurrence on intention depended on the message condition (thereby supporting Hypothesis 1b). When participants were exposed to the antialcohol message, the intention to refrain from binge drinking did not differ significantly between the alcohol conversation condition and the control conversation condition, $F(1, 81) = 0.08$, $p = .77$, $\eta^2 = .01$. However, when participants were not exposed to the antialcohol message, the intention to refrain from binge drinking significantly decreased after talking about alcohol as compared to talking about the control topic, $F(1, 79) = 5.05$, $p = .03$, $\eta^2 = .06$. Thus, a negative effect of conversational occurrence about

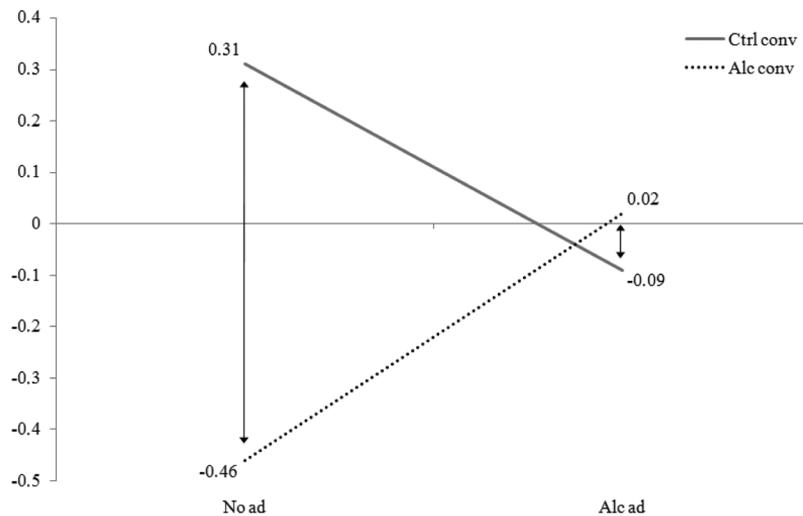


Figure 2. The difference scores between intention to refrain from binge drinking at T0 and intention to refrain from binge drinking at T1. The two ad conditions are depicted on the x axis and the two conversation conditions are illustrated as two different slopes.

alcohol on intention to refrain from binge drinking was found, although only in the no-alcohol message condition.

To further elucidate the findings, the difference scores between intention T0 and intention T1 are illustrated in Figure 2. It is interesting that whereas the greatest increase in the intention to refrain from binge drinking occurred among the participants who were not exposed to an antialcohol ad and did not talk about alcohol, the biggest decrease in the intention to refrain from binge drinking occurred among the participants who were not exposed to an antialcohol ad but did discuss the alcohol topic. Thus, when not exposed to the antialcohol ad, participants' intention to refrain from binge drinking decreased substantially when they talked about alcohol as compared to when they did not. This negative effect of talking about alcohol disappeared when participants first viewed an antialcohol message. That is, when participants were exposed to the antialcohol ad, it hardly mattered whether they discussed the topic of alcohol.

Discussion

We aimed to provide an integrative understanding of the interplay between health message exposure and interpersonal communication on health variables. Specifically, we tested whether conversational occurrence functioned as a moderator for the effects of health message exposure on health intentions (Hypothesis 1a) and whether health message exposure moderated the effects of conversational occurrence on health intentions (Hypothesis 1b). The results supported Hypothesis 1b but not Hypothesis 1a.

The finding that health message exposure and conversational occurrence (borderline) significantly interacted in influencing the intention to refrain from binge drinking is in agreement with previous studies that stress the relevance of the interplay between both factors for health variables (e.g., Geary et al., 2007; Southwell & Yzer, 2007; Van den Putte et al., 2011). However, our subsequent analyses revealed, in contrast with previous studies (e.g., Dunlop et al., 2010; Hardy & Scheufele, 2005; Southwell, 2005), no evidence of a moderating role of conversational occurrence within health campaigns effects. The effects of health message exposure did not differ across the two conversation conditions. A first explanation could be that because interaction analyses require substantial statistical power, the power was too low to detect a significant change in intention between the ad conditions as a function of the conversation.

Second, the discrepancy with previous studies could be the result of differences in study designs. For example, whereas previous studies have mostly used survey-based designs, we used a (longitudinal) lab experiment to adequately assess moderation effects. Doing this, we aimed to enhance our causal understanding of the interplay between health message exposure and interpersonal communication; however, it may have been more difficult to find effects in such a restricted laboratory setting (e.g., a situation where interpersonal communication was operationalized by the mere manipulation of the occurrence of a 5-min conversation). On the other hand, it might be possible that in survey-based designs respondents report only those conversations that have made the strongest impression, whereas an unknown percentage of alcohol related conversations is forgotten and thus not reported. It is possible that such methodological differences account for the discrepancy with previous studies. More research is needed to investigate these null findings to more fully understand the moderating roles of conversational occurrence and health messages. For example, under what circumstances do conversations, messages, or the interaction between both, fail or succeed to influence health variables?

Although we found no evidence of a moderating influence of conversational occurrence on health campaign effects, we found support for such a moderating role

of health message exposure. The results suggested that the effects of conversational occurrence depended on the message condition. When a conversation about alcohol was stimulated within the no-alcohol message condition, participants' intention to refrain from binge drinking significantly decreased as compared to when the alcohol topic was not discussed. This negative effect of conversing about alcohol was not visible in the antialcohol message condition. Thus, by including a control group without health message exposure, we illuminated the effects of conversations that occur without stimulation of a health message. In sum, we have given a different perspective than what has been previously found on the interplay between health campaigns and interpersonal communication: exposure to a health message seems to influence the effects of conversational occurrence on health variables and not necessarily vice versa.

One might wonder why exposure to a health message shortly before a conversation would moderate the influence of conversational occurrence on health variables. As a potential explanation, we argue that exposure to a health message may influence how negatively or positively people speak about the health topic (i.e., the conversational valence). When people converse shortly after health message exposure, the (valence of the) health message is still relatively active in working memory (e.g., Fazio, 1995; Higgins, 1996) and may consequently influence the valence of the conversation (for more information on such anchoring effects, see Strack & Mussweiler, 1997; Tversky & Kahneman, 1974). Because several studies have demonstrated the relevance of conversational valence for health attitudes, intentions, and behaviors (Dunlop et al., 2010; Van den Putte, Monshouwer, de Bruijn, & Swart, 2010; Walther, DeAndrea, Kim, & Anthony, 2010), it is possible that a health message—by influencing the valence of the discussion—subsequently influences health variables. This notion is worth testing in future studies.

It is worth noting that the results suggest a negative (i.e., unhealthy) effect of conversational occurrence when no health message was seen beforehand. Given the fact that unhealthy behaviors often have both pleasant and unpleasant consequences, conversations about such behaviors can address both sides. Conversations about alcohol without exposure to a (negative) antialcohol message may be relatively more focused on the positive aspects and consequences of the unhealthy behavior, causing a decrease in healthy intentions. In this case, one needs to be careful with stimulating conversations about the topic. However, discussions about a health topic may not always have a negative influence. People might discuss other health topics (e.g., using a condom) in a more positive (healthy) manner, subsequently increasing healthy intentions and behaviors. More research is needed to investigate this idea.

Although the findings of this study suggest that health message exposure influences the effects of conversational occurrence, several limitations must be considered. First of all, we first manipulated health message exposure and then manipulated conversational occurrence. One might argue that this design allows for a test of conversational occurrence as a moderator, but the specific order of manipulations does not allow for a moderation test of health message exposure because the health message is shown before the conversation. Although a relevant new finding of our study is that the effect of a health conversation differs depending on health message exposure, indicating that message exposure could therefore be considered a moderator, a possibly even more suitable method to disentangle the two moderating roles would be to manipulate both factors in two different orders. Future research should examine the order effects of alcohol message exposure and alcohol conversations to further clarify the specific roles that health campaigns and conversations play in determining health variables.

Second, we focused on one specific health behavior (alcohol consumption) and one specific (antialcohol) message. Thus, extrapolating our results to health behaviors and health campaigns in general must be done cautiously. Whether the same effects

would be encountered with a different health message or with a different health behavior is not yet evident. Smoking cessation, for example, may be (even) more dependent on habits and addiction, and this health variable could be more difficult to influence through (a combination of) health conversations and health messages. Further studies should extend our findings to other messages and to other health behaviors.

Third, for the purpose of this article, we examined only the occurrence of the conversation; however, we did not examine the influence of conversational content. As mentioned earlier, one relevant aspect may be conversational valence (e.g., Dunlop et al., 2010). Furthermore, when people speak about their personal experiences with regard to health behaviors (such as discussing the number of beers one consumed during the past weekend), such conversations may have stronger effects than when people merely discuss fact-related information (Hardin & Higgins, 1996). In addition, emotional sharing during conversations may increase the effect of the discussion (Mendolia & Kleck, 1993; Rimé, Mesquita, Philippot, & Boca, 1991). Moreover, in a dyadic conversation, one of the two may dominate the conversation. Whether and how this relates to a change in determinants of health behavior is not yet known. Future researchers should investigate the role of conversational content in more detail. Last, we did not investigate how specific message features relate to interpersonal communication and subsequently health variables. Future studies that manipulate message content could provide useful insights into successful health promotion attempts.

These caveats aside, our research provides some valuable insights. A significant effect of conversational occurrence was revealed in the no-alcohol message condition but not in the antialcohol message condition. Talking about alcohol negatively influenced the intention to refrain from binge drinking, an effect that was not visible after exposure to an antialcohol ad. Therefore, we suggest that the negative effect of interpersonal communication on health variables can be countered by health campaign exposure.

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