Talking about health messages

The relationship between perceived complexity, processing time, and conversational intentions

Lennie Donné, John Hoeks and Carel Jansen
University of Groningen

Interpersonal communication has been shown to influence health campaign outcomes, but little is known about ways in which conversations can actually be elicited. In this correlational study, we tested the assumption that perceived complexity of the message can be a predictor of interpersonal communication. Forty participants were exposed to six different health messages varying in perceived complexity. The results show that the more the message was perceived as complex, the longer it took to understand it. Longer message processing times, in turn, were associated with higher intentions to talk, but only about messages that were of low personal relevance. When messages had a high personal relevance, longer processing times were associated with lower intentions to talk. Apparently, if a message is clearly relevant, longer processing due to perceived complexity is detrimental to the occurrence of interpersonal communication.

Keywords: health communication, interpersonal communication, health campaign, message processing

1. Introduction

1.1 Spreading health messages

Interpersonal communication has been identified as an influential factor in spreading information. It plays a major role in classical theories such as the two-step flow theory (Lazarsfeld, Berelson, & Gaudet, 1944), the diffusions-of-innovations theory (Rogers, 1983), the social representations theory (Moscovici, 1984; 1988; Moscovici & Hewstone, 1983), and in theories on word-of-mouth communication, where people verbally share their experience about a product or service with one another (e.g., Matos & Rossi, 2008).

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Interpersonal communication may arise after exposure to mass media messages (e.g., Dunlop, Kashima, & Wakefield, 2010; Hendriks, Van den Putte, De Bruijn, & De Vreese, 2014). Talking about these messages, for instance in the context of health behavior (e.g., Dunlop et al., 2010; Evans, Davis, Silber-Ashley, & Khan, 2012; Van den Putte, Yzer, Southwell, De Bruijn, & Willemsen, 2011; Hendriks, De Bruijn, & Van den Putte, 2012) is thought to be an effective way to further spread information to people who were not exposed to a message themselves. The influence of interpersonal communication about health messages is not limited to merely spreading information: interpersonal communication on health messages may provide social support (Yeshua-Katz & Martins, 2013), influence attitudes, social norms and feelings of self-efficacy concerning the health topic (Frank et al., 2012), it may lead people to discover which social norms are prominent in their environment (Hornik & Yanovitzki, 2003; Southwell & Yzer, 2007), and also help to reduce possible stigmas and taboos by loosening normative constraints (Botta & Pingree, 1997; Southwell & Yzer, 2007). Furthermore, talking about health messages may lead to the priming of the content of these messages, which increases the likelihood of behavior change (Hoeken, Swanepoel, Saal, & Jansen, 2009).

Several case studies have shown successful examples of positive effects that interpersonal communication can have regarding health issues. Conversations between parents and children about drug use, for instance, have been shown to lead to a greater personal risk perception of drug use amongst adolescents (Morton & Duck, 2006), and interpersonal communication on HIV proved to lead to more positive beliefs on HIV prevention (Geary et al., 2007). A growing number of researchers emphasize that campaign designers should focus on triggering conversations between people (e.g., Surkan, DeJong, Herr-Zaya, Rodriguez-Howard, & Fay, 2003; Morgan, 2009; Van den Putte et al., 2011). Indeed, several health organizations specifically aim at creating dialogue between people, for instance about HIV/AIDS and safe sex (described in e.g., Geary et al., 2007; Lubinga, Schulze, Jansen, & Maes, 2010; Evans et al., 2012; Lubinga, Jansen, & Maes, 2014).

1.2 Message complexity triggering conversational intention

The studies mentioned above suggest that interpersonal communication may play a major role in the effectiveness of health messages. An important question, then, is how health messages should be designed in order to trigger interpersonal communication (Hoeken et al., 2009; Dunlop et al., 2010). One possibility is to make health messages more complex, making it necessary for the receiver to invest extra effort and time in processing the message. An example of a complex message is one using metaphor (a "substitution based on underlying resemblance"; McQuarrie & Mick, 1996, p. 431), such as, for instance, referring to "birds and bees" in sexual

education. Because of the extra cognitive processing that is needed in order to arrive at a suitable interpretation, a complex message can be seen as a riddle (cf. Tanaka, 1992), or as a cryptogram (cf. Hoeken, 2005) that needs to be solved in order to understand the message.

In the processing of complex messages three stages can be distinguished (Hoeken et al., 2009). First, there has to be a perception that the message deviates from expectation and cannot be immediately understood in a literal sense. Next, cognitive effort needs to be invested in order to come to a suitable interpretation of the message, which, ideally, is found in the last stage. As a result, feelings of relief may be experienced (Sopory & Dillard, 2002). Successfully processing a complex message, like solving a riddle, may furthermore provide people with pleasurable feelings as a "reward" for the extra processing that was needed to understand the message (Tanaka, 1992). These pleasurable feelings are more commonly known as "pleasure of text" (Barthes, 1975), which refers to "the reward from processing a clever and artful arrangement of signs" (Hoeken et al., 2009, p. 54) and "can give a kind of intellectual satisfaction to many people" (Tanaka, 1992, p. 95). This pleasure of text would not be experienced in case of literal, straightforward messages (Sopory & Dillard, 2002).

Specifically the *delay* in understanding a complex message, making receivers aware of the fact that they "solved the riddle" and therefore inducing pleasure of text as a reward for the extra processing time, may make them want to talk about the message. Research has shown that people like sharing their emotions (Rimé, Mesquita, Philippot, & Boca, 1991; Dunlop et al., 2010), in this case pleasurable feelings; it may be enjoyable to talk to other people about whether they experienced the same pleasurable feelings when processing the message. One may therefore expect a positive relationship between processing time and the intention to talk about the message, through the induction of pleasurable feelings.

However, it is also possible that the relationship between processing time and conversational intention is less straightforward: if people feel they need to put in too much processing time to understand the message, or if they think they do not understand the message at all, pleasure of text may be low, and people may not want to talk about the message. Studies like Jansen and Janssen, (2010), Lubinga et al. (2010), and Lubinga et al. (2014) found that a lower perceived understanding of the message correlated with a lower willingness to talk about the message. The relationship between processing time and conversational intention, then, would resemble an inverted U.

1.3 The effects of message complexity: two sides of the same coin

So far, not a lot is known about the effects of message complexity on the willingness to talk about health messages. Some studies on this topic refer to the health

organization loveLife, that aims at preventing HIV/AIDS from spreading further amongst South African youth. loveLife deliberately used complex messages in its campaigns for several years. The organization specifically aimed at creating dialogue, as was specified in the tagline "Talk about it" (Robbins, 2010). loveLife assumed message complexity leads to a lack of immediate perceived understanding, which would trigger people to talk about the message with each other in order to come to a suitable interpretation of the message (Hollemans, 2005).

Hoeken et al. (2009) also focus on the way in which message complexity may trigger conversations, but instead of focusing on a *lack* of perceived understanding, they suggest that a high perceived understanding triggers people to talk about the message. Inspired by a study by Ritson and Elliot (1999) on advertising, Hoeken et al. (2009) distinguish two different ways in which message complexity may trigger conversation. The first is the idea that reaching a perceived understanding of a complex message, while assuming that others were not successful in understanding the message, may lead to self-congratulatory thoughts (Tanaka, 1992). Conversation, then, may arise because people want to "show off" this perceived understanding to others who were presumably not able to understand the message. The second way Hoeken et al. (2009) assume processing message complexity may trigger interpersonal communication, is that a group of people (e.g., youngsters) thinks they are able to understand the message, as opposed to another group of people (e.g., their parents). Talking about these messages within the group would then strengthen group identity. According to Hoeken et al. (2009), it is a combination of a high perceived understanding of the self and a presumed low understanding of others that triggers conversations on complex messages.

So far, only a few empirical studies have been conducted to test the influence of message complexity on the tendency to discuss the message (Jansen & Janssen, 2010; Lubinga et al., 2010; Lubinga et al., 2014). In these studies, complex anti-HIV/AIDS messages, either existing messages from loveLife or a different health organization (Jansen & Janssen, 2010; Lubinga et al., 2010) or messages created specifically for the purpose of the study (Lubinga et al., 2014) were shown to young South African students and learners.[1] After message exposure, participants filled in a questionnaire measuring actual and perceived understanding, appreciation, and willingness to discuss the messages. The studies found that the most important

1. In Jansen and Janssen (2010), five loveLife billboards were selected containing a complex message in the text. In Lubinga et al. (2010), six existing posters and six existing radio advertisements were selected containing a range of complexity of HIV/AIDS messages. In Lubinga et al. (2014), four different posters were constructed for four different themes concerning HIV/AIDS (alcohol abuse, intergenerational relationships, multiple partners, and peer pressure), each containing no rhetorical figure, only a verbal rhetorical figure, only a visual rhetorical figure, or both.

predictors for talking about health messages varying in message complexity are a high perceived understanding of the message, a high appreciation for the message, a high personal relevance of the message, and a high estimated understanding of the conversation partner. This indicates that, as opposed to what loveLife presumed, a low level of perceived understanding does not lead to a higher tendency to talk about a message, and that, as opposed to what Hoeken et al. (2009) claim, people want to talk about messages when they think their conversation partner understood the message as well.

1.4 The present study

The above-mentioned empirical studies have not found positive effects of a lack of perceived understanding of complex messages on the intention to talk about the message. In the present study, however, we are not interested in a lack of perceived understanding of complex health messages, but in the time that it takes to come to a suitable interpretation, i.e., the processing time, of health messages with varying levels of complexity. In the present study, we therefore aim at investigating the relationship between processing time, triggered by perceived message complexity, and the tendency to talk about health issues. We conducted a correlational study to uncover the relationship between processing health messages with varying levels of perceived complexity and varying durations of processing time on the tendency to talk about these messages with other people. We made a distinction here between the tendency to talk about the advertisement and the tendency to talk about the health topic.

As indicated above, earlier research has found personal relevance to be an important predictor of conversational intention about health messages (Jansen & Janssen, 2010; Lubinga et al., 2010; Lubinga et al., 2014). We therefore included personal relevance as a predictor in our study. A message is often intrinsically personally relevant or not, regardless of how much time it takes to process the message, and regardless of the complexity of the message. We therefore tested whether there was a relationship between personal relevance, processing time and perceived message complexity. We furthermore measured pleasure of text and appreciation (following Jansen & Janssen, 2010; Lubinga et al., 2010; Lubinga et al., 2014), to see whether these variables were related to processing time and personal relevance. Moreover, we included the intention to perform the promoted health behavior (e.g., eating healthier) in our analyses, since most health messages primarily aim at influencing health behavior.

Based on the above-mentioned issues, we formulated the following research questions:

RQ1: To what extent is perceived message complexity related to message processing time?

RQ2: Which variables are related to the intention to talk about health messages (RQ2a) and to the intention to perform the health behavior promoted in these health messages (RQ2b), and how do these variables relate to one another (RQ2c)?

2. Method

2.1 Participants

A total of 40 participants took part in the study (67.5% female). All participants were students at the Faculty of Arts at the University of Groningen (Mean age = 21.00, SD = 1.89). Each participant was tested individually in a sound-proof room at the Faculty of Arts, University of Groningen. All participants received 5 euros (around 5.50 USD) upon completion of the study.

2.2 Materials

Six different health themes were chosen for this study: smoking, skin cancer, alcohol abuse, heart disease, safe sex, and obesity, all related to a specific health behavior (e.g., safe tanning, healthy eating, using a condom, exercising). These topics are often addressed in mass-mediated health campaigns and were thought to be relevant for a wide audience. Each health message consisted of a picture with one text phrase under it. To achieve variance in the messages regarding complexity, we constructed different versions of each health message that were meant to differ on a continuum of perceived complexity, resulting in a total of 12 messages. The obesity message, for instance, showed a picture of a car and a bike. In the less complex message version, the text said: "Prevent obesity: take the bike instead of the car". In the message version that should be perceived as more complex, the text underneath the picture of the car said: "Runs on euros, produces kilos". The text underneath the picture of the bike said: "Runs on kilos, saves euros".

Before conducting the study, all messages were extensively pretested to make sure that the final messages versions indeed were seen as varying in terms of perceived complexity. Participants in the pretest were shown different versions of the messages. After each message they were asked to fill in a questionnaire containing questions regarding to what extent participants understood the messages, how much effort they indicated it took them to process the message, the extent to which they thought the message was complex, whether they appreciated the

message, and whether the message was personally relevant to them. Where necessary, the messages were adjusted and pretested again in order to create a range of perceived message complexity. The final 12 messages, of which two examples can be found in the Appendix, represent a range in perceived complexity (from a mean of 1.55 to a mean of 4.60 on a scale of 1–7, where 1 stands for not at all perceived to be complex, and 7 stands for perceived to be very complex).

2.3 Design

Each participant was exposed to six messages, one for each of the six health themes. Of these six messages, three were intended to be perceived as relatively simple, and the other three as relatively complex. Participants were thus exposed to a mix of less complex and more complex messages, and they were exposed to each health theme only once. Messages were shown in a random order.

2.4 Measures and procedure

The study was designed in *E-Prime*, which was used to present the stimuli and record reaction times and answers to the questions. Each individual study was conducted by one of two trained researchers, and took no more than 30 minutes. Each participant first read a written instruction. After that, the participant was exposed to the six different health messages, in a random order.

After each message, the participants answered questions that were displayed on the computer screen, regarding their actual understanding of the message, appreciation and personal relevance of the message, pleasurable feelings evoked by the message, the behavioral and conversational intentions, and the extent to which they thought the message was complex. The answers that were given to the open-ended questions were recorded with a sound recorder. The study was conducted in Dutch; the items described in this section are translated for the purpose of this paper.

2.4.1 *Processing time*

Processing time for each message was defined as the time it took participants to think they understood the message. The participants were instructed to press a key as soon as they thought they understood the message. With this explicit instruction, we could make sure that processing time (i.e., the time in milliseconds between message onset and the moment the participant pressed the key) would indeed reflect perceived understanding of the message, and that a longer processing time did not reflect, for instance, a higher message appreciation. In the analyses that are reported below, the logarithm of processing time was used.

2.4.2 *Appreciation and pleasure of text*

The appreciation of the message was measured with three seven-point Likert items (Cronbach's α = .88; following Jansen & Janssen (2010) who also measure appreciation in relation to persuasive health messages): "I like this advertisement", "This advertisement appeals to me", and "I think this advertisement is attractive" (1 = I completely disagree, 7 = I completely agree).

Pleasure of text was measured with a seven-point Likert item: "I experienced pleasure with this advertisement" (1 = I completely disagree, 7 = I completely agree).

2.4.3 *Personal relevance*

The personal relevance of the message was measured with one seven-point Likert item: "This advertisement is relevant for me" (1 = I completely disagree, 7 = I completely agree).

2.4.4 *Conversational intention*

The intention concerning conversation behavior was divided into the intention to talk about the advertisement and the intention to talk about the topic. The intention to talk about the advertisement was measured with two seven-point Likert items (Cronbach's α = .84): "I will definitely talk about this advertisement within the next week", and "I will definitely talk about this advertisement within the next month" (1 = I completely disagree, 7 = I completely agree). The intention to talk about the topic was measured by two seven-point Likert items (Cronbach's α = .91): "I will definitely talk about this topic within the next week", and "I will definitely talk about this topic within the next month" (1 = I completely disagree, 7 = I completely agree).

2.4.5 *Behavioral intention*

The intention to perform the promoted health behavior was measured by three seven-point Likert items (Cronbach's α = .79): "I am planning on adjusting my behavior based on this advertisement", "I will perform the promoted behavior within a very short term", and "I am planning on performing the promoted behavior" (1 = I completely disagree, 7 = I completely agree).

2.4.6 *Perceived message complexity*

Perceived message complexity was measured with two seven-point Likert items (Cronbach's α = .93): "I thought it was difficult to discover the meaning of this advertisement", and "I thought this was a complex advertisement" (1 = I completely disagree, 7 = I completely agree).

2.4.7 *Actual understanding*

To measure the participants' actual understanding of the messages, they were asked to say aloud their interpretation of each message after they had pressed the key indicating that they thought they understood the message. The participants' interpretation of each message was recorded with a sound recorder.

Two coders independently judged to what extent the participants' answers matched the actual meaning of the message as established by the coders before the study was conducted. The two coders independently gave scores for how well each participant understood each message, ranging from 0 (no understanding) to 2 (full understanding), based on Lubinga et al. (2010), and Lubinga & Jansen (2011). After initial examination of the data, the coders agreed that it was useful to make a distinction between understanding the general message (e.g., smoking may cause lung cancer), and understanding which health behavior was promoted in the message (e.g., do not smoke), to see whether participants actually understood the meaning of the message or only used their prior knowledge about the health topic to answer the question on actual understanding. The correlation between these two scores was $r = .38$ ($p < .001$).

The interrater reliability for the two coders for actual understanding of the general message was Kappa = .53 ($p < .001$), and the interrater reliability for actual understanding of the promoted behavior was Kappa = .56 ($p < .001$). Both scores indicate a moderate agreement. After the independent coding, the coders discussed the cases for which there was disagreement and jointly decided on a final code for each message within each participant with which the results could be analyzed. An example of an answer that was coded as a 0 for understanding of both the general message and the health behavior promoted in the message is "Tanning at a young age is unnatural" (for a safe tanning message; the correct interpretation of this message as established by the coders was 'In order to prevent damage by UV radiation to young children, you need to protect them from the sun'). An example of an answer that was coded as a 2 for understanding of both the general message and the health behavior promoted in the message was "You need to use a condom in order to prevent STDs" (for a safe sex message; this was the correct interpretation of this message as established by the coders). The scores for the understanding of the general message and the understanding of the promoted health behavior were added up to come to a final understanding score for each participant and for each message, where 0 stood for no understanding at all and 4 stood for understood entirely. The mean actual understanding score for the messages that were designed to be more complex was $M = 2.10$ ($SD = 1.43$); the mean actual understanding score for the messages that were designed to be less complex was $M = 3.24$ ($SD = .93$).

2.5 Data analysis

In order to analyze the results of this study we used the *Mixed GAM Computation Vehicle* package in *R* to create Generalized Additive Models (GAMs). This allows us to test for linear and possibly also nonlinear relationships between various predictors and response variables, while taking into account the variance related to participants and health themes (see, e.g., Tomaschek, Tucker, Wieling, & Baayen, 2014, for an example of statistical analysis using GAMs).

We created GAMs that tested the relationship between perceived complexity, processing time, personal relevance, appreciation and pleasure of text and 1) the intention to talk about the advertisement, 2) the intention to talk about the message topic, and 3) the intention to perform the promoted health behavior. We furthermore tested the relationship between processing time on the one hand, and appreciation and pleasure of text on the other hand. In all of these GAMs, personal relevance was included as a predictor. To each GAM, random intercepts and random slopes regarding the variation between participants and health themes were added, to see whether or not they played a role in the relations we were examining.

Theoretically it was possible to find nonlinear relationships, e.g., an inverted U-relationship between processing time and conversational intention: a longer processing time could be associated with a more positive intention in the middle range, but the intention could go down with very short or very long processing times. In order to test whether such relationships existed in our data, we compared the linear GAM score with the nonlinear GAM score for the GAMs that included processing time as a predictor of conversational intention. Only if the nonlinear GAM score was better (based on model comparison with the maximum likelihood (ML) test, cf. Tomaschek et al., 2014) than the linear GAM score, we retained the nonlinear model.

3. Results

3.1 The relationship between perceived complexity and processing time

We first checked whether perceived message complexity positively predicted processing time, to see whether messages that were perceived to be more complex indeed required more time to process. This was indeed the case: t = 6.23, $p < .001$.[2,3]

3.2 Predictors of conversational intention

Our next step was to determine which variables predicted the intention to talk about the messages. In our analyses, we made a distinction between the intention to talk about the advertisement itself and the intention to talk about the health topic of the message. The linear models of the relationship between processing time and conversational intention proved to have a better fit than the nonlinear models of this relationship, so the results discussed below, which can be found in Table 1 and Table 2, are based on the linear models.

Table 1. Predictors of conversational and behavioral intentions expressed in t

Outcome variable	Conversational intention advertisement	Conversational intention topic	Behavioral intention
Predicting variable			
Processing time	−.99	−1.57	−2.28*
Personal relevance	2.53*	5.14***	8.78***
Appreciation	6.74***	3.49***	2.62**
Pleasure	5.13***	2.20*	.79

* = significant at $p < .05$; ** = significant at $p < .01$; *** = significant at $p < .001$

2. *t* is the coefficient that indicates the size of the linear relationship: a larger *t* indicates a stronger relationship, and a smaller *t* indicates a weaker relationship; a positive *t* indicates a positive relationship, while a negative *t* indicates a negative relationship.

3. We also checked whether personal relevance predicted processing time and perceived message complexity. This was not the case: t = .13, $p = .90$, and t = −.54, $p = .59$, respectively. Furthermore, we found that perceived message complexity and processing time negatively predicted actual understanding: t = −3.85, $p < .001$ and t = −3.15, $p < .001$, respectively. Personal relevance did not predict actual understanding: t = 1.37, $p = 17$.

Table 2. Predictors of appreciation and pleasure, expressed in t

Outcome variable	Appreciation	Pleasure
Predicting variable		
Processing time	−1.09	.31
Personal relevance	3.82***	2.58*

* = significant at $p < .05$; ** = significant at $p < .01$; *** = significant at $p < .001$

3.2.1 *Predictors of the intention to talk about the advertisement*

We did not find a relationship between processing time and the intention to talk about the advertisement ($t = -.99$, $p = .32$). We did, however, find a significant interaction of processing time and personal relevance on the intention to talk about the advertisement ($F = 4.62$, $p < .05$). This interaction shows that when personal relevance is low, the relationship between processing time and the intention to talk about the advertisement is positive, but when personal relevance is high, this relationship is negative.

The intention to talk about the advertisement was positively predicted by personal relevance ($t = 2.53$, $p < .05$), appreciation ($t = 6.74$, $p < .001$), and pleasure ($t = 5.13$, $p < .001$). Appreciation and pleasure were positively predicted by personal relevance ($t = 3.82$, $p < .001$; $t = 2.58$, $p < .05$, respectively), but not predicted by processing time ($t = -1.09$, $p = .28$ and $t = .31$, $p = .75$, respectively). We did not find an interaction effect of processing time and personal relevance on appreciation ($F = 78$, $p = .38$) or on pleasure ($F = 1.23$, $p = .27$).

3.2.2 *Predictors of the intention to talk about the topic*

We found a significant interaction of processing time and personal relevance on intention ($F = 3.93$, $p < .05$), which shows that when personal relevance is low, the relationship between processing time and the intention to talk about the topic is positive, but when personal relevance is high, this relationship is negative.

The intention to talk about the topic was positively predicted by personal relevance ($t = 5.14$, $p < .001$), appreciation ($t = 3.49$, $p < .01$) and pleasure ($t = 2.20$, $p < .05$).

3.3 Predictors of behavioral intention

As can be seen in Table 1, behavioral intention was negatively predicted by processing time ($t = -2.28$, $p < .05$), and was positively predicted by personal relevance ($t = 8.78$, $p < .001$) and appreciation ($t = 2.62$, $p < .01$).

4. Discussion and conclusion

This study explored the relation between processing time, perceived message complexity, and the willingness to discuss health messages. In RQ1, we were interested in the relationship between message complexity and message processing time. The results indicate that messages that were perceived to be more complex, also took longer to process. We therefore continued our analyses with processing time as an indication of message complexity.

In RQ2a, we were interested in the variables that are related to the intention to talk about health messages. The results indicate that processing time and personal relevance in interaction predicted both the intention to talk about the advertisement and the intention to talk about the message topic. When personal relevance was low, a longer processing time was associated with a higher intention to talk about the advertisement and the topic, but when personal relevance was high, a longer processing time was associated with a lower intention to talk about the advertisement and about the topic. This indicates that a longer processing time may have a positive relationship with the intention to talk about a health message, but only when the message is not personally relevant. When a message is highly relevant, on the other hand, a longer message processing time is associated with a decrease in the willingness to talk about it. Studies on the effects of rhetorical questions have found similar results: when the issue at hand is not personally relevant, messages containing rhetorical questions can significantly increase persuasion (Petty, Cacioppo, & Heesacker, 1981). On the other hand, if messages on a highly relevant topic contain rhetorical questions, this leads to a decrease in persuasive effect, partly because this is distracting to participants (Petty et al., 1981). Perhaps message complexity in the present study was a distracting factor for messages that were personally relevant. More research is necessary to explore the mechanism behind this phenomenon.

We found a positive relationship between pleasure and appreciation on the one hand, and the intention to talk about the advertisement as well as about the topic on the other hand. Furthermore, personal relevance proved to be an important direct predictor of the intention to talk about both the advertisement and about the health topic. This result is in line with the results of studies like Jansen and Janssen (2010), Lubinga et al. (2010), and Lubinga et al. (2014), who found that personal relevance is an important factor in determining whether or not people will talk about a message. Our findings indicate that it is important to take the personal relevance of the message topic into account when designing health messages aimed at triggering conversations between people.

We checked for the possibility of an inverted U describing the relationship between processing time and the intention to talk about the message: a longer

processing time would be related to an increased tendency to talk about the message, but when it takes the message recipient too long to understand the message, the intention to talk about the message would decrease. Such a nonlinear relationship between processing time and conversational intention was not found, however.

Since most health messages first and foremost aim at influencing health behavior, in RQ2b, we were also interested in the variables that predicted the intention to perform the promoted health behavior in the messages. We found that this intention was negatively predicted by processing time, and positively by personal relevance and appreciation, which is for the large part consistent with the results for the intention to talk about the message.

In RQ2c, we were interested in the relationship between the variables that predicted the intention to talk about the message. The results discussed in Table 1 and Table 2 indicate that a higher personal relevance was associated with a higher level of appreciation and pleasure, which, in turn, was associated with an increased intention to talk about both the advertisement and the topic. Neither pleasure, nor appreciation were predicted by processing time, nor did we find an interaction of processing time and personal relevance on pleasure or on appreciation. This indicates that processing time, appreciation and pleasure directly predict the tendency to discuss the message,[4] but that there is no indirect relationship between processing time, appreciation and pleasure, and the willingness to discuss the message.

We furthermore found that a longer processing time was associated with a lower actual understanding of the message. This may both indicate that the longer it took participants to be able to understand the message, the lower their actual understanding of the message was, or that messages that were understood less took longer to process. This negative relationship was also found between message complexity and actual understanding. This result may be explained by the fact that messages that were perceived to be more complex also took longer to process, i.e., to understand, indicating that messages that are found to be more difficult to understand may indeed actually be understood less. Especially in the case of health messages, not understanding the message correctly may have negative or even dangerous consequences (Cline, Johnson, & Freeman, 1992; Cho & Salmon, 2007; Lubinga, et al., 2010). These results indicate that it may not be wise to focus on messages that require much time to be understood and that instead, campaign designers should focus on messages that are personally relevant, appreciated, and that provide the audience with pleasure.

4. We found no direct relation between processing time and the intention to talk about the message, but we found that processing time and personal relevance interact in predicting the intention to talk about the message.

Our study made an attempt at uncovering the relationships between processing time, evoked by perceived message complexity, personal relevance, appreciation, pleasure, and the willingness to discuss the message. Health messages with a higher level of perceived complexity, which required more processing time in order to be understood, only increased the tendency to talk about these messages when personal relevance was low. Furthermore, personal relevance directly and positively predicted the tendency to discuss the message. This indicates that in the field of health communication, it is especially important to focus on the personal relevance of a message when it is the goal to trigger conversations on this message. Furthermore, appreciation and pleasure, although not associated with processing time, directly and positively predicted the willingness to discuss the message.

It should be noted that the results of the present study are only based on 40 participants, all of whom were college students. This group of participants may have been more skilled in understanding the more complex health messages than other groups of participants would have been. Moreover, some of the dependent variables, like pleasure and personal relevance, were measured using single-item measures, a shortcoming that should be taken into account in future research on this topic. Furthermore, the study took place in a laboratory setting, exposing the participants to the health messages in a different way than when e.g., browsing through a magazine. Nevertheless, the present study uncovered some interesting results concerning the design of health messages that aim at triggering interpersonal communication. Future research should focus on further developing and testing health messages that trigger interpersonal communication, and study the mechanisms and effects of conversations triggered by these messages on actual health behavior. In order for campaign designers to create health messages that are effective in both triggering discussions about the message and promoting healthier behavior, conducting this type of research is essential.

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Authors' addresses

Lennie Donné
University of Groningen
Oude Kijk in 't Jatstraat 26
9712 EK Groningen
The Netherlands

lennie.donne@gmail.com

Carel Jansen
University of Groningen
Oude Kijk in 't Jatstraat 26
9712 EK Groningen
The Netherlands

c.j.m.jansen@rug.nl

John Hoeks
University of Groningen
Oude Kijk in 't Jatstraat 26
9712 EK Groningen
The Netherlands

j.c.j.hoeks@rug.nl

Appendix

Figure 1. Example of a less complex message on heart disease. Translation: "Eat healthily in order to keep a healthy heart"

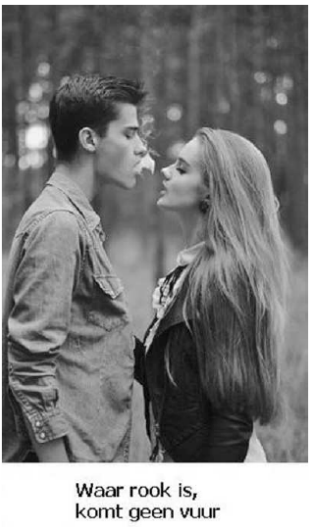

Figure 2. Example of a more complex message on smoking. Translation: "Where there is smoke, there is no fire"