The Use of Message Framing, Temporal Framing and Consequence Type to Increase Consumers' Health Risk Perception

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Cite as:
Unger Franziska, Steul-Fischer Martina (2021), The Use of Message Framing, Temporal Framing and Consequence Type to Increase Consumers' Health Risk Perception. *Proceedings of the European Marketing Academy*, 50th, (93308)

Paper from the 50th Annual EMAC Conference, Madrid, May 25-28, 2021

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Abstract:

Global health issues (e.g. obesity) motivate the investigation of antecedents of health risk perception, because increasing consumers' risk perceptions lead to healthier behavior. We conducted two studies to investigate the impact of message framing (loss vs. gain), temporal framing (short-term vs. long-term) and consequence type (physical vs. social) on consumers' health risk perception. The results show that loss-framed messages and the presentation of physical consequences increase health risk perception. A second study reveals an interaction effect between temporal framing and the presentation of physical vs. social consequences. Consumers' health risk perception increases when presenting long-term physical (short-term social) consequences compared to long-term social (short-term physical) consequences. Our results present theoretical and managerial implications that are important to any publishers of health information (e.g. health insurance companies, governmental institutions).

Keywords: framing effects, health risk perception, health behavior

Track: Consumer Behavior

1. Introduction

Global health issues (e.g. obesity) motivate the investigation of antecedents of health risk perception, because increasing consumers' risk perceptions lead to healthier behavior. Various scholars have underlined the positive relationship between health risk perceptions and behavioral intentions for different health risks (Chandran & Menon, 2004; Heideker & Steul-Fischer, 2017; Menon, Raghubir, and Agrawal, 2008; Murdock & Rajagopal, 2017).

The use of message and temporal framing evidently creates differences in health risk perception among recipients (Chandran & Menon, 2004; Menon et al., 2008). Nevertheless, previous research neglected framing effects for different types of consequences for consumers (Murdock & Rajagopal, 2017). Any publisher of health communication can highlight either the physical or the social, respectively psychological, consequences of healthy or unhealthy behavior. Although, scholars mainly focused on the presentation of negative physical consequences, and rarely analyzed the effects of the presentation of social consequences on health risk perception.

The aim of this paper is to analyze the effects of message and temporal framing on consumers' health risk perception when either physical or social consequences of a certain health outcome are presented. Therefore, we aim to answer the research questions of how message framing (loss vs. gain), temporal framing (short-term vs. long-term) and the presentation of different types of consequences (physical vs. social) have an impact on consumers' health risk perception, and consequently, influence health behavior intention. We conducted two online experimental studies to investigate these effects.

2. Theoretical Background

2.1 Message framing effects

In the present context, message framing is a format of presentation that aims to increase health risk perception among consumers through objectively equivalent health information, which is framed in terms of either gains or losses. In case of a positive presentation of a message (gain-frame), the advantages of engaging in a health behavior are highlighted. Otherwise, a negative presentation of a message (loss-frame) emphasizes the disadvantages of not engaging in a health behavior (Bassett-Gunter, Ginis, and Latimer-Cheung, 2013). Studies that analyze the influence of message framing on consumers' health risk perception as a predictor of health behavior intention are rare. However, the direct effect of message framing on behavior intention has been investigated for different kinds of health risks (Heideker & Steul-Fischer, 2017). Based on Prospect Theory (Kahneman & Tversky,

1979) loss-framed messages should increase consumers' health risk perception and lead to a higher health behavior intention more than gain-framed messages. Because of loss aversion, consumers are more sensitive to losses than to gains. Some studies confirm the findings of Prospect Theory and show a stronger effect of loss-framed messages on health behavior intention (Gerend & Shepherd, 2007; Wirtz, Sar, and Ghuge, 2015). For example, Gerend and Shepard (2007) show greater HPV vaccination intentions after presenting loss-framed (vs. gain-framed) messages. However, the meta-analytic review from O'Keefe and Wu (2012) contradicts these results for promoting skin cancer prevention. O'Keefe and Wu (2012) did not report any significant difference in the persuasiveness of gain- and loss-framed appeals for encouraging sun safety behavior in order to promote skin cancer prevention.

2.2 Temporal framing effects

Temporal framing differentiates between the presentation of proximal and distant frames of health information. While present-oriented messages focus on the immediate consequences of a behavior (e.g. "movement gives you a quick energy boost"), future-oriented messages emphasize the temporally distant consequences of a behavior (e.g. "movement makes you more efficient in the long run"). The literature shows that short-term consequences tend to be more prominent, more relevant and easier for the consumer to grasp. Accordingly, messages that focus on the short-term consequences of a behavior are generally more effective than messages that focus on the possible long-term consequences of a behavior (Gerend & Cullen, 2008; Zhao, Nan, Iles, and Yang, 2015). The Construal Level Theory, according to Trope and Liberman (2010), provides an explanation for the effectiveness of emphasizing short-term consequences. The theory describes the context between psychological distance and mental abstraction. A high psychological distance (e.g. temporal distance) is accompanied by a high mental abstraction and vice versa. Consequently, a high temporal distance, which is often the case for health consequences, leads to a high degree of mental abstraction of the event. Because of that high temporal distance of the event, consumers believe that the onset of the health consequence is less likely, and that they have plenty of time to change their behavior and thereby avoid the consequence (Chandran & Menon, 2004). As a result, health messages should aim to reduce the perceived temporal distance between the provoked behavior and its consequence on the recipient. Thus, consumers will have a higher health risk perception and willingness to comply with the targeted behavior.

2.3 Consequence type

The presentation of physical consequences as a result of a certain health behavior shown in health communication aims to convince recipients of the bodily outcomes of a health risk (e.g. "Smoking causes 9 out of 10 lung carcinomas"). Whereas the presentation of social consequences is intended to draw the recipient's attention to appearance-related outcomes or the consequences of social exclusion due to a certain health behavior (e.g. "Smoking causes your skin to age"). Most literature focuses on the effectiveness of physical consequences (e.g. skin cancer) in health messages to provoke behavioral changes instead of investigating social, appearance and psychological related consequences (e.g. wrinkles). However, recent studies have shown that the presentation of social consequences also plays an important role for the effectiveness of health communication, because social consequences are perceived to occur closer in time and more likely (Martin & Kamins, 2019; Murdock & Rajagopal, 2017). As mentioned above, the Construal Level Theory explains this observation (Trope & Liberman, 2010). Highlighting social consequences in health messages can reduce the perceived temporal distance because social consequences are perceived as temporally closer and thus less abstract (Murdock & Rajagopal, 2017; Trope & Liberman, 2010). Overall, message effectiveness will be enhanced by the presentation of social consequences because they lead to a higher health risk perception, and subsequently to a higher health behavior intention among individuals (Murdock & Rajagopal, 2017; Rosenstock, 1974; Trope & Liberman, 2010). Nevertheless, the question remains, whether framing effects such as message and temporal framing influence this observation.

Message framing: Because of the contradicting results in previous research, and the lack of literature on health risk perception, we propose, in line with Prospect Theory (Kahneman & Tversky, 1979), that a loss-framed description of physical and social consequences results in a higher health risk perception than a gain-framed description. We propose the following hypothesis:

H1. The consumers' health risk perception is higher for loss-framed compared to gain-framed messages of physical and social consequences.

Temporal framing: Studies investigating the temporal framing effect in health communication mainly focused on the short-term or long-term physical consequences of a health risk and their influence on behavior (Gerend & Cullen, 2008; Mollen, Engelen, Kessels, and van den Putte, 2017). However, the presentation of social consequences compared to physical consequences can induce a higher perceived temporal proximity and

probability and thus increase consumers' health risk perception even more (Murdock & Rajagopal, 2017). Nevertheless, the research results of the temporal framing effect are not generally applicable with regard to a preference for a short-term (vs. long-term) presentation format, because individuals' future orientation influences the temporal framing effect and health risk perception (Zhao et al., 2015). The Socioemotional Selectivity Theory (SST) according to Löckenhoff and Carstensen (2004) assumes that individuals perceive their temporal future perspective either as rather limited or rather expansive, which influences health risk perception and health behavior accordingly. If the temporal future perspective is perceived rather limited, consumers tend to focus their goals on the near rather than the distant future. The reverse is true for individuals who perceive an expansive future perspective. Consequently, a limited future perspective leads to a preference for emotionally significant goals (e.g. social goals), while an expansive future perspective leads to the pursuit of goals that optimize the future (e.g. health-promoting behavior). It is important to note that the temporal future perspective, unlike the chronological age of individuals, can be changed by appropriate marketing interventions and accordingly aims at a change in health risk perception and health behavior intentions (Löckenhoff & Carstensen, 2004). We derive the following hypothesis:

H2. Temporal framing moderates the impact of the presentation of consequence type on consumers' health risk perception. The impact is stronger for the presentation of short-term social (long-term physical) consequences compared to short-term physical (long-term social) consequences.

3. Study 1: Message Framing and Consequence Type

In study 1, we examine the influence of message framing and consequence type on consumers' health risk perception (*H1*).

3.1 Method

Two hundred and eleven participants (62.6 % female, mean age = 24.3 years) of this study were randomly assigned to one of four conditions of a 2 (message framing: loss vs. gain) x 2 (consequence type of health risk: physical vs. social) between-subjects design. Our scenario text was supposed to be a health prevention campaign that emphasizes the riskiness of ultraviolet radiation. In the loss-framed (gain-framed) message treatments, the participants were informed about the disadvantages (advantages) of unprotected (protected) exposure to

ultraviolet radiation. Additionally, participants treated with social consequences were informed about the social consequences (e.g. reduced vs. increased self-confidence due to premature skin aging / beautiful skin) of the respective behavior, whereas the participants treated with physical consequences were educated about the consequences of ultraviolet radiation to their bodily health (e.g. increased vs. reduced risk of skin cancer).

Measures: Participants' perceived level of health risk perception was measured using a 10-point scale (1 = no risk to health, 10 = very high risk to health) (Heideker & Steul-Fischer, 2017). In accordance with Menon et al. (2008), the participants were asked to answer questions for health behavior intention to check their perceived need to care about ultraviolet radiation measured on 7-point rating scales (1 = totally disagree, 7 = totally agree). Furthermore, the "perceived probability" (1 = very unlikely, 7 = very likely) and the "perceived temporal distance" (1 = very close, 7 = very distant) of the occurrence of physical and social consequences as a result of ultraviolet radiation were also taken into consideration (Murdock & Rajagopal, 2017).

3.2 Results

The health risk perception is significantly higher for loss-framed messages compared to gain-framed messages (M_{loss} = 6.93 and $M_{positive}$ = 6.21; p = 0.015). Additionally, health risk perceptions are significantly higher for the presentation of physical consequences compared to social consequences in case of the health risk of ultraviolet radiation (M_{social} = 6.27 and $M_{physical}$ = 6.86; p = 0.044). An ANOVA underlines the significant influence of message framing ($F(1,206) = 7.632$; p = 0.006) and consequence type ($F(1,206) = 5.650$; p = 0.018) on health risk perception. There is no significant interaction effect between the message framing and the consequence type ($F(1,206) = 0.096$, $p > 0.10$) (see Figure 1). Loss-framed messages increase health risk perception more strongly than gain-framed messages, which holds true for the presentation of social consequences, as well as for physical consequences. Based on this analysis, hypothesis H_1 can be supported.

The surplus of women in our sample seems to account for the contradicting results to previous work (Murdock & Rajagopal, 2017). Our results reveal that women judge the physical (vs. social) consequences to be significantly more likely than do men (M_{women} = 3.75 and M_{men} = 3.09; $t(209) = -3.425$; p = 0.001). In addition, women assess the occurrence of physical consequences to be closer in time than did men (M_{women} = 4.42 and M_{men} = 4.99; $t(209) = 2.517$; p = 0.013). A regression analysis shows an overall significantly higher health behavior intention as a result of higher health risk perception ($\beta = 0.134$, $t = 3.110$, p = 0.002).

Nonetheless, the total mean of health behavior intention is relatively low ($M_{health\_behavior\_intention}$ = 3.44, SD = 1.350).

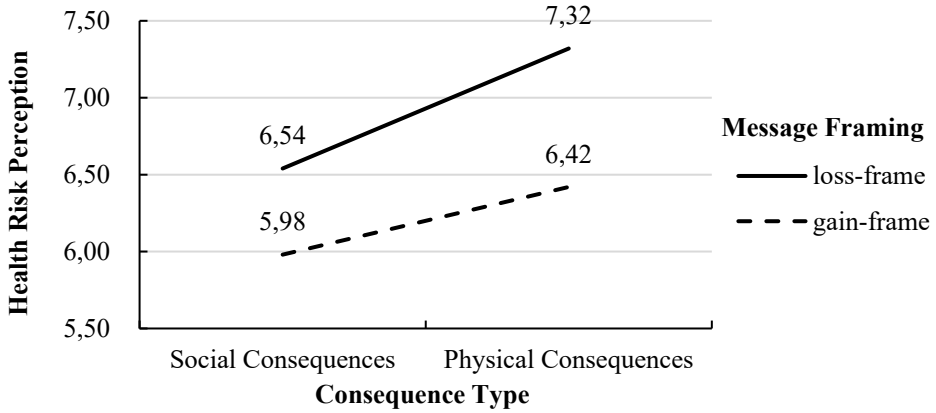

Figure 1. Influence of "message framing" and "consequence type" on health risk perception

4. Study 2: Temporal Framing and Consequence Type

In study 2, we examine the influence of temporal framing and consequence type on consumers' health risk perception (H_2).

4.1 Method

Two hundred and sixty-one participants (64.4 % female, mean age = 23.8 years) of this study were randomly assigned to one of four conditions of a 2 (temporal framing: short-term vs. long-term) x 2 (consequence type of health risk: physical vs. social consequence) between-subjects design. Our scenario text was supposed to be a health prevention campaign that emphasizes the riskiness of obesity. We conducted a pretest (n = 63) prior to the main study to derive the physical and social consequences presented in the scenarios. In the short-term-framed (long-term-framed) treatments, the participants were informed about the immediate (future) disadvantages of obesity. As in study 1, we distinguished between the presentation of social (e.g. decreased self-esteem, social isolation) and physical consequences (e.g. high cholesterol, stroke).

Measures: Consistent with study 1, the same scales were used to measure participants' level of health risk perception and health behavior intention. In addition, we included the covariates "consideration of future consequences" as well as the "psychological and the physical health consciousness" of the participants, which were surveyed on 5-point rating scales (1 = extremely uncharacteristic, 2 = somewhat characteristic, 3 = uncertain, 4 = somewhat characteristic, 5 = extremely characteristic) (Strathman, Gleicher, Boninger, and Edwards, 1994).

4.2 Results

The health risk perception is significantly higher for long-term-framed messages compared to short-term-framed messages (M_{long} = 6.81 and M_{short} = 6.23; p = 0.040). An ANOVA shows a significant influence of temporal framing (F(1,257) = 4.467; $p = 0.036$) on health risk perception. The effect of consequence type (F(1,257) = .970; $p = > 0.10$) on health risk perception is not significant (M_{social} = 6.39 and M_{health} = 6.64; $p > 0.10$). There is a significant interaction effect between the temporal framing and the consequence type (F(1,257) = 5.783; $p = 0.017$) (see Figure 2). The influence of the presentation of consequence type on health risk perception is moderated by the temporal framing effect. The influence is stronger in case of the presentation of short-term social consequences as well as of long-term physical consequences compared to short-term physical consequences and long-term social consequences. Based on this analysis, hypothesis H_2 can be supported. The results reveal a significant positive effect of the consideration of future consequences on health risk perception (β = 0.484, t = 1.971, p = 0.050). Participants also indicate a significant higher physical health consciousness compared to their psychological health consciousness ($M_{psychological}$ = 3.27 and $M_{physical}$ = 3.58; $p = 0.000$). A regression analysis shows an overall significantly higher health behavior intention as a result of higher health risk perception (β = 0.193, t = 5.500, p = 0.000). Nonetheless, the total mean of health behavior intention is relatively low ($M_{health\_behavior\_intention}$ = 3.26, SD = 1.379).

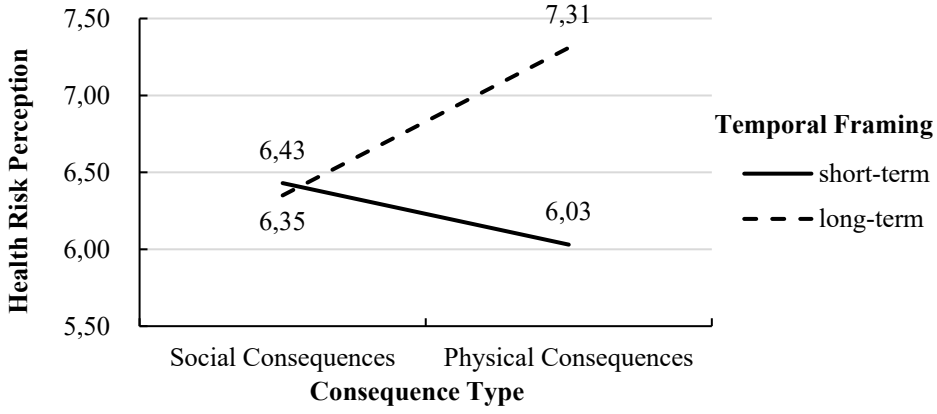

Figure 2. Influence of "temporal framing" and "consequence type" on health risk perception

5. General Discussion

Our results present theoretical and managerial implications that are important to any publishers of health information (e.g. health insurance companies, governmental institutions). The results of our two studies indicate that loss-framed messages lead to significantly higher

health risk perceptions than gain-framed messages. The presentation of physical consequences contributes to significantly higher health risk perceptions than the presentation of social consequences. In addition, long-term-framed messages lead to significantly higher health risk perceptions than short-term-framed messages. Temporal framing moderates the influence of the presentation of the consequence type on health risk perception. The influence is stronger when long-term physical consequences (short-term social consequences) compared to long-term social consequences (short-term physical consequences) are presented. To sum it up, we suggest the use of loss-framed as well as long-term-framed and the presentation of physical consequences in health communication to increase consumers' health risk perception and to promote healthy behavior intention.

Nevertheless, our study is not without its limitations. More variables and antecedents (e.g. individual differences, motivational and affective antecedents) of consumers' health risk perception should be investigated in further studies (Menon et al., 2008). We cannot provide implications for actual or future health behavior, since we measured health behavior intention. We propose to replicate these results for other health risks, more diversified samples and to focus on other consequences and other ways of presenting messages in order to increase consumers' health risk perception. Further studies could reduce the problems in designing health communication due to their presentation, and could support the research area of the influence of different types of framing effects and consequences on health risk perception (Murdock & Rajagopal, 2017).

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