More Harm Is Less Dangerous

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People are less likely to adopt preventive actions when they are informed of two equally threatening and likely health risks, compared with when they are informed of one of the two risks. This happens because a single health risk can be more vividly imagined compared with multiple health risks.

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EXTENDED ABSTRACT

Health has become a global challenge, with health problems increasing across the world. Worldwide obesity rate, for example, has doubled (NCD-RisC 2016). Flu viruses have become stronger over the years (Savage 2008). Many health problems can be avoided through simple preventive actions. Exercising, for example, could help prevent obesity. Thus, policy makers are focused on understanding how preventive behaviors could be encouraged. A significant part of this focus is on making preventive health messages more effective (Gerend & Shepherd, 2007). Preventive messages commonly inform the readers of different health risks associated with a health condition. An anti-obesity message, for example, might inform readers of obesity-related health risks, such as high blood pressure and diabetes. Current research explores whether the number of health risks a preventive message communicates could affect preventive decision making. To illustrate, an anti-obesity message could communicate both high blood pressure and diabetes as obesity-related risks or it could communicate one of these two equally threatening and likely health risks. Which of these two strategies would be more effective in encouraging preventive behavior adoption?

Normatively speaking, a reader should find the health condition more dangerous and thus be more likely to adopt the target preventive action when the message communicates multiple equally threatening and likely health risks (e.g., high blood pressure and diabetes), compared with when it communicates only one of the two risks. Consistently, to encourage adoption of preventive behaviors, policy makers and health experts typically communicate all major risks associated with the health condition.

In contrast to the normative view, we propose that presenting multiple equally threatening health risks is a less effective strategy than presenting only one of these risks—a proposition drawn upon research on imagery. Research in this domain suggests that one’s capacity to simulate mental images is limited (Baddeley & Andrade, 2000). Drawing upon this research on imagery, current research is the first to argue that due to mental imagery capacity limitations, health risks should be less vividly imagined when one has to mentally simulate multiple health risks simultaneously, compared with when one has to simulate only one health risk.

Vivid imagery has been shown to be an important determinant of people’s behaviors, such that a message that evokes more vivid mental images is likely to be more effective in persuading behaviors (Nisbett & Ross, 1980). Drawing upon a synthesis of these findings, we propose that a health message communicating multiple equally threatening health risks would lead to less vivid imagery and, therefore, be less effective in encouraging adoption of preventive behaviors, compared with a message that communicates only one of the two health risks.

Research suggests that when people use affective processing, vivid imagery is an important determinant of their behaviors (Keller & McGill, 1994). However, when people use a deliberative mode of processing, they tend to rely on logical, calculation-based reactions (Hsee & Rottenstreich, 2004). Therefore, we further propose that when a deliberative mindset is induced, people should be more sensitive to the number of health risks. Thus, when people are in a deliberative mindset, communicating multiple health risks in the message should be a more effective in encouraging adoption of preventive behaviors than presenting only one of these risks.

Four experiments, including two field experiments, examined these hypotheses. To provide a strong test of our hypotheses, we compare effectiveness of a message communicating two equally threatening risks with that of a message communicating only one of these two risks. Studies were conducted in Turkey and all health messages were communicated in Turkish. There were no exclusions unless otherwise reported.

Experiment 1

Experiment 1, conducted at a health center, examined the primary hypothesis in the context of obesity—people exposed to two obesity-related risks are less likely to engage in the target preventive action (exercise) and less likely to join an obesity prevention program as opposed to those exposed to only one of the two risks.

During regular check-ups, as is required, the general physician handed over pamphlets describing obesity-related risks to incoming patients (N=240) with a BMI of 25 or over. These pamphlets included affect-laden pictures of a family on the front page and a description of obesity risk(s) on the second page. One version of the pamphlet communicated two risks of obesity—high blood pressure and Type 2 diabetes—pretested to be equally threatening and likely (see figure-1 for the sample message). The visual position of the two risks was counterbalanced across participants in all experiments. The other version communicated one of these two risks—high blood pressure or diabetes. The message encouraged patients to walk regularly to prevent obesity, an advice typically given by the physician. Patients were also asked by the physician to join the obesity prevention program run by the health ministry at the center.

One week after each patient’s visit, a nurse contacted the patient and measured the frequency as well as the duration of the patient’s walks during the week. This nurse also recorded whether the patient had joined the obesity clinic—this information was checked against the clinic records.

Results and Discussion

We used a two-part model to examine the impact of the number of risks on walking duration. The two-part model analysis revealed that those in the two-risk condition were less likely to walk (30.83%) than those in the one-risk condition (47.5%; z=-2.63, p=.009, B=-707, Cl [-1.23, -1.80]). Amongst those who walked, those in the two-risks condition (M=33.15 minutes; SD: 17.13) walked less than those in the one-risk condition (M=44.49 minutes; SD: 27.55; z=-2.24; p=.0425; CI [-21.275, -1.396]; d=0.49).

Finally, a binary logistic regression revealed that patients were less likely to join the obesity program when informed of two risks (33.3%) compared with when exposed to one risk (10.83%; Wald χ² = 4.599; p=.032; B=-1.259, Odds Ratio=.284; CI[0.090, .897]).

This study provides support for our primary hypothesis: Communicating multiple health risks in a preventive message reduced the likelihood of engaging in preventive behaviors than presenting only one of the multiple risks.

Experiment 2

Experiment 2, conducted at a pharmaceutical store, sought to replicate the effect found in previous study in the context of flu.

Customers (N=432) at the store were informed of flu-related risks using posters, which were posted at the entrance and at the check-out counter. These posters communicated either two equal-
ly threatening and likely flu-related risks—muscle aches and sore throat, or only one of these two risks—and encouraged customers to keep their hands clean to prevent flu. Additionally, the posters referred to Flu as Grip-Nezle, an affective term used by lay people to refer to flu in Turkey. In order to examine whether presenting two risks would be as good as sharing a generic health message, in a third condition, a neutral poster communicating a generic health message was posted. Hand-sanitizing wipes packets were available for sale at the check-out counter; sale of wipes was our main dependent variable.

Results and Discussion

We ran a logistic regression with two contrasts. The first contrast showed that there was no difference in the likelihood to purchase hand-sanitizing wipes between those exposed to two-risks (6.61%) and those exposed to neutral health message (5.59%; p=0.837). The second contrast showed that in line with the findings of the previous study, those exposed to a single risk were more likely to buy the hand-sanitizing wipes (12.29%) than those exposed to two risks or neutral message (5.88%; Wald χ² = 6.541; p=0.011; B=0.908; Odds Ratio=2.478; CI[1.236, 4.968]). Findings of Experiment 2 replicated the effect found in the previous study in the context of flu.

Given the previous experiments employed affective pictures or affective terms, we assume that participants relied on their affective reactions while making the decision. However, the previous experiments do not explicitly test this assumption. The next two experiments take care of this limitation.

Experiment 3

Experiment 3 examines the moderating role of affective versus deliberative processing. We argue that when cued to rely on affective reactions, we should replicate the effect found in previous studies. When cued to rely on more deliberative reactions, the effect should be reversed such that participants should be more likely to engage in the preventive action when exposed to multiple risks as opposed to only one risk.

Participants (N=273) first engaged in a task, which cued them to focus on either their affective or deliberative reactions. Drawing upon past research (Hsee & Rottenstreich, 2004), those in the affective-cue condition responded to questions that required them to examine and report their feelings toward different affect-laden words. Participants in the deliberative-cue condition solved simple math problems. Subsequently, participants viewed one of the two versions of an anti-obesity message encouraging them to eat health. As in Experiments 1 and 3, one version communicated two risks of obesity—high blood pressure and diabetes. The other versions communicated only one of these two risks—high blood pressure or diabetes. Participants then chose a free snack between an apple and a brownie.

A logistic regression revealed a significant type of cue by number of risks interaction (z=4.4134; p<0.001; CI[1.3490, 3.5043]). In the affective-cue condition, participants were less likely to choose an apple when informed of two risks (28.89%), compared with when informed of one of the two risks (60%; z=-3.3236; p=0.009; B=-1.3063; CI[-2.0766, -0.5359]; Odds Ratio=2.708). In contrast, in the deliberative-cue condition, participants were more likely to choose an apple when informed of two risks (68.89%), compared with when informed of only one risk (41.93%; z=2.9137; p=0.0036; B=1.1204; CI[1.3667, 1.874]; Odds Ratio=3.066).

Providing support for the underlying conceptualization, the current study shows that increasing the number of health risks communicated in the message can negatively (positively) impact the likelihood of adopting the target preventive action when one is cued to rely on affective (deliberative) reactions.

Experiment 4

In the last experiment, we further examined our underlying conceptualization by examining the mediating role of vivid imagery. We predicted that when relying on affective reactions, preventive message should evoke less vivid images when it communicates two health risks as opposed to one of the two health risks. However, when participants are cued to focus on their deliberative reactions, number of health risks should not impact vivid imagery. Moreover, we expected vivid imagery to mediate the impact of number of health risks on preventive action in the affective-cue condition, but not in the deliberative-cue condition.

To examine the aforementioned hypotheses, during flu season, participants (N=146) were exposed to a preventive message encouraging them to keep their hands clean to prevent flu. This message communicated either two equally threatening and likely flu-related risks—muscle aches and sore throat, or only one of these two risks.

Drawing upon research (Saincure, Heath & Cole, 2005), which shows that using an affective (vs. scientific) frame to refer to a disease can induce affective (vs. deliberative) processing mode, we varied the frame (affective versus scientific) used to refer to flu. One set of messages used in the current study referred to flu as Grip-Nezle, an affective term used for flu by laypeople in Turkey (affective frame). Another set of messages (scientific-frame) referred to flu as A Tipi Enfluenza (Influenza-Type A), a term used by doctors in Turkey. These terms were chosen based on a pretest.

After evaluating the message, participants chose a gift between two items—a pen and a hand-sanitizing wipes pack, which served as the dependent measure. Participants then responded to a final survey, which asked them to evaluate the viewed message on six nine-point scale items (Keller & Block, 1997) measuring how vividly they could imagine the message. Four participants did not take this survey, leaving us with a sample of 142 participants for these measures.

Results and Discussion

A logistic regression revealed a significant interaction between the frame-type and number of risks (z=3.9615; p=0.0001; CI[1.4346, 4.2442]). In the affective-frame condition, fewer participants chose hand-sanitizing wipes when informed of two risks (36.11%) compared with when informed of one of the two risks (75.75%; z=-3.2008; p=0.0014; B=-1.71; CI[-2.757, -0.663]; Odds Ratio=1.808). In the scientific-frame condition, participants were more likely to choose hand-sanitizing wipes when two flu-related risks were communicated (58%) than when one risk was communicated (30%; z=2.363; p=0.018; B=1.129; CI[1.093, 2.066] Exp(B)=3.092).

An ANOVA conducted on the vivid imagery measure revealed a significant interaction between number of risks and frame-type factors (F(1,138)=29.63, p<0.001). In the affective-frame condition, images elicited by the message were less vivid when the message communicated two risks (M=3.143, SD=1.379) than when it communicated one risk (M=4.887, SD=1.163; F(1,138)=35.15, p<0.001; CI[-2.326, -1.163]; d=1.36). No such corresponding difference was found in the scientific-frame condition (F(1,138)=2.62, p>.1; CI[0.098, 0.984]). We further conducted a moderated mediation using PROCESS model 7 (Hayes, 2013), which revealed that vivid imagery mediated the impact of number of risks on likelihood to choose hand-sanitizing wet wipes in the affective-frame condition (B=-1.3034, CI[-2.1902, -0.6375]) but not in the scientific-frame condition (B=0.3310, CI[0.0398, 0.8615]).

This experiment provides further support for our conceptualization related to vivid imagery. In the affective frame condition, presenting two health risks elicited weaker images of the message, which mediated the impact of the number of risks on the likelihood of adopting preventive behavior. However, there was no such cor-
responding difference in vivid imagery in the scientific frame condition.

General Discussion

Current research is the first to reveal that people’s likelihood of adopting a preventive action non-normatively decreases when the health message communicates two health risks associated with the condition as opposed to one of the risks. Our findings further show that when nudged to rely on deliberative reactions, people focus on the number of health risks, thus increasing the likelihood to adopt a preventive action when the message communicates multiple risks as opposed to only one risk.

These findings make important theoretical contributions—First, our findings contribute to the affective decision making research. This is the first research to show that in the context of negative outcomes, people are less likely to adopt a preventive action when it can potentially prevent multiple equally threatening health risks as opposed to a single health risk. Second, our findings contribute to research on vivid imagery. Our findings show that increasing the number of negative outcomes communicated in a message can reduce the vividness with which one can imagine the risks, but only when relying on affective reactions, not when one is cued to rely on deliberative reactions.

We believe our findings have important policy making implications. Public health campaigns often tend to communicate all primary risks associated with a health condition. Given a significant amount of decision making is driven by people’s intuitive, affective reactions (Larrick 1993), current research findings suggest that communicating multiple risks is a strategy which can unintentionally reduce the likelihood of adopting preventive behaviors. Our findings further suggest that for experts, who tend to rely on deliberative cues, presenting multiple health risks is likely to be a more effective strategy than presenting a single health risk. In essence, our findings present insights into how health communication could be made more effective depending on the audience.

REFERENCES


