

# Healthy choices in context: How contextual cues can influence the persuasiveness of framed health messages

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## Abstract

Research has shown that framing messages in terms of benefits or detriments can have a substantial influence on intended behavior. For prevention behaviors, positively framed messages have been found to elicit stronger behavioral intentions than negatively framed messages. Research also seems to indicate that certain contextual features contribute to the persuasiveness of a message. In the present research we test how message framing, contextually presented affect and the number of argument factors interact and contribute to the persuasiveness of a health related message. Consistent with our hypothesis, we found that, in our prevention focused task, increasing the number of arguments increased behavioral intentions (BI) for positively framed messages when subjects were cued, via negative affect, to be attentive to the message. This resulted in a significant framing effect for messages with the maximum number of arguments and a negative background picture. An account of contextual influence in persuasive health messages is discussed.

Keywords: framing, affect, health messages, prevention.

## 1 Introduction

Persuading people to adjust their behavior so that it is more consonant with a healthy lifestyle is no easy matter. Health care organizations are replete with attempts at influencing people to live a more healthy life. Designers of health-persuasive messages can attempt to either encourage a more healthy way of life or discourage an unhealthy one. Determining how the presentational frame of the message influences individuals is of particular importance in health care since the effectiveness of the intended message can have direct bearing on human health and quality of life.

The foundations for understanding how a problems frame may affect decision choice were laid by Kahneman & Tversky's (1979) prospect theory. A central aspect of this work is that people will respond differently depending upon how the decision problem is presented. Specifically, decisions may be presented in such a manner as to accentuate either the positive (gains) or negative (losses) aspects of the task. The effect that positive and negative presentation has on decision choice is referred to as the framing effect. Because of the vast applicability of decision framing, distinct areas of investigation have emerged. Levin, Schneider and Gaeth (1998) (LSG) have distinguished between three types of framing: risky-

choice, attribute and goal framing.

Because most research on health-related choices involves persuasion (Gray, 2008), many health messages can be categorized as goal framing. Goal framing refers to messages that contain arguments describing either the benefits of adopting (gains/positive) or costs of not adopting (losses/negative) a behavior. A distinguishing feature of goal framing is that it attempts to persuade decision makers to adopt a specific behavior which remains the same across frames.

Consider the classic example provided by Detweiler, Bedell, Salovey Pronin and Rothman (1999), in which beachgoers were given a message regarding sunscreen use that varied only in its gain or loss frame. Both the gain and loss framed messages promoted the same behavior and were similar in length and structure. One gain framed argument was "Using sunscreen increases your chances of maintaining healthy, young-looking skin." The corresponding loss framed argument stated "Not using sunscreen decreases your chances of maintaining healthy, young-looking skin." Subjects reported their behavioral intentions to use sunscreen via a questionnaire, and actual behavior was measured by noting the number of people in each condition who later redeemed a coupon for sunscreen. Consistent with their previous research, gain framed messages proved to elicit greater levels of behavioral intention and actual behavior.

In regard to health related messages, gain-framed messages have been found to elicit greater behavioral intention (BI) for prevention behaviors while loss-framed mes-

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sages have been found to elicit greater BI for detection behaviors (Rothman, Salovey, Antone, Keough & Martin, 1993; Rothman & Salovey, 1997; Salovey, Rothman & Rodin, 1998; Detweiler, Bedell, Salovey, Pronin & Rothman, 1999; Rivers, Salovey, Pizzaro D., Pizzaro J. & Schneider, 2005; Kiene, Barta, Zelenski & Cothran, 2005; Gerend & Shepherd, 2007). Prevention behaviors refer to those behaviors which are health-promoting and for which little risk is perceived. Conversely, detection behaviors are those behaviors which are health-detecting and infer some amount of risk in their performance. Previously investigated prevention behaviors include sunscreen use, condom use and smoking cessation. Thus, the relative advantage for gain framed messages in regard to prevention behaviors has been well established.

While the analysis provided by Levin, Schneider & Gaeth provides structure for varying types of framing, it does not address the potential interactions that may exist with certain psychological variables. As they point out, goal frames are more complicated than other frames. They also add that the complication lies in how goal framing manipulates several linguistic and contextual variations within the same task. In the present paper we set out to examine two variables that we identified as being of particular importance for this type of persuasion task: contextually influenced affect and the number of arguments presented.

An extensive body of research has examined how affect and emotions can influence decision making (See the following for reviews: Forgas, 1995; Pfister & Böhm, 2008; Rusting, 1998; Schwarz & Bless, 1991). Although many different accounts depict how affect influences information processing and subsequent decision choices, one explanation is the “affect as information” account proposed by Schwarz and colleagues (Bless et al., 1996; Schwarz, 1990; Schwarz & Clore, 1983). According to this view, negative affect acts as a signal to inform people that they may not be achieving their desired state or goal for a given task. Consequently, this draws their attention to the task at hand and people become more involved and attentive to the task. On the other hand, positive affect informs people that all is well and they do not need to seek out any additional information. As a result, people are less attentive and tend not to seek out additional information from the task when experiencing positive affect. One way of inducing either positive or negative affect involves presentation of affect laden stimuli in the background image. Supporting the affect as information view, this research has shown that negative images elicit a greater attention and stronger response than either positive or neutral stimuli (Coombes, Cauraugh & Janelle, 2007; Hajcak, Dunning & Foti, 2007; Hajcak et al., 2007; Cuthbert, Schupp, Bradley, Birbaumer & Lang, 2000; Most, Smith, Cooter, Levy & Zald, 2007).

Prior research investigating persuasive health messages has found that gain framing elicits greater behavioral intentions for tasks that are focused on the prevention of health related issues (e.g., Rothman & Salovey, 1997), such as the task we use here.

Further, part of the persuasiveness of a message may rest in the number of the arguments presented. In general, persuasiveness should increase as the number of arguments increases. However, the magnitude of this effect should be determined by both attentiveness and the framing of the task. That is, if participants are not attentive to the task because of positive affect cues, then neither the frame nor argument number should be particularly influential. Accordingly, we predict that behavioral intentions should not differ as a function of the number of arguments when a positive background picture is present. On the other hand, when the context contains negative affect cues, the decision maker should be more attentive to the task. In our prevention task, we predict that, for gain framed messages, persuasiveness should increase as the number of arguments increases. However, because negatively framed messages are less effective for encouraging prevention behaviors, this suggests that decision makers will be less involved in the task when it is framed negatively. Consequently, we predict that the number of arguments will be less influential when the problem is negatively framed. In sum, we expect that increasing numbers of arguments should be most influential when a negative affect cue is present and the messages are framed as gains. As a result, we expect behavioral intentions to be greatest when gain framed messages contain a negative background picture and the greatest number of arguments.

## 2 Method

### 2.1 Participants and design

Four hundred and fifty undergraduate students, including 279 females, 155 males and 16 non-gender reporting, participated in this study. We varied frame valence (gain or loss), the number of argument factors (2, 4 or 6) and the background picture, either positive, negative or none in a 2 X 3 X 3 between subjects factorial design.<sup>1</sup> For their participation, subjects received either class credit or credit toward their introductory psychology class research requirement.

The stimuli were randomized so that each subject had an equal opportunity of being represented in any one condition and research assistants were blind as to which variation of the message they were presenting. Each stimuli

<sup>1</sup>We also included a neutral background image but pilot testing showed variability in the valence ratings therefore we did not include it in our later analyses.

Table 1: Arguments used.

1	You don't have to count reps or do multiple sets.
2	Simply performing sit-ups until tired before every shower will eventually burn millions of extra calories & remove pounds of extra fat.*
3	It will take less than one minute & require no change to your routine.
4	It will also tone your stomach and sides & make you look and feel better.
5	In addition, you will increase your cardiovascular health & maintain proper blood pressure.
6	You will lower stress to bones and joints & enjoy some added energy.

\* The text "Simply performing sit-ups until tired before every shower will eventually" was not included as part of argument 2 in the argument length calculations.

packet consisted of three pages, including a consent form, the message and subsequent questionnaire. After signing the consent form, subjects separated it from the rest of the packet so that their answers would remain anonymous.

## 2.2 The persuasive message

In an effort to ensure a balance between the gain and loss framed messages, all of the arguments presented were exactly the same and included no framing manipulation. This eliminated any possibility of a difference in the strength of the arguments between message frames. This also eliminated any possibility that other idiosyncratic features of the arguments, such as their positive or negative tone, would account for differences in message ratings. Thus, between framing conditions, the relative persuasiveness of each message was due solely to the framing manipulation described later.

To ensure a balance between the number of argument conditions, all of the arguments presented were similar in length and structure. Each consisted of two halves that were 7–10 syllables in length and connected by an ampersand. The total length of all but one argument was 17 syllables; due to the word "cardiovascular," argument 5 was 19 syllables. Therefore, the amount of information presented increased uniformly as the number of arguments increased. As a result, the difference in the number of peripheral cues between the 2 and 4 argument conditions was the same as the difference between the 4 and 6 argument conditions and half as much as the difference between the 2 and 6 argument conditions. A full list of the message arguments is provided in Table 1.

Only the last line of the message, which invariably in-

structs subjects to perform sit-ups, contained the frame-valence manipulation. For gain framed messages, this instruction read "Safeguard your health and you will enjoy the reward. Do sit-ups until tired before every shower." For loss framed messages, this instruction read "Don't take chances with your health or you may come to regret it. Do sit-ups until tired before every shower."

## 2.3 Dependent measure

Behavioral Intention (BI) was assessed using a three item measure, which was adapted from a method used by Orth, Oppenheim and Firbasova (2004). Ratings were given on a 5-point scale where 1 represented "Not very true of me" and 5 represented "Very true of me." The self-ratings were: "I believe sit-ups before every shower is definitely right for me," "I will definitely do sit-ups before every shower," and "I will definitely choose another health behavior or no behavior." Ratings were highly consistent (average  $\alpha = .46$ ),<sup>2</sup> and thus summed together with the last item reverse coded to calculate our dependent variable of BI.

## 2.4 Procedure

Subjects reported to the lab or a classroom, were seated and given the 3 page packet. After completing the consent form, they separated it from their stapled packet and returned it to the lab assistant. Subjects then viewed the framed health message and completed the subsequent measures on a third page.

## 3 Results

Behavioral Intention (BI) was submitted to a 2 (frame valence: gain or loss) X 3 (number of arguments: 2, 4 or 6) X 2 (background picture: positive, negative — "none" was omitted for the main analysis) between-subjects ANOVA. The resulting three-way interaction was significant  $t(292) = 2.24$ ,  $p = .0261$ . BI increased with the number of arguments for gain framed messages when a negative background picture was present ( $p = .0001$ ), but BI was not related to number of arguments in any other combination of background picture and frame (including no picture; all  $p$ 's > .23).<sup>3</sup> Figure 1 shows these results.

<sup>2</sup>Cronbach's  $\alpha$  between the first two items was .8; however, analyses performed with the sum of these two items alone did not produce meaningfully different results from those reported in the results section. Thus, these results are not discussed separately.

<sup>3</sup>An overall Valence X Number of Arguments interaction was also observed, such that BI increased with the number of arguments for gain-framed messages ( $p = .0092$ ) but not for loss-framed messages ( $t = 2.73$ ,  $p = .0067$ , for the interaction).

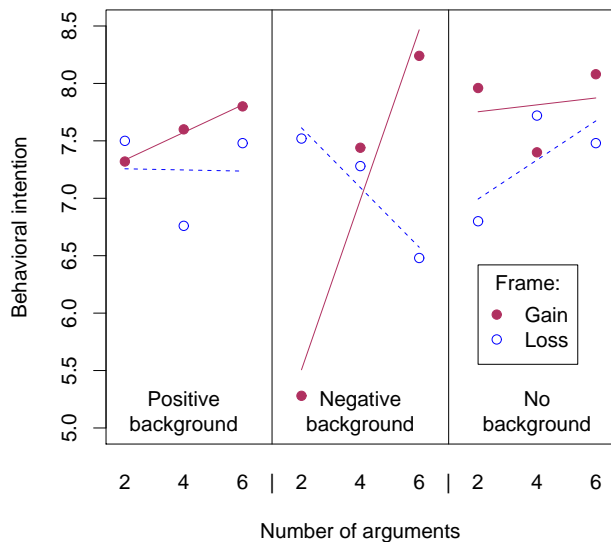


Figure 1: Average Behavioral Intention as a function of frame valence, number of arguments and background picture. Lines (solid for gain, dashed for loss) are based on the best fit regression for each set of three points.

The tendency for BI to increase with the number of arguments for gain framed messages but not for loss framed messages, with the negative background, resulted in a significant framing effect for messages with 6 arguments in which gain-framed messages were rated higher than loss-framed messages  $t(144) = 2.27, p = .028$ . The negative background picture, 6 argument condition proved to be the only one in which a significant framing effect was found.

As predicted, message ratings in the gain frame did not differ significantly as a function of the message frame or the number of arguments for messages with either a positive or no background picture. The average rating across these conditions was 7.48. Thus, when subjects were not presented with a negative affect cue, they were not attentive to the task and simply entered values slightly below the center of the scale, regardless of the message frame or the number of arguments presented.

## 4 Discussion

In the present research we attempted to better understand the processes involved in a persuasive health message by measuring the influence of contextual factors. Our analysis of prior research led us to predict that negative background pictures would lead to greater attentiveness relative to positive background pictures. We predicted that, for gain framed messages, when subjects were cued to be attentive to the task, behavioral intentions would increase as the number of arguments increased. We also

predicted that when participants were cued to be attentive to the task, they would be especially sensitive to the message frame and behavioral intentions would be greater for gain framed than for loss framed messages. When positive affect cues were present in the context, however, we predicted that the message frame and the number of arguments would have less effect on behavioral intentions. As a result, we predicted that the strongest behavioral intentions for our persuasive message would occur when the context contained a negative affect cue, positive framing and the greatest number of arguments.

Consistent with our predictions, increasing the number of arguments did result in relatively higher levels of behavioral intention for gain but not loss framed messages when subjects were attentive to the task (i.e., when the message contained a negative background picture). However, when they were not given a negative affect cue, as in the positive and no background picture conditions, message ratings did not vary across conditions. This resulted in the highest overall level of BI observed for gain framed messages with 6 arguments and a negative background picture. Thus, negative affect cues draw attention to and increase the impact of contextual cues on message persuasiveness.

Although we did not find an overall framing effect for messages with a negative affect cue, when those messages contained 6 arguments, and presumably were the most persuasive, a significant framing effect did emerge. Perhaps the lack of an overall framing effect was due to the subtlety of the framing manipulation, which consisted of only one line that appeared at the end of the message. When the message was maximally persuasive, however, the framing manipulation was sufficient to influence BI. Future research will be needed to determine if this line of reasoning is correct. It may be that the framing effect is insignificant or even reversed when messages are extremely short or the framing manipulation is not pronounced.

These findings also clarify and provide support for the behavior-valence findings established by Rothman and Salovey (1997). Consistent with their findings, the gain frame proved to elicit a higher behavioral intention than the loss frame in our prevention focused task. This was observed in 2/3 of all conditions. While providing support, the findings from this study also clarify how contextual cues can strengthen or attenuate the framing effect.

Based on our findings and analysis of prior research, we propose the following account of contextual influence in persuasive health messages. Consistent with the affect-as-information view, we propose that affectively-laden contextual elements act to induce more detailed processing of the persuasive task. Consequently, when affectively negative information is present in the context, decision makers will become more attentive to the task and in-



formation presented in the message, such as the frame or number of arguments, will have relatively greater impact on an individual's intention to adopt the target behavior. The frame of the task can then act to encourage adoption of the behavior. If the frame acts to enhance the task, as did the positive frame in our study, then related contextual cues (e.g., number of arguments) play a role in the person's likelihood of adopting the particular behavior.

When affectively positive information is present, decision makers will become satisfied and not feel the need to pursue further processing of the information presented in the message. Consequently, the information present in the message, such as the frame or number of arguments, will have less or no influence. In short, when contextual information is affect laden, it can act as an "attention cue" which will either draw greater attention to the task, resulting in further processing, or cue the decision maker that no additional attention nor further processing is necessary. As a result, the frame of presentation and other related contextual variables should have an attenuated impact on the reported likelihood of behavior adoption.

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**Appendix: Background images (negative and positive)**



