

Approach/Avoidance Motivation, Message Framing, and Health Behavior: Understanding the Congruency Effect*

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Abstract Health messages framed to be congruent with individuals' approach/avoidance motivations have been found to be more effective in promoting health behaviors than health messages incongruent with approach/avoidance motivations. This study examines the processes underlying this congruency effect. Participants (undergraduate students, $N = 67$) completed a measure of approach/avoidance orientation (the BIS/BAS scales) and read either a gain- or loss-framed message promoting dental flossing. Results demonstrated a congruency effect: Participants who read a congruently framed message had greater flossing efficacy, intended to floss more, and used more dental flosses than did the participants who read an incongruent message. Moreover, intention to perform the behavior predicted the congruency effect and self-efficacy mediated participants' intentions to perform the health behavior. Discussion centers on the role

of personality factors and situational factors in models of behavior change.

Keywords Approach and avoidance motivation · Message framing · Health behavior · Self-efficacy · Behavioral intentions

Health communications can be framed in terms of the benefits of engaging in a particular behavior (a gain frame), or in terms of the costs of failing to engage in the behavior (a loss frame). Differential effects of gain and loss frames on behaviors are predicted by prospect theory (Tversky & Kahneman, 1981), which suggests that individuals are risk-seeking in the domain of losses and risk-averse in the domain of gains. This framework has been useful in determining how to most effectively frame health communications (Rothman & Salovey, 1997). The type of message frame that will be most effective in a particular situation depends, in part, on aspects of the individual being targeted by the health communication (Mann, Sherman, & Updegraff, 2004).

According to several theories of individual differences in motivation (Carver, Sutton, & Scheier, 2000), behavior is regulated by two distinct systems, an approach system (the behavioral activation system, BAS, Gray, 1990) that regulates appetitive behavior toward potential rewards, and an avoidance system (the behavioral inhibition system, BIS, Gray, 1990) that regulates behavior away from potential threats or punishments. People with a predominant approach orientation are more responsive to cues of reward, whereas people with a predominant avoidance orientation are more responsive to cues of threat and punishment (Carver et al., 2000).

In a study demonstrating what we have termed the congruency effect, participants were classified as either approach- or avoidance-oriented and then read either a

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gain- or loss-framed article about the health behavior of dental flossing. When given the loss-framed message, avoidance-oriented people flossed more than did the approach-oriented people and when given the gain-framed message, approach-oriented people flossed more than did the avoidance-oriented people (Mann et al., 2004). In the current study, we examine the pathways through which the interaction of dispositional motivations and message framing leads to health behavior change.

Models of health behavior change suggest three potential mediating psychological processes, which all may be affected by motivational orientations. First, people may be predisposed to notice cues congruent with their motivational orientation (Derryberry & Reed, 1994). Second, they may pursue goals congruent with their motivational orientation (Elliot & McGregor, 2001), so information framed to be congruent with motivational orientations may lead people to form intentions to perform the health behavior. A third related mediator is self-efficacy, which is important in the performance of a wide range of health behaviors (Bandura, 1998) and which may influence the health behaviors not only directly, but also through the formation of goals or intentions (Ajzen, 1991).

This study explores these three potential mediators of the congruency effect for the health-promoting behavior of dental flossing. Participants' motivational orientation was measured and then they read either a gain-framed or a loss-framed message on flossing. We assessed perception of the message, self-efficacy, and intentions to perform the behavior, and 1 week later we assessed flossing behavior.

Method

Participants

Seventy one undergraduate students received extra credit in a psychology course for participation. Four participants were omitted for not completing all central measures, leaving a total of 67 participants (sex: 28 males, 39 females; age: $M = 19.8$ years; ethnicity: 20 European Americans, 18 Asian/Asian Americans, 8 Latinos/Latinas, 21 missing/other).

Measure of dispositional motivation

As part of a pretest, participants completed the BIS/BAS scale (Carver & White, 1994), a 20-item scale that was designed to assess the relative strengths of people's approach (BAS) and avoidance (BIS) motivations. The seven BIS items ($\alpha = .80$) measure concern over the possibility of bad occurrences and sensitivity to such events. The 13

BAS items ($\alpha = .84$) measure desire to approach positive occurrences.

Procedures

An undergraduate experimenter, unaware of the hypotheses of the study, ran participants individually. Participants completed the study about the processing of health-related messages.¹ Participants were randomly assigned to read either the gain-framed or the loss-framed flossing article and had 10 min to read it. The articles were adapted from the American Dental Association's web page. In the gain-framed message, entitled "Great Breath, Healthy Gums Only a Floss Away," the potential benefits of regular flossing were emphasized. In the loss-framed message, titled "Floss Now and Avoid Bad Breath and Gum Disease," the potential dangers of not flossing were emphasized.

After reading the article, participants indicated their perceptions of the article on several dimensions: accurate, memorable, important, helpful, and useful, on appropriately labeled 7-point scales. These items were averaged to form a reliable index of perceptions of the article ($\alpha = .87$). Nine items assessed participants' self-efficacy about their ability to floss over the coming week on 10-point scales (e.g., "I can floss even if my gums bleed." $\alpha = .93$). Participants also indicated their flossing goals by responding to an item on flossing intentions, "Over the next week, I intend to floss . . . times." Response options ranged from 0 to 8+. At the end of the study, participants were given seven individually wrapped floss sachets, and were told to use them the next seven times they flossed. After 1 week, we e-mailed participants and asked how many times they flossed.

Results

Categorizing avoidance versus approach orientations

Our sample was divided into two groups on the basis of responses to a pretest questionnaire: those who had higher BIS than BAS scores (avoidance people; $N = 23$) and those who had higher BAS than BIS scores (approach people; $N = 44$).

¹ Prior to reading the health article, participants first completed a computer-based anagram-solving task. There was a manipulation embedded in the anagram task. Half of the participants were given one ticket for every anagram they got correct (up to 10), and half of the participants were given 10 tickets, and one was taken away for every anagram they got incorrect. The manipulation did not affect flossing behavior or intentions and will not be mentioned further.

Flossing behavior

We submitted the behavioral data to a 2 (motivational orientation: approach vs. avoidance) \times 2 (message frame: gain vs. loss) ANOVA. There were no main effects, but there was a Motivational orientation \times Message frame interaction, $F(1, 63) = 5.51, p = .02$.² As can be seen in Fig. 1, when given the loss-framed article, avoidance people flossed more ($M = 4.50, SE = 0.82$) than approach people ($M = 2.96, SE = 0.53$). When given the gain-framed article, approach people flossed more ($M = 4.00, SE = 0.58$) than avoidance people ($M = 2.39, SE = 0.72$). Messages congruent with dispositional motivations were most effective at promoting health behaviors (as in Mann et al., 2004).

Perceptions of the health message

No main effects or interactions emerged when examining perceptions of the article as a dependent variable, $F(1, 63) = 0.38, ns$.

Self-efficacy

There were no main effects but there was a Motivational orientation \times Message frame interaction when examining self-efficacy as a dependent variable, $F(1, 63) = 4.61, p = .04$. When given a loss-framed article, avoidance people had stronger beliefs in their ability to floss regularly ($M = 6.53, SE = 0.77$) than approach people ($M = 5.67, SE = 0.50$). When given the gain-framed article, approach people had stronger beliefs in their ability to floss regularly ($M = 7.16, SE = 0.54$) than did the avoidance people ($M = 5.31, SE = 0.67$).

Goals to perform health behavior

There were no main effects but there was a Motivational orientation \times Message frame interaction when examining flossing intentions as a dependent variable, $F(1, 63) = 9.33, p = .003$. When given a loss-framed article, avoidance people had greater flossing intentions ($M = 5.10, SE = 0.69$) than approach people ($M = 3.46, SE = 0.44$). When given

the gain-framed article, approach people had greater flossing intentions ($M = 5.25, SE = 0.49$) than avoidance people ($M = 3.46, SE = 0.44$).

Mediational analysis

Perceptions of the article, self-efficacy, and flossing intentions were all examined as potential mediators of the congruency effect, following Baron and Kenny's (1986) 3-step procedure for testing mediation. Specifically, for each of the three possible mediators, we used multiple regression to test (a) whether the planned interaction predicted the outcome of flossing behavior. For each mediator, the results of this step are identical; the interaction significantly predicts flossing, $\beta = .30, t(63) = 2.35, p = .02$; (b) whether the planned interaction between motivational orientation and message frame predicted the proposed mediator; and (c) whether the proposed mediator remains a significant predictor of flossing behavior after controlling for the effect of the planned interaction.³ Lastly, Baron and Kenny's (1986) modification of the Sobel (1982) test for indirect effects was used to test the significance of the indirect path.

With regard to perceptions of the article, the planned interaction between motivational orientation and message frame was not a significant predictor, $\beta = .31, t(63) = .62, p = .54$. Thus, message perceptions did not mediate the congruency effect.

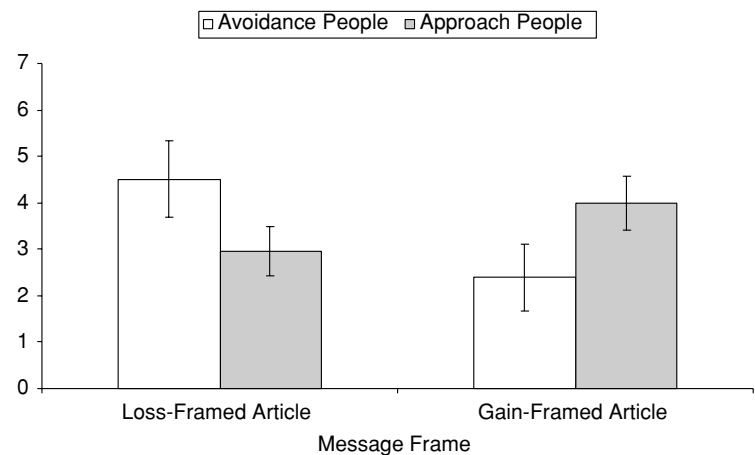
With regard to flossing efficacy, the planned interaction between motivational orientation and message frame significantly predicted participants' beliefs that they could floss regularly, $\beta = .27, t(63) = 2.15, p = .04$. When self-efficacy and the planned interaction were included in a regression predicting flossing behavior, efficacy was a significant predictor of flossing, $\beta = .58, t(62) = 5.52, p < .001$, but the planned interaction was no longer significant, $\beta = .14, t(62) = 1.30, p = .20$. The modified Sobel test was also significant, $Z = 1.98, p < .05$, suggesting that flossing efficacy is a pathway by which motivational orientation and message framing influence flossing behavior.

With regard to intentions to floss, the planned interaction between motivational orientation and message frame significantly predicted how much participants intended to floss over the upcoming week, $\beta = .38, t(63) = 3.05, p = .003$. When intention and the planned interaction were included in a regression predicting flossing behavior, intention was a significant predictor of flossing behavior, $\beta = .67, t(62) = 6.70, p < .001$, but the planned interaction was not, $\beta = .05, t(62) = .45, ns$. The modified Sobel test was significant,

² We tested our interaction hypothesis using two-way ANOVA and a categorical, rather than continuous, operationalization of motivational orientation. As our main dependent measure (flossing) showed substantial deviation from normality, ANOVA allows for a more robust test of the hypotheses as compared to moderated multiple regression. However, to ensure that our results were not simply an artifact of analytical procedure, we replicated the interaction by recoding the flossing measure into three roughly equal categories, and used ordered logit regression with a continuous (BIS minus BAS) rather than categorical measure of motivational orientation (interaction coefficient = $-1.92, SE = .88, Z = -2.17, p = .03$).

³ In all steps of the mediational analyses, the main effects of message frame and motivational orientation were included, but are not reported for the sake of brevity.

Fig. 1 The effect of message framing and approach/avoidance orientation on flossing behavior



$Z = 2.81$, $p < .01$, showing that intention is an additional pathway by which motivational orientation and message framing influence flossing behavior.

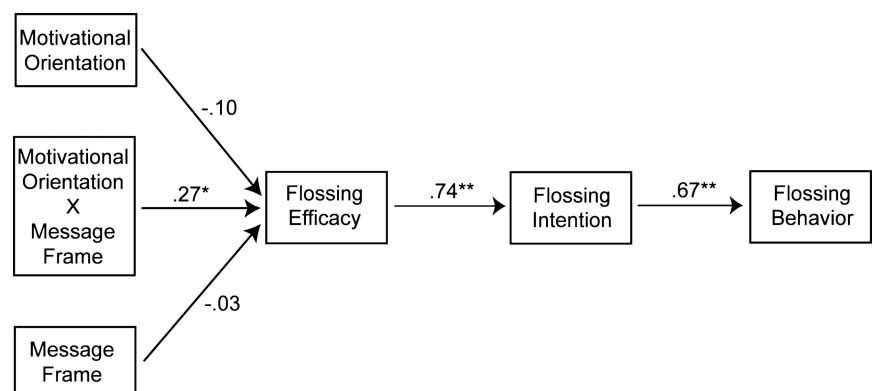
Next, flossing efficacy and intention were both included in a simultaneous regression to determine the more proximal predictor of behavior. Intention emerged as the more proximal predictor of flossing, $\beta = .51$, $t(64) = 3.81$, $p < .001$, whereas the unique influence of efficacy on behavior was no longer significant, $\beta = .23$, $t(64) = 1.69$, $p = .10$. However, in separate analyses, efficacy was a clear and significant predictor of intention, both in analyses where it was the predictor of intention, $\beta = .74$, $t(65) = 8.78$, $p < .001$, as well as when simultaneously controlling for the direct effects of message frame and motivational orientation on intention, $\beta = .69$, $t(62) = 7.96$, $p < .001$. Figure 2 shows the path model in which efficacy and intention predict the effect of motivational orientation and message frame on flossing behavior. This model fits the data well, $\chi^2(7) = 9.70$, $p = .21$; NFI = 0.92; CFI = 0.97; RMSEA = 0.08) and other models including paths from the interaction to either intention or behavior were not significant.

Discussion

In this study, dispositional motivation moderated the effectiveness of differentially framed health messages. Participants who had an approach orientation flossed more after reading a gain-framed article and participants who had an avoidance orientation flossed more after reading a loss-framed article. More importantly, this study suggests that self-efficacy and intentions form a pathway by which dispositional motivations interact with message framing to produce positive health behaviors.

In addition, this study demonstrates that such factors as message framing and dispositional motivations can be integrated into larger theories of health behavior change. The theory of planned behavior (Ajzen, 1991) and social cognitive theory (Bandura, 1998) specify processes that lead to behavior change, such as perceived efficacy and intentions. The current study found both an individual difference factor (approach/avoidance motivation) and a situational factor (message framing) that interact within the context of a particular health message to enhance self-efficacy, intentions, and behavior change. In doing so, the present research provides

Fig. 2 Path model showing efficacy and intention as predictors of the effect of approach/avoidance orientation and message frame on flossing behavior. * $p < .05$. ** $p < .01$



an attempt to integrate both person and situation variables within broad theories of behavior change.

This study joins a number of studies that have found that matching health messages to dispositional tendencies can increase the effectiveness of the message, such as need for cognition (Steward, Schneider, Pizarro, & Salovey, 2004) and monitor-blunter coping style (Williams-Piehot, Pizarro, Schneider, Mowad, & Salovey, 2005). A common mechanism was suggested by Petty and Wegener (1998), who found that matched messages lead to greater scrutiny of the message, and consequently, greater persuasion. In support of this possibility, recent research in our lab (Updegraff, Sherman, Luyster, & Mann, *in press*) has found that the congruency effect obtains only for health messages with strong (and not weak) arguments in favor of the health behavior.

This study demonstrates that approach/avoidance motivation can moderate the differential effectiveness of gain-versus loss-framed health messages. Moreover, this study demonstrates the psychological processes underlying the congruency effect. Receiving a message that is congruent with a long-standing disposition leads to greater self-efficacy, stronger intentions to perform behavior, and subsequently, behavior change. This study suggests not only important personality and situational factors that moderate the effectiveness of health messages, but also that these same factors could be implemented among health-care practitioners in delivering health communications. Practitioners who determine the approach/avoidance motivation of a patient and deliver health messages framed accordingly may find their message more persuasive and effective at promoting positive health behavior.

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