

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 dispositional 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 strong 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 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

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58 people flossed more than did the avoidance-oriented people
59 (Mann et al., 2004). In the current study, we examine the path-
60 ways through which the interaction of dispositional motiva-
61 tions and message framing leads to health behavior change.

62 Models of health behavior change suggest three poten-
63 tial mediating psychological processes, which all may be
64 affected by motivational orientations. First, people may be
65 predisposed to notice cues congruent with their motivational
66 orientation (Derryberry & Reed, 1994). Second, they may
67 pursue goals congruent with their motivational orientation
68 (Elliot & McGregor, 2001), so information framed to be
69 congruent with motivational orientations may lead people
70 to form intentions to perform the health behavior. A third
71 related mediator is self-efficacy, which is important in the
72 performance of a wide range of health behaviors (Bandura,
73 1998) and which may influence the health behaviors not only
74 directly, but also through the formation of goals or intentions
75 (Ajzen, 1991).

76 This study explores these three potential mediators of the
77 congruency effect for the health-promoting behavior of den-
78 tal flossing. Participants' motivational orientation was mea-
79 sured and then they read either a gain-framed or a loss-framed
80 message on flossing. We assessed perception of the message,
81 self-efficacy, and intentions to perform the behavior, and 1
82 week later we assessed flossing behavior.

83 Method

84 Participants

85 Seventy one undergraduate students received extra credit
86 in a psychology course for participation. Four participants
87 were omitted for not completing all central measures, leav-
88 ing a total of 67 participants (sex: 28 males, 39 females;
89 age: $M = 19.8$ years; ethnicity: 20 European Americans,
90 18 Asian/Asian Americans, 8 Latinos/Latinas, 21 missing/
91 other).

92 Measure of dispositional motivation

93 As part of a pretest, participants completed the BIS/BAS
94 scale (Carver & White, 1994), a 20-item scale that was de-
95 signed to assess the relative strengths of people's approach
96 (BAS) and avoidance (BIS) motivations. The seven BIS items
97 ($XX = .80$) measure concern over the possibility of bad oc-
98 currences and sensitivity to such events. The 13 BAS items
99 ($XX = .84$) measure desire to approach positive occurrences.

100 Procedures

101 An undergraduate experimenter, unaware of the hypotheses
102 of the study, ran participants individually. Participants com-

103 pleted the study about the processing of health-related mes-
104 sages.¹ Participants were randomly assigned to read either
105 the gain-framed or the loss-framed flossing article and had
106 10 min to read it. The articles were adapted from the Ameri-
107 can Dental Association's web page. In the gain-framed mes-
108 sages, entitled "Great Breath, Healthy Gums Only a Floss
109 Away," the potential benefits of regular flossing were em-
110 phasized. In the loss-framed message, titled "Floss Now and
111 Avoid Bad Breath and Gum Disease," the potential dangers
112 of not flossing were emphasized.

113 After reading the article, participants indicated their per-
114 ceptions of the article on several dimensions: accurate, mem-
115 orable, important, helpful, and useful, on appropriately la-
116 beled 7-point scales. These items were averaged to form a
117 reliable index of perceptions of the article ($XX = .87$). Nine
118 items assessed participants' self-efficacy about their abil-
119 ity to floss over the coming week on 10-point scales (e.g.,
120 "I can floss even if my gums bleed." $XX = .93$). Partici-
121 pants also indicated their flossing goals by responding to
122 an item on flossing intentions, "Over the next week, I in-
123 tend to floss ... times." Response options ranged from 0
124 to 8+. At the end of the study, participants were given
125 seven individually wrapped floss sachets, and were told to
126 use them the next seven times they flossed. After 1 week,
127 we e-mailed participants and asked how many times they
128 flossed.

129 Results

130 Categorizing avoidance versus approach orientations

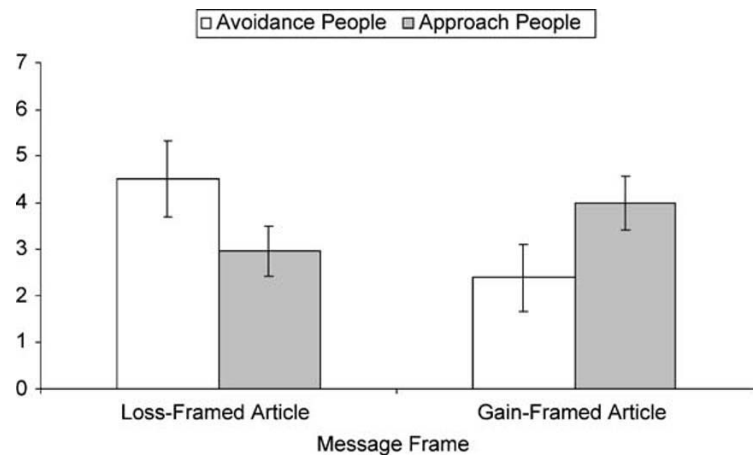
131 Our sample was divided into two groups on the basis of
132 responses to a pretest questionnaire: those who had higher
133 BIS than BAS scores (avoidance people; $N = 23$) and those
134 who had higher BAS than BIS scores (approach people;
135 $N = 44$).

136 Flossing behavior

137 We submitted the behavioral data to a 2 (motivational orien-
138 tation: approach vs. avoidance) \times 2 (message frame: gain vs.
139 1 loss) ANOVA. There were no main effects, but there was
140 a Motivational orientation \times Message frame interaction,

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.

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



141 $F(1, 63) = 5.51, p = .02$.² As can be seen in Fig. 1, when
 142 given the loss-framed article, avoidance people flossed more
 143 ($M = 4.50, SE = 0.82$) than approach people ($M = 2.96,$
 144 $SE = 0.53$). When given the gain-framed article, approach
 145 people flossed more ($M = 4.00, SE = 0.58$) than avoidance
 146 people ($M = 2.39, SE = 0.72$). Messages congruent with dis-
 147 positional motivations were most effective at promoting
 148 health behaviors (as in Mann et al., 2004).

149 Perceptions of the health message

150 No main effects or interactions emerged when examining
 151 perceptions of the article as a dependent variable, $F(1,$
 152 $63) = 0.38, ns$.

153 Self-efficacy

154 There were no main effects but there was a Motiva-
 155 tional orientation \times Message frame interaction when exam-
 156 ining self-efficacy as a dependent variable, $F(1, 63) = 4.61,$
 157 $p = .04$. When given a loss-framed article, avoidance peo-
 158 ple had stronger beliefs in their ability to floss regularly
 159 ($M = 6.53, SE = 0.77$) than approach people ($M = 5.67,$
 160 $SE = 0.50$). When given the gain-framed article, approach
 161 people had stronger beliefs in their ability to floss regu-
 162 larly ($M = 7.16, SE = 0.54$) than did the avoidance people
 163 ($M = 5.31, SE = 0.67$).

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 = $-1.92, SE = .88, Z = -2.17, p = .03$).

164 Goals to perform health behavior

165 There were no main effects but there was a Motivational
 166 orientation \times Message frame interaction when examining
 167 flossing intentions as a dependent variable, $F(1, 63) = 9.33,$
 168 $p = .003$. When given a loss-framed article, avoidance peo-
 169 ple had greater flossing intentions ($M = 5.10, SE = 0.69$)
 170 than approach people ($M = 3.46, SE = 0.44$). When given
 171 the gain-framed article, approach people had greater floss-
 172 ing intentions ($M = 5.25, SE = 0.49$) than avoidance people
 173 ($M = 3.46, SE = 0.44$).

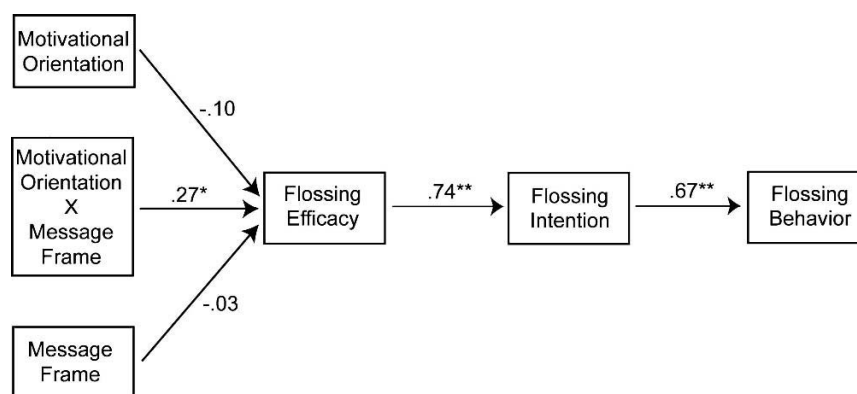
174 Mediation analysis

175 Perceptions of the article, self-efficacy, and flossing inten-
 176 tions were all examined as potential mediators of the con-
 177 gruency effect, following Baron and Kenny's (1986) 3-step
 178 procedure for testing mediation. Specifically, for each of the
 179 three possible mediators, we used multiple regression to test
 180 (a) whether the planned interaction predicted the outcome of
 181 flossing behavior. For each mediator, the results of this step
 182 are identical; the interaction significantly predicts flossing,
 183 $\beta = .30, t(63) = 2.35, p = .02$; (b) whether the planned inter-
 184 action between motivational orientation and message frame
 185 predicted the proposed mediator; and (c) whether the pro-
 186 posed mediator remains a significant predictor of flossing
 187 behavior after controlling for the effect of the planned inter-
 188 action.³ Lastly, Baron and Kenny's (1986) modification of
 189 the Sobel (1982) test for indirect effects was used to test the
 190 significance of the indirect path.

191 With regard to perceptions of the article, the planned inter-
 192 action between motivational orientation and message frame
 193 was not a significant predictor, $\beta = .31, t(63) = .62, p = .54$.

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



194 Thus, message perceptions did not mediate the congruency
195 effect.

196 With regard to flossing efficacy, the planned interac-
197 tion between motivational orientation and message frame
198 significantly predicted participants' beliefs that they could
199 floss regularly, $\beta = .27$, $t(63) = 2.15$, $p = .04$. When self-
200 efficacy and the planned interaction were included in a re-
201 gression predicting flossing behavior, efficacy was a signif-
202 icant predictor of flossing, $\beta = .58$, $t(62) = 5.52$, $p < .001$,
203 but the planned interaction was no longer significant, $\beta = .14$,
204 $t(62) = 1.30$, $p = .20$. The modified Sobel test was also sig-
205 nificant, $Z = 1.98$, $p < .05$, suggesting that flossing efficacy
206 is a pathway by which motivational orientation and message
207 framing influence flossing behavior.

208 With regard to intentions to floss, the planned interaction
209 between motivational orientation and message frame signifi-
210 cantly predicted how much participants intended to floss over
211 the upcoming week, $\beta = .38$, $t(63) = 3.05$, $p = .003$. When
212 intention and the planned interaction were included in a re-
213 gression predicting flossing behavior, intention was a signif-
214 icant predictor of flossing behavior, $\beta = .67$, $t(62) = 6.70$,
215 $p < .001$, but the planned interaction was not, $\beta = .05$,
216 $t(62) = .45$, *ns*. The modified Sobel test was significant,
217 $Z = 2.81$, $p < .01$, showing that intention is an additional
218 pathway by which motivational orientation and message
219 framing influence flossing behavior.

220 Next, flossing efficacy and intention were both included
221 in a simultaneous regression to determine the more prox-
222 imal predictor of behavior. Intention emerged as the more
223 proximal predictor of flossing, $\beta = .51$, $t(64) = 3.81$, $p < .001$,
224 whereas the unique influence of efficacy on behav-
225 ior was no longer significant, $\beta = .23$, $t(64) = 1.69$, $p = .10$.
226 However, in separate analyses, efficacy was a clear and sig-
227 nificant predictor of intention, both in analyses where it was
228 the predictor of intention, $\beta = .74$, $t(65) = 8.78$, $p < .001$,
229 as well as when simultaneously controlling for the direct
230 effects of message frame and motivational orientation on in-
231 tention, $\beta = .69$, $t(62) = 7.96$, $p < .001$. Figure 2 shows the
232 path model in which efficacy and intention predict the effect

233 of motivational orientation and message frame on flossing
234 behavior. This model fits the data well, $\chi^2(7) = 9.70$,
235 $p = .21$; NFI = 0.92; CFI = 0.97; RMSEA = 0.08) and other
236 models including paths from the interaction to either inten-
237 tion or behavior were not significant.

238 Discussion

239 In this study, dispositional motivation moderated the effec-
240 tiveness of differentially framed health messages. Partic-
241 ipants who had an approach orientation flossed more af-
242 ter reading a gain-framed article and participants who had
243 an avoidance orientation flossed more after reading a loss-
244 framed article. More importantly, this study suggests that
245 self-efficacy and intentions form a pathway by which dispo-
246 sitional motivations interact with message framing to pro-
247 duce positive health behaviors.

248 In addition, this study demonstrates that such factors as
249 message framing and dispositional motivations can be inte-
250 grated into larger theories of health behavior change. The
251 theory of planned behavior (Ajzen, 1991) and social cog-
252 nitive theory (Bandura, 1998) specify processes that lead to
253 behavior change, such as perceived efficacy and intentions.
254 The current study found both an individual difference fac-
255 tor (approach/avoidance motivation) and a situational factor
256 (message framing) that interact within the context of a partic-
257 ular health message to enhance self-efficacy, intentions, and
258 behavior change. In doing so, the present research provides
259 an attempt to integrate both person and situation variables
260 within broad theories of behavior change.

261 This study joins a number of studies that have found that
262 matching health messages to dispositional tendencies can
263 increase the effectiveness of the message, such as need for
264 cognition (Steward, Schneider, Pizarro, & Salovey, 2004)
265 and monitor-blunter coping style (Williams-Piehot, Pizarro,
266 Schneider, Mowad, & Salovey, 2005). A common mech-
267 anism was suggested by Petty and Wegener (1998), who
268 found that matched messages lead to greater scrutiny of the

269 message, and consequently, greater persuasion. In support of
270 this possibility, recent research in our lab (Updegraff, Sher-
271 man, & Mann, 2005) has found that the congruency effect
272 obtains only for health messages with strong (and not weak)
273 arguments in favor of the health behavior.

274 This study demonstrates that approach/avoidance moti-
275 vation can moderate the differential effectiveness of gain-
276 versus loss-framed health messages. Moreover, this study
277 demonstrates the psychological processes underlying the
278 congruency effect. Receiving a message that is congruent
279 with a long-standing disposition leads to greater self-efficacy,
280 stronger intentions to perform behavior, and subsequently,
281 behavior change. This study suggests not only important
282 personality and situational factors that moderate the effec-
283 tiveness of health messages, but also that these same factors
284 could be implemented among health-care practitioners in
285 delivering health communications. Practitioners who deter-
286 mine the approach/avoidance motivation of a patient and
287 deliver health messages framed accordingly may find their
288 message more persuasive and effective at promoting positive
289 health behavior.

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