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Improving oral health behavior

A social psychological approach

David K. Sherman, PhD; John A. Updegraff, PhD; Traci Mann, PhD

Kurt Lewin,¹ one of the founders of social psychology, proposed that any behavior is a function of personal factors that a person brings to a particular situation and how those personal factors interact with elements of the situation. Social psychological approaches embody this perspective, examining the interaction between personal factors (such as dispositions and motivations) and situational factors, including how information is structured or presented.²

In this article, we review our research that has used this social psychological approach to understand how people respond to health information, and we describe its relevance with regard to improving oral health behaviors. In particular, we describe our research findings, which demonstrate that dental health messages that are presented in a style that is congruent with people's personalities are more effective in promoting flossing behavior than are messages that are presented in an incongruent style.^{3,4}

All of our studies³⁻⁵ have examined people's health behavior with

ABSTRACT

Background. The authors describe social psychological research that has found consistent beneficial effects of framing health messages to be congruent with personality factors in encouraging preventive oral health behaviors.

Methods. The authors describe several studies in which they administered health messages to young adults who did not floss and who were classified as predominantly approach-oriented or avoidance-oriented on the basis of a short personality questionnaire. They framed the messages to emphasize the benefits of dental flossing or the costs of not flossing. The authors assessed the effectiveness in terms of flossing efficacy and flossing behavior.

Results. When patients received a dental health message that was congruent with their motivational orientation—approach or avoidance—they had a stronger belief that they were capable of flossing, expressed greater intentions to floss and exhibited increased flossing behavior (flossing 50 to 65 percent more often in the following week).

Conclusions. Two factors that dental practitioners should consider when delivering information are whether the patient is more approach- or avoidance-oriented and whether to frame the message in terms of gains or losses.

Clinical Implications. Practitioners can use these theory-based findings in dental practice to promote positive oral health behaviors by administering brief personality assessments to patients and by framing the message accordingly.

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regard to dental flossing. Preventive oral health behaviors such as daily brushing, flossing and regular dental visits are necessary to prevent the rapid accumulation of plaque that can lead to long-term health problems such as periodontitis, tooth loss, coronary heart disease, stroke and preterm birth.⁶⁻¹¹ Despite the importance of these behaviors, adherence to oral health recommendations often is low. Thus, efficient and effective interventions are needed to increase adherence.

In this article, we describe several studies that provide a starting point for creating such interventions.

MESSAGE FRAMING AND DISPOSITIONAL MOTIVATIONS

A growing body of literature has examined the differential effects of message framing—or how messages are presented—on health behaviors.¹² The features of a health behavior can be framed in terms of the benefits of engaging in the behavior (called a “gain frame”) or in terms of the costs of failing to engage in the behavior (called a “loss frame”). For example, a gain-framed message states, “If you floss regularly, you will have healthier teeth and gums,” whereas a loss-framed message states, “If you don’t floss regularly, the health of your teeth and gums is at risk.” Although these frames refer to objectively equivalent situations, research has shown that they have different effects on people’s judgments, decisions and behaviors.¹³ These differential effects are based on “prospect theory,”¹⁴ which suggests that people are more likely to engage in risky behavior when losses are highlighted and more averse to taking risks when gains are highlighted.

This framework has been useful in determining how to most effectively frame health communications. In particular, researchers make a distinction between risk detection behaviors, such as undergoing testing for the human immunodeficiency virus, and prevention behaviors, such as using sunscreen.¹² Because risk detection behaviors are inherently risky, as they may detect a serious disease, a message that focuses on the losses associated with the potential test results should be more effective in promoting the behavior than a message focused on the potential gains associated with testing.

By contrast, for behaviors that prevent illness, a message that focuses on the gains associated with performing the behavior should be more effective than a loss-framed message.¹² Dental

behaviors, such as flossing, can be considered both prevention and detection behaviors as they enable a person to both prevent gingival disease and detect dental problems (for example, bleeding gingivae during flossing). In determining how to frame information about dental flossing, we have examined, through our research, other factors beyond detection and prevention that would predict which message frame is most effective. In particular, we have examined the personal factor of approach and avoidance motivation.

According to several theories of motivation,¹⁵⁻¹⁷ behavior is regulated by two distinct systems: an approach system that regulates appetitive behavior toward potential rewards and an avoidance system that regulates behavior away from potential threats or punishments.¹⁸ Although all people use both systems at different times, differences exist among people regarding the extent to which they are generally approach-oriented or avoidance-oriented. People with a strong approach orientation are more responsive to cues of reward, whereas people with a strong avoidance orientation are more responsive to cues of threat and punishment.¹⁵ Moreover, researchers and practitioners can assess these approach and avoidance orientations via simple questionnaires.¹⁹

THE CONGRUENCY EFFECT

Because dispositional motivations are known to be central in regulating a wide variety of behaviors,²⁰ adopting this framework has proved useful in determining how dental health messages should be framed for different people. Those who are more sensitive to approach cues may be more receptive to changing their behavior via a gain-framed dental health message, and people who are more sensitive to avoidance cues may be more receptive to a loss-framed dental health message.

Our first study regarding what we term the “congruency effect” examined this hypothesis in a sample of young adults who did not floss their teeth regularly.³ The participants, 63 undergraduate students at the University of California, Los Angeles (UCLA), completed a simple 20-item measure of motivation based on Carver and White’s scales¹⁹ that contained items assessing their approach motivation (for example, “When I get something I want, I feel excited and ener-

ABBREVIATION KEY. UCLA: University of California, Los Angeles.

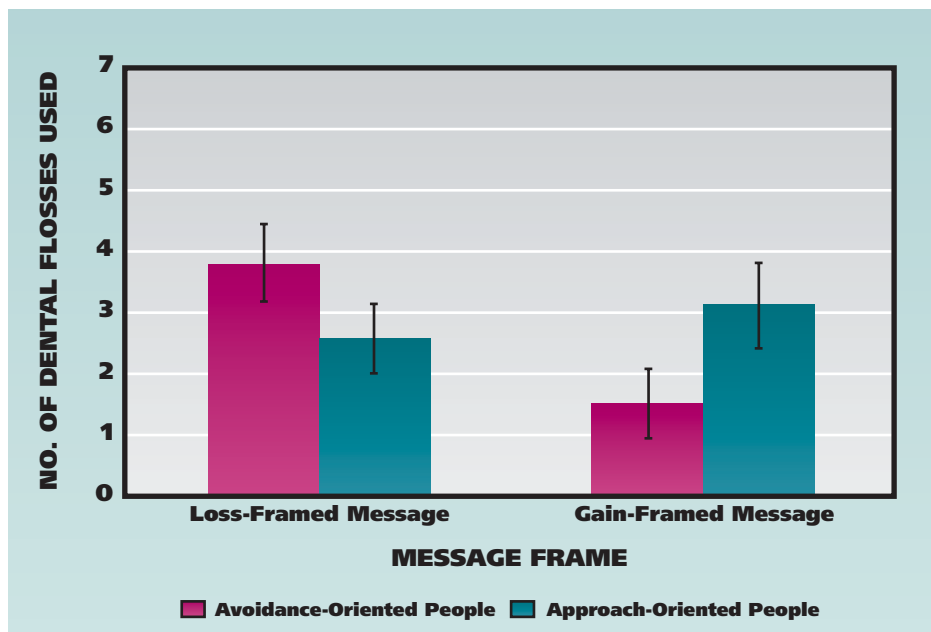


Figure 1. The effect of message framing and approach and avoidance orientation on flossing behavior. Error bars refer to ± standard error of the mean. Data were analyzed via a 2 × 2 analysis of variance. The interaction was significant: $F_{1,59} = 5.09, P = .03$. For more details, see Mann and colleagues,³ who used a multiple regression analysis with the difference between approach and avoidance orientation treated as a continuous measure. Adapted with permission of the American Psychological Association from Mann and colleagues.³

gized”) and avoidance motivation (for example, “I worry about making mistakes”). The scales ranged from 1 (strongly disagree) to 5 (strongly agree).²¹ From this questionnaire, we classified participants as being primarily approach-oriented (if their approach motivation scores were greater than their avoidance motivation scores; $n = 33$) or primarily avoidance-oriented (if their avoidance motivation scores were greater than their approach motivation scores; $n = 30$).

We then randomly assigned participants to read one of two articles we wrote advocating dental flossing.²² One article emphasized the benefits that would occur with regular flossing (the gain-framed message), while the second article emphasized the potential dangers and risks that would occur by failing to floss (the loss-framed message).²²

The gain-framed message, titled “Great Breath, Healthy Gums Only a Floss Away,” emphasized the potential benefits of regular flossing, as well as the undesirable outcomes that would be prevented. For example, an excerpt from the gain-framed message informed participants that “flossing your teeth daily removes particles of food in the mouth, avoiding bacteria, which promotes great breath.” The loss-framed message,

titled “Floss Now and Avoid Bad Breath and Gum Disease,” emphasized the potential dangers of not flossing, as well as the desirable outcomes that would be missed. Accordingly, the comparable excerpt in the loss-framed message read, “If you don’t floss your teeth daily, particles of food remain in the mouth, collecting bacteria, which causes bad breath.”

At the conclusion of the 20-minute experimental session, research assistants gave all participants seven individually wrapped single-use packages of dental floss for them to take home. The following week, the research assistants asked the participants to report the number of packages of floss they had used.

By providing participants with dental floss, we hoped to provide what Lewin¹ called a “channel factor” for those who did not floss to facilitate the behavior. Having dental floss at hand, we reasoned, should open up the channel to make it easier for them to perform the relevant behavior to the extent that they were motivated by the message.²

The predicted interaction effect between the personal and situational factors emerged (Figure 1).³ When given the loss-framed message, avoidance-oriented people flossed more often than did approach-oriented people. When given the gain-framed message, approach-oriented people flossed more often than did avoidance-oriented people. Thus, people engaged in more positive dental behaviors—flossing 65 percent more often in the next week—when they received a dental health message that was congruent with their approach or avoidance motivation.³

Psychological mechanisms. We have since replicated these findings in two separate studies,^{4,5} each shedding light on the psychological mechanisms behind the congruency effect. In one follow-up study,⁴ we examined whether receiving information congruent with their dispositions leads people to have a stronger belief that they are capable of flossing (that is, flossing efficacy) and whether this leads them to increase

their intentions to floss, which leads to the actual behavioral change. Again, the participants were young adults (mean age, 19.8 years), 67 undergraduates at UCLA who did not floss their teeth regularly. They indicated their approach or avoidance orientation by using the same questionnaire that was used in the earlier study, before being randomly assigned to read the gain-framed or loss-framed message.

We classified participants as we had done in the previous study³ (23 avoidance-oriented people and 44 approach-oriented people). They then completed a nine-item measure of flossing efficacy, which is their beliefs about their ability to floss during the coming week (two of the items were “I can floss every day” and “I can floss even if my gums bleed”). Participants rated these efficacy items on 10-point scales (1 = strongly disagree, 10 = strongly agree). They also indicated their flossing goals by responding to the item, “Over the next week, I intend to floss X times.” Response options with regard to flossing goals ranged from 0 to 8+. At the end of the study, research assistants gave all participants seven individually wrapped packages of dental floss to take home and told them to use them the next seven times they flossed. After exactly one week, the research assistants contacted participants via e-mail and asked them how many packages of dental floss they had used during the previous week. This number served as our measure of flossing behavior.

Figure 2 depicts the results.⁴ The study replicated the congruency effect on actual flossing behavior, with participants in this study flossing 50 percent more often in the week after reading the congruently framed message than they did after reading the incongruently framed message. Moreover, the study found that participants reported greater flossing efficacy after reading a congruent message. Further analyses showed that this increased sense of efficacy led them to have intentions to floss more, which they carried through into increased flossing behavior the next week.

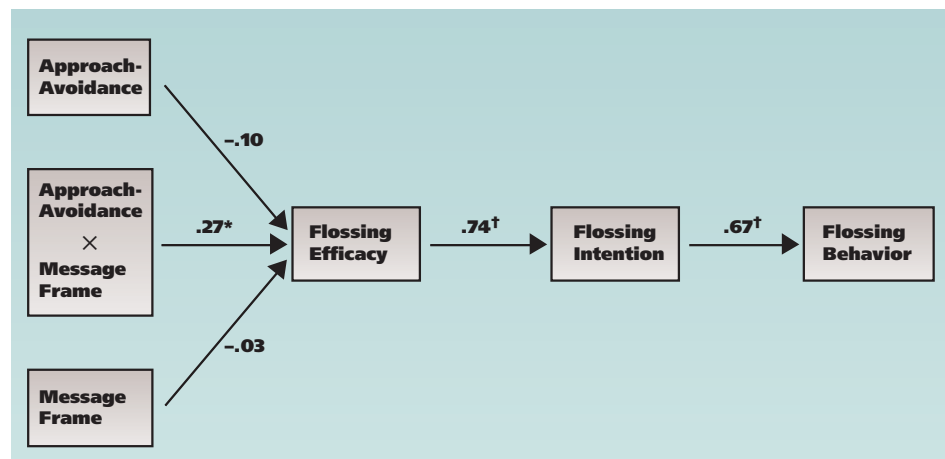


Figure 2. Path model showing efficacy and intention as mediators of the effect of the approach and avoidance orientations and message frame on flossing behavior. Coefficients represent standardized regression weights in the path model. Nonsignificant paths from “Approach-Avoidance” and “Message Frame” to “Flossing Efficacy” indicate no main effects of motivation or message frame. The significant path from “Approach-Avoidance × Message Frame” to “Flossing Efficacy” indicates that the match between the approach and avoidance orientation and the message frame was the only significant determinant of efficacy, intention and behavior. *: $P < .05$. †: $P < .01$. Adapted with permission of Springer Science and Business Media from Sherman and colleagues.⁴

Message type. An important question raised by these findings is whether any dental health message would be effective if it is framed to be congruent with approach and avoidance orientations, or whether it needs to be a particular type of message. In another study,⁵ we addressed this issue by asking 136 undergraduates (mean age, 19.7 years) at Kent State University, Kent, Ohio, who indicated that they did not floss regularly (80 approach-oriented and 56 avoidance-oriented, classified according to the questionnaire as in previous studies) to read congruently framed messages. These messages contained strong arguments for flossing (“Flossing eliminates bacteria that can damage the gums.”) and presented empirical evidence (“A randomized controlled study showed a 75 percent improvement in dental health and breath quality among people who flossed daily.”) or contained weak arguments for flossing (“People report that flossing helps them develop dexterity and coordination in their fingers.”) and presented anecdotal evidence (“As a regular flosser reports, ‘Now that I’ve started flossing my teeth regularly, my breath seems a lot better.’”).

Congruency and argument strength. We analyzed data via a 2×2 analysis of variance that examined the joint effects of congruency and argument strength on perceptions of the messages. Updegraff and colleagues⁵ discussed these analyses in more detail. As predicted, dental

health messages that contained strong arguments and were framed to be congruent with approach and avoidance orientations were perceived by participants as being the most convincing messages.⁵ In fact, subjects perceived messages that contained weak arguments as being even less convincing when they were framed to be congruent with approach and avoidance orientations. This suggests that when messages are framed to be congruent with their approach or avoidance orientations, people are better able to discern strong and weak arguments, indicating that they are more attuned to what is being communicated. Moreover, it appears that strong arguments in favor of a health behavior are needed for motivational orientation to exert an impact on the person's health behavior.

IMPLICATIONS FOR DENTAL PRACTICE

Health messages are most effective when they tell a person why they should change their behaviors. Yet, our research shows that how the "why" is communicated is vitally important as well. Our social psychological approach suggests two factors that dental practitioners should consider when they are delivering information. First, it may be fruitful, and not difficult, to evaluate whether a patient is more approach- or avoidance-oriented. During intake, a patient can complete the simple personality scale used in our research.^{19,21,22}

Second, once the dentist determines the patient's motivational orientation, he or she can frame the information accordingly.²³ Because failure to floss occurs regularly among some patients and leads to negative outcomes, plenty of opportunities exist for a dentist or dental staff member (for example, the hygienist) to present flossing information. This information could emphasize either the positive things that can happen when one flosses (gain-framed) or the negative things that can happen when one fails to floss (loss-framed), and being cognizant of this distinction may prove fruitful. Our research has provided consistent evidence that congruently framed health messages can lead to increases in dental flossing. We suggest that practitioners who determine the dispositional motivation of a patient and deliver health messages framed accordingly may find their message more persuasive and more effective in improving compliance.

Presenting any health information to patients, however, runs the risk of causing them to become defensive. If dental health problems are caused

by an unhealthful lifestyle, such as smoking or poor oral hygiene habits, then patients may interpret the invocation to change their dental behavior as a personal threat. Findings from social psychology studies demonstrate that people are defensive about health information related to tobacco use, caffeine use and alcohol use.^{24,25} One way to reduce this defensiveness is to first ask patients to focus on other aspects of their lives that are important to them in domains unrelated to the health message (for example, their hobbies). Extensive research has found that when people affirm themselves in this way, they are less defensive and more receptive to health messages that contain important information but are potentially psychologically threatening.²⁶⁻²⁸

Despite the fact that health interventions are most successful when they are guided by theory,²⁹ most oral health interventions have not been guided in this way.^{30,31} As research findings suggest, even minimal interventions can be effective if they are tailored to address key theory-relevant characteristics of the targeted person.^{3,4,32,33} Although our research has found consistent evidence to support these types of social psychological interventions, two important limitations are that all of our studies were conducted with college students, and that we have examined only one behavior: dental flossing.

CONCLUSION

It is important that future research extends these study findings to community samples of varying educational levels, cultural backgrounds and socioeconomic status, as well as includes additional measures of dental health, such as plaque, gingivitis and caries.³⁴ We hope that we have presented some useful ideas from the social psychological community to the dental community in the service of developing such interventions and facilitating more positive oral health behaviors. ■

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