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# When "Fit" Leads to Fit, and When "Fit" Leads to Fat: How Message Framing and Intrinsic v. Extrinsic Exercise Outcomes Interact in Promoting Physical Activity

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Abstract

A unique aspect of exercise is that people may choose to engage in to achieve a variety of outcomes, ranging from extrinsic (appearance, health) to intrinsic (satisfaction, enjoyment). We examined how the impact of gain- vs. loss-framed messages depends on the type of outcome emphasized. Drawing from regulatory focus theory (Higgins, 1997, 2000), we predicted that gain-framed messages would "fit" with intrinsic outcomes and loss-framed messages would "fit" with extrinsic outcomes, but the effect of such fit on physical activity would depend on participants' need for cognition (NC). We tested these hypotheses with a sample of 176 sedentary young adults who read an exercise message with randomly-assigned frame (gain/loss) and outcome (intrinsic/extrinsic). Participants provided daily reports of exercise over the following week. The predicted interaction between frame, outcome, and NC was found ($p$ = .001), such that a "fit" message promoted somewhat, but not significantly, greater exercise for those with high NC, but a "non-fit" message promoted significantly greater exercise for those with low NC. Furthermore, differences in physical activity were partially mediated by attitudes towards exercise. Findings shed light on how the outcomes and motivations associated with physical activity shape people's behavioral responses to framed health communications.

*Keywords*: exercise, health behavior, persuasive communication, messages, intrinsic motivation, extrinsic motivation

# When "Fit" Leads to Fit, and When "Fit" Leads to Fat: How Message Framing and Intrinsic v. Extrinsic Exercise Outcomes Interact in Promoting Physical Activity

According to the Surgeon General (U.S. Department of Health and Human Services [USDHHS], 2000), more than sixty percent of adults in America do not participate in regular physical activity and twenty-five percent are not at all active. Physical activity has a number of well-known benefits, such as reducing risk for cardiovascular disease, diabetes mellitus, osteoporosis and cancer (USDHHS, 1996). Physical activity plays an integral role in weight regulation as well, and unlike many other preventive health behaviors, physical activity has a number of psychological benefits, such as improved mood and self-esteem (McAuley, Mihalko, & Bane, 1997; Yeung, 1996). However, despite the many and various benefits that physical activity can provide, it remains a pressing public health challenge to motivate people to incorporate physical activity into their lives.

One way of motivating people to change their health behavior is by incorporating message framing into health communications. Health message framing refers to crafting communications that emphasize the benefits associated with adherence (a gain-framed message) – such as "Regular exercise will improve your strength and endurance" – or that emphasize the costs associated with nonadherence (a loss-framed message) – such as "Lack of exercise will make you gain weight". In this study, we focus on how the fit between the kind of message frame used and the kind of outcome (intrinsic vs. extrinsic) emphasized in communications about physical activity influence people's engagement in physical activity. Of particular importance, we show that the impact of such message fit on subsequent physical activity depends on the level of engagement of the recipient.

**Health Message Framing**

Drawing from Prospect Theory (Kahneman & Tversky, 1979), Rothman and Salovey (1997) proposed that the risk implications of a health behavior should determine whether gain- or loss-framed messages should be most likely to motivate behavior change. They hypothesized that behaviors that are construed as inherently risky – such as illness detection behaviors, where there is a chance that a serious illness could be discovered – should be best promoted by loss-framed messages. On the other hand, behaviors that are not typically construed as risky – for example, illness prevention behaviors such as exercise – should be best promoted by gain-framed messages. Indeed, some studies of exercise have found this predicted advantage of gain-framed vs. loss-framed messages for promoting physical activity behavior (Jones, Sinclair & Courneya, 2003; Latimer, Rench, et al., 2008). However, a number of studies have not (McCall & Ginis, 2004; van't Riet, Ruiter, Werrij & de Vries, 2009). In fact, a recent meta-analytic review (O'Keefe and Jensen, 2007) found gain-framed messages to be only slightly but not significantly more persuasive than loss-framed messages in encouraging physical activity, and substantial variability in the magnitude of framing effects across studies was noted.

**"Fit" Between Message Frame and Motivations for Physical Activity**

One way of understanding the mixed findings regarding the use of message framing for promoting physical activity is to consider that exercise can have a number of distinct consequences, such as improving appearance, physical health, and psychological well-being. Furthermore, message framing studies have varied in the degree to which their communications emphasized mainly the physical health consequences of exercise (e.g., Arora, Stoner, & Arora, 2006; Latimer, Rench, et al., 2008; Latimer, Rivers et al., 2008; McCall & Ginnis, 2004) or other benefits such as enjoyment, improved mood and self-confidence (Jones et al., 2003; Jones,

Sinclair, Rhodes, & Courneya, 2004; Robberson & Rogers, 1988). In the exercise literature, these various outcomes have often been viewed along the dimension of intrinsic to extrinsic motivations (e.g., Mulland & Markland, 1997; Ntoumanis, 2001; Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997). Intrinsic motivations are those that provide no obvious external incentives, and are pursued solely for the inherent rewards that an activity provides, such as the personal satisfaction, challenge, or enjoyment that physical activity may offer. In contrast, extrinsic motivations are those that are performed for reasons other than inherent rewards and satisfaction, such as to fit in or please others, to not look fat in a bathing suit, or to achieve physical health benefits (cf. Frederick & Ryan, 1993; Mulland & Markland, 1997; Ryan et al., 1997).

We propose that gain-framed messages should tend to "fit" the motivations associated with intrinsic outcomes, whereas loss-framed messages should tend to "fit" the motivations associated with extrinsic outcomes. Our reasoning draws from research on regulatory focus theory (Higgins, 1997, 2000). Regulatory focus theory describes two distinct motivational orientations that people can have regarding a goal: promotion and prevention. A promotion regulatory focus is concerned with accomplishment and aspirations towards ideals (i.e., "wants") and sensitizes people to presence and absence of positive outcomes – such as those typically emphasized in gain-framed messages. A prevention regulatory focus is concerned with safety, security and the fulfillment of obligations (i.e., "oughts") and sensitizes people to the presence and absence of negative outcomes – such as those typically emphasized in loss-framed message. We propose that messages that describe intrinsic outcomes such as feeling good, being challenged, and increased confidence or self-esteem emphasize promotion-related concerns because they are outcomes people are more likely to pursue for the positive outcomes that can be achieved. In contrast, messages that describe extrinsic outcomes such as physical appearance, not

looking bad, and long-term physical health consequences are more likely to emphasize prevention-related concerns, as they are outcomes that people are more likely to pursue for the negative outcomes that can be avoided.

To illustrate, in a study of people's responses to a beverage product, Lee and Aaker (2004) showed that when a message described the energy creation associated with a beverage (defined by Lee and Aaker as a promotion concern, but also akin to intrinsic outcomes of enjoyment, mood, and self-confidence), a gain-framed message was viewed more favorably than a loss-framed message. However, when a message described the effect of the beverage on preventing a health problem (defined as a prevention concern, but also an extrinsic outcome), a loss-framed message was perceived more favorably than a gain-framed message. In the context of physical activity, Robberson and Rogers (1988) also found that that when a message focused on the self-esteem consequences of exercise (likely a promotion and intrinsic concern), gain-framed messages led to the greatest intentions to exercise. In contrast, when the message focused on the physical health consequences of exercise (a prevention/extrinsic concern), loss-framed messages led to the greatest intentions. However, each of these studies only examined people's immediate cognitive responses to the messages – that is, perceptions of the message, intentions to engage in behavior, which are often used as evidence of "fit" – so the findings say little about how message framing and the types of outcomes emphasized in a message interact in promoting changes in actual behavior.

**"Fit", Persuasion, and Exercise Behavior**

Persuasion in a health-related context requires more than simply changing people's perceptions of messages or intentions, but actually changing people's behavior. A tenet of persuasion research is that a change in long-term attitudes and behavior results from recipients

*both* elaborating on the central arguments of a message, as well as having favorable reactions to those arguments (Petty & Cacioppo, 1986). For people who are already elaborating on the arguments of a message, any cue that increases the favorability of their reactions should promote long-term impact. However, for people who may only be paying superficial attention to a message, any cue that increases their likelihood of elaboration should promote long-term impact, as long as the message is generally strong and responses to the message are favorable.

The experience of regulatory fit is known to influence persuasion via both of these routes – increased elaboration and increased favorability – but these different routes to persuasion are likely to emerge in different contexts. Fit is known to make people "feel right" about their reactions to a message, which can intensify a person's favorable reaction to a message (Cesario, Grant, & Higgins, 2004). This sense of "feeling right", in turn, can translate into a sense of feeling right about the goal itself and increase the motivation towards it (Higgins, 2000). This effect of fit on "feeling right" has been found in a number of contexts, for instance, when fit is induced via *integral* means – that is, as a result of the persuasion situation, such as from a match between the frame and outcomes emphasized in a message – and also via *incidental* means, such as through an unrelated previous task. Despite the fact that this sense of "feeling right" due to fit can emerge in a number of ways, the effect of "feeling right" on persuasion has only been shown when people explicitly attend to the quality of the message (Cesario, Higgins, & Scholer, 2008). This suggests that some level of engagement with the message is likely to be necessary for the experience of "feeling right" to enhance persuasion.

Fit can also influence the elaborative processing of a message, but this effect may only emerge in situations when a person is not already predisposed to be engaged with the message. A recent study that induced a sense of fit through *incidental* means (Koenig, Cesario, Molden,

Kosloff, & Higgins, 2009) provided clear evidence that *non-fit* promotes greater elaboration of a message by inducing a "feeling of wrongness" which motivates greater scrutiny of a message. Across three studies in which people were responding to messages that were of intentionally low personal relevance – and hence, superficial processing of the message was to be expected – Koenig and colleagues (2009) found that people induced to experience a sense of regulatory *non-fit* were less persuaded by superficial message cues, more persuaded by argument quality, and their attitudes were more resistant to attempts at counter-persuasion. These findings suggest that in cases when a recipient is not particularly engaged with a message, the experience of non-fit can promote persuasion by increasing the level of elaboration on a message.

**The Moderating Role of Need for Cognition**

Taken together, evidence suggests that fit may promote greater persuasion at high levels of engagement, but non-fit may promote greater persuasion at low levels of engagement. Need for cognition is an individual difference variable that refers to one's tendency to engage in effortful thinking, and is often used in persuasion research as an indication of a person's general engagement with a persuasive message (Cacioppo & Petty, 1982). Those low in need for cognition embody a lack of propensity towards effortful cognitive tasks, while those at the high end of need for cognition tend to not only engage in effortful cognitive tasks more often, but also seek out and find enjoyment in effortful tasks (Petty & Cacioppo, 1986). Individuals high in need for cognition tend to have better recall of information to which they have been exposed, be more attuned to the quality of information, be less responsive to peripheral message cues, and generate more thoughts about issues presented in messages (see Cacioppo, Petty, Feinstein, & Jarvis, 1996 for a detailed review).

We propose that need for cognition is one factor that will determine whether "fit" vs. "non-fit" messages are more likely to lead to changes in subsequent behavior. Specifically, we hypothesize that people with high need for cognition should already be more engaged with the message, so persuasion among high NC people may be enhanced by a message with a fit between the frame and type of outcome emphasized. In contrast, we hypothesize that people with a low need for cognition should be more persuaded by a message in which the frame and type of outcome do not fit, as such a message may stimulate greater elaboration on the message.

### Present Study

The present study is the first to examine the effect of fit between the frame and the type of outcome emphasized in a message on subsequent physical activity. We tested our hypotheses in a study of mostly sedentary young adults who read a message with randomly-assigned frame (gain/loss) and outcome (intrinsic/extrinsic). After reading the exercise message, physical activity was measured each day over the following week to assess the influence of the messages on actual exercise behavior.

## Method

### Participants

One hundred and ninety-two undergraduate students participated in the study in exchange for partial fulfillment of a class requirement. Only individuals who had *not* reported on a pretest measure that they exercised regularly (at least 3 times per week for at least 20 minutes each session) over the past 6 months were included in the study. Sixteen participants did not provide any data for the follow up and were excluded from data analyses (8.33% attrition). There were no significant differences between participants lost to attrition and those retained in gender, need for cognition, or past exercise behavior ($p$'s > .13). The final sample of one hundred and seventy-

six participants consisted of 143 females and 33 males with ages ranging from 16 to 35 (M = 19.0, *SD* = 1.91). The sample was predominantly Caucasian (84%) and African American (11%).

**Procedure**

Participants completed measures individually on a computer. Before reading an article advocating exercise and regular physical activity, participants completed a set of personality questionnaires that included need for cognition and past exercise behavior. Next, participants were randomly assigned to read one of four versions of an exercise article – gain-framed intrinsic (*n* = 46), gain-framed extrinsic (*n* = 42), loss-framed intrinsic (*n* = 44), or loss-framed extrinsic (*n* = 44) – and then reported their attitudes about exercise. In order to encourage the formation of concrete intentions to exercise after reading the health message, participants were asked to describe up to five ways that they might be able to incorporate exercise into their daily lives. At the end of the session, participants were given a web link to access an internet-based survey and asked to log onto the survey each evening for the following week to report their daily physical activity.

**Measures**

**Need for cognition.** The abbreviated 18-item Need for Cognition scale (Cacioppo, Petty, & Kao, 1984) was used to assess need for cognition (NC). The scale contained statements about participants' reactions to demands for cognitive effort, such as "I would prefer complex to simple problems." Participants rated their agreement using a Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree). The reliability of the measure was strong ($\alpha = .89$).

**Exercise attitudes.** Seven items were used to assess participants' attitudes about exercise. Items asked participants to rate using a 7-point Likert scale how *useful, wise, beneficial,*

*enjoyable*, *pleasant*, *interesting*, and *relaxing* exercising regularly would be. Responses were averaged across items to create a reliable measures of attitudes ($\alpha = .84$)

**Follow-up exercise.** Exercise behavior in the week following the study was assessed via a daily online survey. A daily, rather than weekly, survey was use to reduce memory biases that are known to occur over more extended timeframes (Matthews, 2002). The online survey was a modified version of the Godin Leisure-Time Exercise Questionnaire (GLTEQ; Godin & Shephard, 1985), which was modified to refer to the current day rather than past week, with response options on a Likert scale ranging from 1 (0 minutes) to 5 (more than 45 minutes). For each category of physical activity (mild, moderate, and strenuous), responses of 15 minutes or more (options 3, 4, and 5 on the Likert scale) were tallied to yield a daily frequency score of physical activity that was analogous to the validated version of the GLTEQ, which asks participants to report the number of times in the last week they exercised at each category for more than 15 minutes. Consistent with the scoring instructions established by Godin and Shepherd (1985), the frequencies of mild, moderate and strenuous activities were then multiplied by the corresponding standard metabolic equivalent (MET) of 3, 5, and 9, respectively, summed, and averaged across the number of days of responses to generate an index of physical activity over the one week follow-up.

**Past exercise.** Past exercise behavior was assessed using the items and scoring procedures of the GLTEQ, which assessed the frequency and intensity of physical activity over the week prior to the study.

## Materials

Four articles were tailored from the American Heart Association's "Physical Activity in Daily Life" web page (www.americanheart.org/presenter.jhtml?identifier=2155) to use for the

specific purpose of this study. The articles were approximately 275 words in length and had an educational tone in presenting various facts about exercise and physical activity that were customized to reflect the concerns and health issues of a young adult population. Previous testing with a young adult sample revealed the message arguments to be strong overall ($M$ = 5.5 on a 1 to 7-point Likert scale) with no significant differences in argument strength between the four message conditions ($p$ = .58). All articles presented identical guidelines to help begin an exercise program or increase daily physical activity. However, arguments promoting regular exercise were presented differently in each version.

The two gain-framed articles highlighted the positive outcomes of exercising regularly – one focused on the intrinsic benefits of regular exercise and one focused on the extrinsic benefits of regular exercise. The two loss-framed articles highlighted the negative outcomes of not exercising regularly – one focused on the intrinsic consequences of not exercising regularly and one focused on the extrinsic consequences of not exercising regularly. The crucial passages from the four articles are reported in Table 1.

To ensure our manipulations were valid, a team of 3 trained coders (B.A level and higher), blind to study hypotheses and experimental conditions, were asked to rate each of the statements in the 4 messages along and the dimension of intrinsic/extrinsic outcome (1 = "completely intrinsic outcome" to 7 = "completely extrinsic outcome"). Interrater reliability among the coders was strong, $r$ = .99. As expected, statements in the intrinsic messages referred to more intrinsic outcomes ($M$ = 3.2, $SD$ = 1.8) and statements in the extrinsic messages referred to more extrinsic outcomes ($M$ = 6.0, $SD$ = .90), a significant difference, $t(14) = -4.65$, $p < .01$.

As a validation of gain/loss framing and promotion/prevention focus, we had a sample of 164 young adults rate the extent to which each message described the "positive things they could

obtain by exercising" and the "negative things they could avoid by exercising" (1 = "strongly disagree" to 5 = "strongly agree"). For each message, an overall balance score was created by taking positive minus negative. As expected, loss-framed messages were viewed as describing mainly negative consequences ($M$ = -2.35, $SE$ = .13) and gain framed messages were viewed as describing mainly positive consequences ($M$ = 1.90, $SE$ = .13), a significant difference, $t(163)$ = 17.90, $p < .001$. Consistent with the proposition that extrinsic outcomes of exercise are viewed as mainly negative consequences to be avoided, the extrinsic messages were viewed as significantly more negative than neutral ($M$ = -.38, $SE$ = .08), $p < .001$. Although the intrinsic messages were not viewed significantly more positively than neutral ($M$ = -.06, $SE$ = .07), they were significantly more likely to be viewed as describing the positive consequences that could be obtained by exercising than the extrinsic messages, $t(163) = -3.47$, $p < .001$.

## Results

### Analytic Strategy

The fit between message frame (MF) and exercise outcome (EO) was represented by the interaction MF x EO on exercise behavior. Furthermore, we predicted that NC would moderate the MF x EO interaction, such that a fit between MF and EO would result in a greater exercise behavior for those high in NC, whereas a non-fit between MF and EO would result in a greater exercise behavior for those low in NC. Thus, we predicted a three-way interaction between MF, EO, and NC. We tested the significance of the 3-way interaction through moderated multiple regression (Aiken & West, 1991). NC was standardized prior to inclusion in analyses. The experimental conditions were effects-coded as MF (loss = -1, gain = 1) and EO (extrinsic = -1, intrinsic = 1).

### Preliminary Analyses

On average, participants completed 5.51 days of follow-up data, and compliance was not associated with any demographic or analytic variables, all *p*'s > .20. Although NC (*M* = 3.13, *SD* = .58), MF, EO and their interactions were not significantly associated with past exercise (all *p*'s > .15), we included past exercise as a covariate to account for preexisting differences in activity level. However, we note that results do not differ if past behavior is removed from the model. Gender was only associated with need for cognition, such that males (*M* = 3.37, *SD* = .42) reported a higher need for cognition than females (*M* = 3.12, *SD* = .62), *t*(175) = 2.19, *p* = .015. However, gender did not account for or moderate any findings described in this paper, so it is not included in any subsequent analyses.

**Hypothesized Interaction of Message Frame, Exercise Outcome, and Need for Cognition**

Table 2 shows the results of the moderated regression analysis for exercise behavior. There were no significant main effects of MF, EO, or NC, or two-way interactions. However, as hypothesized, the NC x MF x EO interaction was significant ($\beta$ = .24, *p* = .001), indicating that the influence of a fit between MF and EO depended on participant NC. To simplify interpretation of this 3-way interaction, we collapsed MF and EO into a single variable representing message fit. Gain-framed messages highlighting intrinsic exercise outcomes and loss-framed messages highlighting extrinsic exercise outcomes were treated as the "fit" messages, while the gain-framed extrinsic and loss-framed intrinsic messages were the "non-fit" messages. As expected, neither fit ($\beta$ = -.09) nor NC ($\beta$ = .08) significantly predicted physical activity (*p*'s > .19), but the fit x NC interaction was significant ($\beta$ = .20, *p* = .003).

Figure 1 displays the interaction between message fit and NC on overall physical activity over the week. As predicted, among participants high in NC (at +1 *SD*), those reading a fit message reported somewhat higher levels of physical activity (*M* = 37.19, *SE* = 3.50) than those

who read a non-fit message (*M* = 30.73, *SE* = 3.80), although this difference was not statistically significant, *t* = 1.25, *p* = .21. In contrast, among participants low in NC (-1 *SD*), this pattern was reversed, with those reading a fit message (*M* = 21.59, *SE* = 3.55) reporting significantly lower levels of physical activity than those reading a non-fit message (*M* = 37.61, *SE* = 3.86), *t* = -3.05, *p* < .01. Viewing the interaction differently, fit messages led to significantly lower levels of physical activity for low NC participants compared to high NC participants (*t* = 3.15, *p* < .01), whereas non-fit messages led to somewhat but not significantly lower levels of physical activity for high NC compared to low NC participants (*t* = 1.24, *p* = .22) Thus, the fit x NC interaction was primarily driven by fit messages leading to low levels of physical activity among low NC participants.

The fit x NC interaction was most apparent in participants' reports of strenuous physical activity across the week, which are also known to have the greatest reliability and validity compared to mild and moderate activity (Godin & Shephard, 1985; Jacobs, Ainsworth, Hatman, & Leon, 1993). Again, in predicting frequency of strenuous activity, neither message fit ($\beta$ = .02) nor NC ($\beta$ = .11) were significant (*p*'s > .15), but the hypothesized interaction between message fit and NC was significant ($\beta$ = .17, *p* = .02). As Figure 2 shows, among participants high in NC, fit messages (*M* = 1.52, *SE* = .23) resulted in nearly twice as many episodes of strenuous physical activity compared to non-fit messages (*M* = .90, *SE* = .25), *t* = 1.84, *p* = .07. As predicted, this pattern was reversed among participants low in NC, as non-fit messages (*M* = 1.12, *SE* = .25) resulted in twice as many episodes of strenuous physical activity than fit messages (*M* = .60, *SE* = .23), *t* = -1.52, *p* = .13. Although these simple contrasts only approached significance, we present these frequencies to allow for a better presentation of how the messages led to differences in physical activity than the overall GLTEQ scores provide.

**Potential Mechanisms**

Two measures collected immediately after presentation of the messages – participants' attitudes towards exercise, and the specificity of the exercise plans they listed – allowed to us examine potential mediators of the fit x NC on exercise behavior. Only attitudes was significantly predicted by the fit x NC interaction ($\beta$ = .17, $t$ = 2.26, $p$ = .02). Consistent with hypotheses, among participants with high NC (+1 *SD*), fit messages led to significantly more favorable attitudes towards exercise ($M$ = 5.68, $SE$ = .11) than non-fit messages ($M$ = 5.28, $SE$ = .12), $t$ = 2.50, $p$ = .01. In contrast, among participants with low NC (-1 *SD*), non-fit messages led to similar attitudes ($M$ = 5.48, $SE$ =.12) as the fit messages ($M$ = 5.35, $SE$ = .11), $t$ = -.76, $p$ = .45. Viewing the interaction differently, fit messages among high NC participants were associated with more favorable attitudes than fit messages among low NC participants ($t$ = 2.15, $p$ = .03), whereas non-fit messages were associated with similar attitudes among high NC compared to low NC participants ($t$ = 1.12, $p$ = .27). Thus, this interaction was primarily driven by fit messages leading to favorable attitudes among high NC participants.

In separate analyses, attitudes was significantly associated with both overall physical activity, $r$ = 20, $p$ < .001, as well as the frequency of strenuous physical activity, $r$ = .26, $p$ < .001. To test whether attitudes towards exercise mediated the effects of the fit x NC interaction on physical activity, we followed Baron and Kenny's (1986) approach to testing mediation by adding attitudes to the models predicting physical activity described above. In each of these models, the fit x NC interactions on physical activity were attenuated by the inclusion of attitudes, but both remained significant predictors of physical activity ($\beta$ = .21, $p$ < 0.01 for overall physical activity, $\beta$ = .23, $p$ < 0.01 for strenuous physical activity). To test whether this attenuation of the fit x NC interaction after the inclusion of attitudes was significant, we

conducted bias-corrected bootstrap tests of the indirect effect of fit x NC on physical activity via attitudes (cf. MacKinnon, Lockwood, & Williams, 2004). These tests showed that although the effect of fit x NC on overall physical activity was not significantly mediated by attitudes (*B* = .43, *SE* = .36, *n/s*), the effect of fit x NC on frequency of strenuous physical activity was significantly mediated by attitudes (*B* = .05, *SE* = .03, 95% *CI* = .01 to .13). This mediating effect of attitudes accounted for 20% of the total effect of the message fit x NC interaction on strenuous physical activity.

## Discussion

Physical activity is a unique health behavior in that it has a number of distinct consequences, often viewed along the dimension of intrinsic and extrinsic outcomes. As such, physical activity offers a unique opportunity to examine how message framing interacts with the types of outcomes emphasized in promoting changes in behavior. Drawing from a growing body of research in regulatory focus theory (Higgins, 1997, 2000), we proposed that intrinsic and extrinsic outcomes are likely to relate to promotion and prevention concerns, respectively, and that the degree to which gain- and loss-framed messages motivate physical activity behavior rests on the type of exercise outcome emphasized, as well as overall level of engagement of the individual.

As predicted, the influence of fit v. non-fit messages on exercise behavior depended on recipients' level of engagement with the message – an effect observed above and beyond the measured impact of past exercise behavior. In particular, the fit messages led to somewhat, but not significantly, greater exercise behavior in high need for cognition participants compared to non-fit messages, whereas non-fit messages led to significantly greater exercise behavior in low need for cognition participants compared to fit messages. Although some of the simple contrasts

did not reach significance, the overall moderation of fit effects by need for cognition was clearly supported – both in terms of their effects on exercise attitudes as well as on subsequent behavior.

We believe these results help to shed light on the mixed findings of prior message framing studies promoting physical activity (Jones, Sinclair & Courneya, 2003; Latimer, Rench, et al., 2008; McCall & Ginis, 2004; van't Riet, Ruiter, Werrij & de Vries, 2009). Physical activity serves primarily an illness prevention function, one for which Rothman and Salovey (1997) predicted a gain-framed advantage. However, previous message framing studies have not been consistent in showing this gain-framed advantage. Thus, our results suggest that the most effective way to frame a message promoting physical activity may depend less on the nature of the behavior itself – such as its illness prevention function or presumed riskiness (Rothman & Salovey, 1997) – and depend more on how people construe the motivations associated with the behavior and how the frame of the message "fits" with these motivations. Our findings are consistent with the notion that gain-framed messages might be "differentially effective" (Latimer, Salovey, & Rothman, 2007, pp. 646) and not automatically the best choice in promoting physical activity. This study joins a growing body of literature that shows how the effects of framed messages on health behavior are determined in large part by the motivations and construals that people have for the behaviors, rather than the simple detection versus prevention function that the behavior may serve (cf. Bartels, Kelly & Rothman, in press; Kiene, Barta, Zelenski, & Cothran, 2005).

Our findings also highlight the usefulness of regulatory focus theory for informing the design of persuasive health messages, particularly for health behaviors that have consequences that may be viewed in either promotion or prevention terms. Although we did not directly assess participant feelings of regulatory fit or non-fit as previous studies employing regulatory focus

theory have done (i.e., Latimer, Rivers, et. al, 2008), we did find that intrinsic outcomes of exercise were viewed in significantly more promotion-related terms than extrinsic outcomes, suggesting that the body of research on regulatory fit and persuasion may be useful in understanding how to improve health communications. We also emphasize that our findings are among the few to examine how principles of fit and persuasion jointly influence change in *behavior*, rather than simply immediate perceptions of the quality of a message (e.g., Cesario et al., 2004; Lee & Aaker, 2004) or intentions to engage in a behavior (e.g., Robberson & Rogers, 1994). In our study, the effects of the messages on strenuous physical activity were partially but not completely mediated by attitudes towards exercise, suggesting that attitude change may have played some role in our findings.

Our findings also showed that when examining attitudes as the outcome, the fit x NC interaction was driven by fit messages resulting in more positive attitudes than non-fit messages among those high in NC. In contrast, when examining behavior as the outcome, the fit x NC interaction was driven by the fit messages resulting in *less* physical activity among those low in NC. Given that most research on regulatory fit and persuasion has used more immediate, attitude-related measures (i.e., perceptions of messages, feelings about products or behaviors) rather than longer-term behavioral measures as outcomes, it is not surprising that the existing literature generally supports the prediction that regulatory fit leads to greater persuasion than regulatory non-fit. However, Koenig and colleagues (2009) show that regulatory *non*-fit can promote attitude change via increased elaboration, so we believe it is important for research to further examine how the experience of fit may influence persuasion in multiple manners, as well as utilize behavioral measures in future research on health-related persuasion.

Another direction for research is to further elucidate the mechanisms responsible for our findings. While our results provide clear evidence that need for cognition moderated the effectiveness of the matched versus mismatched messages, we did not specifically test the underlying mechanisms of elaboration and "feeling right". Furthermore, while we did find that intrinsic messages were viewed in more promotion-related terms than extrinsic messages, we do not suggest that intrinsic outcomes are always promotion-focused and extrinsic outcomes are always prevention-focused. With any given outcome of physical activity, there are likely to be individual differences in the degree to which a person views it as promotion- or prevention-focused. Lastly, while a strength of the present study was its assessment of exercise behavior rather than just intentions, behavior was documented via self-report. Future studies might benefit from the inclusion of a more objective measure of exercise as an outcome. Thus, as the present study is the first to show these particular effects, future research is needed to replicate and extend our findings.

It would also be worthwhile to see how our findings might play out in other health domains. For example, smoking cessation is another prevention behavior for which people have varying reasons to engage in and which may also vary in terms of the underlying motivation. Interestingly, smoking cessation is a behavior for which message framing studies have also found mixed findings (Steward, Scheinder, Pizarro, & Salovey, 2003; Toll, O'Malley, et al., 2007; Toll, Salovey, et al., 2008) and for which people might be either intrinsically (i.e., feeling of self-control) or extrinsically (i.e., physical health concerns) motivated to carry out. Thus, an investigation of how framing interacts with the reasons for quitting, as well as the engagement of the recipient, is a potentially valuable direction for future research.

This study is the first to specifically investigate how the impact of gain- and loss-framed messages on exercise behavior depends on the type of outcome emphasized, as well as on the need for cognition of the recipient. As such, our findings indicate that in promoting exercise *behavior* – rather than changing people's intentions (cf. Robberson & Rogers, 1988) – the recipient's level of engagement is likely to be a factor that shapes people's responses to framed messaged. Moreover, we believe our findings help identify the contexts in which gain- and loss-framed messages are most effective in promoting physical activity, and help to make sense of the variability that exists in literature on message framing for exercise (cf., O'Keefe & Jensen, 2007). In sum, we believe that a further examination of how the types of outcomes emphasized in health behavior interventions – such as intrinsic v. extrinsic outcomes – is an exciting and potentially fruitful direction for future research, which can help identify concrete strategies to improve the effectiveness of messages that promote physical activity.

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Table 1

*Sample Passages from the Four Exercise Articles*

| | **Gain-Framed** | **Loss-Framed** |
|---|---|---|
| **Intrinsic Outcomes** | Exercise now and feel better later!<br><br>Exercise will improve your life!<br><br>Benefits of physical activity include: improved self-esteem and confidence, better mental health, improved quality of life, feelings of relaxation, and reduced stress. | Forgot to exercise? Forget being happy!<br><br>Lack of exercise will make you feel miserable!<br><br>Consequences of lack of physical activity include: decreased self esteem and confidence, poor mental health, decreased quality of life, and increased anxiety and stress. |
| **Extrinsic Outcomes** | Exercise now and look better later!<br><br>Exercise will improve your appearance!<br><br>Benefits of physical activity include: avoiding the *freshman 15*, better grades with increased energy, better physical health, and overall body definition and muscle tone. | Forgot to exercise? Forget the bathing suit!<br><br>Lack of exercise will make you look miserable!<br><br>Consequences of lack of physical activity include: weight gain (the *freshman 15*), poor grades with low energy levels, poor physical health, and lack of body definition and muscle tone. |

Table 2

*Regression Analysis Predicting Exercise Behavior Across 7-Day Follow-Up (N=176)*

| Variable | *B* | SE | β | *t* | *p* |
|---|---|---|---|---|---|
| Past Exercise | 0.23 | 0.07 | 0.24 | 3.31 | 0.001 |
| Message Frame (MF) | 2.72 | 1.85 | 0.11 | 1.47 | 0.15 |
| Exercise Outcome (EO) | 0.90 | 1.85 | 0.04 | 0.49 | 0.63 |
| Need for Cognition (NC) | 1.90 | 1.90 | 0.07 | 1.00 | 0.32 |
| MF x EO | -3.06 | 1.85 | -0.12 | -1.66 | 0.10 |
| MF x NC | -2.90 | 1.90 | -0.11 | -1.53 | 0.13 |
| EO x NC | 0.53 | 1.90 | 0.02 | 0.28 | 0.78 |
| MF x EO x NC | 6.23 | 1.91 | 0.24 | 3.26 | 0.001 |

Note: Total $R^2$ = .16.

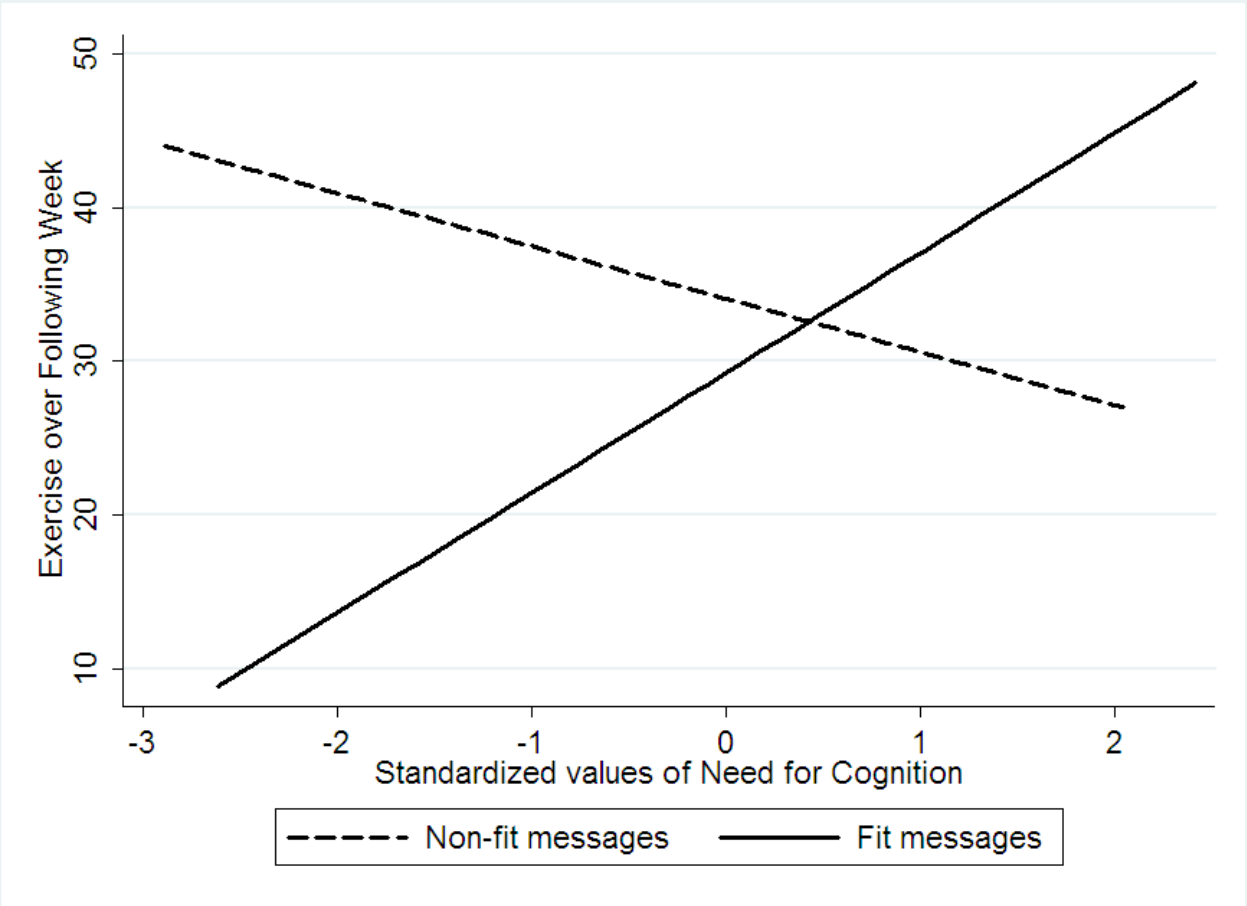


*Figure 1.* Estimated levels of exercise as a function of message fit and need for cognition. Exercise is scored in approximate METS per week (see methods for details).

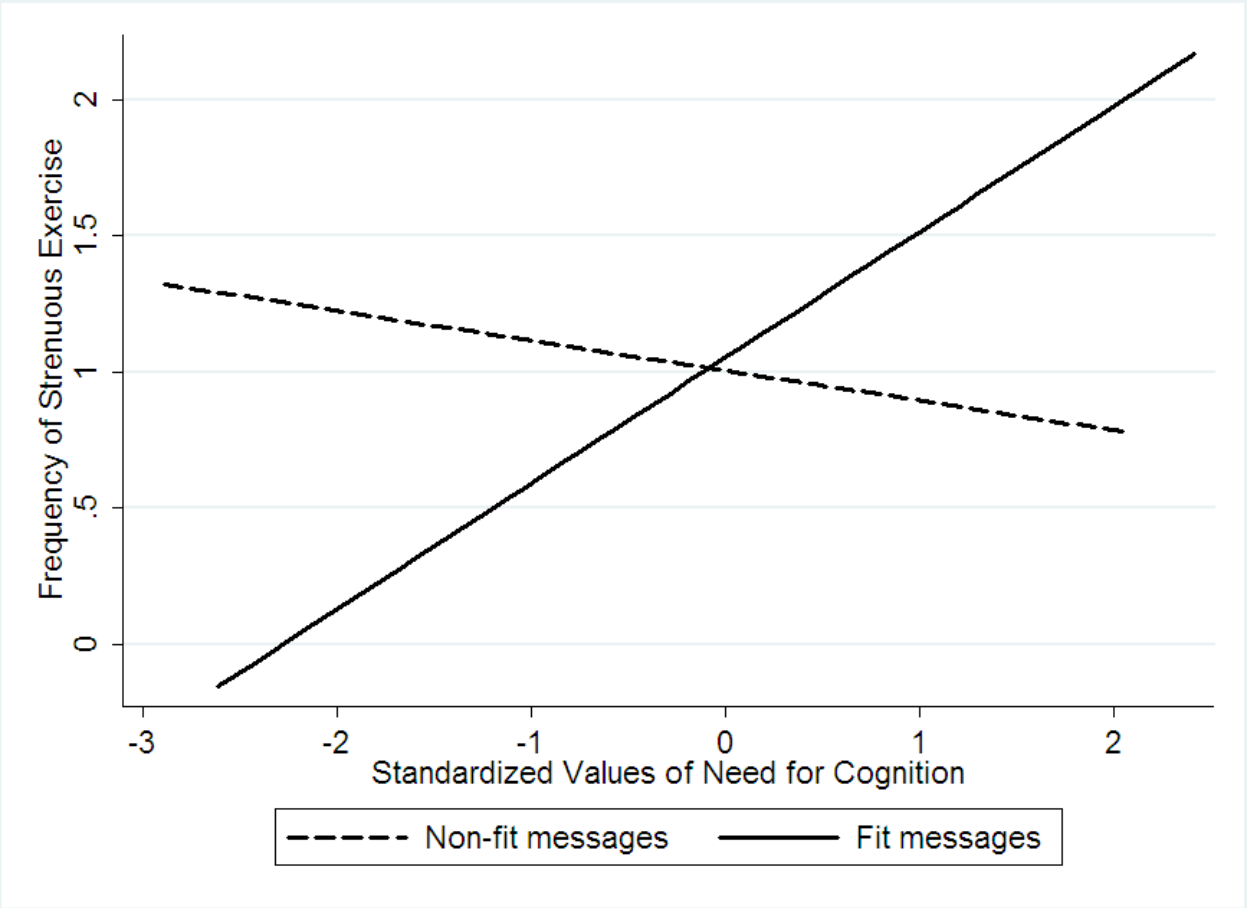


*Figure 2.* Estimated frequency of 15+ minute episodes of strenuous exercise over one week as a function of message fit and need for cognition.