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How regulatory fit enhances motivational strength during goal pursuit

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Abstract

Higgins' (2000) theory of regulatory fit proposes that motivational strength will be enhanced when the manner in which people work toward a goal sustains (rather than disrupts) their regulatory orientation. This enhanced motivational strength in turn should improve efforts at goal attainment. In Experiment 1, predominantly promotion- and prevention-focused participants were given the goal of writing a report on their leisure time, and were assigned either eagerness- or vigilance-framed means to use. Promotion/eagerness and prevention/vigilance participants were about 50% more likely to turn in their reports than promotion/vigilance and prevention/eagerness participants. In Experiment 2, participants read either a promotion- or a prevention-framed health message urging them to eat more fruits and vegetables, and were then asked to imagine either the benefits of compliance or the costs of non-compliance. Promotion/benefits and prevention/costs participants subsequently ate about 20% more fruits and vegetables over the following week than promotion/costs and prevention/benefits participants. The implications of regulatory fit's enhancement of motivational strength are discussed.

Which factors increase people's motivational strength in goal pursuit? This is one of the most pervasive questions in the realm of human motivation. A classic perspective on this issue is expectancy-value theory (see Feather, 1982), according to which motivational strength is highest when the product of people's expectancies for, and value of, goal attainment is highest. Another important determinant of motivational strength is people's anticipated reactions to, and subsequent attributions for, performance (Weiner, 1986). In Weiner's analysis, for example, a person who anticipates succeeding at a task, and attributes this success to personal skill, will have greater motivational strength than a person who attributes this success to luck; whereas a person who anticipates failing and attributes this failure to lack of effort will have greater motivational strength than a person who attributes this failure to lack of personal skill.

In a related line of research, Bandura (1986) has demonstrated the role of self-efficacy (i.e. the belief that one is capable of carrying out the actions required to produce some desired outcome) in

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enhancing motivational strength. For difficult goals, for example, people with high self-efficacy are likely to have higher motivational strength than people with low self-efficacy, because the former see the goal pursuits as challenges to be overcome, whereas the latter see the goal pursuits as threats to be avoided.

These classic approaches have recently been supplemented by several 'volitional' theories of goal pursuit. For example, Gollwitzer's (1996) model of action phases identifies the ways in which planning—including being in an 'implemental mindset' and forming 'implementation intentions'—alleviate volitional problems, such as initiating goal efforts and overcoming obstacles to goal completion. Kuhl's (2000) action control theory analyses the 'functional architecture' underlying people's motivational systems, and examines the ways in which various problems of control—e.g. emotion control, attention control, motivational control—can affect self-regulation efforts *independently* of such cognitive influences as expectancies or attributions. As another example, Oettingen, Pak, and Schnetter (2001) show that mentally contrasting positive fantasies about a desired goal with one's current discrepancy from the goal increases motivational strength for goals with high expectancies, and decreases motivational strength for goals with low expectancies (compared to imagining either fantasies or discrepancies alone). Thus, a number of classic theories and recent approaches have combined in different ways the variables of expectancies, incentives for goal attainment, and beliefs about one's ability—as well as mindsets, intentions, and control strategies—in order to predict when and how people's motivational strength can be maximized.

In addition to these important determinants of motivational strength, Higgins (2000) recently proposed a different kind of influence on people's motivational strength. Specifically, Higgins' theory of regulatory fit proposes that motivational strength will be enhanced when the manner in which people work toward a goal sustains (rather than disrupts) their current regulatory orientation. Completing a goal in a way that sustains one's orientation lends a subjective sense of importance to the activity (see Higgins, Idson, Freitas, Spiegel, & Molden, 2003), which should lead to a greater sense of commitment to the goal. It should be noted that using different types of strategic means is just one way in which goal pursuit can proceed in a manner that sustains or disrupts one's regulatory orientation. Other states induced during goal pursuit by situational or interpersonal factors could also sustain or disrupt one's original regulatory orientation, without necessarily involving a change in strategic means. For example, providing normative versus novel instructions for engaging in a task could produce fit versus non-fit, respectively (see Bianco, Higgins, & Klem, 2003), as could completion of the task in a physical setting that is congruent or incongruent with one's task orientation, completion of the task for a reward that is compatible or incompatible with one's task orientation, and so on.

To illustrate conditions of regulatory fit versus non-fit, let us consider the regulatory focus distinction between promotion and prevention orientations. Regulatory focus theory (see Higgins, 1997) assumes that self-regulation operates differently when serving fundamentally different needs, such as the distinct survival needs of *nurturance* (e.g. nourishment) and *security* (e.g. protection). Regulatory focus theory proposes that nurturance-related regulation involves a *promotion focus*—a regulatory state concerned with advancement, accomplishment, and aspirations (i.e. a concern with the presence or absence of positive outcomes). In contrast, security-related regulation involves a *prevention focus*—a regulatory state concerned with protection, safety, and responsibility (i.e. a concern with the absence or presence of negative outcomes). Typical promotion-focused goals might include creating a supportive environment for one's children or starting a new company, whereas typical prevention-focused goals might include guarding one's house against burglars or looking out for one's family's financial security. It should be noted, however, that almost any goal can be viewed with either a promotion or a prevention focus, depending on the chronic or temporary regulatory orientation of the perceiver and/or the framing of the goal in terms of gains/non-gains or non-losses/losses.

Within the realm of regulatory focus, *eagerness*-related means are the type of means that best sustain a concern with advancement, accomplishment, and aspirations (see Crowe & Higgins, 1997). Therefore, *promotion*-focused people who use eagerness-related means or work toward the goal with a strategic eagerness/approach orientation should experience greater regulatory fit and motivational strength than those who use vigilance-related means or work toward the goal with a strategic vigilance/avoidance orientation. In contrast, *vigilance*-related means are the type of means that best sustain a concern with protection, safety, and responsibility (see Crowe & Higgins). Therefore, *prevention*-focused people who use vigilance-related means or work toward the goal with a strategic vigilance/avoidance orientation should experience greater regulatory fit and motivational strength than those who use eagerness-related means or work toward the goal with a strategic eagerness/approach orientation. To summarize, whereas factors such as expectancy, value, attributions for performance, and self-efficacy may determine people's initial level of motivational strength in a goal completion setting, regulatory fit may determine whether this motivational strength is enhanced or weakened throughout the goal completion process itself.

Förster, Higgins, and Idson (1998) obtained evidence for this regulatory fit hypothesis in a set of studies in which they either experimentally manipulated participants' regulatory focus or measured participants' chronic regulatory focus using the Self-guide Strength measure (see Higgins, Shah, & Friedman, 1997). The participants performed an arm-pressure procedure while completing a set of anagrams. Half of the participants pressed upward on the bottom of a surface—which involves arm flexion, a motor action previously shown to induce an approach/eagerness orientation (Cacioppo, Priester, & Berntson, 1993). The other half of the participants pressed downward on the top of a surface—which involves arm extension, a motor action previously shown to induce an avoidance/vigilance orientation.

Förster et al. (1998) found that promotion-focused participants who engaged in arm flexion found more anagrams than those who engaged in arm extension, whereas prevention-focused participants who engaged in arm extension found more anagrams than those who engaged in arm flexion. In other words, participants who experienced regulatory fit between their regulatory state (i.e. promotion or prevention) and the manner in which the motor action induced them to complete the goal (i.e. with a strategic eagerness/approach orientation or a strategic vigilance/avoidance orientation) found more anagrams than participants who did not experience regulatory fit. This fit effect was replicated in other studies by Förster et al. which used persistence as the measure of motivational strength. In addition, Förster et al. found that the fit effect was independent of participants' expectancies for successful goal attainment, an important traditional determinant of motivational strength.

In another study testing the regulatory fit hypothesis, Shah, Higgins, and Friedman (1998, Study 1) assessed participants' chronic ideal and ought strength and had them perform an anagram task that was framed in either promotion or prevention terms. The regulatory fit hypothesis was supported, in that the partial correlation of ideal strength to anagram performance was positive and significant in the promotion, but not the prevention, framing condition; whereas the partial correlation of ought strength to anagram performance was positive and (marginally) significant in the prevention, but not the promotion framing condition. Study 2 replicated the design of Study 1, and also asked participants to perform the task using either eager or vigilant means. In addition to replicating the results of Study 1, Study 2 revealed that the partial correlation of ideal strength to anagram performance was positive and significant in the promotion framing/eager means condition, but not in the promotion framing/vigilant means condition, or either of the two prevention framing conditions. In contrast, the partial correlation of ought strength to anagram performance was positive and significant in the prevention framing/vigilant means condition, but not in the prevention framing/eager means condition, or either of the two promotion framing conditions. In other words, the best goal performance was found for those participants who experienced regulatory fit between the means they used and both their chronic and task-induced regulatory state.

Finally, a recent study by Freitas, Liberman, and Higgins (2002, Study 2) primed participants' regulatory focus by asking them to think either about how their promotion focus aspirations (ideals) had changed over time or how their prevention focus responsibilities (oughts) had changed over time. They then had participants perform a series of math problems under either distracting conditions in which vigilant means had to be emphasized or non-distracting conditions in which eagerness means could be emphasized. Freitas et al. found that prevention-focused participants outperformed promotion-focused participants when vigilant means were required, but that promotion-focused participants slightly outperformed prevention-focused participants when vigilant means were not required. Again, when the strategic means that were used sustained participants' regulatory focus, and regulatory fit was thus achieved, higher performance levels resulted.

The present research was designed to extend the regulatory fit hypothesis beyond laboratory tasks by examining the impact of regulatory fit on succeeding in everyday life tasks. In the first study, we examined whether students with a predominant (chronic) promotion or a predominant (chronic) prevention focus who used strategic means that fit their regulatory state—eager or vigilant means, respectively—would be more likely than those who used non-fitting strategic means to *turn in a report* on how they spent their upcoming Saturday. In the second study, we extended our research to a health-related domain, and examined whether students who read a promotion- or a prevention-framed message encouraging them to eat more fruits and vegetables, and were then asked to monitor the amount they ate over the course of a week, would *eat more fruits and vegetables* if they imagined the *benefits* they might accrue through compliance—which sustains an eagerness orientation but disrupts a vigilance one—or the *costs* they might incur through non-compliance—which sustains a vigilance orientation but disrupts an eagerness one. For students, turning in a report and taking steps to improve their diet are both common life tasks; thus, these studies possess considerable practical as well as theoretical significance.

EXPERIMENT 1

Previous researchers have suggested that the mental simulation of steps needed for goal completion helps people develop plans to achieve those goals (e.g. Gollwitzer & Brandstätter's work on implementation intentions, 1997; Taylor & Pham's work on 'outcome' versus 'process' simulation, 1996). Given promotion-focused people's eagerness tendencies—which translate into a tactical preference for approaching matches to desired end-states rather than avoiding mismatches to desired end-states (see Crowe & Higgins, 1997)—and prevention-focused people's vigilance tendencies—which translate into a tactical preference for avoiding mismatches to desired end-states rather than approaching matches to desired end-states (see Crowe & Higgins)—we reasoned that there might be differences in the *plans* that it is most effective for people with a promotion versus a prevention focus to simulate.

People with a promotion focus who eagerly simulate and develop approach-oriented plans—i.e. plans that sustain their regulatory orientation, and therefore provide them with regulatory fit—may perform better at a task than people with a promotion focus who vigilantly simulate and develop avoidance-oriented plans—i.e. plans that disrupt their regulatory orientation, and do not provide them with regulatory fit. Similarly, people with a prevention focus who vigilantly simulate and develop avoidance-oriented plans—i.e. plans that sustain their regulatory orientation, and therefore provide them with regulatory fit—may perform better at a task than people with a prevention focus who eagerly simulate and develop approach-oriented plans—i.e. plans that disrupt their regulatory orientation, and do not provide them with regulatory fit.

In Experiment 1, we first administered the Self-guide Strength measure, which measures the accessibility of people's 'ideal' (promotion-related) and 'ought' (prevention-related) selves (see Higgins, 1997). Next, we asked participants to complete a mental simulation procedure with respect to a report they were asked to write on how they spent their upcoming Saturday. This mental simulation procedure was framed in either eager or vigilant terms. Finally, we assessed the rate at which participants completed the goal, i.e. the rate at which they mailed in or brought back the report. We predicted that the framing of the mental simulation task would interact with participants' predominant regulatory focus to affect the likelihood that they would turn in the report.

Method

Participants

Seventy-one Columbia University undergraduates participated in this experiment. All participants received $5 for completing the first portion of the experiment, which was conducted in the laboratory. In addition, participants who completed the second part of the experiment (the report) at home received a $7 cheque in the mail, or the equivalent amount in cash if they turned in the report by hand. Participants were randomly assigned to conditions. Thirty-six females and 35 males participated in this study.

Note: In order to ensure a standard time frame for turning in the report, so as not to give an advantage to participants who completed the first part of the study earlier in the semester, we designated a cutoff date of 4 weeks from the Saturday after a participant had completed the first part of the experiment as the latest point in time at which a report could still be turned in and be included in our analyses. This criterion resulted in the exclusion of three participants who turned in their reports after the deadline. (All participants were paid for turning in their reports, however, whether their data were included in the analyses or not.) The average turn-in time for these excluded participants was 31.00 days, compared to the mean of 7.41 (SD = 5.60) days for the rest of the sample. In addition, in order to ensure that participants wrote a report of reasonable quality, we set a minimum requirement of 100 words. This criterion excluded four additional participants who turned in reports that did not meet the minimum length. The average report length for excluded participants was 62.00 words, compared to the mean of 295.12 (SD = 189.36) words for the rest of the sample. The application of the above two exclusion criteria left 64 participants (31 females and 33 males) for the main analyses.[1]

Procedure

All tasks and instructions were administered individually to participants via computer terminals in soundproof booths.

[1]It is notable that a disproportionate, although non-significant, number of participants who were excluded for sending in their reports late or writing short reports were in 'non-fit' conditions. Specifically, five out of the seven excluded participants were in the prevention/eagerness condition, one was in the promotion/vigilance condition, and one was in the promotion/eagerness condition. This pattern is one we might have expected, in that even those participants without fit who turned in their reports would be predicted to have lower motivational strength than participants with fit who turned in their reports, a difference that might be reflected in longer turn-in times or shorter report lengths. If we had coded late and short reports as being equivalent to 'not turning in a report'—i.e. as not meeting minimal standards of completing the assignment—this would have actually increased the relative number of non-fit participants counted as not turning in a report, thus strengthening the results supporting our prediction. However, we conducted a conservative test of our hypothesis by excluding such participants entirely.

Strength guide. In order to measure participants' predominant regulatory focus, all participants completed, in a prescreening session that took place separate from and prior to the first portion of the experiment, the Self-guide Strength measure (see Higgins et al., 1997), which measures the accessibility of people's 'ideal' (promotion-related) and 'ought' (prevention-related) selves. Participants were first provided with a definition of the 'ideal self' and the 'ought self.' The ideal self was defined as the type of person they ideally would like to be, or the type of person they hoped, wished, or aspired to be. The ought self was defined as the type of person they believed they ought to be, or the type of person they believed it was their duty, obligation, or responsibility to be. Participants were told that they would be asked to list several attributes that corresponded to their ideal and ought selves. Attributes describing the ideal self had to be different from those describing the ought self, and all attributes were to be provided as quickly and accurately as possible.

Participants were then asked to list, in a seemingly random order, three ideals and three oughts. After listing each attribute, participants were asked to rate the extent to which they ideally would like to (for their ideals) or ought to (for their oughts) possess the attribute on a 4-point scale from 1 to 4 (*slightly*; *moderately*; *a great deal*; *extremely*), and then to rate the extent to which they actually possessed the attribute on the same 4-point scale. The computer recorded the time it took each participant to provide each attribute and make the corresponding extent determinations. All reaction time measures were first transformed using a natural logarithmic transformation, because the reaction time distributions were positively skewed. A total ideal strength score and a total ought strength score were then calculated by separately summing the ideal attribute and extent reaction times, and the ought attribute and extent reaction times.

Strategic means. The goal we used for this study was similar to the everyday task that Gollwitzer and Brandstätter (1997, Study 2) asked participants to carry out in their research on implementation intentions. Specifically, participants in our study were asked to write a report on how they spent their upcoming Saturday, and to mail or bring this report to the experimenter as soon as it was completed. Before they left the lab, participants were assigned one of two types of strategic means to use in carrying out the task. Specifically, all participants were asked to imagine certain implementation steps that they might take in writing the report, and the steps were framed to represent either eager means or vigilant means. In each of the two strategic means conditions, participants were asked to: (a) read three sets of instructions corresponding to three stages of the simulation; (b) press the space bar when they were ready to begin each corresponding phase of the simulation; and (c) close their eyes and carry out each phase of the simulation for 45 s, after which the computer beeped to alert them to continue to the next phase. The three simulations related to *when*, *where*, and *how* participants planned to write their reports. Abbreviated versions of the instructions across the two conditions are as follows.

For the *when/eagerness* simulation, participants were asked to imagine a good, convenient time when they would be able to write their reports. For the *when/vigilance* simulation, participants were asked to imagine times that were bad or inconvenient for writing their reports, when they were busy with other things, so that they could avoid these times.

For the *where/eagerness* simulation, participants were asked to imagine a comfortable, quiet place where they might write their reports. For the *where/vigilance* simulation, participants were asked to imagine places that were uncomfortable or had lots of distractions from writing their reports, so that they could avoid these places.

Finally, for the *how/eagerness* simulation, participants were asked to imagine themselves capturing as many details as they could and making their reports vivid and interesting. For the *how/vigilance* simulation, participants were asked to imagine themselves not forgetting to leave any details out and being careful not to make their reports bland or boring.

After the mental simulation procedure, the experimenter thanked each participant and handed out a two-page form on which to write the report, as well as a stamped envelope addressed to the experimenter (unless a participant expressed an intention to return the report by hand). Each participant was then paid $5, partially debriefed, and dismissed.

Each participant who sent in or delivered a report was mailed or given a cheque or cash for $7. All of the original participants were later contacted and fully debriefed.

Results

Our primary prediction was that predominant regulatory focus would interact with mental simulation framing to predict whether participants turned in their reports. In order to determine participants' predominant regulatory focus, we first subtracted each participant's prevention score from his or her promotion score, then conducted a median split across all participants on the difference between these two scores. A three-way chi-square with the variables *predominant regulatory focus* (*promotion*, *prevention*), strategic *means* (*eagerness*, *vigilance*), and *whether participants turned in their reports* (*yes*, *no*) revealed only the predicted three-way interaction, Pearson $\chi^2(1) = 3.89$, $p < 0.05$. Table 1 shows the numbers of participants in each of the eight conditions. As can be seen, 74% of participants in both the promotion/eagerness and prevention/vigilance conditions turned in reports, compared to only 54% of participants in the promotion/vigilance condition and only 46% of participants in the prevention/eagerness condition. Collapsing across the two 'fit' conditions (promotion/eagerness and prevention/vigilance) and the two 'non-fit' conditions (promotion/vigilance and prevention/eagerness), participants with regulatory fit between their orientation and strategic means framing were 48% more likely to turn in their reports than participants without regulatory fit.[2]

An analysis of variance ANOVA with the factors predominant regulatory focus and strategic means revealed no effects on report length, with the exception of a marginal effect of means framing on report length, $F(1, 40) = 2.73$, $p < 0.11$ (all other Fs < 1). Specifically, participants in the vigilance framing condition wrote non-significantly longer reports (347 words) than participants in the eagerness framing condition (240 words). Although we might have predicted that participants in fit conditions

Table 1. Number of participants who turned in a report by predominant regulatory focus and means framing

	Means framing			
	Eager		Vigilant	
	Whether turned in report		Whether turned in report	
	Yes	No	Yes	No
Predominant regulatory focus				
Promotion	14	5	8	7
Prevention	5	6	14	5

[2]Sex of participant also interacted with regulatory focus, means framing, and the 'turn-in' variable; this four-way chi-square was significant, Pearson $\chi^2(4) = 10.91$, $p < 0.03$. In order to interpret this complex interaction more easily, we replaced the regulatory focus and means framing variables with a single 'fit/non-fit' variable and reconducted the analysis, which was now only marginally significant, Pearson $\chi^2(1) = 2.52$, $p = 0.11$. What this analysis revealed in short was that the fit effect was weaker for females than for males. Females overall had a very high rate of return (over 70%) compared to males (under 60%), which could have produced a ceiling effect for females that reduced the possibility of finding a strong fit effect for them.

would write longer reports than participants in non-fit conditions, due to the presumably greater motivational strength of the former participants, the standardized two-page length of the form on which participants were asked to write their reports may have led to a suppression of such effects. No differences were found in the amount of time it took participants to turn in their reports (all Fs < 1).

Discussion

In Experiment 1, we obtained evidence that for people with a predominant *promotion* focus, the mental simulation of *eagerness*-related steps to complete a goal enhances motivational strength, as reflected in subsequent goal completion rates, relative to the mental simulation of vigilance-related steps. In contrast, for people with a predominant *prevention* focus, the mental simulation of *vigilance*-related steps to complete a goal enhances motivational strength, as reflected in subsequent goal completion rates, relative to the mental simulation of eagerness-related steps. Thus, the presence of regulatory fit between people's predominant regulatory focus and the type of plans they mentally simulated was found to have a profound impact on the likelihood that they would complete the goal of turning in a report. Overall, people with regulatory fit were almost 50% more likely to turn in their reports than people without regulatory fit. There were no main effects of either predominant regulatory focus or strategic means on whether participants turned in their reports. Only the fit between regulatory focus and strategic means exerted an influence on participants' behaviour.

The implications of these results are important for several reasons. First, Experiment 1 is the first study to examine the effects of regulatory fit on enhancing performance of a *real-world* behaviour in an applied setting—specifically, participants' writing of a report at home, an everyday task that has relevance to many students' academic goals. Second, Experiment 1 is also the first study to look at whether regulatory fit can increase, not merely quality of goal performance, but actual *rates* of entire goal completion, relative to non-fit conditions. In this sense, Experiment 1 provides a particularly stringent test of the regulatory fit hypothesis. Finally, the results of Experiment 1 suggest how the effectiveness of a well-established goal implementation technique, mental simulation of plans, might be further enhanced—namely, by adapting it strategically to fit people's regulatory states.

The second study we conducted extended our test of the regulatory fit hypothesis in several respects. First, instead of measuring chronic regulatory focus, as in Experiment 1, we experimentally manipulated the framing of an identical goal—eating more fruits and vegetables—as either an accomplishment/promotion-related or a security/prevention-related health issue. Second, rather than varying the type of plans to be mentally simulated, we manipulated the *strategic direction* in which participants were asked to imagine possible outcomes—specifically, as benefits to be obtained through compliance or as costs to be incurred through non-compliance.

Finally, it could be argued that using strategic means that fit one's regulatory orientation improves goal performance, because this fit increases the actual or perceived *instrumentality* of the means in helping participants attain their goals. While this would still be an interesting finding, and one that would not be predicted by traditional models of motivational strength, we believe that regulatory fit enhances effective action without necessitating an (indirect) increase in the value of the goal from an increase in instrumentality.

In support of this notion, Higgins et al. (2003, Studies 1–3) had promotion- or prevention-focused participants choose between an expensive coffee mug and a disposable pen using either an eager or a vigilant strategy, and found that participants rated the price of the coffee mug as higher when they had chosen it under fit than under non-fit conditions (the explanation for the findings being that 'value from fit' transferred to the outcome of the decision-making process). In these studies, it is highly unlikely that fit led to an increase in *actual* instrumentality of the choice strategy, given that (1) the choice was

so easy for everyone to make and (2) virtually all participants chose the mug. In addition, Higgins et al. (Study 5) showed that fit effects on the evaluation of a hypothetical programme to improve middle school were not mediated by *perceived* instrumentality—specifically, ratings of the effectiveness and efficiency of one's improvement strategy. Finally, Spiegel and Higgins (S. Spiegel & E. T. Higgins, unpublished work, 2001) found that fit effects on anagram performance were not mediated by perceived instrumentality—specifically, a rating of how useful participants thought the task would be in helping them meet a prespecified performance criterion. In Experiment 2, then, we included a measure of participants' confidence in their ability to change their eating habits to incorporate more fruits and vegetables, in order to test whether the fit effect on goal performance is independent of perceived instrumentality.

EXPERIMENT 2

Rothman and Salovey (1997) have suggested that people's perceptions of a health issue have important implications for the likelihood that they will change their behaviour in response to messages that emphasize either 'benefits' to be obtained through compliance or 'costs' to be incurred through non-compliance with respect to this issue (see also Banks et al., 1995; Meyerowitz & Chaiken, 1987). In other words, a recipient's behavioural response to a health message may be a function of both the strategic framing of the outcomes to be imagined *and* the pre-existing psychological perception of the health issue. We propose, in the spirit of Rothman and Salovey, that in order to predict the effectiveness of a health-related message in changing behaviour, it is useful to consider how individuals perceive particular health issues. More specifically, we propose that, in order to predict which type of strategic framing will be more effective—framing that emphasizes benefits versus costs—it is useful to consider the self-regulatory systems that are engaged when health behaviours are advocated.

Experiment 2 investigated how the fit between regulatory focus and strategic outcome framing influences the effectiveness of health messages in changing behaviour, even when the advocated behaviour is kept constant. Health messages were constructed to manipulate these variables. All of the messages advocated the *exact same health behaviour*—specifically, eating more fruits and vegetables.

As in Experiment 1, the principle of regulatory fit provided a theoretical basis for our predictions in this study. Specifically, Higgins (2000) proposes that regulatory fit may be achieved when either the *type* of means that is used sustains a person's regulatory orientation, as in Experiment 1—e.g. eagerness for a promotion focus or vigilance for a prevention focus—or when the *level* of means that is used sustains a person's regulatory orientation—e.g. high versus low eagerness for a promotion focus. Idson, Liberman, and Higgins (2000) found that for promotion-focused people, who are inclined toward eagerness means, an emphasis on obtaining benefits induces a *high level* of this type of motivation (eagerness), whereas an emphasis on suffering costs induces a *low level* of this type of motivation (eagerness). Therefore, we predicted that inducing promotion-focused participants to focus on the benefits they could obtain through compliance with an advocated health behaviour would lead to enhanced motivational strength—and subsequently greater behavioural change—than inducing them to focus on the costs they might suffer through non-compliance. In contrast, Idson et al. found that for prevention-focused people, who are inclined toward vigilance means, an emphasis on suffering costs induces a *high level* of this type of motivation (vigilance), whereas an emphasis on obtaining benefits induces a *low level* of this type of motivation (vigilance). Therefore, we predicted that inducing prevention-focused participants to focus on the costs they might suffer through non-compliance with an advocated health behaviour would lead to enhanced motivational strength—and

subsequently greater behavioural change—than inducing them to focus on the benefits they might obtain through compliance.

Method

Participants

Participants were 190 Columbia undergraduates (102 females and 88 males), who were paid for their participation. Forty participants failed to return for the second session; these participants' data were subsequently excluded from our analyses. The number of participants who failed to return to complete the experiment did not vary by condition. The final number of participants was 150 (85 females and 65 males). There were between 16 and 23 participants in each of the eight experimental conditions. No sex differences were found in any of our results.

Procedure

Participants were informed that they were participating in a two-session experiment designed to study the nutritional habits of college students. The experiment was described as a cooperative effort among several universities and disciplines, an effort that was designed to document and evaluate the eating patterns of college students. Participants were asked about their current nutritional habits, and then read a message designed to encourage undergraduates to improve these habits.

In Session 1, participants were given a booklet that consisted of the following items: a cover letter, a 'Food Habits Questionnaire (FHQ),' a health message, and an item asking them, 'If you wanted to change your current diet by including more fruits and vegetables, how *confident* are you that you could make such a change?' (on a 7-point scale from 1 = *not at all* to 7 = *extremely*). This latter measure was included in order to allow us to rule out the possibility that effects of regulatory fit on fruit and vegetable consumption were mediated by participants' beliefs about the instrumentality of these means in helping them achieve the goal. Participants were then given a Daily Nutrition Log booklet, and were instructed to return in a week with the completed booklet for a second session. In Session 2, participants turned in their daily log booklets, were paid, and were fully debriefed.

Materials

FHQ. The FHQ was designed to measure participants' average pre-message fruit and vegetable intake. Participants were first asked a number of questions about their general eating and drinking habits; these items were included in order to conceal the true purpose of the fruit and vegetable intake measure. On the second page of the FHQ, participants were given a chart on which they were asked to indicate the number of days (0–7) in the previous week on which they had consumed *at least* one serving of each of 22 food items.[3]

Six of the 22 food items asked about were fruits and vegetables (*potatoes*, *leafy green vegetables*, *beans*, *other vegetables*, *fruit*, and *fruit juice*). The total on these six items was used as an indicator of average pre-message fruit and vegetable intake.

[3]We decided that asking participants to accurately recall the actual *number* of servings of each of the 22 food items they had consumed over the previous week would be unreasonable. We therefore opted for the less sensitive, but more reasonable, measure of pre-message nutritional intake described above.

Daily Nutrition Log booklet. The Daily Nutrition Log booklet included seven daily logs that participants were asked to fill out (one a day over the following 7 days, with the day on which Session 1 took place counted as Day 1). The Daily Nutrition Log was used to record how many servings of fruits and vegetables participants ate daily (using the same six food categories as the FHQ). Participants were asked to indicate, next to each of the six fruit and vegetable categories, how many servings of that category they had consumed that day (by circling a number from 0–8). For example, a participant who had eaten two servings of potatoes that day would circle the '2' next to the category *potatoes*. A serving was defined at the top of each page as 'approximately one half-cup.' This definition was used in order to obtain as precise an estimate of post-message fruit and vegetable intake as possible.

Experimental Manipulation

Each health message was approximately 150 words in length. A 2×2 experimental design was used, with the variables *regulatory focus* (*promotion*; *prevention*) and *outcome framing* (*benefits*; *costs*). Regulatory focus was manipulated by highlighting different types of concerns associated with eating fruits and vegetables. Messages with a *promotion focus* emphasized a concern with *accomplishment:*

> A diet rich in essential nutrients, like those found in fruits and vegetables, has direct effects on the biochemistry of the brain, resulting in increased energy, better moods, and a general sense of happiness and fulfillment. People who eat a balanced diet, of which fruits and vegetables are an integral part, can experience greater confidence and optimism, which in turn makes them more appealing to others as well as successful in their endeavors. Having an adequate supply of nutrients in the bloodstream is also important for maintaining attractive hair and skin, and promotes an active metabolism, which burns fat and contributes to an overall toned and attractive body. The vitamins and minerals found in fruits and vegetables provide the nourishment necessary for greater concentration and attentiveness, and for maximizing mental abilities and creativity. Good nutrition can have a substantial positive effect on test performance and IQ (intelligence) scoring. If you eat the right amount of fruits and vegetables daily, you can experience an overall sense of feeling good about yourself.

Messages with a *prevention focus* emphasized a concern with *safety*:

> Human beings require a whole regimen of nutrients for basic good health. Eating fruits and vegetables supplies the body with the nutrients it needs, enabling the body to produce substances from within which buffer it from the physical demands of the world we live in (pollution, daily stress, bad weather, etc.). The vitamins and minerals found in fruits and vegetables are known to play a protective role, and help to repair already damaged tissues. Eating fruits and vegetables helps to facilitate the actions of the immune system, which works to keep you healthy and safe from illness. A well-nourished immune system stops pathogens (poisons) and neutralizes their toxins, and forms a barrier against invading bacteria to prevent their spread. Certain vegetables have even been shown to be effective in protecting the body from cancer and heart disease. The nutrients found in fruits and vegetables also contribute to healthy teeth, gums, and bones. If you eat the right amount of fruits and vegetables, you can actively help keep yourself safe from illness and obtain overall good health.

Within each regulatory focus condition, each message was also framed such that it encouraged participants to imagine either the benefits they might obtain through compliance or the costs they might incur through non-compliance. It was these outcome framings that we expected to interact with

regulatory focus to predict behavioural change. Specifically, within the promotion focus condition, the *emphasis on benefits* version read, 'If you eat the right amount of fruits and vegetables daily, you can experience an overall sense of feeling good about yourself.' In contrast, the *emphasis on costs* version read, 'If you do not eat the right amount of fruits and vegetables, you cannot experience an overall sense of feeling good about yourself.'

Within the prevention focus condition, the *emphasis on benefits* version read, 'If you eat the right amount of fruits and vegetables, you can actively help keep yourself safe from illness and obtain overall good health.' In contrast, the *emphasis on costs* version read, 'If you do not eat the right amount of fruits and vegetables, you cannot actively help keep yourself safe from illness and facilitate overall good health.'[4]

It should be emphasized that the substantive informational content of the messages across the conditions of this study varied only by regulatory focus, and that within a given focus condition, the informational content was essentially the same (with the exception of the outcome framing). In addition, *all* messages advocated the *exact same health behaviour*—eating fruits and vegetables.

Results

Pre-message Fruit and Vegetable Intake

A 2×2 ANOVA with the factors regulatory focus and outcome framing revealed no significant effects on pre-message fruit and vegetable intake, as indicated by the Session 1 FHQ (all $ps > 0.10$).

Confidence in Ability to Change Eating Habits

A 2×2 ANOVA with the factors regulatory focus and outcome framing revealed no significant effects on participants' confidence that they could change their eating habits (all $Fs < 1$). Thus, confidence or perceived instrumentality of the means could not have served as a mediator of fit effects on behaviour.

[4]Within each regulatory focus/strategic means condition, we also manipulated *regulatory reference* in order to check on whether it had any independent effect (see Carver & Scheier, 1990 for a discussion of self-regulatory systems with positive versus negative reference values). In the promotion focus conditions, the message described the significance of eating fruits and vegetables for either approaching the desired end-state of 'achievement' or avoiding the undesired end-state of 'non-fulfillment.' In the prevention focus condition, the message described the significance of eating fruits and vegetables for either approaching the desired end-state of 'safety' or avoiding the undesired end-state of 'danger.' For example, in the *promotion focus/emphasis on benefits/positive end-state as reference point* version, the message read:

> A diet rich in essential nutrients, like those found in fruits and vegetables, has direct effects on the biochemistry of the brain, resulting in *increased energy, better moods, and a general sense of happiness and fulfillment* [italics added] . . . . If you eat the right amount of fruits and vegetables daily, *you can experience an overall sense of feeling good about yourself* [italics added].

In contrast, in the *promotion focus/emphasis on benefits/negative end-state as reference point* version, the message read:

> A diet rich in essential nutrients, like those found in fruits and vegetables, has direct effects on the biochemistry of the brain, resulting in *the avoidance of lowered energy, unpleasant moods, and the absence of a sense of unhappiness and unfulfillment* [italics added] . . . . If you eat the right amount of fruits and vegetables daily, *you will not experience an overall sense of feeling bad about yourself* [italics added].

Because regulatory reference had no main or interactive effects on any of our results, all findings have been collapsed across regulatory reference conditions.

Fruit and Vegetable Intake

In order to obtain a general measure of the change in participants' fruit and vegetable intake, we converted the daily log entries of each participant for the post-message week (Days 1–7) to the same scale used in the pre-message measure of fruit and vegetable intake (i.e. the number of days on which the participant had eaten *at least one serving* of a particular fruit or vegetable category, with the number of days then totalled across the six fruit and vegetable categories). A measure of change in fruit and vegetable intake was calculated. Collapsing across all message conditions, there was a significant increase from pre- to post-message measurement points in fruit and vegetable intake (mean change = 3.55, $SD = 7.13$, $t(149) = 5.36$, $p < 0.001$).

Overall, then, the health messages were effective in changing participants' behaviour. However, this general measure of change in fruit and vegetable intake was too gross to reveal differences among message conditions. In order to effectively compare conditions, then, we relied on a measure that was sensitive to the actual amounts of fruits and vegetables participants ate on each day following the experimental manipulation. This was possible through the use of participants' daily logs detailing how many servings of fruits and vegetables they had eaten.

Mean intake of fruit and vegetable servings across the 6 days subsequent to message exposure (Days 2–7) was calculated for each of the four conditions.[5] The correlation between pre- and post-message fruit and vegetable intake was significant, $r(147) = 0.54$, $p < 0.001$. This correlation was virtually unchanged when confidence ratings were controlled for, $r(147) = 0.53$, $p < 0.001$. In addition, an ANOVA conducted on post-message intake, with regulatory focus and outcome framing as predictors, and controlling for pre-message fruit and vegetable intake, revealed a significant *regulatory focus* × *outcome framing* interaction, $F(8, 148) = 6.75$, $p < 0.01$. As predicted, promotion-focused messages encouraging participants to imagine benefits were more effective than promotion-focused messages encouraging participants to imagine costs, whereas prevention-focused messages encouraging participants to imagine costs were more effective than prevention-focused messages encouraging participants to imagine benefits (see Table 2). This interaction remained essentially unchanged when confidence was included in the analysis as a covariate.

Planned contrasts (using means adjusted for pre-message intake) within each regulatory focus condition revealed that participants who had received a promotion-focused/benefit-framed message had a higher mean fruit and vegetable intake ($M = 8.25$) than participants who had received a promotion-focused/cost-framed message ($M = 7.05$), $t(82) = 1.73$, $p < 0.10$. In contrast, participants

Table 2. Means (SDs) for fruit and vegetable intake by regulatory focus and outcome framing

	Outcome framing	
	Benefits	Costs
Regulatory focus		
Promotion	8.25 (3.8)	7.05 (3.1)
Prevention	6.46 (3.6)	8.06 (3.6)

Notes: 1. Mean fruit and vegetable intake refers to the mean number of servings from Days 2–7. For example, participants in the promotion/benefits condition ate an average of 8.25 servings during the entire 6 days examined.

2. Means are adjusted for pre-message intake.

[5]Day 1 was excluded from this more refined measure of fruit and vegetable intake, because some participants were tested in the morning and others in the afternoon, and thus the effect of the message on how many servings were eaten over the course of the entire day could not be clearly isolated.

who had received a prevention-focused/cost-framed message had a higher mean fruit and vegetable intake ($M = 8.06$) than participants who had received a prevention-focused/benefit-framed message ($M = 6.46$), $t(64) = 2.06$, $p < 0.05$ (see Table 2). Collapsing across the two 'fit' and 'non-fit' conditions, participants with regulatory fit between their regulatory focus and outcome framing recorded eating 21% more servings of fruits and vegetables during the target week than participants without regulatory fit.

Discussion

In Experiment 2, we found that when the goal of eating more fruits and vegetables was represented as a promotion-focused health issue, messages that had participants imagine potential benefits from success in diet change were more effective than messages that had participants imagine potential costs from failure in diet change. The opposite was found when the goal of eating more fruits and vegetables was represented as a prevention-focused health issue. Only this regulatory fit effect was significant, and it in fact resulted in an increase of over 20% in the number of servings of fruits and vegetables consumed by people with regulatory fit over those with non-fit during the week following their reading of the message. Importantly, the manipulated regulatory focus of the health issue involved (i.e. promotion versus prevention) did not by itself change behaviour, nor did the strategic direction of the outcome framing (i.e. making benefits happen versus making costs not happen). Behaviour change occurred only as a function of the fit between the strategic direction of outcome framing and the regulatory orientation of the participants. Moreover, this effect was not mediated by the perceived instrumentality of the means in achieving the goal, as evidenced by the fact that our independent variables had no main or interactive effects on participants' confidence that they could change their eating habits, and by the fact that the fit effect remained when participants' confidence was included in the analysis as a covariate.

The above findings suggest that regulatory focus theory and the regulatory fit principle can be used to increase the effectiveness of health messages. Promotion-focused messages in which potential benefits from compliance were imagined were found to be more effective than messages in which potential costs from non-compliance were imagined. Prevention-focused messages in which potential costs from non-compliance were imagined were found to be more effective than messages in which potential benefits from compliance were imagined.

These results suggest that researchers and practitioners seeking to increase the effectiveness of a campaign to change some health-related behaviour would benefit from knowing the regulatory focus of the recipients with respect to the health issue in question, and from targeting the strategic direction of their message conclusions to suit this focus. For example, practitioners might want to know whether recipients of a health-related message have the goal of promoting health or preventing disease with respect to the focal behaviour, and to frame the strategic direction of their message in terms of either benefits or costs, respectively. Alternatively, it might be possible to alter both recipients' orientation to the goal—i.e. promotion or prevention—and the way in which the message is framed—i.e. with respect to benefits or costs—as we did in the present study, in order to maximize regulatory fit and enhance effective goal pursuit.

SUMMARY AND CONCLUSIONS

The present studies extend previous research on how regulatory fit affects people's motivational strength, by examining the effects of fit on the pursuit of everyday life tasks. In Experiment 1, we found that promotion-focused participants who engaged in an eager mental simulation prior to

completing the goal of writing a report, and prevention-focused participants who engaged in a vigilant mental simulation prior to completing the same goal, were much more likely to turn in their reports than promotion-focused participants who completed a vigilant simulation or prevention-focused participants who completed an eager simulation. In Experiment 2, we found that when all participants were given the same goal of eating more fruits and vegetables, participants who read about the goal as a promotion issue ate a greater number of servings on subsequent days when a message they read on this topic had them imagine the potential benefits of changing their behaviour than when it had them imagine the costs of not changing their behaviour, whereas the reverse was true for participants who read about the goal as a prevention issue.

Both of these studies, then, found that when people's regulatory orientation—either their chronic regulatory focus (Experiment 1) or their temporary, situationally induced regulatory focus (Experiment 2)—was sustained by the manner in which they worked toward a goal—either simulating eager or vigilant plans (Experiment 1) or imagining the benefits of compliance or the costs of non-compliance (Experiment 2)—they exhibited higher goal performance than when their orientation was disrupted by the manner in which they worked toward a goal. Specifically, in Experiment 1, participants with regulatory fit were almost 50% more likely to complete and mail in a report that had been assigned to them than participants without fit. In Experiment 2, participants with regulatory fit ate over 20% more servings of fruits and vegetables during the subsequent week than participants without regulatory fit.

These findings have important implications for which factors researchers and policy makers should consider in designing campaigns to change people's behaviour in everyday domains. Specifically, these findings suggest that not only should the desirability of performing the focal behaviour be emphasized, but also that the *fit* between people's regulatory orientation and the manner in which they work toward the goal should be taken into account.

The two studies reported herein demonstrate the beneficial effects of regulatory fit in enhancing effective action within the domain of regulatory focus theory. Other recent research in our lab has demonstrated the effects of regulatory fit in enhancing people's attributed value to a chosen object in a decision-making context within the realm of locomotion and assessment orientations (see Higgins, Kruglanski, & Pierro, in press; Kruglanski et al., 2000). Specifically, Avnet and Higgins (2003) found that participants assigned greater value to a chosen object if they were high in locomotion orientation and used a quicker, 'progressive elimination' strategy to choose this object, or if they were high in assessment orientation and used a more thorough, 'full comparison' strategy, than vice versa. Although this research examined the effects of fit on evaluation of outcomes rather than performance on goals, it is possible that people with fit in the realm of locomotion and assessment might also demonstrate enhanced motivation with respect to certain types of goals. Other instances of fit or non-fit between regulatory orientations and task completion methods—e.g. a fun/serious prior mental model of an activity coupled with fun/serious task instructions—have also been shown to produce differences in task performance (see Bianco et al., 2003). Future research should investigate the effects on goal performance of regulatory fit involving various types of regulatory orientations and methods of goal completion.

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