

Counterfactual thinking and regulatory fit

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Abstract

According to regulatory fit theory (Higgins, 2000), when people make decisions with strategies that sustain their regulatory focus orientation, they “feel right” about what they are doing, and this “feeling-right” experience then transfers to subsequent choices, decisions, and evaluations. The present research was designed to link the concept of regulatory fit to functional accounts of counterfactual thinking. In the present study, participants generated counterfactuals about their anagram performance, after which persistence on a second set of anagrams was measured. Under promotion framing (i.e., find 90% or more of all the possible words) upward counterfactual thinking in general elicited larger increases in persistence than did downward counterfactual thinking in general, but under prevention framing (i.e., avoid failing to find 90% or more of all the possible words) upward evaluation (comparing reality to a better reality) elicited larger increases in persistence than did upward reflection (focusing on a better reality), whereas downward reflection (focusing on a worse reality) elicited larger increases in persistence than did downward evaluation (comparing reality to a worse reality). In all, the present findings suggest that the generation of counterfactuals enhances the likelihood that individuals will engage in courses of action that fit with their regulatory focus orientation.

Keywords: Counterfactual, regulatory fit, assimilation, contrast, motivation.

1 Introduction

Individuals are commonly beset by thoughts of what would, might, or could have been if events had taken a different turn. This phenomenon — termed “counterfactual thinking” — has generated a great deal of interest over the past 25 years (for reviews, see Miller, Turnbull, & McFarland, 1990; Roese, 1997; Mandel, Hilton, & Catellani, 2005). In addition to research implicating counterfactuals in judgments of causality, blame, suspicion, and victim compensation (e.g., Kahneman & Miller, 1986; Miller & Gunasegaram, 1990; Wells & Gavanski, 1989), work has focused on how counterfactual thinking influences emotions. For instance, research suggested that people will have a stronger emotional reaction to an outcome to the extent that counterfactual alternatives are highly salient (Gleicher et al., 1990; Johnson, 1986; Kahneman & Miller, 1986). Thus, a traveler who misses a plane flight by several minutes is expected to experience more negative affect than is a traveler who misses the same flight by two hours (Kahneman & Tversky, 1982).

Extending these early findings, researchers began to stress a distinction between upward and downward counterfactuals (Markman, et al., 1993; McMullen, Markman, & Gavanski, 1995; Roese, 1994; Sanna, 1996). Upward counterfactuals compare reality to a more desirable alternative world (e.g., “If only I had pumped my brakes, I could have avoided the accident”), whereas downward counterfactuals compare reality to a less desirable alternative world (e.g., “If I hadn’t been wearing my seat belt, I could have been killed”). Through an affective contrast mechanism (Schwarz & Bless, 1992; Sherif & Hovland, 1961), upward counterfactuals can elicit negative affect whereas downward counterfactuals can elicit positive affect (Markman et al., 1993; Markman, et al., 1995; Medvec, Madey, & Gilovich, 1995; Roese, 1994; Sanna, 1996).

In turn, researchers also attempted to describe the possible functions that upward and downward counterfactual thoughts might serve. One identified function is the contrast-based affective response to downward counterfactuals (e.g., McMullen, 1997; Roese, 1997; Taylor & Schneider, 1989) — a given outcome will be judged more favorably to the extent that a less desirable alternative is salient. By highlighting how the situation or outcome could easily have been worse, downward coun-

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terfactuals can enhance coping and well being. On the other hand, upward counterfactuals are posited to serve a preparative function. Thus, although upward counterfactuals may devalue the actual outcome and make people feel worse (e.g., Markman & McMullen, 2003; Mellers, Schwartz, Ho, & Ritov, 1997; Roese, 1994), simulating routes to better realities may help individuals improve upon their outcomes in the future (Johnson & Sherman, 1990; Karniol & Ross, 1996; Taylor & Schneider, 1989).

Providing initial empirical support for the motivational functions of counterfactual thinking, Markman, Gavaniski, Sherman, and McMullen (1993) had participants play blackjack against a computer-simulated opponent and led them to believe that they would either be playing no additional hands of blackjack or three additional hands of blackjack. Participants who expected to play again demonstrated a greater tendency to generate upward counterfactuals relative to those who did not expect to play again. According to Markman et al., participants who expected to play again generated upward counterfactuals because they needed preparative information to help them perform better. On the other hand, participants who did not expect to play again needed no such information and, instead, wanted only to feel good about their current performance. Thus, the downward counterfactuals they generated served the affective function. Roese (1994) followed up this work by directly manipulating upward and downward counterfactual generation in order to examine their subsequent effects on both motivation and behavior. Participants induced to generate upward counterfactuals performed better on an anagram task than did those who generated downward counterfactuals (Morris & Moore, 2000; Nasco & Marsh, 1999; Parks, Sanna, & Posey, 2003).

Notably, all of the studies reviewed thus far have focused exclusively on the emotional and motivational consequences of *contrastive* counterfactual generation whereby judgments are displaced *away* from the counterfactual reference point. However, recent theorizing and research have suggested that *assimilative* counterfactual generation whereby judgments are pulled *toward* the counterfactual reference point are also possible (e.g., Landman & Petty, 2000; Markman, Elizaga, Ratcliff, & McMullen, in press; Markman & McMullen, 2003, 2005; Markman, Ratcliff, Mizoguchi, McMullen, & Elizaga, in press; Markman & Tetlock, 2000; McMullen, 1997; McMullen & Markman, 2000, 2002; Wayment, 2004).

In order to account for how assimilation and contrast effects can both arise following the generation of counterfactuals, Markman and McMullen (2003; see also Markman & McMullen, 2005; Markman et al., in press) developed the Reflection and Evaluation Model (REM) of comparative thinking. At the heart of the model is the assertion that two psychologically distinct modes of men-

tal simulation operate during comparative thinking. The first mode is *reflection*, an experiential (“as if”) mode of thinking whereby one imagines that information about the comparison reference point is true of, or is part of, oneself or one’s present standing, and the second mode is *evaluation*, whereby the outcome of a mental simulation run is used as a reference point against which to evaluate oneself or one’s present standing.

Figure 1 depicts the interaction between simulation direction and simulation mode. To illustrate, consider the student who receives a B on an exam but realizes that an A was easily attainable with some additional studying. In the case of upward evaluation, the student switches attention between the outcome (a grade of B) and the counterfactual reference point (a grade of A). According to the REM, such attentional switching (“I got a B...I could have gotten an A but instead I got a B”) involves comparing the outcome to the counterfactual reference point and thereby instigates evaluative processing (see also Oettingen, Pak, & Schnetter, 2001). In the case of upward reflection, however, the student’s attention is focused mainly on the counterfactual reference point itself. Focusing on the counterfactual instigates reflective processing whereby the student considers the implications of the counterfactual and temporarily experiences the counterfactual as if it were real (“What if I had actually gotten an A?”). In a sense, the student is “transported” into the counterfactual world (Green & Brock, 2000). Likewise, consider the case of a driver who pulls away from the curb without carefully checking rear and side-view mirrors, and subsequently slams on the brakes as a large truck whizzes by. In the case of downward evaluation, the driver switches attention between the counterfactual reference point (being hit by the truck) and the outcome (not being hit by the truck), thereby instigating evaluative processing (“I was fortunate to not have been hit by that truck”). In the case of downward reflection, however, the driver’s attention is mainly focused on the counterfactual itself, thereby instigating reflective processing (“I nearly got hit by that truck”).

The evidence for assimilative responses to counterfactuals that has accumulated so far has mostly focused on affective reactions — upward and downward counterfactuals can engender both positive *and* negative affect (e.g., McMullen, 1997). The present paper, however, examines the motivational consequences of upward and downward assimilative and contrastive counterfactuals. To do so, we consider the interaction between *simulation direction* (upward versus downward) and *simulation mode* (reflective versus evaluative). According to the REM, upward evaluation should be motivationally superior to upward reflection because the former is more likely to specify implementation strategies that allow one to evaluate the observed consequences of one’s actions and imple-

		Mode	
		Reflection	Evaluation
Direction	Upward	“I almost got an A.”	“I got a B. . . I failed to get an A.”
	Downward	“I nearly got hit by that truck.”	“I was fortunate to not have been hit by that truck.”

Figure 1: The interaction between simulation direction and mode.

ment novel strategies (see also Gollwitzer, Heckhausen, & Stellar, 1990; Segura & Morris, 2005). Upward reflection, on the other hand, functions very much like a positive fantasy that can engender anticipatory consumption of motivation. According to Oettingen (1996), in a positive fantasy,

“... a person may ‘experience’ the future event ahead of time and may color the future experience more brightly and joyfully than reality would ever permit. Therefore the need to act is not felt, and the thorny path leading to implementing the fantasy may be easily overlooked” (pp. 238-239).

The divergence between the REM and other functional approaches is perhaps even more evident when downward counterfactuals are considered. Previous models of counterfactual thinking and motivation (e.g., Markman et al., 1993; Roese, 1994, 1997), and more recent and general models of mental simulation (e.g., Oettingen, 1996; Oettingen et al., 2001; Sanna, Stocker, & Clarke, 2003) have contended that goal-based mental simulations necessarily involve contrasts with reality. The REM, on the other hand, predicts that whereas downward reflection should enhance motivation in achievement domains because it raises an individual’s awareness of the possibility that a negative goal-state could have been attained (see also Wayment, 2004), downward evaluation should engender complacency because it suggests that a negative goal-state has been successfully avoided. In an initial test of these ideas, McMullen and Markman (2000, Study 3) found that students reported less motivation in a class following the generation of contrastive downward counterfactuals about their first exam score, but reported more motivation following the generation of assimilative downward counterfactuals. Importantly, however, whereas McMullen and Markman (2000) measured only *intentions* to perform better in the future, the present research obtained behavioral measures of persistence and performance following counterfactual generation. Moreover, whereas McMullen and Markman (2000) focused only on downward counterfactuals, the present research focused on the motivational consequences of both downward *and* upward counterfactuals.

1.1 Regulatory focus and fit theory

The present work attempts to build on the REM account by examining the consequences of counterfactual generation when individuals are focused on either promotion or prevention goals (e.g., Higgins, 1998, 2000; see also Hur, 2000; Pennington & Roese, 2002; Roese, Hur, & Pennington, 1999). According to regulatory focus theory (Higgins, 1998), promotion-oriented individuals are focused on growth, advancement, and accomplishment and thus tend to pursue strategies aimed at approaching desirable outcomes. On the other hand, prevention-oriented individuals are focused on protection, safety, and responsibility and thus tend to pursue strategies aimed at avoiding undesirable outcomes. Within the context of counterfactual thinking, a promotion focus should encourage individuals to devise strategies (e.g., putting more effort into school work) designed to achieve outcomes that are more favorable than the actual outcome, whereas a prevention focus should encourage the development of strategies (e.g., checking all rear-view and side mirrors before pulling out of a parking space) that attempt to avoid outcomes that are less favorable than the actual outcome.

Recent research examining value and decision making has shown that the choice strategy or the manner in which an object is chosen can affect the object’s perceived value (e.g., Avnet & Higgins, 2003; Camacho, Higgins, & Luger, 2003; Higgins, Idson, Freitas, Spiegel, & Molden, 2003), and this effect on value has been termed the *regulatory fit effect* (e.g., Higgins, 2000, 2005). According to regulatory fit theory, when people engage in decisions or choices with strategies that sustain their orientation, they “feel right” about what they are doing, and this “feeling-right” experience then transfers to subsequent choices, decisions, and evaluations. For example, Avnet and Higgins (2003) found that people offered more of their own money to buy the same chosen book light when the choice strategy they used fit their regulatory orientation than when it did not fit, and Higgins et al. (2003) found that people assigned a price up to 40% higher for the same chosen coffee mug when their choice strategy fit their regulatory orientation than when it did not fit.

Regulatory fit theory also predicts that motivational strength will be enhanced when the manner in which peo-

ple work toward a goal sustains (rather than disrupts) their regulatory orientation, and that this enhanced motivational strength should in turn improve efforts at goal attainment. Recently, Spiegel, Grant-Pillow, and Higgins (2004) applied this notion to the domain of mental simulation. These researchers hypothesized that people with a promotion focus who eagerly simulate and develop approach-oriented plans should perform better at a task than people with a promotion focus who vigilantly simulate and develop avoidance-oriented plans, whereas people with a prevention focus who vigilantly simulate and develop avoidance-oriented plans should perform better at a task than people with a prevention focus who eagerly simulate and develop approach-oriented plans. In support, Spiegel et al. (2004, Experiment 1) found that participants with regulatory fit between their predominant regulatory focus and the type of plans they mentally simulated were 50% more likely to turn in a report on time than participants without regulatory fit.

In a similar vein, we suggest that counterfactuals will enhance motivational strength to the extent that there is regulatory fit between the counterfactual and the predominant regulatory focus. The initial formulation of the REM (Markman & McMullen, 2003) made the general prediction that upward counterfactuals should be more associated with promotion concerns, whereas downward counterfactuals (and downward reflection in particular) should be more associated with prevention concerns. In a refinement of this initial prediction, however, we hypothesize that upward evaluation (i.e., the explicit comparison of reality to an imagined better reality) may be associated with both a promotion *and* a prevention focus. Roeser (1997) has characterized upward counterfactual thoughts as being "...part of a virtual, rather than an actual, process of avoidance behavior..." (p. 135), and Mandel and his colleagues (e.g., Mandel, 2003; Mandel & Lehman, 1996) have provided evidence that upward counterfactuals are applied most commonly toward how an outcome could have been avoided and prevented. More generally, then, upward counterfactual thinking may focus one on how an actual negative outcome can be avoided in the future, but can also suggest means by which one can approach a relatively more favorable future outcome.

In the present paper, we offer new and more specific predictions regarding the moderating role of promotion versus prevention concerns on the motivational consequences of counterfactual thinking. First, we hypothesize that whereas upward reflection provides a good regulatory fit with promotion focus because it gives rise to the eager simulation and development of approach-oriented plans (Spiegel et al., 2004), upward evaluation should provide a good regulatory fit with both promotion and prevention foci because it focuses the individual on both the approach-related plans associated with the at-

tainment of a desired end-state (i.e., the counterfactual outcome) *and* the avoidance-related plans associated with the prevention of an undesired end-state (i.e., the actual outcome). Thus, upward evaluation and upward reflection should both be motivating in a promotion context, whereas upward evaluation should be more motivating than upward reflection in a prevention context. Secondly, we hypothesize that downward reflection should provide a good regulatory fit with prevention focus because it focuses the individual on the vigilant simulation and development of avoidance-related plans, whereas downward evaluation should not be motivating in any context, as it merely focuses the individual on feeling better about the present state of affairs. Thus, whereas neither downward reflection nor downward evaluation should be motivating in a promotion context, downward reflection should be more motivating than downward evaluation in a prevention context. Overall, then, in a promotion context upward counterfactuals should be motivating and downward counterfactuals should not, whereas in a prevention context, upward evaluation and downward reflection should be motivating and upward reflection and downward evaluation should not.

1.2 Study Overview

Participants completed an initial set of anagrams, received performance feedback, and were then instructed to generate either upward or downward counterfactuals about their performance. Subsequently, participants were instructed to either reflect upon the counterfactual they generated or evaluate their performance by comparing it to the counterfactual they generated. Participants then completed a second set of anagrams. Importantly, however, the incentive for completing the second set of anagrams was framed either in terms of gaining or not gaining an extra dollar for the promotion focus (from a starting point of \$4), or in terms of losing or not losing a dollar for the prevention focus (from a starting point of \$5). Framing the same objective incentive (i.e., \$5 for success and \$4 for failure) in terms of the possibility of either gaining extra money or not, or the possibility of losing money or not, allowed us to examine the interactive effects of simulation direction, simulation mode, and regulatory focus context on motivation independent of differences in the actual incentive (Shah, Higgins, & Friedman, 1998).

Overall, we predicted that regulatory focus would interact with simulation direction and mode in the following way:

1. Under promotion framing, upward counterfactual thinking will elicit a larger increase in persistence than will downward counterfactual thinking; and

2. Under prevention framing, upward evaluation will elicit a larger increase in persistence than will upward reflection, whereas downward reflection will elicit a larger increase in persistence than will downward evaluation.

2 Method

2.1 Participants and Design

One hundred sixty-six male and female introductory psychology students at Ohio University participated in exchange for course credit. The data from 14 participants in the downward counterfactual condition were eliminated because they responded incorrectly to the counterfactual solicitation (i.e., they generated upward counterfactuals in addition to, or instead of, downward counterfactuals). The remaining 152 participants were randomly assigned to the conditions of a 2 (*Direction*: upward vs. downward) X 2 (*Mode*: reflective vs. evaluative) X 2 (*Regulatory Focus Framing*: promotion vs. prevention) between-subjects design. Participants were run on separate IBM computers in groups no larger than four.

2.2 Procedure

Participants were seated at computers running MediaLab software (Jarvis, 2004) and informed that the purpose of the experiment was to understand “puzzle-solving.” After signing consent forms, participants clicked on a computer mouse to begin, and the following instructions appeared on the screen:

In the experiment you will be solving anagrams. This task involves unscrambling a series of letters to FORM AS MANY WORDS AS POSSIBLE using ALL OF THE LETTERS in the series. For example, the letters “ALSET” can be unscrambled to form the words “TALES”, “STALE”, and “STEAL”.

You will be given two sets of 10 anagrams to solve. Your performance on the second set of anagrams will determine how much MONEY you will earn for participating in the experiment. The first set of 10 anagrams will serve as practice for the second set. Following completion of the first set, you will receive FEEDBACK concerning your PERFORMANCE on this first set.

Each anagram may have no solution, one solution, or multiple solutions. You have as much time as you require for finding all of the solutions that you can.

Participants then began solving the practice set of anagrams. Each anagram appeared in the center of the screen, and participants were asked to type in their solutions in the field that appeared below it. Participants were given the options of both skipping to the next anagram in the set and returning to previous anagrams in the set. Three of the ten anagrams that appeared in the practice

set were taken from practice items developed by Shah et al. (1998), and the others were developed by the present authors. The ten anagrams used in the experimental set were identical to the ten anagrams employed by Shah et al. (1998) in their experimental set. Each anagram in both the practice and experimental sets had between two and four possible solutions.

Participants worked at their own pace and were given as much time as they wished to complete the set of anagrams. The computer kept track of how long participants spent generating solutions to each anagram. Following completion of the first set, all participants received *accurate* information regarding their performance, but *inaccurate* information concerning the total number of possible solutions by employing the following feedback format: “Out of ‘2X’ possible solutions, you correctly found ‘X’ solutions.” Thus, for example, a participant who found 12 correct solutions across the entire practice set of anagrams was told that, “Out of 24 possible solutions, you correctly found 12 solutions.” The purpose of providing “2X” feedback was to leave each participant with equivalent “room” to generate either upward or downward counterfactuals (cf. Markman et al., 1993).

Next, participants were instructed to, “. . . think about how something different could have happened rather than what actually happened.” Those assigned to the upward counterfactual condition were then told, “Specifically, think about how your performance on the anagrams might have turned out BETTER than it actually did,” whereas those assigned to the downward counterfactual condition were told to “. . . think about how your performance on the anagrams might have turned out WORSE than it actually did.” Participants then provided their counterfactual thoughts in writing.

Simulation mode was then manipulated. The evaluative mode instructions directed participants to “Close your eyes and think about your ACTUAL performance on the anagrams COMPARED to how you MIGHT have performed BETTER (WORSE). Take a minute and VIVIDLY EVALUATE your performance in comparison to how you might have performed better (worse),” whereas the reflective mode instructions directed participants to “Close your eyes and VIVIDLY imagine what might have been. Spend about a minute VIVIDLY IMAGINING how your performance on the anagrams might have been BETTER (WORSE) — the imagined performance you have been thinking about.” Participants were then asked to describe these thoughts in writing.

At this point, participants were reminded that they had an opportunity to win money for their performance on the second set of anagrams. Participants assigned to the promotion-framing condition were told that their goal was to find 90% or more of all the possible words, and that although they were assured of receiving \$4 for par-

ticipating in the experiment, it was possible for them to earn an extra dollar. They would earn the extra dollar if they found 90% or more of all the possible words, but they would not receive the extra dollar if they failed to find 90% or more of all the possible words.

Participants assigned to the prevention-framing condition were told that their goal was to not miss more than 10% of all the possible words, and that although the experimenter was planning to pay them \$5 for participating in the experiment, it was possible for them to lose a dollar. They would not lose a dollar if they missed 10% or less of all the possible words, but they would lose a dollar if they missed more than 10% of all the possible words. In order to ensure that participants understood the framing instructions, an essay box appeared on the following screen that asked them to describe the payoff contingencies to which they had just been exposed. One hundred percent of the participants were able to accurately report the instructions they had just received.

Participants then proceeded to the experimental set of anagrams and were given as much time as they wished to solve them. Once again, the computer kept track of how much time was spent generating solutions to each anagram, and participants were provided with the options of both skipping anagrams and returning to previous anagrams. Following completion of the second set, all participants were informed that they had either succeeded in finding 90% or more of all the possible solutions, or had succeeded in failing to miss more than 10% of all the possible solutions. At this point, participants were probed for suspiciousness regarding any aspects of the experiment. Although several individuals indicated mild suspicion regarding the feedback they received following the practice set of anagrams, none reported completely doubting the feedback. Following the suspiciousness probe, participants were debriefed, paid \$5, and thanked.

2.3 Coding

Two independent judges, both of whom were blind to experimental condition, and one of whom was blind to the experimental hypotheses, coded the counterfactuals generated by each participant for evidence of reflective versus evaluative processing along a 3-point (-1 = *reflective* to +1 = *evaluative*) rating scale. An example of a counterfactual that received a “-1” (reflective) was, “I imagined the letters moving for me, instead of me going through them all individually. Meaning, I imagined the word appearing for me,” and an example of a counterfactual that received a “+1” (evaluative) was, “I could have performed a lot better than I did if I applied more thought.” Interrater reliability on this measure was high ($r = .84$), and thus the two coder’s ratings were averaged.

3 Results

3.1 Manipulation Check

Analyses were conducted to establish that the reflection and evaluation manipulations elicited relative tendencies to engage in reflective versus evaluative processing. As expected, a Direction X Mode ANOVA performed on the mode scores revealed a main effect of Mode, $F(1, 148) = 19.02$, $p < .001$, $\eta^2 = .11$, indicating that participants instructed to engage in reflection demonstrated more reflective processing ($M = -.20$, $SD = .85$) than did those who were instructed to engage in evaluation ($M = +.39$, $SD = .72$).

3.2 Persistence

To examine our predictions regarding changes in persistence from the first to the second anagram task, a persistence change score was computed by subtracting the total amount of time spent on the practice set (Set 1) of anagrams ($M = 619.56$ sec, $SD = 297.44$) from the total amount of time spent on the experimental set (Set 2) of anagrams ($M = 706.60$ sec, $SD = 308.84$). A Direction X Mode X Regulatory Focus ANOVA was then performed on these change scores. To begin, the analysis revealed a main effect of Direction, $F(1, 144) = 11.79$, $p = .001$, $\eta^2 = .08$, indicating that participants who generated upward counterfactuals showed a larger increase in persistence ($M = +154.65$ sec, $SD = 349.53$) than did those who generated downward counterfactuals ($M = -1.6$ sec, $SD = 246.61$). Secondly, a significant Direction X Mode interaction was obtained, $F(1, 144) = 3.72$, $p = .05$, $\eta^2 = .03$, indicating that participants who were instructed to engage in upward evaluation showed a larger increase in persistence ($M = +225.67$ sec, $SD = 360.40$) than did those who were instructed to engage in upward reflection ($M = +86.85$ sec, $SD = 317.94$), $F(1, 144) = 3.94$, $p = .05$, $d = .41$, whereas those who were instructed to engage in downward reflection showed a larger increase in persistence ($M = +26.01$ sec, $SD = 274.79$) than did those who were instructed to engage in downward evaluation ($M = -31.63$ sec, $SD = 246.61$), although not significantly, $F < 1$, $d = .22$.

Importantly, the Direction X Mode interaction was qualified by a significant Direction X Mode X Regulatory Focus interaction, $F(1, 144) = 4.52$, $p = .035$, $\eta^2 = .03$. To explore the nature of the 3-way interaction, the Direction X Mode interaction was examined separately in the promotion and prevention conditions (see Figure 2). In the promotion condition there was a significant main effect of Direction, $F(1, 72) = 12.51$, $p = .001$, $\eta^2 = .15$, indicating that participants who generated upward counterfactuals showed larger increases in persistence ($M = +238.25$

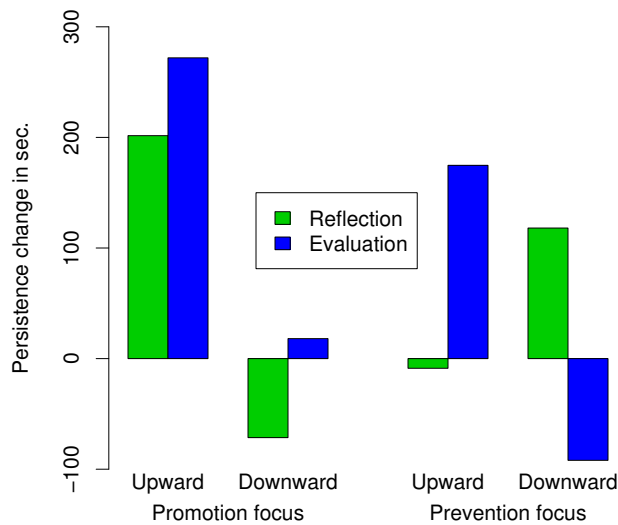


Figure 2: Change in persistence from Set 1 to Set 2 as a function of direction, mode, and focus.

sec, $SD = 373.60$) than did those who generated downward counterfactuals ($M = -26.69$ sec, $SD = 239.60$). No other effects were significant (all $ps > .29$). In the prevention condition, on the other hand, whereas neither the Direction nor Mode main effects were significant (all $ps > .26$), the Direction X Mode interaction was significant, $F(1, 72) = 10.03, p = .002, \eta^2 = .12$. As depicted in Figure 2, whereas participants who were instructed to engage in upward evaluation showed larger increases in persistence ($M = +174.76$ sec, $SD = 194.58$) than did participants who were instructed to engage in upward reflection ($M = -8.76$ sec, $SD = 342.63$), $F(1, 72) = 5.20, p = .03, d = .66$, participants who were instructed to engage in downward reflection showed larger increases in persistence ($M = +118.06$ sec, $SD = 234.28$) than did participants who were instructed to engage in downward evaluation ($M = -91.98$ sec, $SD = 237.32$), $F(1, 72) = 4.93, p = .03, d = .89$.¹

4 Discussion

By examining the moderating role of promotion versus prevention concerns on the interactive effects of coun-

terfactual direction and processing mode, the results of the present study provide additional insight into the motivational consequences of counterfactual thinking. Consistent with predictions, under promotion framing upward counterfactual thinking in general elicited larger increases in persistence than did downward counterfactual thinking in general, but under prevention framing upward evaluation (comparing reality to a better reality) elicited larger increases in persistence than did upward reflection (focusing on a better reality), whereas downward reflection (focusing on a worse reality) elicited larger increases in persistence than did downward evaluation (comparing reality to a worse reality).

At the outset, specific hypotheses were offered with regard to the regulatory focus orientation that might provide the best fit with each type of counterfactual. First, we hypothesized that upward reflection would provide a better regulatory fit with a promotion focus than with a prevention focus because it gives rise to the eager simulation and development of approach-oriented plans (Spiegel et al., 2004). Providing additional support for this hypothesis, upward reflection was found to elicit larger increases in persistence under promotion framing than under prevention framing, $F(1, 144) = 5.51, p = .02, d = .70$ (see Figure 2).

Secondly, we suggested that upward evaluation might provide a congruent regulatory fit with both promotion and prevention concerns because it focuses the individual simultaneously on the attainment of a desired end-state (i.e., the counterfactual outcome) and the prevention of an undesired end-state (i.e., the actual outcome). In support, upward evaluation was shown to elicit equivalent increases in persistence under both promotion and prevention framing, $F(1, 144) = 1.12, p = .29, d = .27$.

Thirdly, we hypothesized that downward reflection should provide a good regulatory fit with prevention focus because it focuses the individual on the vigilant simulation and development of avoidance-related plans. Consistent with this hypothesis, downward reflection elicited a larger increase in persistence under prevention framing than it did under promotion framing, $F(1, 144) = 4.12, p = .05, d = .48$.

Finally, downward evaluation was not expected to be particularly motivating in either regulatory focus context because it focuses the individual on feeling better about the present state of affairs. Consistent with this prediction, the results indicated that under promotion framing downward counterfactual thinking in general elicited smaller increases in persistence than did upward counterfactual thinking in general, and under prevention framing downward reflection elicited larger increases in persistence than did downward evaluation.

¹ Given that persistence is hypothesized to be the mediator of any effects on performance, the analysis of performance is somewhat secondary and is therefore reported in a footnote. A performance change score was computed by subtracting the total number of Set 1 anagrams solved correctly from the total number of Set 2 anagrams solved correctly. Overall, participants performed better on the second set of anagrams than they did on the first set of anagrams ($M = +.84, SD = 3.59$), $t(151) = 2.87, p = .005$. However, a Direction X Mode X Regulatory Focus ANOVA performed on these change scores revealed no significant main effects or interactions (all $ps > .16$).

4.1 Implications for Research on Decision-Making and Choice

Higgins (2000, 2005) has suggested that people experience regulatory fit when the manner of their engagement in an activity sustains their goal orientation or interests regarding that activity. When there is fit, people engage more strongly in what they are doing and feel right about it. Regulatory fit theory has profound implications for research on decision-making and choice because it provides insight into how individuals impute value. For example, Higgins et al. (2003) measured participants' chronic regulatory focus orientation and were then told that they could choose between a coffee mug (determined to be more desirable in pre-testing) and a pen as a gift. Furthermore, half of the participants were told to think about what they would gain by choosing the mug or the pen (eager strategy), whereas the other half were told to think about what they would lose by choosing the mug or the pen (vigilant strategy). Participants were then asked either to assess the price of the chosen mug or to offer a price to buy it. According to the results, participants assigned a price up to 40% higher for the same chosen coffee mug when their choice strategy fit their regulatory orientation (promotion-eager; prevention-vigilant) than when it did not fit (promotion-vigilant; prevention-eager). The implication here is that when the experience of fit strengthens evaluative reactions to choice options, the fit experience should exert further effects on the likelihood that a particular option is chosen. Importantly, moreover, regulatory fit is not expected to directly affect the hedonic experience of an object or an event. Rather, regulatory fit is posited to affect an individual's *confidence* in his or her reaction to an object or event, and it is this reaction that enhances evaluative responses.

In the language of regulatory fit theory, generating upward reflective counterfactuals feels right in a promotion context, generating downward reflective counterfactuals feels right in a prevention context, and generating upward evaluative counterfactuals feels right in either a promotion or prevention context, *independent* of the positive or negative affect that may be accrued from generating the counterfactual (i.e., one's hedonic experience of the event, as determined by emotional responses to the counterfactual). This has important implications for decision-making, as it suggests that the generation of counterfactuals enhances the likelihood that individuals will choose courses of action that fit with their preferred (chronic or contextually determined) orientation — eagerness means for promotion, vigilance means for prevention. To illustrate, a promotion-oriented student who is seeking strategies for improving class performance would be well-served by generating upward counterfactuals about prior outcomes because such counterfactuals

fit with the student's habitual orientation. Not only should the student be more likely to select promotion-oriented strategies (e.g., studying over a longer period of time, asking more questions in class) but, importantly, the student should also pursue such strategies with greater *vigor* because the experience of regulatory fit enhances engagement strength. On the other hand, a prevention-oriented student would be better served by generating downward reflective counterfactuals. In addition to enhancing the likelihood of selecting prevention-oriented strategies (e.g., getting more sleep, socializing less), regulatory fit should also enhance the strength of the student's engagement in such strategies. More generally, if the manner in which an individual makes a decision sustains the decision-maker's regulatory state, then it should also increase the level of engagement or confidence in the decision-maker's reaction toward a decision outcome. This suggests that decision-makers are more likely to *act upon* useful inferences (Roese, 1997) derived from counterfactuals under conditions of fit than under conditions of non-fit.

4.2 Coda

This research was designed to provide empirical support for an emerging Reflection and Evaluation Model (Markman & McMullen, 2003) that specifies the motivational consequences of engaging in counterfactual thinking. In contrast to early functional approaches (e.g., Markman et al., 1993; McMullen, Markman, & Gavanski, 1995; Roese, 1997) that ascribed a preparative function to upward (but not downward) counterfactuals, and an affective enhancement function to downward (but not upward) counterfactuals, the REM suggests that the emotional and motivational consequences of counterfactual thinking can best be understood when one considers how the direction of the counterfactual simulation interacts with the mode in which the counterfactual simulation is processed. In turn, the present work suggests that individuals' strength of engagement toward goal pursuit should be enhanced to the extent that there is a fit between the counterfactuals they generate and their regulatory orientation.

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