

## In Pursuit of Progress: Promotion Motivation and Risk Preference in the Domain of Gains

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This article examines the role of promotion motivation in decision making in the domain of gains. Using a stock investment paradigm in which individuals believed that they were making decisions that were real and consequential, we found that promotion motivation, and not prevention motivation, predicted the likelihood of switching between risky and conservative choices in the domain of gains. Promotion-focused participants chose a relatively risky option when their stock portfolio remained unchanged (stuck at 0, the status quo) but switched to a relatively conservative option when they had just experienced a large gain (Studies 1–4), both when regulatory focus was measured (Study 1) and manipulated (Studies 2–4). Studies in which progress was manipulated (Study 3) and measured (Study 4) provided evidence that it is *perceptions of progress* that underlie this tactical switch in risk preferences within the promotion system. We discuss the implications of these findings for decision making and the role of progress in self-regulation.

*Keywords:* regulatory focus, self-regulation, risky decision making, prospect theory

Rather than asking who is risk-seeking versus who is risk-averse, researchers increasingly have asked, *when* are people risk-seeking versus risk-averse? While much research suggests a general tendency for risk aversion in both nonhuman and human animals (Kacelnik & Bateson, 1997; Weber, Shafir, & Blais, 2004), decades of research inspired by prospect theory (Kahneman & Tversky, 1979) supports the idea that people are more risk-seeking in the domain of losses than in the domain of gains, where they are generally risk-averse (Kühberger, 1998; Kühberger, Schulte-Mecklenbeck, & Permer, 1999; Schneider, 1992). In our research, we investigated the possibility that individuals in a particular motivational state (promotion motivation) may display *either* risk-averse *or* risk-seeking preferences in the domain of gains and that this shift in risk preference depends on perceptions of progress.

Although risk aversion in the domain of gains was initially established as a psychophysical or cognitive phenomenon (Kahneman & Tversky, 1979), cumulative evidence has shown the important influence of motivation on risk preference (e.g., Atkinson, 1957; Josephs, Larrick, Steele, & Nisbett, 1992; Larrick, 1993; Lopes, 1987; Mishra & Fiddick, 2012; Schneider & Lopes, 1986; Scholer, Zou, Fujita, Stroessner, & Higgins, 2010). We propose that regulatory focus theory (Higgins, 1997) provides a useful motivational framework for examining people's tendencies to be either risk-averse or risk-seeking. Regulatory focus theory posits that there are two distinct motivational systems—the promotion and prevention systems—that differ in both motivational sensitivities and strategic preferences. Building on earlier work that has demonstrated that prevention motivation drives risk preference in the domain of losses (Scholer et al., 2010), in the current work we explore the role of promotion motivation in understanding risk preference in the domain of gains. In particular, we argue that the dynamics of the promotion system can shed light on when and why individuals are risk-averse—and risk-seeking—in the domain of gains.

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### Motivation and Risk Preferences in the Domain of Gains

Prospect theory posits that people display risk aversion under gains because marginal utility decreases as one moves further away from the reference point. As utility sharply diminishes, certain, as opposed to uncertain, gains become relatively more

attractive (Kahneman & Tversky, 1979). The idea that people are generally risk-averse in the domain of gains has also been supported by a number of motivational perspectives that attempt to explain why, beyond psychophysics, individuals may prefer risk aversion when things are looking up (e.g., Lopes, 1987; Mishra & Fiddick, 2012; Schneider & Lopes, 1986). Although these “hot” perspectives differ in their specifics, as we review later, the take-away messages are generally consistent with the “cold” perspectives: in the domain of gains, people tend to be risk-averse.

One general approach is to directly measure people’s attitudes toward risk as a way to understand individuals’ general tendency to engage in risk-seeking or risk-averse behavior. For example, Lopes and colleagues, drawing on earlier theories of personality differences in achievement motivation (Atkinson, 1964; McClelland, Atkinson, Clark, & Lowell, 1953), differentiated people as being chronically oriented toward either security (generally risk-averse) or potential (generally risk-seeking; Lopes, 1987; Schneider & Lopes, 1986). Specifically, Lopes (1987) argued that risk preferences are determined as a function of an individual’s dispositional orientation toward risk seeking or risk aversion and the opportunities afforded in a specific situation (aspiration level). This model places significant emphasis on risk preference as a dispositional trait, arguing that security-oriented people are generally more risk-averse than potential-oriented people, though both orientations are likely to pursue risk-averse choices when the aspiration level is less than the expected value (Schneider, 1992). Indeed, motivational orientations are operationalized directly by people’s past risk-averse or risk-seeking choices (Schneider & Lopes, 1986). In other words, an individual’s future risk-seeking behaviors are predicted on the basis of his or her past risk seeking. This is similar to the way risk preference is treated when it is measured as a personality trait, such as sensation seeking (Zuckerman, 2007). These approaches highlight the idea that, at least in the domain of gains, some people like to take risks and some do not.

A second general approach is to understand how broader motivational concerns may be related to risk preference. For instance, risk sensitivity theory provides a need-based model to explain risk preference. Here, need refers to the disparity between an individual’s present state and a goal or desired state (Mishra, Lalumiere, & Williams, 2010). According to risk-sensitivity theory, decision makers prefer high-risk options in situations of high need, when low-risk options are unlikely to meet those needs (Stephens, 1981; Stephens & Krebs, 1986). In this view, the reason why individuals tend to be risk-averse in the domain of gains is that the presence of gains (or gain frames) suggests lower perceived needs (i.e., people perceive themselves as close to a desired state or having exceeded the threshold of a desired state; Mishra & Fiddick, 2012). In contrast, individuals who find themselves below the reference point perceive that they are in a situation of high need (i.e., far from a desired state). This theory thus predicts that individuals tend to be risk-averse under gains because their need to meet a desired state is low (Mishra & Fiddick, 2012; Mishra et al., 2010; Rode, Cosmides, Hell, & Tooby, 1999).

Other approaches have emphasized the role of potentially painful counterfactuals in motivating risk-aversion under gains. For example, building on theories positing that individuals are motivated to avoid regret (Bell, 1982, 1983; Loomes & Sugden, 1982, 1987), Josephs et al. (1992) and Larrick (1993) proposed that risk

preferences may be driven by individuals’ desire to avoid regretting a “bad” decision. In the domain of gains, choosing the certain option over a risky option can generally protect against regret because a certain gain always pays off. Consistent with this perspective, Josephs et al. (1992) found that low self-esteem individuals, who are especially motivated to avoid regret, were significantly more risk-averse than high self-esteem individuals in the domain of gains.

Notably, all of these general approaches assume some element of invariance in understanding risk preference: within the domain of gains, some motivations lead to risk seeking and other motivations lead to risk aversion. We consider a different possibility that involves conceptualizing risk seeking and risk aversion as behavioral tactics that are not tied to a single underlying motivation (cf. Scholer & Higgins, 2008, 2013). Specifically, we suggest that risk seeking and risk aversion can be flexibly deployed in the service of the *same* underlying motivation (e.g., eagerness). As we develop in the following text, our approach draws on hierarchical models of motivation (e.g., Carver & Scheier, 1998; Miller, Galanter, & Pribram, 1960) to argue that often motivation is not for risk per se but for the extent to which a risky or conservative choice in the present situation best serves the current underlying motivational state. In other words, risky or conservative tactics can be used to serve the *same* goal in different situations.

### Regulatory Focus Theory and Risk Preferences in Prevention Motivation

Regulatory focus theory provides a particularly useful framework for understanding what motivates people’s choices in the domains of gains and losses because it distinguishes between two motivational systems—promotion and prevention—that are differentially sensitive to the distinction between gains and nongains (promotion) versus the distinction between nonlosses and losses (prevention; Higgins, 1997, 1998). Building on a long history of the importance of distinguishing between nurturance and security as two critical, but different, needs (e.g., Bowlby, 1969/1999), regulatory focus theory articulates how these motivational systems affect orientations toward desired end states and strategic preferences. Promotion-focused individuals are concerned with nurturance needs and are oriented toward desired end states as ideals and accomplishments, whereas prevention-focused individuals are concerned with security needs and are oriented toward desired end states as duties and safety (Higgins, 1997, 1998). Individuals can differ in the chronic strength of these systems, but these regulatory orientations can also be situationally manipulated (e.g., Friedman & Förster, 2001; Higgins, Roney, Crowe, & Hymes, 1994; Liberman, Molden, Idson, & Higgins, 2001; Shah & Higgins, 1997; Shah, Higgins, & Friedman, 1998). It is important to note that promotion and prevention refer to the motivational state of an individual, whether the source of that current state is a chronic predisposition to be in that state or a situation that induces that state.

As noted earlier, the systems differ not only in representations of desired end states but also in terms of the strategic preferences that best serve these goals. Within the prevention system, safety and security concerns are best served by using vigilant strategies in goal pursuit—carefully avoiding mismatches to desired end states and avoiding matches to undesired end states (Crowe & Higgins,

1997; Higgins et al., 1994; Liberman et al., 2001; Molden & Higgins, 2005; Wang & Lee, 2006). Success within the prevention system is defined as maintaining nonloss (e.g., “0” or the absence of negativity), whereas failure is defined by the presence of loss (e.g., “-1” or the presence of negativity; Brendl & Higgins, 1996; Higgins, 1997; Higgins & Tykocinski, 1992). What matters is maintaining a satisfactory status quo of “0” and restoring it if necessitated by the presence of a loss. In other words, a good day within the prevention system requires only maintaining nonlosses or the absence of negative outcomes. Advancing to a better “+1” state beyond the status quo 0 (i.e., a gain), is *not* considered necessary for success.

Recent work using a stock investment paradigm where participants chose between a risky choice option and a conservative choice option provided evidence that prevention motivation, not promotion motivation, predicts risk preference in the domain of losses (Scholer et al., 2010). This work suggested not only that not all individuals are risk-seeking in the domain of losses but that even prevention-focused individuals are risk-seeking when it clearly serves their vigilant motivation to return to the status quo. Specifically, these studies found that the vigilance of the prevention system can be served by either a risk-seeking tactic (i.e., the risky choice option) or a risk-averse tactic (i.e., the conservative choice option), depending on which tactic is more likely to satisfy the need to return to a nonloss 0 (e.g., return to safety).

When prevention-focused individuals were in a state of nonloss, they exhibited risk-averse, or conservative, choices (see also Crowe & Higgins, 1997; Friedman & Förster, 2001; Scholer, Stroessner, & Higgins, 2008). They continued to exhibit risk aversion in a state of loss if the conservative choice offered the higher likelihood of returning to nonloss 0 (the status quo ante or safety). However, when they were in state of loss and the risky option offered the only possibility of returning to nonloss, prevention-focused individuals preferred the risky option. Scholer et al. (2010) did not find such switching between risky versus conservative choices as a function of higher likelihood of returning to nonloss 0 for individuals who had a promotion focus.

Similar evidence of prevention-focused individuals’ choosing different risk-related tactics depending on the safety or security status of the current condition has been documented in other domains as well. For example, research on close relationships has shown that prevention-focused individuals usually strive to ensure relationship harmony by avoiding behaviors or situations that might intensify conflict or result in rejection (Ayduk, May, Downey, & Higgins, 2003). However, when a major conflict threatens long-term relationship stability, they actively work to resolve the conflict in order to re-establish relationship security (Winterheld & Simpson, 2011).

In sum, in the domain of losses, these dynamics within the prevention motivational system illustrate how tactical shifts between choosing either a risk-seeking option or a risk-averse option can serve the *same* underlying motivational concern (i.e., the need to maintain or restore a state of nonloss or safety). Individuals with a prevention focus, whether chronic or situationally induced, were generally risk-averse; however, when the risky option offered the best means for restoring a nonloss, prevention-focused individuals were risk-seeking. In other words, changes in behavior at a lower level of a motivational hierarchy (i.e., switching between risky or conservative tactics) can be tied to stability at a higher level of the

motivational hierarchy (prevention motivation). Furthermore, these tactical profiles reveal core aspects of what it really means to be vigilant in maintaining nonloss (cf. Kamrath & Scholer, 2013). We turn next to exploring how these motivational dynamics may operate in the domain of gains within the promotion system.

### The Domain of Gains and the Promotion Need for Progress

The promotion system’s concern with advancement is best served by using eager approach strategies in goal pursuit—enthusiastically approaching matches to desired end states and approaching mismatches to undesired end states (Crowe & Higgins, 1997; Higgins et al., 1994; Liberman et al., 2001; Molden & Higgins, 2005; Wang & Lee, 2006). What matters within the promotion system is advancing from the status quo 0 to a +1 better state (Brendl & Higgins, 1996; Higgins, 1997, 1998; Higgins & Tykocinski, 1992). In other words, success within the promotion system is defined by achieving gains, advancing away from 0 toward a more positive +1. A good day within the promotion system is filled with gains; the absence of negatives (nonlosses) is not enough. Promotion-focused individuals would rather have experiences that contain extremely positive components, even at the expense of including some negative aspects, than experiences that compromise this by being moderate or average on all dimensions (Zhang & Mittal, 2007).

Historically, the eagerness of the promotion system has been linked to a preference for risky choices in decision making (Crowe & Higgins, 1997; Friedman & Förster, 2001; Molden & Higgins, 2005). However, most work on behaviors within the promotion system has examined decision making in neutral states (i.e., 0). At 0, it is not surprising that promotion-focused people generally display a tendency to be risk-seeking, because a risky option provides the greatest potential for moving away from 0 toward +1. Indeed, given that nongains are perceived as failures within the promotion system, risk seeking may be the default tactic at 0, because promotion-focused individuals are motivated to do whatever it takes to progress toward +1 (just as prevention-focused individuals were willing to do whatever it took to restore 0 in Scholer et al., 2010). When promotion-focused individuals are at 0, the best chance of advancing to +1 is to choose a relatively risky option, even if it also exposes an individual to the risk of -1. However, once progress has been clearly achieved (i.e., once individuals have successfully attained a +1 gain), promotion-focused individuals may shift their preference to a conservative, risk-averse option as the best way to sustain eagerness and hold onto the recently achieved gain. Specifically, we propose that *perceived progress* serves as a regulatory signal for promotion-focused individuals to guide their choices between risky and conservative tactical options.

Our proposal builds on work that has suggested that progress may be an important signal directing self-regulatory efforts (e.g., Carver & Scheier, 1990). When people perceive that they have not been progressing as well as they would like toward a given goal, they increase their effort (Carver & Scheier, 1998; Heath, Larrick, & Wu, 1999; Locke & Latham, 1990). On the other hand, when individuals do feel that they have made sufficient progress toward attaining a goal, they often reduce effort directed at that goal and shift to other priorities (the idea of *coasting* or *goal balancing*;

Carver, 2003; Fishbach, Dhar, & Zhang, 2006; Fishbach & Zhang, 2008; Koo & Fishbach, 2008). Building on these ideas, we suggest that within the domain of gains, progress may be a relatively more important signal within the promotion versus prevention systems and that progress may serve as a signal within the promotion system for whether risky or conservative choices would best support successful advancement.<sup>1</sup> For those with a promotion focus, the experience of progress signals a shift from the need to take risks to attain successful advancement to the need to avoid risks to hold onto it.

### Overview of Studies

In sum, we predicted that risk preferences in the domain of gains would be guided by both an individual's motivational orientation (promotion vs. prevention) and perceptions of progress. When actual or perceived progress is high, promotion-focused individuals should choose the conservative option (a risk-averse tactic), consistent with the general risk aversion in the domain of gains that has been found in the decision-making literature. However, when actual or perceived progress is nonexistent or low (i.e., when promotion-focused individuals do not perceive that they have advanced very far from the state of 0), they should choose the risky option (a risk-seeking tactic), displaying the risk-seeking preference of promotion-focused individuals that has been found in earlier regulatory focus studies (Crowe & Higgins, 1997; Friedman & Förster, 2001). In contrast, prevention-focused individuals should be less sensitive to progress as a signal in the domain of gains because they are primarily concerned with maintaining 0 rather than advancing beyond it. We tested this hypothesis in four studies in which participants believed that potential outcomes were real and consequential, using both measured (Study 1) and manipulated (Studies 2–4) regulatory focus.

### Study 1

In this first study, we examined if the risk-seeking behavior of promotion-focused individuals shifts as a function of the magnitude of gain. We drew on the stock investment paradigm developed by Scholer et al. (2010), which permits the examination of risk-seeking behavior in response to gains that participants experience as real. Participants received feedback on an initial investment (no change, small gain, large gain) and then were given a choice between two stocks: a relatively risky option or a relatively conservative option. We hypothesized that the promotion system would be particularly sensitive to changes in the domain of gains (i.e., positive deviations from 0). In particular, we predicted that in the domain of gains, promotion-focused participants would prefer the risky option (a risk-seeking tactic) when only a minimal gain was made but would switch to the conservative option (a risk-averse tactic) after a significant gain. We further predicted that this manipulation would not affect the risk preferences of prevention-focused participants, given that prevention-focused participants are relatively insensitive to positive deviations from 0.

### Method

**Participants and design.** Ninety-four participants from the subjective pool of a behavioral lab at a university in London,

United Kingdom, were recruited to participate in a lab study. After completing an initial questionnaire-based study for which they were paid £5, participants were given the option to invest their £5 in a stock investment study in which they were randomly assigned to get feedback that an initial investment decision resulted in no change from their original state, a small gain, or a large gain. Seventy-five participants (79.8%; 42 women) chose to make this investment and took part in the full study. Based on the demographic information participants supplied, there were no significant differences between participants who terminated versus continued the study in terms of gender (68% female vs. 56% female, respectively) or age ( $M_s = 25.32$  vs.  $24.08$  years). However, those who decided to participate in the stock investment study reported that they were “relatively more knowledgeable about the financial market than others” ( $M_{\text{stay}} = 2.99$ ,  $SD = 1.12$ , vs.  $M_{\text{stop}} = 2.37$ ,  $SD = 1.12$ ),  $F(1, 92) = 4.62$ ,  $p = .034$ . There were also marginally significant differences in the promotion and prevention strength of those who terminated versus continued the study—promotion:  $F(1, 92) = 2.92$ ,  $p = .091$ ; prevention:  $F(1, 92) = 3.35$ ,  $p = .071$ . Those who continued the study showed both higher promotion ( $M = 0.39$ ,  $SD = 4.22$ ) and prevention strength ( $M = 0.42$ ,  $SD = 4.15$ ) than those who terminated (promotion:  $M = -1.57$ ,  $SD = 5.42$ ; prevention:  $M = -1.66$ ,  $SD = 5.39$ ). Given that individuals high in both promotion and prevention motivations were more likely to continue with the study, we suspect that people who opted to continue with the study were simply more motivated in general. These differences are in contrast to those of Scholer et al. (2010), who did not find that regulatory focus motivation or stock investment experience differed between participants who terminated versus continued study participation in a similar paradigm. Thus, there is no reason to believe that the paradigm itself yields a strong selection bias issue. Furthermore, relatively higher motivation levels overall create a more conservative test of our primary hypotheses based on promotion or prevention strength. When asked, the most common reason given by participants who declined to continue on to the second stock investment study after completing the initial questionnaire was that they felt they could better use their time elsewhere. Preliminary analyses produced no significant main effects or interaction effects involving gender, age, or self-reported stock investment background, so these variables were excluded from the reported analyses.

#### Procedure and materials.

**Regulatory focus measure.** Participants first completed the regulatory focus strength measure (see Higgins, Shah, & Friedman, 1997). Compared with other regulatory focus measures, the strength measure is well suited for the current purpose because it is a general measure of regulatory focus motivation and does not use risk preference as a basis for classification. Furthermore, it is a widely used measure for assessing the chronic strength of the promotion and prevention systems that has been demonstrated to have both discriminant and predictive validity (Förster, Higgins, &

<sup>1</sup> Our analysis of progress within the promotion system draws upon the conceptualization of progress as displacement rather than velocity (Hsee & Abelson, 1991). While velocity is certainly an important aspect of progress, we focused on progress as displacement because this conception is more closely aligned with the idea of advancing from a current status quo 0 to a +1 better state. We return, however, to potential connections between promotion motivation and progress-as-velocity in the General Discussion.



Idson, 1998; Förster, Liberman, & Higgins, 2005; Freitas, Liberman, Salovey, & Higgins, 2002; Friedman & Förster, 2001; Higgins et al., 1997; Shah & Higgins, 1997; Shah et al., 1998). This measure has also been used in prior research examining the relationship between prevention focus and risk preference in the domain of losses (Scholer et al., 2010).

The strength measure is an idiographic reaction time (RT) measure that captures the accessibility of ideal and ought self-attributes. Participants were provided with definitions of ideal versus ought selves (ideal self: defined as the type of person they ideally would like to be, the type of person they hope, wish, or aspire to be; ought self: defined as the type of person they believe it is their duty, obligation, or responsibility to be). They were told that they would be asked to provide attributes that described their ideal and ought selves. Participants were then asked to list four ideal and four ought attributes in a seemingly random order (i.e., one ideal, two ought, one ideal, one ought, one ideal, one ought, one ideal). After listing each of the ideal attributes, participants were asked to rate the extent to which they ideally would like to possess the attribute (ideal extent) and the extent to which they actually possessed the attribute (actual/ideal extent) on a 4-point scale from 1 to 4 (*slightly; moderately; a great deal; extremely*). Similarly, after listing each of the ought attributes, they were asked to rate the extent to which they ought to possess the attribute (ought extent) and the extent to which they actually possessed the attribute (actual/ought extent) on the same 4-point scale. Participants were told that the attributes describing the ideal self had to be different from those describing the ought self and that all attributes were to be provided as quickly and accurately as possible. The computer recorded the time each participant took to produce each attribute and to make the corresponding ratings. The regulatory focus strength measure uses RTs to all three types of questions as a way to get converging evidence of system accessibility; all three questions provide evidence of the accessibility of each *ideal* and *ought* (Higgins et al., 1997).

Following the practice of Scholer et al. (2010), we used the *z* score method to create indices of promotion and prevention strength. The reaction time of each attribute was first *z* scored before being summed and averaged. As is typically done, we reversed the signs for promotion and prevention strength such that higher scores indicate increased motivational strength. As is standard practice (e.g., Higgins et al., 1997; Scholer et al., 2010), the first nine RT scores for each dimension (promotion, prevention) were chosen based on the notion that output primacy is one criterion for chronic accessibility (see Higgins, 1996). Note, however, that an analysis using all attributes produced by each participant yielded almost identical results. For the Promotion Strength subscale (the nine response times for the promotion attribute questions), Cronbach's  $\alpha$  was .63; for the Prevention Strength subscale (the nine response times for the prevention attribute questions), Cronbach's  $\alpha$  was .62. This reliability is comparable to that reported in other published studies (e.g., Freitas et al., 2002; Scholer et al., 2010).

**Assessing risk-seeking.** After completing the strength measure, participants received instructions from the experimenter for what was described as a second study. The experimenter informed participants that they had earned £5 for completing the first study and that they could either terminate the study or invest their £5 in a second study about stock investment. Participants were told that

if they decided to invest their money, they would receive information about investment performance from a computer simulating real-world stock market conditions. Furthermore, they were told that people typically earned £7 in the stock-investment study but that there was a chance they could lose the £5 they had invested or even more. If they lost money, however, they could eliminate any loss beyond £5 by completing a third study that involved completing 20 pages of questionnaires (cf. Scholer et al., 2010; Thaler & Johnson, 1990). In other words, the conditions were set so that participants believed that they could really gain or lose money. If participants decided to invest, they returned the £5 to the experimenter as the initial investment and were directed to begin the investment study on the computer. Thus, participants began the stock-investment study with a status quo reference point of £5.

In the stock-investment scenario, participants were given a choice to invest in one of two different stocks presented in random order. This initial choice was provided simply to allow the placement of participants in a position above or below the status quo. Stock 1 was described as giving investors *on average* a 50% chance of gaining £24 and a 50% chance of losing £7. Stock 2 was described as giving investors on average a 90% chance of gaining £10 and a 10% chance of losing £5. The expected value of these stocks was equivalent (£8.50), but they differed in variance, which is one way to operationalize risk (variance = 240.25 and 20.25, respectively; see March, 1988; March & Shapira, 1987). Consistent with the findings documented in Scholer et al. (2010) and with research suggesting that people tend toward risk aversion (Lopes, 1987), 74.7% of participants preferred the conservative choice on this initial decision prior to any outcome manipulation, and this choice was not predicted by promotion or prevention strength.<sup>2</sup>

After investing their £5 in the first stock pick, participants saw the stock results unfold on a computer display that updated their stock performance every 12 s. After tracking stock performance for 60 s, participants were shown a summary page that displayed their position after the first investment and offered a second investment option. Participants were randomly assigned to one of three conditions: no change, small gain, or large gain. Specifically, in the no-change condition, participants were informed, "Your stock value has not changed. The total value is £5 now." In the small gain condition, participants were informed, "Your stock is UP £4. The total value is £9 now." In the large gain condition, participants were informed, "Your stock is UP £20. The total value is £25 now."

The primary dependent variable then followed. Participants were given a choice to invest £5 in one of two stock options: a conservative option ("100% chance of no change from the current state") or a relatively risky option ("50% chance to gain £5 and 50% chance to lose £5"). The expected value of these stocks was equivalent (0), but they differed in an objective characterization of risk (i.e., variance; the conservative option had a variance of 0, whereas the risky option had a variance of 25). In addition, in rating the perceived riskiness of the two options (1 = *conservative*, 5 = *risky*) at the end of the study, participants reported seeing the

<sup>2</sup> This same pattern of results was obtained in Studies 2–4. In all studies, consistent with Scholer et al. (2010), participants were risk-averse on the initial, pre-outcome manipulation decision (68.8% of participants chose the conservative option in Study 2, 79% chose the conservative option in Study 3, and 83.2% chose the conservative option in Study 4).

risky option as indeed riskier than the conservative option ( $M_{\text{risky}} = 3.82$ ,  $SD = 0.99$ ;  $M_{\text{conservative}} = 1.96$ ,  $SD = 0.89$ ),  $t(72) = 11.47$ ,  $p < .001$ . Thus, the risky option was riskier on both an objective measure of risk (variance; see March, 1988; March & Shapira, 1987) and in terms of subjective perceptions of riskiness.

At the conclusion of the stock investment study (and in all subsequent studies), we also included a manipulation check to ensure that participants correctly understood and remembered our stock progress manipulation by being able to accurately report the amount of money (or, in subsequent studies, the number of tickets) they received for the initial investment and the outcome of their first investment. We excluded from our analyses any participants who did not correctly report these two numbers, as this knowledge is critical to our experimental test (i.e., this exclusion criteria was applied in the following three studies as well). In this study, two participants (4%) reported the incorrect amount and thus were excluded from the analysis (the total sample size in the analyses reported below is thus 73). Including these two observations yielded the same pattern of results, though not all effects were statistically significant. All participants received £7 for participation in the stock-investment study.

## Results and Discussion

Overall, 34.6% of participants chose the risky option in the no-change condition, 54.2% chose the risky option in the small-gain condition, and 34.8% chose the risky option in the large-gain condition. To test whether choices across the investment outcome conditions differed as a function of regulatory focus, we conducted a logistic regression analysis with investment choice as a dichotomous dependent measure (0 = conservative choice, 1 = risky choice), testing the effect of promotion strength while controlling simultaneously for prevention strength. Because the regulatory focus strength measure is an RT measure, entering promotion and prevention strength simultaneously into the model is a standard practice (e.g., Higgins et al., 1997) that allows one to control for the shared variance due to individual differences in overall RTs. We dummy coded the three investment outcome conditions into two variables representing “small gain” (1 = small gain, 0 = otherwise) and “large gain” (1 = large gain, 0 = otherwise), using the no-change condition as the comparison group (see Aiken & West, 1991). The small-gain variable tests the contrast between the small-gain and no-change conditions, and the large-gain variable tests the contrast between the large-gain and no-change conditions. Thus, this coding allowed us to test the hypothesis that only a large gain, but not a small gain, would trigger the switch for promotion-focused individuals from the risky to the conservative option. The logistic regression included promotion strength, prevention strength, and small-gain and large-gain main effects, as well as all four interaction terms between the two regulatory strength variables and the two investment outcome variables.

Table 1, Panel A, presents the full regression table; there were no significant main effects. As predicted, the results yielded a marginally significant interaction between promotion strength and large-gain investment outcome, odds ratio (OR) = 0.49,  $B = -0.72$ ,  $SE = 0.43$ ,  $p < .092$ . In contrast, the interaction effect between prevention strength and large-gain investment outcome was not significant, OR = 1.54,  $B = 0.43$ ,  $SE = 0.32$ ,  $p = .18$ . The

Table 1  
Summary of Logistic Regression Analysis (Study 1)

Predictor	<i>B</i>	<i>SE</i>	<i>p</i>	<i>e<sup>B</sup></i>
Panel A <sup>a</sup>				
Ideal strength	−0.039	0.217	.856	.961
Ought strength	−0.129	0.189	.494	.879
Large gain	−0.638	0.772	.408	.528
Small gain	0.658	0.602	.274	1.930
Ideal Strength × Large Gain	−0.720	0.427	.092	.487
Ought Strength × Large Gain	0.431	0.320	.178	1.539
Ideal Strength × Small Gain	0.065	0.258	.800	1.067
Ought Strength × Small Gain	0.159	0.234	.497	1.172
Constant	−0.534	0.428	.213	.586
$\chi^2$	16.984			
Degrees of freedom	8			
Panel B <sup>b</sup>				
Ideal strength	0.020	0.116	.861	1.020
Ought strength	−0.051	0.109	.641	.951
Large gain	−0.952	0.706	.178	.386
Ideal Strength × Large Gain	−0.780	0.386	.043	.458
Ought Strength × Large Gain	0.353	0.280	.208	1.423
Constant	−0.220	0.294	.454	.803
$\chi^2$	13.33			
Degrees of freedom	5			

Note.  $N = 73$ . Dependent measure effect-coded (conservative = 0; risky = 1).  $e^B$  = odds ratio.

<sup>a</sup> This analysis included two dummy-coded variables for investment outcome conditions: large gain (1 = large gain, 0 = otherwise) and small gain (1 = small gain, 0 = otherwise). <sup>b</sup> This analysis included one dummy-coded variable for investment outcome conditions: 1 = large gain, 0 = no change or small gain.

interactions between small gain and each of the two regulatory focus strength measures were also not significant ( $ps > .4$ ).

A simple logistic regression within the large-gain condition confirmed that stronger promotion strength predicted a significantly lower likelihood of choosing the risky option, OR = 0.47,  $B = -0.76$ ,  $SE = 0.37$ ,  $p < .039$ . As predicted, high-promotion-strength individuals (based on a median split) in the large-gain condition were much less likely to choose the risky option (10%) compared with low-promotion-strength individuals in the large-gain condition (54%),  $\chi^2(1, N = 23) = 4.79$ ,  $p = .03$ . Promotion strength did not significantly predict choice in the small-gain condition, OR = 1.03,  $B = 0.03$ ,  $SE = 0.14$ ,  $p = .85$ , or the no-change condition, OR = 0.96,  $B = -0.04$ ,  $SE = 0.22$ ,  $p = .86$ . Prevention strength was not associated with risk preference in the no-change, small-gain, or large-gain conditions ( $ps > 0.25$ ).

We then conducted a second logistic regression analysis to complement our primary analysis. We predicted that the effects of promotion motivation in the large-gain condition should differ from both the no-change and small-gain conditions. This analysis thus included one dummy-coded variable for investment outcome (1 = large gain, 0 = no change or small gain); by combining the no-change and small-gain conditions in this way, we could test the contrast between the large-gain condition versus the other two. As predicted, this analysis revealed only a significant Promotion × Large Gain interaction, OR = 0.46,  $B = -0.78$ ,  $SE = 0.39$ ,  $p = .043$ . As in the primary analysis, there was no significant Prevention × Large Gain interaction, OR = 1.42,  $B = 0.35$ ,  $SE = 0.28$ ,  $p < .21$  (see Table 1, Panel B).

While prior research has shown a general tendency for people to be risk averse in the domain of gains (Blais & Weber, 2006; Lopes,

1987), the current study reveals a situation in which the strength of promotion motivation, but not the strength of prevention motivation, moderates this tendency. We acknowledge that the pattern in this first study only partially supports our hypothesis. While promotion-focused participants were more likely to be risk-averse in the large-gain condition relative to the no-change or small-gain conditions, the interaction effect was marginally significant in the full model, and the within-condition analyses were significant only within the large gain condition. Thus, we have evidence that promotion motivation is related to risk-averse choice after a large gain, but we did not find that promotion motivation was related to risky choice after no change or a small gain.

We speculate briefly on this finding, noting also that this was the only study in which evidence for risk seeking at the status quo within the promotion system was not observed. We are thus hesitant to make too much of this null finding, especially given that a combined analysis of all four studies presented in the General Discussion shows that overall, promotion motivation predicts risk seeking in no-change or minimal-gain situations. One possibility is that the sample in Study 1 was relatively high in both chronic promotion and prevention strength overall, making it harder to detect relationships between variation in promotion motivation and risky choice. We do know, in fact, that the sample of participants who chose to invest in the stock-investment study tended to be higher in both promotion and prevention strength. It should also be noted regarding the small-gain condition that Scholer et al. (2010, Study 2) included a gain condition identical to the present small-gain condition (“up \$4”) and also did not find that promotion strength predicted risky choice in that condition. The small-gain condition may be particularly “noisy” in terms of interpretations of progress, a limitation we address most directly in Studies 3 and 4. In addition, in the remaining studies, we drew on more diverse samples and used experimental manipulations of regulatory focus to further address the potential limitations of Study 1.

Nonetheless, in support of our core tenets, the study does provide initial evidence that positive deviations from the status quo are particularly relevant within the promotion system and that after significant progress, promotion-focused individuals are more likely to make risk-averse choices. Furthermore, there was no effect of prevention strength in the large-gain condition. In sum, this first study provides support for the idea that promotion motivation can be linked to risk aversion after significant progress in the domain of gains.

## Study 2

Study 2 was designed to expand on Study 1 by manipulating regulatory focus and examining more directly the mechanisms that might contribute to the switch from risk-seeking to risk-averse tactics after a large gain for individuals in a promotion focus. We developed an online study adaptation of the stock investment paradigm used in Study 1, using lottery tickets instead of pounds as the currency of the stock-investment paradigm.

Study 2 used a situational manipulation of regulatory focus (see Freitas & Higgins, 2002; Higgins et al., 1994) rather than measuring it as a chronic individual difference variable. The most direct advantage of manipulating rather than measuring regulatory focus is increased confidence in our proposed causal argument. In addi-

tion, observing the predicted pattern with both a chronic measure and a state measure allows us to make clear links to both personality and situational approaches to understanding motivated behavior (cf. Kammrath & Scholer, 2013).

In Study 2, we also included a mood measure to directly address the possibility that any observed differences in risky choice could be due to changes in mood (valence or arousal), not to differences in the activation of the promotion or prevention systems. Prior research has argued that people in a positive mood try to protect and maintain their positive state (Isen & Simmonds, 1978) and attempt to avoid substantial losses (Arkes, Herren, & Isen, 1988). This research has shown that when the stakes are high, people in a positive mood may be more risk-averse in order to avoid large losses. From this perspective, a potential alternative account is that the large gain condition may induce a positive mood, and this positive mood produces risk aversion. This positive mood account, however, would predict the same effects for participants in a promotion focus and a prevention focus. Past research has also shown that the promotion and prevention motivational systems differ in their arousal intensity levels after success, such that promotion-focused individuals experience happiness (a positive, high-arousal state) and prevention-focused individuals experience calmness (a positive, low-arousal state; Higgins et al., 1997; Idson, Liberman, & Higgins, 2000). Prior research has also shown that higher arousal narrows attention and restricts allocation of processing resources to the decision’s most prominent features (Lewinsohn & Mano, 1993; Mano, 1992) and that positively aroused participants show a higher tolerance for risk (Mano, 1994). According to this view, however, promotion-focused people should be more risk-seeking after receiving high positive feedback (i.e., the large gain condition). Thus, while it seemed unlikely that changes in emotional valence or arousal could account for the full pattern of findings in Study 1, we included an assessment of mood in Study 2 to more clearly address this possibility.

## Method

**Participants and design.** We recruited 138 individuals (42% female;  $M_{age} = 28.66$  years,  $SD = 10.29$ ; 55.8% Whites, 26.7% Asian Americans, 7.4% African Americans, 0.7% Hispanic Americans, and 8.1% other) via Amazon’s Mechanical Turk online marketplace to participate for monetary compensation. Participants were randomly assigned to condition in a 2 (regulatory focus: promotion, prevention)  $\times$  3 (investment outcome: no change, small gain, large gain) design.

**Procedure and materials.** Participants were told that they would be asked to take part in two different tasks—an essay-writing task and a stock-investment task. In the first task, we manipulated regulatory focus by asking participants to write brief essays either on their current aspirations, ideals, and hopes and how these aspirations, ideals, and hopes had changed since childhood (promotion manipulation) or on their current obligations, duties, and responsibilities and how these obligations, duties, and responsibilities had changed since childhood (prevention manipulation; see Freitas & Higgins, 2002; Higgins et al., 1994). This manipulation was reinforced by asking participants to write a second essay about either their ideal or ought selves (a time when



their ideals or oughts were realized) while they waited for the feedback from their first investment.

Participants were told that they would be taking part in a study exploring people's buying preference in various stock market contexts. Participants then read:

You and everyone else participating in this study have been assigned five "tickets" for a real lottery. At the end of the study, your tickets and those of all other participants will be entered in the lottery, and we will randomly draw tickets to determine the winners of the prizes (including \$25 Amazon gift certificates). The more tickets you have for the lottery, the higher your chances of winning a prize—just like a raffle. If you have 20 tickets, you'll be twice as likely to win as if you have 10 tickets. In the "stock market," we're about to describe, you'll have a chance to increase your number of tickets (and your chance of winning in the final lottery) or to lose some of them.

In this way, we made it clear to the participants that their investment decisions had real consequences for the benefits they could get from participating in the study.

Participants were given a choice to invest their five tickets in two different stocks presented in random order. As in Study 1, this initial choice was provided simply to allow the opportunity for investment outcome feedback; the options were identical to those in Study 1. After making their initial investment, participants were asked to wait for a few moments while the computer compiled the results of their stock-market-investment decision. While the participants were waiting, we asked participants to participate in an ostensibly unrelated essay task (the second regulatory focus induction). Once participants finished the manipulation, they were directed to the next screen, which displayed their position after the first investment, the critical investment outcome manipulation. In this study, all participants were randomly assigned to one of three conditions: no change, small gain (up four tickets), or large gain (up 20 tickets).

Then, participants were asked to make the critical investment decision, the primary dependent measure. Participants were given a choice to invest in one of two stock options: a conservative option ("100% chance of no change from the current state") or a relatively risky option ("50% chance to gain five tickets and 50% chance to lose five tickets"). As in Study 1, the expected value of these stocks was equivalent (0), but they differed in variance, such that the conservative option had a variance of zero, whereas the risky option had a variance of 25.

Immediately after making this choice, participants completed the Positive Affect and Negative Affect Scales (PANAS) questionnaire (Watson, Clark, & Tellegen, 1988) to evaluate current mood on a 5-point scale (1 = *not at all or very slightly*, 5 = *extremely*). At the end of the survey, participants were asked to recall the number of tickets they were given for the first investment and the investment outcome, rated their subjective perception of the riskiness of the stock options on a 5-point scale (1 = *conservative*, 5 = *risky*), and provided demographic background information.

We then informed participants that they had finished the stock market study. All participants were told that in addition to the original tickets they had received, they would receive additional tickets to be entered into the lottery for a \$25 Amazon

voucher lottery. After the study was finished, we conducted a random drawing to determine the winner of the lottery.

## Results and Discussion

**Manipulation checks.** As in Study 1, we first checked whether participants could accurately report information critical to the gain manipulation: both the number of tickets they were given at the beginning of the stock-investment task and the number of tickets they had in total after their first investment. Eighty-one percent of participants correctly provided this information; only these participants ( $N = 112$ ) were included in the subsequent analyses. The same pattern of results is obtained with all participants included in the model, although not all effects are statistically significant. Furthermore, as in Study 1, subjective risk perceptions were consistent with the objective characterization of risk of the stock options. Participants reported seeing the objectively riskier stock as riskier than the objectively more conservative option ( $M_{\text{risky}} = 3.04$ ,  $SD = 0.70$ ;  $M_{\text{conservative}} = 1.52$ ,  $SD = 0.90$ ),  $t(111) = 14.00$ ,  $p < .001$ .

**Mood check.** A 2 (regulatory focus: promotion focus, prevention focus)  $\times$  3 (investment outcome: no change, small gain, large gain) multivariate analysis of variance (MANOVA) on positive mood and on negative mood showed a significant main effect of the regulatory focus manipulation on negative mood,  $F(1, 106) = 4.08$ ,  $p = .046$ , such that participants in the prevention-focused condition ( $M = 2.14$ ,  $SD = 0.98$ ) reported a significantly higher level of negative mood than participants in the promotion-focused condition ( $M = 1.84$ ,  $SD = 0.65$ ). There was no main effect of investment outcome, nor was there a significant Regulatory Focus  $\times$  Investment Outcome interaction (both  $ps > .11$ ). Although participants in the prevention condition reported having a somewhat more negative mood than participants in the promotion condition, it is important to note that overall levels of negative mood were quite low. The mean rating of prevention-focused participants on the negative mood was significantly below the scale midpoint (3),  $t(59) = 6.80$ ,  $p < .001$ . There were no significant main effects or interactions of positive mood (all  $ps > .19$ ). Furthermore, and most important, when either negative or positive mood was entered as a covariate in the analyses reported, the same patterns of results remained unchanged and significant.

In addition, we also conducted a 2  $\times$  3 MANOVA on two discrete positive emotions: relaxed (a low-arousal positive mood) and excited (a high-arousal positive mood). We did not observe any significant main effects or interaction effects ( $ps > .16$ ). Thus, it seems unlikely that the effects in this study can be accounted for by differences in mood or arousal. For consistency with the other studies, the results presented are based on the analyses that did not include mood scores.

**Primary analysis.** Consistent with our hypothesis, 76.5% of the promotion-focused participants chose the risky option in the no-change condition, 61.5% chose the risky option in the small-gain condition, and only 31.8% chose the risky option in the large-gain condition,  $\chi^2(2, N = 52) = 8.11$ ,  $p < .02$ . Specifically, among promotion-focused participants, those who were in the large-gain condition were less likely to choose the risky option than those in the no-change condition,  $\chi^2(1, N = 39) =$



7.65,  $p = .006$ , as well as those in the small-gain condition,  $\chi^2(1, N = 35) = 2.95, p = .09$ , although this last contrast was marginal. There was no significant difference between the no-change and the small gain conditions ( $p = .44$ ). In contrast, the choices of prevention-focused participants did not vary across conditions ( $ps > .51$ ). As can be seen in Table 2, participants in the prevention-focused condition were relatively indifferent between the risky and conservative options across conditions.

While a  $2 \times 3$  chi-square test did not yield a significant regulatory focus by investment outcome interaction,  $\chi^2(1, N = 112) = 3.70, p = .157$ , a parallel analysis using logistic regression did. For this analysis, parallel to what was reported in Study 1, we conducted a logistic regression with the investment decision as a dummy coded outcome measure (0 = conservative choice, 1 = risky choice). As in Study 1, we dummy coded the three investment outcome conditions into two variables representing “small gain” (1 = small gain, 0 = otherwise) and “large gain” (1 = large gain, 0 = otherwise). In the regression, we controlled for the main effect variables (i.e., regulatory focus, small gain, and large gain) and tested the interaction terms of Regulatory Focus  $\times$  Small Gain and Regulatory Focus  $\times$  Large Gain. That is, the Regulatory Focus  $\times$  Small Gain interaction tests whether the effects of regulatory focus differed in the no-change versus small-gain conditions. The Regulatory Focus  $\times$  Large Gain interaction tests whether the effects of regulatory focus differed in the no-change versus large-gain conditions. As predicted, only the interaction between regulatory focus and large gain yielded a significant effect,  $OR = 0.11, B = -2.17, SE = 0.96, p = .024$ . There was no significant Regulatory Focus  $\times$  Small Gain interaction,  $OR = 0.54, B = -0.62, SE = 1.02, p = .54$ .

Given some debate about whether the chi-square test is more suitable than logistic regression when all of the independent variables are dichotomous (Agresti, 2012), we present both the chi-square and the logistic regression analysis results across the remaining studies. In addition, the logistic regression allowed us to test our hypotheses with the inclusion of important covariates (e.g., mood) and to include the mediation analysis reported in Study 4. As is seen in this study, the results are always parallel though sometimes stronger using one versus the other analysis method.

Overall, Study 2 provided further evidence that promotion-focused individuals, but not prevention-focused individuals, are particularly sensitive to changes in the domain of gains. Using a manipulation of regulatory focus, we replicated the pattern from Study 1 that promotion-focused participants are more likely to make risk-averse choices after a large gain. In this study, the

choices of promotion-focused participants differed significantly across investment outcome conditions. When participants in a promotion focus experienced no change from the starting reference point, they were more likely to choose a risky option. However, when they experienced significant change from the starting reference point, they were more likely to choose a conservative (risk-averse) option.

In contrast, the risk preferences of prevention-focused individuals did not differ by conditions; across all three conditions, prevention-focused individuals were relatively indifferent between the risky and conservative options. Although we might have predicted that prevention-focused individuals would tend to be more conservative overall, we believe it is possible that the nature of the options drove this relative indifference. Even the risky option (potential loss of five tickets) would not have resulted in a true loss. Thus, prevention-focused individuals may have felt relatively safe choosing either the risky or conservative option. In addition, just as Scholer et al. (2010) observed that promotion motivation was unrelated to choice in the domain of losses, it is likely that prevention motivation is not a strong predictor of choice in the domain of gains; we return to this issue in the General Discussion. As predicted, this study revealed significant differences in the ways in which individuals in a promotion versus prevention focus responded to positive deviations from the status quo; these differences in gains—a large gain versus a small or no gain—influenced promotion-focused risky behavior but did not significantly affect prevention-focused risky behavior.

Study 2 also suggested that these patterns were not driven by differences in mood—valence or arousal—as a result of the regulatory focus or investment outcome manipulations. Although participants in the prevention-focus condition reported higher negative mood than those in the promotion-focus condition, these differences in mood did not predict risky choice, nor did controlling for mood in the analysis change the pattern of results. Thus, while mood can be an important contributor to risky choice, it does not appear to either contribute to or dilute the regulatory focus effect.

### Study 3

In Study 3, we sought to more directly examine the proposed mechanism that underlies the promotion motivation preference for a conservative option by manipulating perceived progress. In this study, all participants received the same “up 20” signal, which was used as a manipulation for “large gain” in Studies 1 and 2, but we framed it either as significant or insignificant progress. We predicted that promotion-focused individuals would not switch from choosing the risky option to choosing the conservative option if the gain was represented as insignificant progress that did not signal successful advancement. In contrast, we predicted that prevention-focused participants would be less sensitive to the manipulation of progress frame.

### Method

**Participants and design.** Participants consisted of 196 individuals (52.5% female;  $M_{age} = 33.17$  years,  $SD = 11.98$ ; 79% Whites, 9.5% Asian Americans, 5.5% African Americans, 4.5%

Table 2  
*Risky Choice as a Function of Regulatory Focus and Investment Outcome (Study 2)*

Focus	Investment outcome (%)		
	No change	Small gain	Large gain
Prevention focus	54.5	50.0	55.0
Promotion focus	76.5	61.5	31.8

Note.  $N = 112$ .

Hispanic Americans, and 1.5% other) who took part in our study via Amazon's Mechanical Turk online marketplace.<sup>3</sup> Participants were randomly assigned to condition in a 2 (regulatory focus: promotion vs. prevention)  $\times$  2 (progress framing: low vs. high) between-participants design.

**Procedure.** The procedure was identical to Study 2 except that all participants received the same amount of gain feedback framed differently. After the first investment, all participants were told, "Your stock is UP 20. The total value is 25 now." Thus, all participants received the same objective investment outcome feedback. However, this feedback was followed by a statement and figure that described this outcome as a minor or major gain. In the low-progress frame, participants were told, "A minor gain: You haven't advanced very far from where you started. You could still make a lot more progress with your next investment!" together with Figure 1a. In the high-progress frame, participants were told, "A major gain: You've already come really far! You've made a lot of progress with your first investment!" together with Figure 1b. Participants then made the critical investment outcome choice, with options identical to Study 2.

Immediately after the second choice, participants evaluated their current mood (modified Differential Emotions Scale; Fredrickson, Tugade, Waugh, & Larkin, 2003) using a 5-point Likert scale (1 = *not at all or very slightly*, 5 = *extremely*). In this study, we included a different mood scale to again check for the possibility that mood could account for our results.

Participants were then asked to recall the number of tickets that they were given to start the stock investment and that they got after the first investment. To check the effectiveness of the progress manipulation, we also asked participants to rate the following three items: (a) "I'm satisfied with the progress that I made with my first investment," (b) "I'd come really far after my first investment," and (c) "I made a lot of progress with my first investment" on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*,  $\alpha = .80$ ). At the end of the survey, participants then rated their subjective perception of the riskiness of the stock options (1 = *conservative*, 5 = *risky*) and provided demographic background information.

## Results and Discussion

**Manipulation checks.** First, we checked whether participants could accurately report the number of tickets they were given to start with in the stock-investment task and the amount they had in total after their first investment. Twenty (10%) of participants did not report the correct information. We excluded this group of participants in the results reported. Additional analyses including this group of participants yield the same pattern of results, although not all effects are significant. The mean score of the three progress manipulation check items showed that, indeed, participants in the low-progress condition reported significantly lower progress ( $M = 3.65$ ,  $SD = 0.76$ ) than participants in the high-progress condition ( $M = 4.27$ ,  $SD = 0.55$ ),  $F(1, 174) = 39.01$ ,  $p < .001$ . As in earlier studies, participants' subjective perceptions of the riskiness of the stock options were consistent with the objective levels of risk. The objectively riskier option was perceived to be riskier than the objectively more conservative option ( $M_{\text{risky}} = 3.10$ ,  $SD = 0.56$ ;  $M_{\text{conservative}} = 1.07$ ,  $SD = 0.31$ ),  $t(174) = 43.11$ ,  $p < .001$ .

**Primary analysis.** We again replicated the pattern obtained in earlier studies. Among promotion-focused participants, 64.10% chose the risky option when in the low-progress frame compared with only 30.61% when in the high-progress frame,  $\chi^2(1, N = 88) = 9.82$ ,  $p = .002$ . In contrast, the progress manipulation showed a substantially reduced effect among the prevention-focused participants,  $\chi^2(1, N = 88) = 3.59$ ,  $p = .06$ , although prevention-focused participants also tended to become more conservative in the high-progress frame. The 2  $\times$  2 chi-square test supported a significant interaction effect between regulatory focus and progress frame,  $\chi^2(1, N = 176) = 12.65$ ,  $p < .001$ . The progress frame manipulation showed a significantly stronger effect among the promotion-focused participants than the prevention-focused participants. Table 3 summarizes the distribution.

We then conducted a logistic regression with a dichotomous dependent measure (0 = conservative choice, 1 = risky choice). We dummy coded the progress-frame conditions (0 = low progress frame, 1 = high progress frame), and the regulatory-focus manipulation (0 = prevention focus, 1 = promotion focus). There was a marginally significant main effect of the progress manipulation,  $B = -0.82$ ,  $SE = 0.44$ ,  $OR = 0.44$ ,  $p = .06$ , but no main effect of regulatory focus manipulation. In contrast to the chi-square test, the interaction term between regulatory focus and the progress manipulation was not significant,  $B = -0.58$ ,  $SE = 0.63$ ,  $OR = 0.56$ ,  $p = .36$ . We therefore conducted an additional logistic regression with the dichotomous progress-frame manipulation replaced by the continuous progress manipulation check variable. Consistent with our hypothesis, the interaction effect between regulatory focus and the continuous progress manipulation check measure was significant,  $B = -0.90$ ,  $SE = 0.38$ ,  $OR = 0.41$ ,  $p = .018$ . Specifically, for promotion-focused participants, high perceived progress was associated with reduced preference for the risky option,  $B = -1.51$ ,  $SE = 0.39$ ,  $OR = .22$ ,  $p < .001$ , whereas this association was not present for prevention-focused participants,  $B = -0.26$ ,  $SE = 0.35$ ,  $OR = .78$ ,  $p = .46$ . We conducted additional analyses including both positive and negative mood measures as covariates, and the results remain unchanged. Thus, differences in mood are unlikely to account for our findings.

In sum, Study 3 provided further evidence that perceived progress is central to understanding when promotion-focused people will shift from a risk-seeking tactic to a risk-averse tactic in the domain of gains. Although all participants experienced the same objective gain, promotion-focused individuals were particularly responsive to the progress frame, suggesting that progress in the domain of gains is a particularly relevant signal within the promotion system, with significant consequences for risky decision making.

Although the progress manipulation showed a significantly reduced effect among prevention-focused participants, we ob-

<sup>3</sup> In total, 200 participants completed the study. To make sure all participants paid sufficient attention in the task, we included three attention check questions at the end of the survey: (a) "How closely did you pay attention to the instructions in this study?" (b) "To what extent did you take this study seriously?" and (c) "How honest/accurate were your answers?" to which participants responded using a 7-point Likert scale. The majority of participants reported that they paid full attention ( $M = 6.53$ ,  $SD = 0.68$ ,  $\alpha = .82$ ), with four participants reporting values three standard deviations below the mean. We excluded these four participants from the sample.

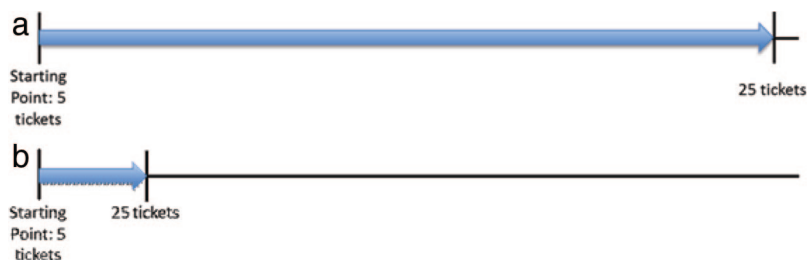


Figure 1. Experimental materials used in Study 3 to manipulate low progress versus high progress.

served an unexpected trend for even prevention-focused participants to be more risk-averse in the domain of gains when they perceived greater progress. A closer look at the risk preferences among the prevention-focused participants showed that this effect was mainly driven by a relatively high preference for the risk-seeking tactic in the low-progress condition, with 57.1% choosing the risky option. We suspect that at least for some prevention-focused people, the “low-progress” manipulation may have been experienced as negative feedback, signaling an outcome that was experienced as below an acceptable standard (i.e., less than 0). If some of our prevention-focused participants interpreted this condition as a loss (–1), they may have been more likely to select a risky option, as Scholer et al. (2010) found. In Study 4, we refined our study paradigm to reduce the possibility of participants’ interpreting “low progress” in this way by creating an idiographic approach to manipulating high and low progress. By doing so, we also hoped to have participants’ perceived progress closer to the experimental manipulation of progress, another limitation of Study 3.

### Study 4

Study 4 was designed to further test the mechanism that leads promotion-focused individuals to switch from a risky to conservative choice after a large gain. To create experimentally an experience of clear progress, we designed an idiographic variation of the stock investment paradigm. In this study, prior to making their first investment, participants were given an opportunity to indicate what would constitute their individual loss, no change, and gain zones (described in more detail in the following sections) within the stock-investment paradigm. Large-gain feedback was then idiographically tailored to each individual’s specification of these zones. This approach gave us greater confidence that our large-gain condition was indeed perceived as a significant gain by each participant and that our minimal-gain condition was unlikely

to be perceived as a loss. This revision of the design was partially based on a separate pilot study ( $N = 57$ ) in which we asked participants the number of tickets that they would need to gain in order to experience minimal versus significant progress under the stock-investment design. On average, participants reported that a gain of 2.7 tickets ( $SD = 2.76$ , minimum = 0, maximum = 10) would be experienced as minimal progress and a gain of 7.3 tickets ( $SD = 5.75$ , minimum = 1, maximum = 25) would be experienced as significant progress. As the standard deviations indicate, participants’ responses varied substantially. We felt that employing an idiographic approach could thus help to ensure that our large-gain manipulation was truly experienced as significant progress by all participants, providing further support for the idea that the promotion system is particularly sensitive to changes in the domain of gains.

Furthermore, to examine more directly whether perceived progress indeed mediates the switch to a preference for a risk-averse tactic (the conservative option), we also included an assessment of *perceived progress* following the investment outcome feedback. This measure allowed us to test whether perceived progress mediated the differential responses among promotion-focused participants after a large gain.

### Method

**Participants.** One hundred fifty one individuals from the United States (62% female;  $M_{age} = 32.75$  years,  $SD = 11.82$ ; 72.8% Whites, 6.3% Asian Americans, 9.5% African Americans, 5.7% Hispanic Americans, and 5.7% other) participated in this study via Amazon’s Mechanical Turk online marketplace.<sup>4</sup> Participants were randomly assigned to condition in a 2 (regulatory focus: promotion vs. prevention)  $\times$  2 (investment outcome: small gain vs. large gain) between-participants design.

**Procedure.** Participants were told that they would be taking part in a study that involved multiple tasks. We followed the same procedure used in Studies 2 and 3 to manipulate regulatory focus.

After the first essay-writing task, participants started the decision-making task. They read the same cover story used in Studies 2 and 3. However, prior to participants making any

Table 3  
Risky Choice as a Function of Regulatory Focus and Progress Frame (Study 3)

Focus	Progress frame (%)	
	Low progress	High progress
Prevention focus	57.1	36.9
Promotion focus	64.1	30.6

Note.  $N = 176$ .

<sup>4</sup> Following the procedure implemented in Study 3, we asked the same three attention check questions at the end of the survey. The majority of the participants reported that they paid full attention ( $M = 6.73$ ,  $SD = 0.47$ ,  $\alpha = .64$ ), with seven participants reporting values three standard deviations below the mean. We excluded these seven participants from the following analysis. Of these seven excluded participants, five of them also did not pass the investment outcome manipulation check.



investment decisions, we asked them to indicate what would personally feel like a significant gain, a significant loss, and no real change from the status quo. Specifically, we presented participants with Figure 2 and asked them to consider three zones: their personal gain zone (“What amount would you have to gain to feel like you’d made big progress? This is your ‘gain zone.’”), loss zone (“What amount would you have to lose to feel like you’d lost something significant? This is your ‘loss zone.’”), and no-change zone (“The values that fall between these thresholds represent what, to you, feels like your ‘no change zone.’ In other words, these are the values that you wouldn’t experience as very different—if at all different—from your starting place.”). Participants were presented with slider bars to indicate their gain and loss zones. The gap between these gain and loss thresholds constituted their “no-change” zone. They could slide the bar to any number between 0 and 20 tickets for the gain zone question and any number in between 0 and –20 tickets for the loss zone question. The threshold for the gain zone was the basis of our large progress manipulation, but we included a question about the loss zone so as not to bias participants toward expecting a particular outcome.

The procedure that followed was identical to that employed in Studies 2 and 3 up to the point that the participants received the information about their investment outcome. Participants were randomly assigned to one of the two conditions: small-gain or large-gain investment feedback. The large-gain feedback was tailored for each participant based on the specification of their gain zones in the first part of the study. On average, participants reported that 7.96 tickets ( $SD = 4.86$ ) would constitute a real gain. If participants reported a gain threshold between 0 and 5, they received feedback that their stock was up 6 for a total value of 11 tickets. If participants reported a gain threshold between 6 and 10, they received feedback that their stock was up 12 for a total of 17 tickets. If participants reported a gain threshold between 11 and 15, they received feedback that their stock was up 18 for a value of 23 tickets. If participants reported a gain threshold between 16 and 20, they received feedback that their stock was up 24 for a total value of 29 tickets. Thus, in the large-gain condition, all participants received gain feedback that was 20% higher than the upper limit of the bracket into which they fell.

Our small-gain condition was created to give participants feedback that they had progressed slightly (“Your stock is UP 2. The total value is 7 now”), though our pilot testing suggested

that many participants would experience this subjectively as no real change from the starting point. Indeed, the majority of the participants (92%) indicated a gain threshold greater than two tickets, suggesting that our feedback was likely to be experienced as a no-change situation for many participants. This condition was thus experienced by participants as either no progress or minimal progress—that is, a combination of the no-change and the small-gain conditions in Studies 1 and 2. Given our hypothesis that promotion-focused individuals tend to be risk-seeking under both the no-change and the small-gain conditions, and given that most of the participants indeed indicated that “UP 2” fell into their no-change zone, we were comfortable that we had created feedback that was in the domain of gains but clearly distinct from our large-gain condition.

Immediately after viewing the investment outcome information, participants were asked to respond to four questions gauging perceived progress. On a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), participants rated the extent to which they agreed with four statements: “I’m satisfied with the progress that I’ve made,” “I’m content with the progress I’ve made,” “The progress I’ve made so far has met my expectations,” and “I haven’t made sufficient progress with the first investment” (reverse coded;  $\alpha = .90$ ).

Then, participants were asked to make the critical investment decision. Participants were given a choice to invest in one of two stock options, either 100% chance of no change from the current state or 50% chance to lose and 50% chance to gain the total amount of tickets that they possessed after the first investment. As in the earlier studies, the expected value of the stocks was equivalent, but the risky stock varied in both an objective characterization (high variance) and subjective perception of risk.

Immediately after making this choice, participants completed the PANAS questionnaire (Watson et al., 1988) to evaluate current mood on a 5-point scale (1 = *not at all or very slightly*, 5 = *extremely*). At the end of the survey, participants were asked to recall the number of tickets they received after the first investment and the number of tickets they had in total after their first investment. They then rated their subjective perception of the riskiness of the stock options on a 5-point scale (1 = *conservative*, 5 = *risky*) and provided demographic background information.

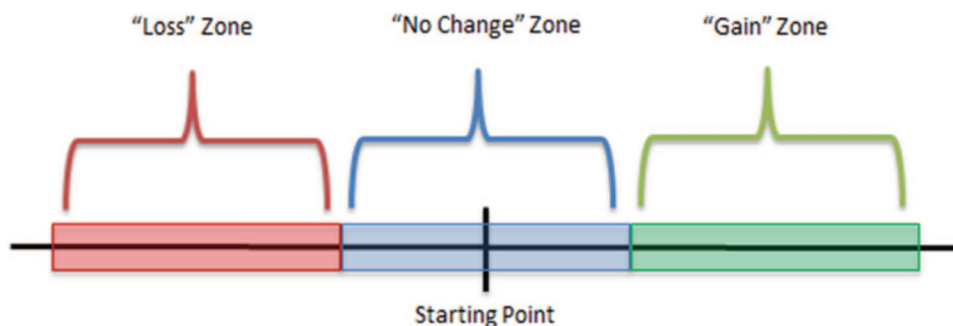


Figure 2. Experimental materials used in Study 4 to explain the notions of loss, no-change, and gain zones.

## Results and Discussion

**Manipulation checks.** First, we checked whether participants could accurately report the number of tickets they were given to start with in the stock investment task and the number of tickets they had in total after their first investment. In all, 95% of participants correctly provided this information; only these participants ( $N = 143$ ) were included in the subsequent analyses. The same pattern of results is obtained with all participants included in the model, although not all effects are statistically significant. In rating the perceived riskiness of the two options, participants reported seeing the objectively riskier stock as riskier than the objectively more conservative option ( $M_{\text{risky}} = 3.09$ ,  $SD = 0.60$ ;  $M_{\text{conservative}} = 1.14$ ,  $SD = 0.50$ ),  $t(142) = 30.58$ ,  $p < .001$ .

**Primary analysis.** Consistent with our hypothesis, there was a significant regulatory focus by investment outcome interaction effect,  $\chi^2(1, N = 143) = 7.36$ ,  $p = .007$  (See Table 4 for actual choices across regulatory focus and investment outcome conditions.) Among promotion-focused participants, only 22.6% chose the risky option in the large-gain condition, whereas 60% chose the risky option in the small-gain condition,  $\chi^2(1, N = 67) = 11.49$ ,  $p < .001$ . In contrast, the investment outcome manipulation had no main effect within the prevention-motivation condition,  $\chi^2(1, N = 76) = 0.27$ ,  $p = .603$ . In addition, there was a significant effect of regulatory focus in the small-gain condition,  $\chi^2(1, N = 78) = 5.16$ ,  $p = .023$ . In the small-gain condition, the majority of promotion-focused participants chose the risky option (63.9%), whereas the majority of prevention-focused participants chose the conservative option (61.9%).

We then conducted a logistic regression with the investment decision as a dummy-coded outcome measure (1 = risky choice, 0 = conservative choice), investment outcome (1 = large gain, 0 = small gain), regulatory focus (1 = promotion focus, 0 = prevention focus), and their interaction term as predictor variables. There was a significant main effect of regulatory focus, with promotion-focused participants generally more likely to prefer the risky option,  $OR = 2.87$ ,  $B = 1.06$ ,  $SE = 0.47$ ,  $p = .025$ . This was further qualified by a significant interaction between regulatory focus and investment outcome,  $OR = 0.21$ ,  $B = -1.55$ ,  $SE = 0.74$ ,  $p = .035$ . Separate logistic regressions within the promotion-focus and the prevention-focus conditions showed that there was a significant change across the small-gain and the large-gain conditions among the promotion-focused participants,  $OR = 0.17$ ,  $B = -1.80$ ,  $SE = 0.55$ ,  $p = .001$ , but not among the prevention-focused participants,  $OR = 0.78$ ,  $B = -0.25$ ,  $SE = 0.49$ ,  $p = .60$ . For this

analysis and the subsequent regression analyses, we repeated the same procedures including positive and negative mood scores as covariates, and the results remain unchanged. For consistency with earlier studies, the results presented in the following are based on the analyses that did not include mood scores.

**Perceived progress.** To test whether participants experienced a different degree of progress as a function of regulatory focus and investment outcome, we then conducted a linear regression with investment outcome, regulatory focus, and their interaction term as the predictors. Consistent with our hypothesis, there was a significant main effect of the investment outcome manipulation,  $B = 0.82$ ,  $SE = 0.26$ ,  $t(139) = 8.15$ ,  $p < .001$ , as well as a significant interaction between regulatory focus and investment outcome,  $B = 0.51$ ,  $SE = 0.26$ ,  $t(139) = 1.99$ ,  $p < .049$ . While both promotion-focus and prevention-focused participants reported a significantly higher level of progress in the large-gain condition, the effect size was significantly larger for promotion-focused participants,  $B = 1.33$ ,  $SE = 0.17$ ,  $t(65) = 7.90$ ,  $p < .001$ , relative to prevention-focused participants,  $B = 0.82$ ,  $SE = 0.19$ ,  $t(74) = 4.28$ ,  $p < .001$ . An analysis comparing these two coefficients confirmed that the effect size was significantly larger for promotion-focused participants than for prevention-focused participants,  $\chi^2 = 5.21$ ,  $p < .02$ .

We then conducted two logistic regressions to test the effect of perceived progress and its interaction with regulatory focus on risk preference. There was a significant effect of perceived progress on risk preference,  $OR = 0.50$ ,  $B = -0.69$ ,  $SE = 0.19$ ,  $p < .001$ , such that participants who perceived more progress in the investment outcome were *less* likely to choose the risky option in the subsequent investment. The interaction between regulatory focus and perceived progress on risk preference was marginally significant,  $OR = 0.52$ ,  $B = -0.66$ ,  $SE = 0.40$ ,  $p = .10$ . Simple regressions within each of the regulatory focus conditions showed that perceived progress was significantly associated with conservative preference among promotion-focused participants,  $OR = 0.32$ ,  $B = -1.14$ ,  $SE = 0.34$ ,  $p = .001$ , whereas the effect was marginal among prevention-focused participants,  $OR = 0.65$ ,  $B = -0.43$ ,  $SE = 0.27$ ,  $p = .11$ .

**Mediation analysis for perceived progress.** Thus far, we have established Regulatory Focus  $\times$  Investment Outcome interaction effects on risk preference and perceived progress, as well as a significant link between perceived progress and risk preference. Next, we used the bootstrapping method (with 1,000 iterations) provided by Preacher, Rucker, and Hayes (2007) to test whether perceived progress mediated the link between the Regulatory Focus  $\times$  Investment Outcome interaction and risk preference. In this analysis, perceived progress served as the mediator and regulatory focus served as the moderator. The large gain served as the independent variable. The interaction effect of investment outcome and regulatory focus on risk preference became marginally significant,  $OR = 0.27$ ,  $B = -1.31$ ,  $SE = 0.75$ ,  $p = .08$ , after controlling for our mediator, perceived progress, while the effect of perceived progress remained significant,  $B = -0.55$ ,  $SE = 0.23$ ,  $p = .02$ . The 95% corrected confidence intervals for the size of the indirect effect of investment outcome excluded zero, 95% confidence interval (CI)  $[-2.7199, -0.1165]$  among the promotion-

Table 4  
Risky Choice as a Function of Regulatory Focus and Investment Outcome (Study 4)

Focus	Investment outcome (%)	
	Small gain	Large gain
Prevention focus	38.1	32.4
Promotion focus	60.0	22.6

Note.  $N = 143$ .

focused participants, but not among the prevention-focused participants, 95% CI [-0.9754, 0.0960]. This analysis supported a significant moderated mediation effect (see Figure 3). For promotion-focused but not prevention-focused participants, perceived progress mediated the effect of investment outcome on risk preference.<sup>5</sup>

Study 4 provided further evidence that in the domain of gains, progress serves as an important signal in the promotion motivational system to switch from risky to conservative tactics. In contrast, prevention-focused individuals were less sensitive to signals of progress in the domain of gains.

### General Discussion

The present research contributes both to our understanding of motivational factors in decision making in the domain of gains and to knowledge regarding regulatory focus theory. Across four studies, we provided evidence that the promotion motivational system, but not the prevention motivational system, consistently predicted varying risk preferences in the domain of gains. Individuals in a promotion-focused motivational state—whether that state was a chronic disposition or was situationally induced—exhibited both risk-seeking and risk-aversion, depending on whether they had or had not made a large gain and whether this gain was perceived as significant progress. When promotion-focused individuals perceived that they had clearly made progress, they chose the conservative option (a risk-averse tactic). However, when they did not perceive that they had made clear progress, they chose the risky option (a risk-seeking tactic). These effects were obtained with risky and conservative options that differed both in their objective risky characterization (variance) and in participants' subjective interpretation of their riskiness.

The four studies together provide consistent evidence to support our hypothesis; however, we recognize that the results from some studies reported in this article were stronger than others. To examine the strength of the relation between promotion motivation and risky choice in the domain of gains, we conducted a combined analysis across all four studies. Because we used the regulatory strength measure in Study 1, we used the predominant regulatory focus strength score (i.e., promotion strength minus prevention strength) to create a dichotomous promotion focus versus prevention focus variable to use in the combined analysis. If the predominant score was above 0, the participant was coded as a promotion-focus case; otherwise the participant was coded as a prevention-focus case. We also grouped the participants in the low-progress condition (in Study 3) with the participants in the small-gain conditions

(in Studies 1, 2, and 4), and the participants in the high-progress condition (in Study 3) with the participants in the large-gain conditions (in Studies 1, 2, and 4). We then conducted a 2 (regulatory focus: promotion, prevention)  $\times$  3 investment outcome (no change, small gain, big gain) chi-square analysis. Consistent with our hypothesis, there was a significant regulatory focus by investment outcome interaction effect,  $\chi^2(2, N = 504) = 21.71, p < .001$ . The gain/progress manipulation had a significant effect among promotion-focused participants,  $\chi^2(2, N = 244) = 30.21, p < .001$ , but not among prevention-focused participants,  $\chi^2(2, N = 260) = 1.74, p = .42$ . Among promotion-focused participants, 64.29% in the no-change condition and 61.4% in the small-gain condition preferred the risky option, whereas only 27% in the large-gain condition chose the risky option (see Table 5).

We have argued that the conservative choices made by promotion-focused participants in the large-gain condition reflect a tactical switch in behavior, such that conservative choice became the choice that served promotion-focus concerns. An alternative possibility is that risk-averse choices within the large-gain condition were driven not by a tactical preference activated by promotion-system concerns but by a large gain inducing a prevention focus. This is an interesting possibility, given that regulatory flexibility may be a very functional self-regulatory mechanism (cf. Kashdan & Rottenberg, 2010). Under some conditions, it could be adaptive to have situational triggers that induce shifts between the promotion and prevention systems. Although we believe that this issue of regulatory flexibility at the system level is an important one to be explored further, we do not believe that it accounts for the present pattern of results, as we detail in the following.

First, if the large gain induced a prevention focus among participants in our promotion conditions, we would expect there to be similar patterns between participants in this condition and participants who were directly induced into a prevention focus. However, there are meaningful differences between these conditions, although individuals in both conditions were risk-averse. As reported in our combined analysis, within the large-gain condition, there was a significant difference in the choices made by individuals in a promotion focus (27% choose risky option) versus in a prevention focus (40.9% choose risky option),  $\chi^2(1, N = 225) = 4.89, p < .027$ . Promotion-focused individuals preferred the conservative option significantly more than the prevention-focused individuals in the large-gain condition. Thus, it is unlikely that the risk-averse behavior of promotion-focused individuals in the large-gain condition could be driven by a switch from promotion focus to prevention focus: promotion-focused individuals in the large-gain condition look even more risk-averse than prevention-focused individuals in the large-gain condition.

Further and perhaps more critical evidence comes from the results of Studies 3 and 4 that show that the mechanism associated

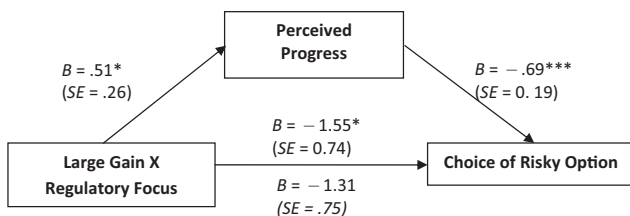


Figure 3. Mediation analysis demonstrating that the effect of the large-gain manipulation on the risk preference of promotion-focused participants is driven by perceived progress (Study 4). \*  $p < .05$ . \*\*\*  $p < .001$ .

<sup>5</sup> We also tested an alternative mediation model where the link between perceived progress and investment outcome was also moderated by regulatory focus. Again, the interaction effect of regulatory focus and investment outcome dropped to nonsignificance,  $B = -0.07, SE = 0.54, p = .89$ , after controlling for the interaction term between progress satisfaction and regulatory focus. Results confirmed the significance of the indirect effect of Large Gain  $\times$  Regulatory Focus interaction via perceived progress, 95% CI [-1.8848, -0.5048]. Given that the interaction term between regulatory focus and perceived progress on risk preference was marginally significant, we chose not to report this analysis in the main text.



Table 5  
*Risky Choice as a Function of Regulatory Focus and Investment Outcome (Combined Across Studies)*

Focus	Investment outcome (%)		
	No change	Small gain	Large gain
Prevention focus	43.2	49.6	40.9
Promotion focus	64.3	61.4	27.0

Note.  $N = 504$ .

with risky choice in the large-gain condition differs for individuals in a promotion versus prevention focus. In both studies, perceived progress was associated with a shift toward the conservative option for individuals in a promotion focus but not in a prevention focus. In Study 4, we examined this most directly in the tested mediation model, finding that perceived progress mediated the effect of investment outcome on risky choice for individuals in a promotion focus but not in a prevention focus. If a large gain induced a switch to a prevention focus in the promotion conditions, we should again expect that the mechanism underlying choice should be similar across the prevention, large-gain conditions and the promotion, large-gain conditions. However, in both studies, perceived progress was critical for predicting choice only for individuals in the promotion condition but not in the prevention condition.

In addition to the data from the current studies, some existing research also provides support for the idea that a large gain is unlikely to induce a switch from promotion to prevention motivation. It could be argued that success feedback in a task performance situation provides a progress signal similar to the large gain in our studies. If large gains (or success feedback) induce a prevention focus, we would expect promotion-focused individuals who receive success feedback to respond emotionally like prevention-focused individuals. If they did, they would experience quiescent-related feelings such as calmness that have been shown to be related to the prevention system (Higgins, 2001). However, prior work has shown that following success feedback in a task performance situation promotion-focused individuals experience cheerfulness-related feelings such as feeling happy (e.g., Idson et al., 2000, Study 3), feelings consistent with the promotion system and not the prevention system (Higgins, 2001).

Although the current studies do not suggest that large gains induce a change in behavior because of a shift in underlying motivational system, we believe that it is still an important and interesting question for future work to explore when regulatory flexibility occurs because of shifts at the tactical level as observed in the present studies and in Scholer et al. (2010) and when regulatory flexibility occurs because of shifts at the system level (e.g., shifts from promotion to prevention motivation). For example, the magnitude of the gain or loss may be one factor that influences how these processes unfold. A small loss may not induce a prevention motivation, but a catastrophic home invasion (or an event such as 9/11) may be the kind of loss that induces a prevention concern with vigilance, even for individuals who typically have strong and predominant promotion systems. Consequently, understanding how different types of situational factors influence the likelihood of change at different levels of a self-regulatory hierarchy would be valuable to examine in future research.

Future research could also be valuably directed toward a deeper understanding of how each motivational system (promotion, prevention) operates in its domain of relative insensitivity (promotion in loss, prevention in gains). Just as Scholer et al. (2010) found that promotion motivation was unrelated to choice in the domain of losses, the current studies reveal that prevention motivation is not a strong predictor of choice in the domain of gains. Across outcome conditions (as shown in the combined analysis), individuals in a prevention focus chose the risky stock 45% of the time, indicating relative indifference to the conservative versus risky options. While not surprising that participants in a prevention focus were unaffected by positive deviations from the status quo, it could be seen as puzzling that there was not stronger evidence of an overall conservative preference.

We believe that the findings of Scholer et al. (2010) are instructive in this regard as well. In the domain of losses, prevention motivation was associated with both risky and conservative choice, depending upon which option best served the underlying motivational concern with returning to the status quo ante. In the domain of gains, to the extent that prevention motivation might direct choice, it should predict *maintaining* (i.e., not losing) the status quo. How this relates to a preference for risky or conservative choice would depend on how well each option serves the need of maintaining the status quo, just as was observed in the domain of losses by Scholer et al. (2010). In addition, it is possible that in Studies 1–3, participants may have had idiosyncratic expectations of what outcomes they “should” receive in the paradigm (and, thus, there may be variance in how individuals subjectively experienced the small-gain/no-change conditions). In Study 4, we directly addressed this issue by using an idiographic paradigm. In this study, in which we are most confident that our “UP2” condition was indeed experienced by all participants as no change or small gain (i.e., UP2 was certainly *not* itself experienced as a loss), and where the risky choice in the “UP2” condition involved some possibility of losing the status quo, the results show that individuals in a prevention focus were more risk averse (62.9% preferred the conservative choice).

Another question that needs to be addressed in future research is how the magnitude of the gain (e.g., \$5 or \$5,000) over a broader range of values matters for subjective perceptions of progress and risk preferences. Although the range of values in the current studies was relatively narrow and the possible gains relatively small, some empirical evidence (Harinck, Van Dijk, Van Beest, & Mersmann, 2007) suggests that the amounts of money used in our studies are likely to be experienced as fairly significant by our participants. That said, exploring risk-seeking and risk-averse preferences across a wider range of gains deserves further study.

Likewise, while the current study manipulated the degree of gain by using a stock investment paradigm, future studies could look at a broader range of contexts (e.g., personal nonmonetary gains, collective gains) to examine how the context affects tactical shifts in risk preferences. Another important question is how quickly people adapt to progress. In the current article, we assume that individuals do not immediately adapt to the new state after advancement. That is, the notion of progress is defined in reference to a relatively stable reference point. However, regulatory focus orientations may interact in important ways with the rate of adaptation. Future studies should explore the possibility that after significant progress, the choices of promotion-focused individuals

may again become risk-seeking after sufficient delay—the phenomenon of promotion-focused people always wanting more.

### Implications for Decision Making

We believe that the regulatory focus perspective is useful for understanding the motivational dynamics that underlie risky decision making because it distinguishes between two motivational systems that prefer risk-seeking and risk-averse choices as *tactics* in the service of different motives that are sensitive to different current conditions. The prevention motivational system is concerned with the domain of losses and functions to maintain a 0 state of nonloss and avoid a  $-1$  state of loss. When a  $-1$  state of loss has occurred, preference for a risky option or a conservative option depends on which option under current conditions is most likely to restore a state of nonloss 0. In contrast, the promotion motivational system is concerned with the domain of gains and functions to advance from a current state of 0 to a state of  $+1$  gain. Preference for a risky option or a conservative option depends on whether clear progress in reaching the  $+1$  region is perceived to have been made. If the  $+1$  region is perceived to have been attained, then the conservative option is preferred; if not, then the risky option is preferred.

From this regulatory focus perspective, risk seeking and risk aversion are not personality traits. They are tactics in the service of different motives and will be preferred differentially depending on whether it is a promotion or a prevention motive that is presently active and on how each tactic serves that present motive under current conditions. Moreover, whether the promotion or the prevention system is active does not depend just on personality because each focus can be situationally induced. In this regard, our findings suggest a promising direction for future research to identify the critical conditions that influence when people switch from risk-seeking to risk-averse preferences across a wide range of decision-making contexts. These results also highlight the functional flexibility of these motivational systems; promotion-focused individuals are not rigidly risk-seeking. They flexibly adapt their behavioral tactics in service of sustaining underlying strategic concerns.

In contrast to some other perspectives that attempt to identify a single factor that can systematically explain risk-seeking preferences across both losses and gains (Cohen, Jaffray, & Said, 1985, 1987; Fishburn & Kochenberger, 1979; Schneider & Lopes, 1986), the regulatory focus perspective proposes different key factors for the domain of losses and the domain of gains; the motivational system of prevention is concerned with losses and nonlosses, and the motivational system of promotion is concerned with gains and non-gains. Moreover, it is important to note that the prevention and promotion systems function differently with respect to what underlies risk preferences. The prevention system is motivated to maintain (or restore) the status-quo (security), and it is this factor that determines whether a risk-seeking or risk-averse choice is preferred under current conditions. In contrast, the promotion system is motivated to advance and attain accomplishments, and it is this factor of perceived progress that determines whether a risk-seeking or risk-averse choice is preferred under current conditions. Given these differences, we would not expect that individuals would necessarily display similar risk preferences in the domain of losses and the domain of gains (cf. Cohen et al., 1985,

1987). Moreover, as previous research (Scholer et al., 2010) and the current research demonstrate, individuals can *switch* between being risk-seeking and risk-averse within the *same* domain (i.e., within losses or within gains), choosing the tactic that better serves their motivational needs under current conditions.

### Implications for the Role of Progress in Self-Regulation

Although our methodological approach draws strongly on traditions in the decision-making literature, our conceptual approach is more broadly grounded in theories of self-regulation. The self-regulation literature has long emphasized how perceived progress in self-regulation affects effort and goal-directed behaviors (Carver & Scheier, 1998). In the current studies, promotion-focused individuals responded to the experience of significant progress by switching from risky to conservative tactics. How does this fit with work in the self-regulation literature that suggests (a) that progress leads to decreased effort within the focal goal pursuit and (b) that the rate of progress, not the level of progress, may be critical?

Our analysis of progress within the promotion system draws upon the conceptualization of progress as *displacement* (Hsee & Abelson, 1991), which captures the idea of progress in terms of “How far have I come?” Alternatively, progress can also be characterized as *velocity*, which refers to the rate at which the outcome is changing (i.e., “How fast did I get here?”). Both displacement and velocity have been shown to affect the satisfaction that people have with their decisions (Hsee & Abelson, 1991). Velocity has received significant attention within the self-regulation literature, particularly within Carver and Scheier’s (1990) feedback control model. This work and others provide evidence that velocity is a significant contributor to affective responses in goal pursuit (Carver & Scheier, 1998; Chang, Johnson, & Lord, 2010; Lawrence, Carver, & Scheier, 2002). While velocity is certainly an important aspect of progress, we focused in the current studies on progress as displacement because this conception is most closely aligned with the idea of achieving (or not) an advance from present status quo 0 to a  $+1$  gain.

In this regard, our findings bring two new elements into classic goal progress models. First, the progress information in the domain of gains only mattered to a subset of participants: whereas promotion-focused people were affected by the amount of progress in the domain of gains, prevention-focused individuals were generally unaffected. These results are consistent with earlier research testing self-discrepancy theory that found that patterns of self-discrepancy relations that signaled a lack of progress in the promotion system were associated with negative feelings (frustration and unhappiness), whereas patterns of self-discrepancy relations that signaled a lack of progress in the prevention system were not associated with negative feelings. As in the current work, it was as if “progress” simply did not matter in the same way to individuals with a prevention focus (see Strauman & Higgins, 1993).

Second, whereas self-regulatory models have tended to focus on the effects of progress on affect (e.g., Carver & Scheier, 1990; Strauman & Higgins, 1993) or on subsequent effort, such as Carver and Scheier’s (1998) discussion of individuals’ reducing their self-regulatory efforts when sufficient progress has been made (i.e., “coasting”), we provide evidence that progress may

also influence risk preferences in the context of decision making. Specifically, perceived progress within the domain of gains leads promotion-focused participants to “ease up” in a different way—by switching from risky to conservative tactics. That is, promotion-focused people are still motivated to attain the advanced state of +1 but when sufficient progress has been made they switch from risk-seeking to risk-averse tactics to ensure that the +1 gain remains.

Although the current research was concerned with progress as displacement, it would be interesting to examine in future research whether the rate of progress (i.e., velocity) in the domain of gains would also influence promotion-focused individuals’ risk preferences. Our findings in Study 3, in which participants displayed different risk preferences as a function of whether the *same* large gain was framed as making progress or not making progress, indicate that perceived progress can be as important as objective progress. Future research could examine the effects of manipulating perceptions of progress velocity for the same objective gain on risk preferences.

It is possible, for example, that promotion-focused individuals are sometimes willing to take problematic risks, including unethical risks in a competitive situation, when they perceive their rate of progress as not being great enough. An effective strategy to reduce problematic risky behavior from promotion-focused individuals might be to use framing to make them perceive the extent and rate of their progress as being sufficient. On the other hand, if the problem in some other situation is that promotion-focused individuals are being too risk-averse in their choices and behaviors, then framing could be used to make them perceive the extent and rate of their progress as not being sufficient. By understanding better the motivational dynamics underlying preferences for risk-seeking and risk-averse tactics, decision makers could proactively adopt strategies to influence their own and others’ risk preferences to match the level of risk that best suits their goals.

### Concluding Comment

The current findings suggest that promotion motivation, *not* prevention motivation, determines risk preferences in the domain of gains. We found that promotion-focused individuals exhibit *both* risk seeking and risk aversion in the domain of gains, depending on the amount of progress they experience. By examining the promotion motivation underpinnings of risk preferences in the domain of gains and showing how alternative risk preferences, *as tactical choices*, can serve the *same* motivation, we have reconsidered from a motivational perspective what it means to be risk-averse and risk-seeking in the domain of gains. Together with the findings of Scholer et al. (2010) in the domain of losses, the present findings provide a relatively simple motivational story about risk seeking. Individuals with a prevention motivation (chronic or situationally induced) are naturally concerned with the domain of losses and want to maintain or restore a 0 nonloss (e.g., safety), and they will choose a risk-seeking tactic to make it happen if necessary. Individuals with a promotion motivation are naturally concerned with the domain of gains and want to make progress and advance to a +1 gain (e.g., accomplishment), and they will choose a risk-seeking tactic to make it happen if necessary. A relatively simple motivational story with significant im-

plications for any decision—social, political, or economic—that involves the element of risk.

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