

Risk Preference: How Decision Maker's Goal, Current Value State, and Choice Set Work Together

Xi Zou
Nanyang Technological University

Abigail A. Scholer
University of Waterloo

E. Tory Higgins
Columbia University

When and why do people choose a more or a less risky option? To answer this question, we propose that it is essential to examine the dynamic interrelations among three factors—the decision maker's goal (e.g., promotion vs. prevention goal), the current value state (e.g., the domain of gains vs. losses), and the choice set (i.e., perceived available options). We review previous theories that highlight the significance of each of these three factors. We then propose a motivational framework of risk preference that describes how these three factors *work together* motivationally to impact risk preference, illustrated by evidence from regulatory focus research. We then draw on this new motivational framework to examine the ways in which achievement motivation, need for power, and need for relational security are related to decision under risk, and discuss the broader implications of this motivational framework of risk preference.

Keywords: decision-making, goal, motivation, regulatory focus, risk

People make choices all the time. Sometimes people choose between two different courses of action, and sometimes they choose between taking action and not taking action. Often, one choice option is more risky than the other. Such choices are seen in a wide range of life domains, with significant implications for financial, social, and physical well-being. What determines whether a person prefers a more or a less risky option? For a long time, this question has challenged scholars and laypeople alike. In particular, people have been fascinated by why individuals sometimes choose the risky option—accepting low odds, leaping into daring ventures, and making themselves vulnerable, often in ways that seem on the surface to defy logic or rationality.

Those who choose a highly risky option are sometimes revered, such as Tenzing Norgay and Edmund Hillary, the first to summit Mt. Everest (Robinson, 2008). At other times they are criticized or dismissed as impulsive or foolhardy, such as the leaders of the 1996 Mt. Everest disaster that resulted in the deaths of eight people (Krakauer, 1997). Just as there can clearly be no simple evaluation of risk as “good” or “bad,” we suggest that there is no simple

answer to what motivates people to choose a more or a less risky option. This does not mean, however, that there is no answer. We propose that there is a motivational framework that can help us understand what motivates people to choose a more or a less risky option. Our approach is grounded in advances in motivation science, which has long recognized that needs, motives, and goals affect the fundamental ways in which humans perceive, think, and act (e.g., Bruner, 1957; Erdelyi, 1974; Festinger, 1957; Kunda, 1990). By placing motivation at the center of our proposal, we not only make novel predictions about when people will choose a more or less risky option but also highlight the psychological mechanisms that underlie *why* people do so.

Previous research has, of course, grappled with the question of *why*. As we review in detail below, many influential theories have identified critical factors that influence risk preference. Across approaches, these critical factors can be distilled to three key components. First, several theories identify the *current value state* (e.g., whether the decision maker is in the domain of gains or losses) as the primary driver. For example, prospect theory describes how people are more likely to choose the more risky option in the domain of losses than in the domain of gains (Kahneman & Tversky, 1979).

Second, other theories show that the *choice set* (i.e., perceived available options) can affect whether people choose a more or a less risky option. The influence of the perceived available options on choice arises not only from the objective characteristics of the options, but also from subjective differences as a function of the presentation of the options. For example, fuzzy-trace theory (FTT, Reyna & Brainerd, 1991, 1995) shows that when equivalent options are presented in a linguistically different manner, people change their preferences for more or less risky options.

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Xi Zou, Division of Leadership, Management, and Organisation, Nanyang Technological University; Abigail A. Scholer, Department of Psychology, University of Waterloo; E. Tory Higgins, Department of Psychology, Columbia University.

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Correspondence concerning this article should be addressed to Xi Zou, Division of Leadership, Management, and Organisation, Nanyang Technological University, 50 Nanyang Avenue, S3-B1A-09, Singapore 639798. E-mail: zou.xi@ntu.edu.sg

Third, still other theories emphasize the important role of the *decision maker* in affecting the choice of a more or a less risky option (e.g., Bromiley & Curley, 1992; Eysenck & Eysenck, 1977; Lejuez et al., 2002; Zuckerman, 1979), by identifying personality traits that are correlated with risk preference or examining the effect of decision maker's goals. For example, people high on sensation-seeking are more likely to be addicted to risky gambling (Blaszczynski, Wilson, & McConaghy, 1986). Alternatively, a decision maker's goal can serve as a reference point that influences risk preference (Heath, Larrick, & Wu, 1999). For instance, many New York City cab drivers set daily earning goals, and they go home once they have exceeded them. As drivers exceed their goals more rapidly on rainy days, they end up working fewer hours on *low-risk* (i.e., high passenger demand) days and more hours on *high-risk* (i.e., low passenger demand) days (Camerer, Babcock, Loewenstein, & Thaler, 1997).

Building on this earlier work, we consider, from a motivational perspective, how *all three* of these factors—the current value state, the choice set, and the decision maker's goals—*work together* to influence whether individuals choose a more or a less risky option. As we will present in detail below, to predict risk preference, it is essential to understand how the decision maker's goals dynamically intersect with the current value state and the choice set to determine which option can best satisfy those goals. Depending on the decision maker's goal, for example, a risky option could be in the service of either restoring safety or making progress. Further, the relevance of this risky option depends not only on the decision maker's goal, but also on the current value state. For example, a more risky option is relevant to the goal of maintaining safety when the decision maker is in danger and only the more risky option offers a chance to restore safety, but not when the decision maker is safe and a less risky option can maintain safety. Further, a particular combination of current value state and choice set can also be highly relevant to the goal of one decision maker while being irrelevant to the goal of another decision maker. As will be shown, it is how all three factors work together that underlies whether the more or the less risky option is chosen.

Before introducing in detail our motivational three-factor framework of risk preference, let us provide a concrete example to illustrate what we propose is underlying these choices. Imagine two different decision makers, Emma and Iris, who have just invested money in the stock market and currently find themselves in the same objective situation: with *less* money than their initial investment. Emma and Iris have different goals. Emma is a dreamer who is always focused on her aspirations and ideals. She eagerly pursues opportunities for advancement, wanting to attain new gains. In contrast, Iris is concerned about maintaining safety and the status quo. Focused on her responsibilities and duties, Iris tries vigilantly to ensure an even keel, wanting to maintain non-losses. Imagine that Emma and Iris, each of whom is currently in loss, face one of two different choice sets.¹ In choice set A, Emma and Iris face a choice between a relatively more risky option and a relatively less risky option, in which only the more risky option has the potential to return them to their starting investment. In choice set B, Emma and Iris face a choice between a relatively more risky option and a relatively less risky option, in which both options offer the possibility of returning them to their starting investment. Under these different circumstances, what predictions would each of the above three perspectives make?

The perspective that emphasizes the (perceived) *current value state* as a factor emphasizes whether decision makers perceive themselves to be in the domain of losses or gains as a key determinant of risk preference: After losing the initial investment, both decision makers find themselves below their reference point—a loss. Historically, such theories would predict that decision makers in the domain of losses would choose the risky option (Fishburn & Kochenberger, 1979; Hershey & Schoemaker, 1980; Kahneman & Tversky, 1979). Thus, it is predicted that both Emma and Iris, for both choice set A and choice set B, would be more likely to choose the more risky option than the less risky option.

Now consider the perspective that emphasizes the *choice set* as a factor. This perspective would hone in on the difference between choice set A and choice set B. For instance, one such theory, FTT (Reyna & Brainerd, 1991, 1995), might predict that individuals would be more likely to choose the relatively more risky option for choice set A than for choice set B because the gist comparison of the two options in a set (*can help me return to my starting investment vs. can't help me return to my starting investment*) is clearer for choice set A than for choice set B.

Now consider the perspective that emphasizes the *decision maker* as a factor. This perspective would hone in on the difference between the personality traits of Emma and Iris. Emma appears to be more eager to pursue potential opportunities than Iris, whereas Iris appears to be more cautious. Thus, on the basis of decision makers' characteristics alone, such theories would predict that Emma would be more likely than Iris to choose the risky option for both choice set A and choice set B.

In contrast to considering each of these three factors alone, we argue that it is necessary to take into consideration *all three factors together*: the current value state, the choice set, and the characteristics of the decision maker. In particular, from a motivational perspective, the goals of the decision maker affect the psychological meaning and significance of both the current value state and choice sets. In other words, despite the objectively identical current value state and choice sets, it is not the case that Emma and Iris are facing the same motivational choice. Rather, the current value state and choice sets have different motivational relevance for Emma and Iris, and may or may not offer the possibility of satisfying their distinct goals. For example, Emma's goal is to advance beyond where she started. What matters to her is the difference between gains and nongains. For Emma, falling below the starting point is not much worse than staying where she started because in both cases she has not reached her goal to advance clearly beyond her starting point. Thus, for Emma, none of the options of either choice set A or choice set B clearly fit her goal to gain advancement. Thus, she is likely to be indifferent between the options for both the A set and the B set.

In contrast to Emma, Iris's goal is to maintain her starting investment. What matters to her is the difference between non-losses and losses. For Iris, the situation is dire, and what matters about the options in both choice sets is whether they can satisfy her goal of returning to the level of the starting investment (restore a satisfactory status quo). In case A, this means she will prefer the more risky option to the less risky option because only the more

¹ In this example, we assume that the expected value of the two options in each set are the same. They only vary in terms of how risky they are.

risky option can get her back to her starting investment. In case B, however, Iris will prefer the less risky option, because it offers the possibility of returning to the status quo with higher certainty and less potential downsides than the more risky option.

In sum, we propose that to predict whether individuals will choose the more or the less risky option, it is necessary to consider all three factors—the current value state, the given set of options, and the decision maker’s goals—and understand how they *work together* motivationally. Given the dynamic between the decision maker’s goal and the current value state, how worthwhile is each option? That is, to what extent would the decision maker satisfy his or her goal by choosing a particular option under a given current value state? These questions concerning the interrelations among the three factors are critical to our motivational approach.

We begin by reviewing existing theories to understanding risk preference, organizing them in terms of how each of the three broad factors that we summarized above is emphasized by these previous theories. We examine what important insights previous theories have offered regarding these factors, and discuss what they say about the underlying psychological mechanisms that drive the choice of a more or a less risky option. Consistent with prior literature, we define risk broadly: riskiness is the pursuit of an option that involves outcome variability (Figner & Weber, 2011; Markowitz, 1952; Mishra, Barclay, & Sparks, 2017), where the outcome variance includes either desired or undesired outcomes or a mixture of both desired and undesired outcomes.² We do not attempt to be exhaustive in reviewing all prior theories of risk preference, nor do we comprehensively review all facets of each theoretical approach outlined below. Rather, in an attempt to understand the motivational dynamics of risk preference, we focus on prominent and illustrative theories that have explored how one or more of these three factors influence risk preference. We then develop our approach in detail, outlining the ways in which we build upon, complement, and diverge from the existing perspectives.

Characteristics of Current Value States, Choice Sets, and Decision Makers

Characteristics of Current Value States

The current value state has a long history in the decision-making literature. Going back to the diminishing marginal utility principle (Bernoulli, 1738), the current value state was conceptualized as current wealth. For example, one hundred dollars could be very valuable to a poor person while having very little value to an extremely wealthy person. An important development in expected utility theory (von Neumann & Morgenstern, 1944) was to specify risk attitude by taking into account the marginal utility principle. As a result, the utility function of a risk-averse individual would be characterized by a concave-down function, whereas a risk-seeking individual would be characterized by a convex-up function. Although changes in the current value state could influence the steepness of the curve, the general shape was argued to remain stable for individuals (von Neumann & Morgenstern, 1944).

Later, prospect theory (Kahneman & Tversky, 1979) conceptualized the current value state as a perceived recent change in relation to a reference point. Thus, receiving one hundred dollars

would be a significant perceptible change if someone has no money, but a less noticeable change if someone has a million dollars. Arguably one of the most prominent psychological theories of risk preference, this perspective on current value state has been very influential in understanding how individuals make decisions when changes are in the domain of gains versus losses. It shows that an individual’s risk preference is inconsistent among the same choices, depending on whether those choices are presented as either gains or losses. This finding presents a significant challenge to the expected utility hypothesis (Bernoulli, 1738; von Neumann & Morgenstern, 1944), illustrating that it is erroneous to assume that individuals’ risk preferences are stable. Rather, prospect theory argues that an individual’s utility function is concave in the domain of gains, but convex in the domain of losses.

Notably, prospect theory builds on psychophysical models and is *not* a motivational theory of risk preference. In fact, Kahneman and Tversky (1984) referred to their decision weight function as reflecting the “psychophysics of chances” (p. 344). A person who turns down an 80% chance of winning \$2,000 in favor of a sure \$1,000 is simply responding to the same type of perceptual parameters that a decision maker assesses when considering whether the difference in weight between 1 and 2 pounds seems greater than the difference between 10 and 11 pounds. However, although not a motivational theory, prospect theory is clearly relevant to the current discussion because it launched a rich research tradition examining the role of (perceived) *current value state* in decision under risk, and has clear implications for understanding how the current value state matters for the construction of subjective utility and preference for different choice options.

To be more specific, prospect theory (Kahneman & Tversky, 1979) draws attention to the idea that utility may vary depending on current value states—that is, whether an individual is making a decision in the domain of gains or in the domain of losses. The value function under prospect theory outlines three principles that influence utility. First, people judge outcomes relative to some neutral point of comparison, or reference point, against which they encode those outcomes as gains or losses. This notion that people interpret their current state relative to a reference point is clearly illustrated in a classic example on adaptation levels (Helson, 1964, cited by Kahneman, 2011): If you immerse your left hand in a bowl of ice water and your right hand in a bowl of warm water, then put both hands in a bowl of room-temperature water, the water in the third bowl will feel relatively warm to your left hand and relatively cool to your right hand. Second, people are de-

² Here, we follow the most widely used definition of risk in developing our theory. However, we recognize that risk can also be defined in variety of ways (for a review, see Fox, Erner, & Walters, 2015). Another popular view of risk emphasizes risk as involving losses or negative outcomes only. For example, The *Oxford English Dictionary* (2019) defines risk as “exposure to the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility” (Oxford University Press, 2019). The clinical definition of risk refers to behaviors that can result in loss or harm to oneself or others such as skydiving, recreational drug use, and unprotected sex (e.g., Furby & Beyth-Marom, 1992; Steinberg, 2008). Managers perceive risk as exposure to possible negative outcomes (March & Shapira, 1987). Psychometric studies of risk intuitions highlight two dimensions: a dread component that is characterized by lack of control or potential catastrophic consequences, and an unknown component that is characterized by unobservable, unknown, or delayed consequences (Slovic, 1987).

scribed as exhibiting loss aversion: they find losses to be more painful than comparable gains are pleasant (i.e., losses loom larger than gains).³ For example, the intensity of reactions is greater when salaries are cut by 5% than when they are increased by 5% (Dunn, 1996). Third, people exhibit diminishing sensitivity to both increasing magnitude of losses and increasing magnitude of gains. In other words, they become less and less sensitive to changes in position as they move away from the reference point (i.e., marginal value is diminishing). For example, a gambler who loses \$100 when she has already lost \$10,000 will be much less sensitive to the loss than one who has previously only lost \$200. Together, these three elements influence the subjective utility that decision makers construct. These principles underlie the classic prospect theory predictions (Kahneman & Tversky, 1979): In general, people are more likely to choose the more risky option in the domain of losses (*risk seeking*) but the less risky option in the domain of gains (*risk averse*).⁴

The primary legacy of prospect theory, from a motivational perspective, is that it shines a spotlight on how subtle changes in the current value state, even in terms of how the same objective situation is framed, can affect the decision makers' preference for a more or a less risky option. Indeed, decades of research have supported the notion that the current value state plays a robust and powerful role in guiding risk preference. In this regard, field experiments have shown that framing the current state as not acceptable or as a loss better motivates people to take risks and engage in changes than framing the current state as acceptable or as a gain. For example, in a study conducted at a medical clinic in the U.S., women were shown videos aimed at promoting HIV testing (Kalichman & Coley, 1995). In the control condition, information in the video was framed in terms of the benefits associated with getting tested. Only 23% of the women shown this version of the video chose to be tested within two weeks. In the experimental condition, the information was framed in terms of the costs and risks associated with not getting tested (e.g., "by not getting tested a woman is putting herself, the people she loves, and her unborn children if she becomes pregnant at risk.") Among those who saw this version, 63% chose to be tested.

In similar research, loss frames have been more effective than gain frames in persuading people to obtain skin cancer detection exams (Rothman & Salovey, 1997) and in encouraging women to conduct breast self-examinations (Meyerowitz & Chaiken, 1987). As the current value state changes from status quo to loss (such as an increase in inequality), there is also a significant increase in risk-taking behavior, such as violence (Morenoff, Sampson, & Raudenbush, 2001), drug and substance abuse (Room, 2005), and crime (Wilkinson & Pickett, 2009; Wilson & Daly, 1997). In sum, decision makers are influenced by even relatively subtle changes in the perceived current value state. Thus, if we want to understand decision under risk, the perceived current value state must be considered.

Characteristics of Choice Sets

In addition to the current value state, characteristics of the choice set also influence whether individuals choose a more or a less risky option. An illustrative and prominent theory that has emphasized the implications of the choice set is fuzzy-trace theory (FTT, Reyna & Brainerd, 1991, 1995; Reyna, Lloyd, & Brainerd,

2004). Grounded in research on memory, FTT proposes that decision makers form representations of a choice set ranging from a verbatim representation of quantities to a gist representation of qualitative meaning. By showing how decision makers form qualitatively different inferences of quantitatively equivalent options, FTT has important implications for motivational approaches. A key insight from FTT is that decision makers often encode choice options in terms of simple gist (e.g., the simplest bottom-line meaning), and it is the comparison of the categorical gist representations (e.g., *save some people* vs. *save none*), rather than the precise parameters, that frequently guides choice preferences.⁵ Furthermore, FTT highlights how this investigation of gist meaning can often provide insights into individuals' risk preference. Specifically, in FTT the decision-making process begins with the simplest qualitative distinctions that can be made (a fuzzy-processing preference). Decision makers will tend to select the option whose gist offers the highest benefits and lowest costs. Decision makers rely on finer distinctions only if the simplest gist representations of the options are identical in subjective utility.

An illustration of how FTT accounts for risk preference is provided by research reexamining the famous Asian disease problem (Tversky & Kahneman, 1981). In the gain frame, people typically have a choice between Program A, which will save 200 lives (less risky option), and Program B, which provides a 1/3 probability that 600 people will be saved and a 2/3 probability that no people will be saved (more risky option). In the loss frame, people typically have a choice between Program A, in which 400 people will die (less risky option), and Program B in which there is a 1/3 probability that no one will die and a 2/3 probability that 600 people will die (more risky option). According to FTT, the gist representations can account for why more people are likely to choose the more risky option in the domain of losses than in the domain of gains (Reyna & Brainerd, 1991). In the gain frame, the gist representations are likely encoded as "saving some people" (less risky option) versus "either saving some or saving none" (more risky option). Given that people prefer "saving some" over "saving none," they prefer the less risky option. In the loss frame, the gist representations are likely encoded as "some people die" (less risky option) versus "either some die or none die" (more risky

³ There are recent discussions about the reality of loss aversion per se as an empirical effect and, thus, how much support this psychophysical account of loss aversion has received (e.g., Gal & Rucker, 2018; Higgins & Liberman, 2018; Simonson & Kivetz, 2018).

⁴ We acknowledge that this conclusion is simplified. An important element that we do not discuss here is the overweighting of small probabilities, which leads to the so-called fourfold pattern of risk attitudes: risk-averse behavior when gains have moderate probabilities or losses have small probabilities; risk-seeking behavior when losses have moderate probabilities or gains have small probabilities (Tversky & Kahneman, 1992). Here, our goal is not to exhaustively review this theory, nor do we comprehensively review all facets of each theoretical approach outlined below. Rather, we focus on the gains versus losses framing effect from prospect theory to illustrate the importance of the current value state.

⁵ Note that FTT makes important developmental predictions about the extent that decision makers rely on verbatim versus gist representations, such that children and adolescents are more likely to rely on verbatim representations than adults (Reyna, Wilhelms, McCormick, & Weldon, 2015). What we are describing here is how the theory argues adults typically approach decisions.

option). Given that people prefer “none die” over “some die,” they prefer the more risky option.

Further changes in the linguistic presentation of the options can also eliminate risk aversion in the domain of gains as well as risk taking in the domain of losses (Kühberger & Tanner, 2010; Reyna, Chick, Corbin, & Hsia, 2014). For instance, in the gain frame presented above, the more risky option could be restated as simply “1/3 probability that 600 people will be saved,” removing the mathematically redundant information that there is a 2/3 probability that no one will be saved. When that information is no longer salient, the gist representation of this option becomes simply “saving some people.” As a result, in the gain frame participants no longer show a preference for the sure thing option that also has “saving some people” as the gist representation. Consider now an alternative modification in the gain frame. The risky option could be simplified as “2/3 probability no one saved” (e.g., removing the mathematically redundant information, “1/3 probability that 600 will be saved”), resulting in “saving none” as the gist representation and thereby accentuating the rejection of the risky option.

Now consider alterations in the loss frame. By removing the mathematically redundant information, the risky option can be presented as either “a 2/3 probability that 600 people will die” (i.e., “some will die” as the gist representation) or “a 1/3 probability no one dies” (i.e., “none will die” as the gist representation). By doing so, researchers can significantly accentuate or remove, respectively, the risk-taking preference in the domain of losses. These findings demonstrate that the representation of an option that either eliminates or emphasizes “the some versus none” categorical contrast plays a significant role in underlying the framing effect. This finding is significant as the presence or the absence of the zero complement in the risky option (i.e., “2/3 probability no one saved” in the gain frame, or “1/3 probability no one dies” in the loss frame) is considered irrelevant for predicting risk preference under prospect theory.⁶ However, under FTT, the zero complement is crucial since it enables the relevant contrast (some vs. none).

Building on the research from FTT that demonstrates the importance of categorical representations in the decision-making process (e.g., Mills, Reyna, & Estrada, 2008; Reyna, 2012; Reyna, Chick, et al., 2014; Reyna et al., 2011; Reyna & Mills, 2014), we further propose that not only the presentation of the choice set matters, but the decision maker’s goals and the current value state also play a role in affecting how the decision maker represents the more and the less risky options. The same option can categorically satisfy (or not) a decision maker’s goal given a current value state; these categorical representations regarding goal satisfaction are critical in driving risk preference. For example, an option that has the possibility of restoring a status quo that has been lost would satisfy a decision maker’s goal to return to status quo (i.e., maintain a nonloss), but would not satisfy a decision maker’s goal to advance beyond the previous status quo (i.e., obtain a gain). Alternatively, a decision maker with a particular goal could form categorically different representations of the same option across two different current value states. For example, consider a decision maker whose goal is to restore a status quo that has been lost. Depending on the specifics of the current value state (e.g., a loss of \$500 or \$5,000), a given option (a chance of gaining \$600) may or may not be able to restore the status quo. For this decision maker with the same goal to restore a status quo (i.e., move away

from loss to nonloss), the same option would be categorized as having the potential to satisfy the goal in the former current value case but not in the latter.

In sum, research from FTT theory demonstrates the critical role of categorical representations of the choice set in risk preference. Furthermore, this theory illustrates how changes to the choice set itself can affect how worthwhile each option is perceived to be, ultimately influencing individuals’ preference for the more or the less risky option. Thus, if we want to understand decision under risk, we also must consider the perceived characteristics of the options in the choice set.

Characteristics of Decision Makers

The third factor that has received significant attention in research on risk preference is the decision makers’ characteristics; mainly, studying how the decision makers’ personality or goals (both chronic and temporary) can lead to different choices. Personality and chronic goal approaches focus on differences in dispositions, needs, and motives that are assumed to be relatively stable across situations and over time. Broadly, these approaches classify people by their desire for risk itself, building on the assumption that some people like risk more and thus seek out risks more often (e.g., Bromiley & Curley, 1992; Eysenck & Eysenck, 1977; Lejuez et al., 2002; Zuckerman, 1979). For instance, individual differences in sensation-seeking, the extent to which people take risks to have novel and exciting experiences, are related to making riskier choices (Zuckerman, 1979, 2007; Zuckerman & Kuhlman, 2000). Consistent with the essence of the construct, there is a particularly strong correlation between sensation-seeking and the likelihood of taking recreational risks (e.g., chasing a tornado by car to take dramatic photos), a domain prototypically characterized in terms of thrill and adventure (Weber, Blais, & Betz, 2002). For example, people high on sensation-seeking enjoy mountain climbing and wild uninhibited parties (Zuckerman, Eysenck, & Eysenck, 1978). In other words, people high in sensation-seeking value risky activities intrinsically.

Similarly, other researchers have directly assessed individuals’ risk preferences on various risk decision-making tasks to categorize them as more or less risk-taking types. This approach is similar to the personality approach described above, because it assumes that there is a stable individual difference in risk preference and that risky behavior reflects an intrinsic preference for risk per se. For example, economists have used choices among chance gambles to measure stable individual differences in risk taking (e.g., Barsky, Juster, Kimbal, & Shapiro, 1997; Hariri et al., 2006; Jaeger et al., 2010). Lopes and colleagues also directly assessed individuals’ preferences for more or less risky options in a series of decisions in an attempt to identify people who chronically value potential (i.e., the risk-taking type) versus security (i.e., the conservative type), respectively (Lopes, 1987; Schneider & Lopes, 1986).

Further, clinical psychologists have devised tasks such as the Balloon Analog Risk Task (BART) and Iowa gambling task to

⁶ This finding also shows the limits of the value function and probability function under the prospect theory in explaining framing effects (see further discussions from Reyna & Brainerd, 1991, 1995; Kühberger & Tanner, 2010).

measure individual differences in risk preference. For instance, the BART involves pressing a button to insert puffs of air in a visually depicted balloon; each puff adds a fixed amount of money to an account, but if the balloon explodes before the participant cashes out, the participant receives nothing. Risk taking in these tasks has successfully predicted such behaviors as drug use, unprotected sex, gambling, and stealing (e.g., Bechara et al., 2001; Lejuez et al., 2002).⁷ Indeed, such self-reported measures of risk-taking propensity are purposefully designed to capture a decision maker's chronic preference toward risk. However, these approaches do not separate risk preferences from the underlying motivation; rather, a decision maker's underlying risk-related motivation is inferred directly from the risky choices they make.

Another characteristic of decision makers that can influence risk preference is an individual's goals; these approaches typically consider both an individual's chronic and momentary goals. One prominent example is the goals-as-reference-points theory (Heath et al., 1999; Larrick, Heath, & Wu, 2009). This theory complements prospect theory by articulating how an individual's goals establish reference points. Although the central idea in prospect theory is that people derive utility from *gains* and *losses* measured relative to a reference point, prospect theory is silent about where the reference point comes from (Barberis, 2013). The goals-as-reference-points theory argues that decision makers can have different goals, which "serve as reference points and alter outcomes in a manner consistent with the value function of prospect theory" (p. 79, Heath et al., 1999). That is, the goal-as-reference point divides the space of outcomes into a positive and a negative region: meeting the goal places the decision maker in the domain of gains, whereas falling behind the goal places the decision maker in the domain of losses. Based on this theory, one needs to know a decision maker's goal to understand how they choose between a more and a less risky option. For example, according to prospect theory, an individual who just earned \$400 from a stock investment would be assumed to be in the domain of gains. However, based on the goals-as-reference-points theory, the individual can be either in the domain of gains or losses depending on her goal. If her goal was to earn \$500, she is now in the domain of losses. However, if her goal was to earn \$300, she is now in the domain of gains. In predicting risk preference, goals-as-reference points theory would then follow the prospect theory predictions and argue that this individual would be likely to be risk seeking if her goal was \$500 and risk-averse if her goal was \$300. While the goal clarifies an origin of the reference point and thus the value of the outcome, the goals-as-reference-points theory emphasizes that "the value function is sufficient to explain a wide range of empirical findings" (p. 79, Heath et al., 1999).

Similar to the goals-as-reference-points approach, our motivational approach draws on the concept of goal to characterize the decision maker. Indeed, different goals can create different reference points and by creating different reference points, different goals can lead to different risk preference (March & Shapira, 1992; Payne, Laughhunn, & Crum, 1981). However, goals do more than establish reference points. In our model, we take a system perspective to define goals, which can reflect both temporary and chronic needs, motives and goals, involving both desired outcomes and desired strategies. An individual's goals—whether these arise from relatively stable or momentary motivational concerns—influence how individuals perceive the current value state, the choice

set, and their dynamic interaction. Just because decision makers are at or above the reference point (i.e., the goal is satisfied) does not mean that they necessarily prefer the less risky option. Similarly, just because decision makers are below the reference point (i.e., the goal is not satisfied) does not mean they necessarily prefer the more risky option. For example, given Iris's goal of maintaining or restoring the starting point status quo, any choice option that would maintain or restore a status quo would be experienced as a success (Higgins & Liberman, 2018); this means that if the less risky option offers a chance to return to the status quo, Iris would prefer the less risky option even when she is in the domain of losses. Below, we further elaborate on how the three factors—decision maker's goals, the current value state, and the choice set—work together to predict risk preference.

Three-Factor Motivational Framework of Risk Preference: An Analysis Using Regulatory Focus

As reviewed above, critical insights from earlier approaches highlight the importance of each of three factors that affect whether people make a more or a less risky choice. For example, prospect theory highlights the role of the current value state (domain of gains vs. losses); fuzzy-trace theory highlights the role of the choice set (influencing gist representations); and the goals-as-reference-points theory highlights the role of the decision maker's goals (different reference points from different goals). Whereas both prospect theory and fuzzy-trace theory draw primarily on psychophysical and cognitive mechanisms to account for risk preference, goals-as-reference-points theory is explicitly motivational in predicting the origins of the reference point. Nonetheless, according to the goals-as-reference-points theory, the predictions about risk preference then follow quite directly from the psychophysical mechanisms proposed by prospect theory.

From a motivational perspective, these existing theories are particularly informative because they clearly highlight three key factors that influence individuals' risk preference. Building on these theories, we propose a motivational three-factor framework that considers how these factors *work together* to understand when and why individuals prefer a more or a less risky choice. Our framework can be broadly applied to understanding various types of motivation that underlie risk preference. Indeed, later we will discuss how it applies to work on achievement motivation, need for power, and need for relational security. How all three factors work together to predict risk preference is especially well illustrated, however, in research evidence from recent empirical work on risk preference that was conducted in the context of regulatory focus theory (Higgins, 1997). Thus, we will take advantage of that evidence. To do so, we begin by providing a brief introduction to regulatory focus theory.

Regulatory Focus Theory

Regulatory focus theory distinguishes between two coexisting motivational systems, the promotion and prevention systems, which serve critical, but different, survival needs (Higgins, 1997).

⁷ Some critiques have also pointed out that such repeated behavioural measures of risk taking are likely to involve learning, as well as confounding feedback of reward and risk (Wallsten, Pleskac, & Lejuez, 2005).

Individuals with a promotion focus are concerned with nurturance, growth, and advancement, and they pursue goals as hopes and aspirations (Crowe & Higgins, 1997; Higgins, Roney, Crowe, & Hymes, 1994; Liberman, Molden, Idson, & Higgins, 2001; Molden & Higgins, 2005; Wang & Lee, 2006). Promotion-focused individuals typically pursue goals using eager strategies, reflected in behaviors such as preferring multiple alternatives (Liberman et al., 2001) and emphasizing a positive future (Grant & Higgins, 2003; Scholer, Ozaki, & Higgins, 2014; Yinlong Zhang & Mittal, 2007). In contrast, individuals with a prevention focus are concerned with safety and security and pursue goals as duties, obligations, and responsibilities (Higgins, 1997). Prevention-focused individuals typically pursue goals through vigilant strategies, reflected in behaviors such as carefully vetting potential downsides and emphasizing the possibility that things might go wrong (Crowe & Higgins, 1997; Higgins et al., 1994; Liberman et al., 2001; Molden & Higgins, 2005; Wang & Lee, 2006). Research provides evidence that regulatory focus systems are distinct from personality traits such as sensation-seeking or conscientiousness. For example, promotion-focused individuals do not simply search for any kind of adventure or excitement like the high sensation-seeking do (Zuckerman, 1979, 2007). Promotion-focused individuals respond to stimuli that signal the possibility of large gains, but not simply to risk (Zou & Scholer, 2016). Likewise, although prevention-focused individuals prefer vigilant approaches to pursuing goals, this does not imply that they always show self-discipline, act dutifully, or aim for achievement as high conscientious individuals do (Costa & McCrae, 1992; Goldberg, 1993). Rather, prevention-focused individuals prioritize the maintenance of the status quo and security, even if it means engaging in compromising behaviors (Zhang, Cornwell, & Higgins, 2014; Zhang, Higgins, & Chen, 2011).

Regulatory focus systems constitute fundamental motivational concerns. Indeed, to survive, people (and other animals) need nurturance and growth as well as safety and security (Bowlby, 1969, 1973). Thus, people have both systems and are likely to be in a promotion state at least some of the time and in a prevention state at least some of the time. However, in any given moment, the concerns of one system may predominate over the other, either because a momentary situation induces one of the two foci or because one focus has higher chronic accessibility than the other for a particular individual (Higgins, 1997, 1998). Thus, it is possible to conceptualize the predominant system as either a promotion goal or a prevention goal that guides behavior in any given moment.

In addition to having different strategic preferences in goal pursuit (i.e., eagerness for promotion vs. vigilance for prevention), promotion and prevention also differ in how desired versus undesired end-states are defined. Whereas a classic motivational theory, such as achievement motivation (Atkinson, 1964; McClelland, 1951, 1961), would differentiate people on their motive to succeed versus fear of failure, regulatory focus theory emphasizes that it is what counts as success, and what counts as failure, that is critically different in the promotion versus prevention systems (Higgins, 2014; Scholer & Higgins, 2013). Promotion-focused individuals are motivated to move from the current, status quo state “0” to a better state “+1.” Success is thus reflected in *gains*, or positive deviations from the status quo or neutral state—the difference between “0” as a nongain and “+1” as a gain. Important gains are

those related to growth, improvement, and making progress in fulfilling hopes and aspirations (ideals). Promotion-focused individuals are less sensitive to negative deviations from the status quo or neutral state—that is, to the difference between “0” and “–1” (Brendl & Higgins, 1996; Higgins, 1997; Higgins & Tykocinski, 1992). Instead, failure for a promotion-focused individual is captured simply by remaining at “0,” or the status quo, and failing to advance—a *nongain*. Even if “0” is not a loss, it is not satisfactory to the promotion-focused individuals, as it does not represent the gains that define success (Higgins, 2014; Higgins & Cornwell, 2016; Scholer & Higgins, 2013).

In contrast, prevention-focused individuals are motivated to maintain the status quo “0,” which represents a *nonloss*, against the worse state of “–1,” which represents a *loss* (Brendl & Higgins, 1996; Higgins, 1997, 2014; Higgins & Tykocinski, 1992). Important nonlosses are those related to maintaining safety and fulfilling duties and responsibilities (i.e., oughts). Therefore, success for a prevention-focused individual is captured by maintaining the status quo, or by holding onto “0” (a nonloss), whereas failure is reflected in an inability to maintain this state and falling to a worse state, or being less than “0” at “–1” (a loss). Importantly, this means that the status quo “0” has a very different meaning within the prevention system than within the promotion system. When at the status quo, the goals of prevention-focused individuals are satisfied but the goals of promotion-focused individuals are not (Higgins, 2018; Higgins & Cornwell, 2016; Scholer & Higgins, 2013).

In this regard, regulatory focus theory, similar to the fuzzy-trace theory, suggests that decision makers do not necessarily rely on the richly specified representations of information when making their decisions. Fuzzy-trace theory draws on the perspective of psycholinguistics and suggests that decision makers prefer representations that are more economical, and encode, store and remember the gist of verbal information (e.g., Mills et al., 2008; Reyna, 2012; Reyna, Chick, et al., 2014; Reyna et al., 2011; Reyna & Mills, 2014). Regulatory focus theory suggests that decision makers form representations of choice options in terms of whether they serve either a prevention-focused goal of maintaining nonlosses or a promotion-focused goal of obtaining gains. This approach is generally consistent with the fuzzy-trace theory perspective in highlighting the important role of categorical representations, where the categorical representation of goal attainment is also driven by motivational relevance—it is a *success* or *failure* depending on whether a choice option does or does not satisfy, respectively, the decision maker’s regulatory focus goal.

Below, we will use the distinction between the promotion motivational system and the prevention motivational system, functioning as a difference in decision makers’ goals, to provide empirical examples of how taking into account this factor *together with* the factors of current value state and choice set can enable us to better understand when and why people prefer a more or a less risky option. In these empirical examples, we will explain how these different goals interact with the other two factors in predicting risk preference. Across several studies (Scholer, Zou, Fujita, Stroessner, & Higgins, 2010; Zou, Scholer, & Higgins, 2014), we have employed a general paradigm that allowed us to examine the dynamic ways in which decision maker’s regulatory focus, current value states, and choice sets influence risk preference.

In the first phase of the experiment, regulatory focus is either measured (Higgins et al., 2001; Higgins, Shah, & Friedman, 1997) or manipulated to assess or influence (Freitas & Higgins, 2002; Higgins et al., 1994) the degree to which the promotion or prevention goals are dominant.⁸ Following this, participants receive compensation (e.g., \$5) for their participation. The paradigm is structured so that participants believe that this compensation is truly theirs (e.g., in laboratory studies, they are given the money to hold in their own hands). The experimenter then tells participants that they have the option to participate in a second stock investment study, in which they may invest their earnings in a simulated stock market. Participants are told this simulation may result in gains, losses, or no change. To ensure that participants believe that outcomes are real, such that potential losses have real consequences, participants are told that if they were to lose money, they will have the option to get the money back by completing additional questionnaires (adapted from Thaler & Johnson, 1990). Those who elect to participate in the second portion of the study are first given a choice of investment options in which to invest their money. Following this investment, participants watch the investment results of their selected option.

The specific feedback that participants receive differs across studies and is detailed below. However, the general structure is that participants invest money in a simulated stock market and then receive feedback that they have lost money, that they have gained money, or that there is no change from their initial investment. The critical dependent measure is whether, after this feedback, participants choose to invest in a more or a less risky option. Consistent with past research in economics, biology, and psychology and as discussed earlier, risk is characterized by outcome variance, where the riskier of two options with the same expected value is the one with higher outcome variance (e.g., Bernoulli, 1738; Daly & Wilson, 2001; Friedman & Savage, 1948; Real & Caraco, 1986; Rubin & Paul, 1979; Winterhalder, Lu, & Tucker, 1999). Notably, in every study this characterization is also matched by participants' own subjective sense of which option is riskier.

Prevention Motivation and Risk Preference

To understand the dynamic interrelation among the decision maker's goal, the current value state, and the choice set, our empirical analysis starts with identifying the decision maker's current goal and the current value state. Then, we analyze how the decision maker would react to various combinations of choice set options given the nature of the goal and whether this goal is satisfied or not under the given current value state. Beginning with a decision maker with a prevention goal, if the current value state is the domain of losses (i.e., "−1"), then the goal is not satisfied. Given this current value state, prevention-focused individuals are motivated to leave the "−1" state and return to the status quo. Thus, how worthwhile each option in the choice set is perceived to be depends on the extent to which the option serves the goal to return to the status quo.

In these studies, there are three possible option combinations in the choice sets: (a) only the risky option provides a chance to return to the status quo; (b) both the more and the less risky options provide a chance to return to the status quo; and (c) neither the more nor the less risky option provides a chance to return to the status quo. To the extent that prevention-focused individuals are

motivated to return to the status quo, we predict that they would choose the risky option when it is the only means to reach this goal. However, when both the more and the less risky options provide a chance to return to the status quo, they would choose the safer option—the less risky option—to return to the status quo. But when neither option affords a chance to return to the status quo, we predict that prevention-focused individuals would become indifferent to the two options.

We tested these hypotheses in a series of experiments; here we summarize in detail one illustrative study. In one study examining the domain of losses (Scholer et al., 2010), we first measured chronic regulatory focus differences (Higgins et al., 1997). Then, participants received \$5 for their initial participation to invest in their choice of stocks. Following the investment, participants watched the investment results of their selected stock. Participants were then told that their initial stock pick was down a total of \$9 (i.e., they had lost an additional \$4 beyond the original \$5 invested), placing them clearly beneath the status quo of \$5. Participants were then given the option to invest in a second stock. Thus, in this design, participants need to win \$9 or more in the second round to return to the status quo.

Here, participants were randomly assigned into one of three different conditions. In the first condition, participants were presented with a less risky option (75% chance of winning \$6; 25% chance of losing \$10) that provided no possibility to return to the status quo, but a more risky option (25% chance of winning \$20; 75% chance of losing \$4) that did provide the possibility to return to the status quo. In a second condition, participants were presented with a different choice set in which both the more risky option (same as above) and the less risky option (65% chance of gaining \$9 and 35% chance of losing \$11) had the possibility of restoring the status quo. In a third condition, participants were presented with a choice set in which neither the more risky option (90% chance of gaining \$5 and 10% chance of losing \$20) nor the less risky option (75% chance of gaining \$6 and 25% chance of losing \$10) had the possibility of restoring the status quo. Notably, in our design, the more risky option was riskier both in an objective characterization of risk as variance and in terms of participants' subjective perceptions of risk.

If the extent to which each option is worthwhile for prevention-focused decision makers is related to the extent to which each option serves their goal to return to the status quo (i.e., restoring safety), then prevention-focused decision makers should prefer the more risky option when it is the only way to return to the status quo; they should prefer the *less* risky option when it offers a more certain way to return to the status quo; and they should be indifferent when neither option can restore the status quo. This is precisely the pattern that was observed.

Examples of risky tactics in the service of prevention goals have also been observed in research on regulatory focus motivation in nonhuman animals (Franks, Champagne, & Higgins, 2013; Franks, Higgins, & Champagne, 2012). This stream of research demon-

⁸ Notably, in this series of empirical research, we have used two different measures of chronic regulatory focus: a reaction time measure (Higgins, Shah, & Friedman, 1997) and a self-report questionnaire (Higgins et al., 2001) as well as multiple situational manipulations of regulatory focus state. More details about each of these measurements can be found in the cited papers.

strates that animals systematically shift risk preference as a function of the circumstances; that is, those animals who prefer the less risky option in a safe environment are more likely to prefer the more risky option in the absence of safety. For instance, in one study with Long-Evans rats, Franks et al. (2012) observed rats in an open enclosure and recorded the relative amounts of time they spent pursuing darkness versus food rewards. Based on this observation, they classified the rats as either prevention-focused (those that were particularly motivated by safety and nonloss, i.e., darkness) or promotion-focused (those that were particularly motivated by nurturance and gains, i.e., food rewards). In a separate testing session, separated in time by six months, the rats were exposed to a noxious novel object in proximity to their safe home cage (i.e., a change from 0 to -1). Approaching the novel object was a risky behavior that could operate in the service of maintaining safety—that is, to eliminate the threat, the rats could approach and bury the object. Just as has been observed with human animals, Franks et al. (2012) found that rats who exhibited a tendency to pursue safety in the open enclosure (prevention goal) spent the longest time with the noxious novel object (to eliminate the threat by burying it). The tendency to pursue gains in the open enclosure (promotion goal) did not predict time spent with the noxious novel object.

Similar evidence has also been documented with animal samples by biologists who study reproductive success or fitness (Kacelnik & Bateson, 1996, 1997; Stephen & Krebs, 1986). A particularly relevant example is the foraging behavior of yellow-eyed junco birds (Caraco, Martindale, & Whittam, 1980). For example, suppose that a foraging bird must consume 1000 calories before dusk to survive the night. This bird seeks food from one of two different food patches, which offer the same mean payoff (120 calories) but differ in payoff variance: Patch 1 is low variance, ranging from 110 to 130 calories, whereas Patch 2 is high variance, ranging from 40 to 200 calories. If this bird has only acquired 800 calories and needs at least 200 more to survive the night, it should prefer the high-risk patch, because it is the only option that serves the bird's concern with survival. However, if the bird has already acquired 900 calories through the day and requires only 100 more to meet its energy need for the night, its survival is guaranteed if it forages from the low-risk patch, and thus the low-risk patch should be preferred. This pattern is indeed what has been observed.

Together, these findings demonstrate that there is no one-to-one clear mapping that individuals will always choose a more or a less risky option given a particular current value condition, given a decision maker with a particular goal, or given a particular choice set. Rather, humans, as well as nonhuman animals, *shift* their risk preferences as a function of how well each option in a choice set satisfies their goals in a given current value state. By taking this dynamic motivational approach, we can start to appreciate the ways in which choices between more and less risky options are integrative *and* systematic. For this case of a prevention goal, it is this unique combination of the decision maker motivation (i.e., the prevention goal of maintaining status quo), the current decision-making value state (i.e., below the status quo), and the choice set (e.g., when the more risky option provides the only means to restore the status quo vs. when the less risky option provides the more certain means to restore the status quo) that leads to this precise pattern of findings.

Promotion Motivation and Risk Preference

Similar to the research on prevention goals, research also reveals a unique pattern of interplay between decision makers with promotion goals, current value state in the domain of gains, and more and less risky options that vary in the extent to which they serve the decision makers with promotion goals. Historically, work on regulatory focus and risk preference was conducted in the context of relatively neutral, status-quo “0” states (Crowe & Higgins, 1997; Friedman & Förster, 2001; Molden & Higgins, 2005). At “0,” it is not surprising that promotion-focused individuals generally display a preference for the more risky option, because this is the option that is more likely to provide a chance of clearly moving away from “0” toward “+1”—that is, to serve their goal of making a clear advancement or progress. Indeed, given that nongains are perceived as failures within the promotion system, 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 them to the risk of “ -1 .” For those with a promotion goal, “ -1 ” is just another nongain like “0.” At the current value state of “0,” the goal of promotion-focused decision maker is to move toward “+1” and thus the risk is worth taking.

In one study examining the domain of gains, Zou et al. (2014) employed the general stock investment paradigm used in Scholer et al. (2010). Participants received feedback after the initial investment that there had been no change—they had neither won nor lost money. They were still at status quo “0.” Participants were then given a choice to select between a less risky option that guaranteed their current state and a more risky option that gave them the possibility of winning or losing money. Consistent with the promotion goal to move toward a “+1” gain, as well as these individuals perceiving “0” and “ -1 ” as comparable nongains, individuals with a promotion goal preferred the risky option. In contrast, individuals with a prevention goal preferred the less risky option, consistent with their desire to maintain the satisfactory status quo “0.” Promotion-focused individuals wanted to move away from the status quo because it represented nongain failure, whereas prevention-focused individuals wanted to remain at the status quo because it represented nonloss success.

Following the same logic, we would also predict that promotion-focused individuals would *shift* their risk preference when the current value state is “+1.” At this state, promotion-focused individuals are no longer at a nongain “0” from which they must move away. They do not need to move away from a “+1” gain. Indeed, our studies show that immediately after making a significant advance (e.g., a large financial gain after an investment), promotion-focused individuals now prefer the less risky option for the next round. In one experiment, we manipulated the current value state that each participant was in—whether it had progressed to the “+1” value state (“zone of big-gain”) or not (“zone of the status quo”). In another experiment, participants reported their personal definition of what counted as real progress—how much positive change would be needed to count as having progressed to a “+1” value state or be considered as still being at the “0” value state. We manipulated the results of their first investment to put them into the zone of progress (“+1” state) or not (“0” state).

Then, participants were presented with 100% chance of no change from the current value state (the less risky option) or 50% chance to lose and 50% chance to gain the total amount of money that they possessed in the current value state (the more risky option). Here, the risky option entails a potential chance of losing the current “+1” state. The results showed that promotion-focused participants prefer the no-change less risky option more than the risky option when they are in the zone of big-gain (“+1” state), but they continue to prefer the more risky option if they are in the zone of status quo (“0” state).

These findings demonstrate that the extent to which the more risky option or the less risky option is worthwhile for promotion-focused individuals depends on how well each option serves their goal of making progress. Promotion-focused individuals preferred the more risky option when they believed they had *not* made sufficient progress to count as a real “+1” gain. Once progress had been clearly achieved (i.e., success in attaining a “+1” gain), promotion-focused individuals experienced the more risky option as less worthwhile because it represents an unnecessary risk given that progress had already been made.

Notably, when promotion-focused individuals do not meet their goals, they are not necessarily in the domain of losses (“-1”; i.e., they could be at nongain “0”). Even a small gain might not satisfy a promotion goal because it is not enough to be experienced as making clear progress—not a real “+1” gain. Similarly, when prevention-focused individuals do meet their goals, they are not necessarily in the domain of gains (“+1”; i.e., they could be at nonloss “0”). This differs from the goals-as-reference-points theory, which proposes that when a goal is satisfied, the decision maker is in the domain of gains, but when a goal is not satisfied, the decision maker is in the domain of losses. Thus, in our motivational approach, satisfaction or dissatisfaction with the current value state is independent of gains versus losses per se.

In Figure 1, we summarize the existing research on prevention and promotion goals to demonstrate the extent to which a more or a less risky option in the choice set is worthwhile depends on how well each option can satisfy the decision maker’s goal given the current value state. Step one is to identify the decision maker’s goal. Step two is to then identify whether the decision maker’s goal is satisfied or not given the current value state. Step three is to analyze how worthwhile are the more and the less risky options in the service of the decision maker’s goal, given the current value state.

As illustrated in Figure 1, in the domain of “-1” losses (Scholer et al., 2010), for example, both a prevention-focused decision maker (with a goal of maintaining the status quo) and a promotion-focused decision maker (with a goal of making clear progress) do not have their goal satisfied. They differ, however, in the relevance of choice options that can or cannot restore a nonloss “0” status quo. Only a prevention-focused decision maker shows a strong preference for a risky option when it offers the only chance to return to the status quo. Promotion-focused decision makers are indifferent between the more and the less risky options because neither can serve their goal to make significant progress beyond the status quo.

In the domain of “+1” gains (Zou et al., 2014), as another example in Figure 1, the difference between a small gain and a large gain does not matter for prevention-focused decision makers because they would code both as satisfactory states. In contrast, for

decision makers with promotion goals, it matters whether the decision maker’s current value state is perceived as a large gain or a small gain. A large gain is more likely to be perceived as success in making real progress, and thus the promotion-focused decision maker is in the domain of “+1” after receiving a large gain. Because real progress has been made, promotion-focused decision makers prefer the less risky option (Zou et al., 2014). However, the small gain is perceived as a failure in making real progress; thus, the promotion-focused decision maker is still within the domain of “0” in this case and prefers the risky option when it provides the only chance to progress to “+1.”⁹

In sum, to understand how motivation impacts decision makers’ risk preferences, we cannot examine only the current value state, only the choice set, or only the decision maker’s goals. Rather, we need to examine how all these three factors work together—that is, the motivational dynamics among them. In the next section, we further develop the motivational framework to articulate how these three factors work together to influence risk preference.

Unpacking How the Three Factors Work Together

By taking into account all three factors and how they work together, it is possible to predict when individuals are likely to choose a more or a less risky option *and* when they are likely to *switch* from preferring one risk option to preferring the other. In this section, we further illustrate a motivational framework of risk preference that consists of these three factors. Under our motivational framework, the analysis begins with knowing the decision maker’s goals. Then, we will add the current value state as the second factor, and, finally, we will add the choice set and discuss how the dynamics among these three factors together determine risk preference.

Decision Maker’s Goal

Although theories such as expected utility theory (Bernoulli, 1738) and prospect theory (Kahneman & Tversky, 1979) do not provide an explicit conceptualization of the decision maker, these theories do make assumptions about the psychology of the decision maker. Decision makers under these theories do not need to have any higher-level executive function, personality, needs, goals, or motives. The psychological experience of the physical environment change is automatic, and thus, it is not surprising that there is no variable in these theories to characterize the decision maker per se.

Whereas the role of the decision maker’s motivation receives little, if any, attention in some theories, it is central in other

⁹ Notably, in Zou et al. (2014), for the promotion-focused decision makers in the small gain condition, they were given a risky option that offered a chance to progress to the “+1” domain (while the less risky option was “no change”). In this case, we observed a preference for the more risky option for the promotion-focused decision makers. However, we hypothesize that promotion-focused decision maker in small gain condition (zone of “0”) or in the domain of “-1” would be indifferent to the options when neither the more nor the less risky option offers a chance to progress to “+1,” as neither can satisfy their goals. We did not test this case in Zou et al. (2014). However, Scholer et al. (2010) included a study where promotion-focused decision makers were in the domain of “-1” and were offered with a choice set in which neither option provided a chance to progress to “+1.” In this case, the promotion-focused decision maker showed indifference.

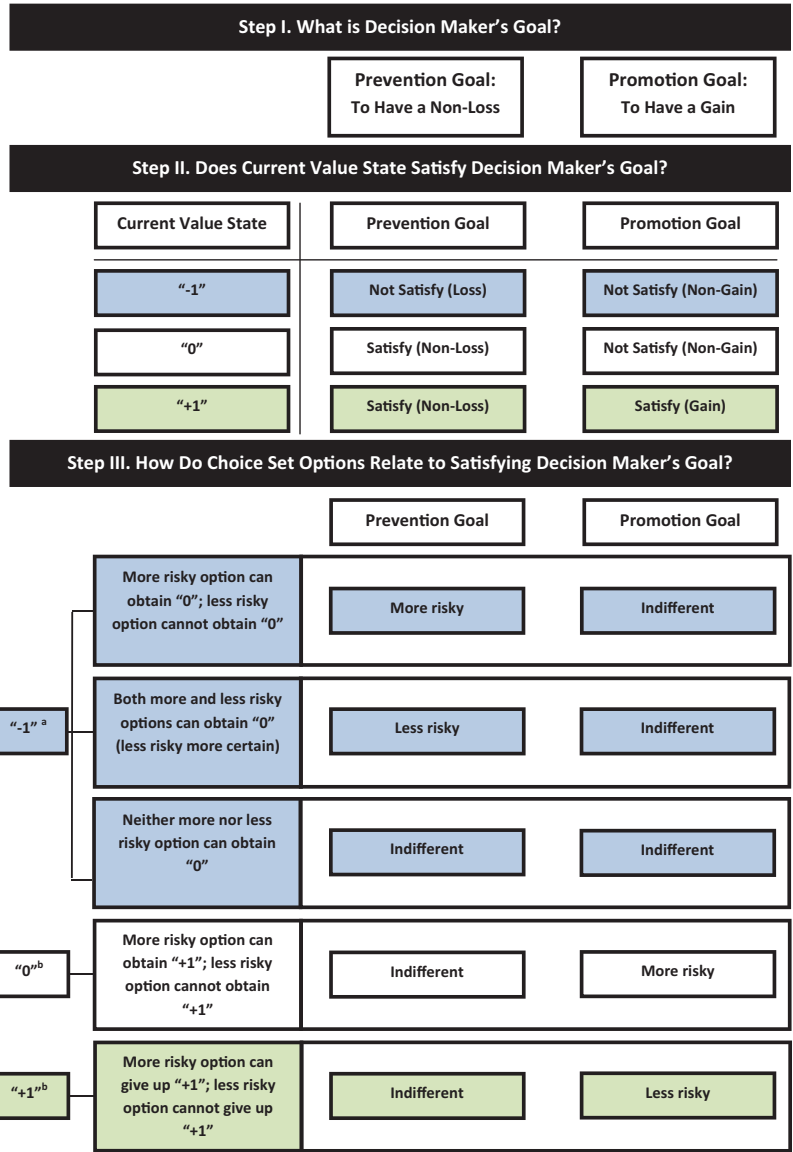


Figure 1. Overview of regulatory focus findings. (a) This set of predictions was reported in Scholer et al. (2010). (b) This set of predictions was reported in Zou et al. (2014). See the online article for the color version of this figure.

theories. As we reviewed earlier, there is a long history in the literature of taking an individual difference approach to study risk preference. The essential challenge for this approach is to identify a one-to-one mapping, making a direct link between a type of personality and a risk preference. The problem for such approaches is that evidence indicates that individuals do not display a consistent risk preference (for a review on this issue, see Fox & Tanenbaum, 2011). Instead, risk preference reversals are pervasive. This is hardly surprising, as individuals typically show across-time, within-situation stability in their choices rather than across-situation consistency (Mischel & Shoda, 1995), and this can lead to reversals in choices.

Our motivational approach also does not assume such a one-to-one mapping. Rather, a decision maker can adopt multiple tactics

(means) to pursue their goals. Similarly, the same tactic can possibly address multiple goals. This view of motivational systems draws on hierarchical models of self-regulation. Specifically, hierarchical models distinguish between different levels of a motivational system (e.g., goals vs. means) and explain how very abstract goals (e.g., "be good") get translated into concrete behaviors (e.g., "volunteer at a soup kitchen"; Austin & Vancouver, 1996; Cantor & Kihlstrom, 1987; Carver & Scheier, 1998; Elliot, 2006; Kruglanski et al., 2002; Miller, Galanter, & Pribram, 1960; Scholer & Higgins, 2008). Under a hierarchical model, the levels are independent, such that the same means may serve multiple goals (multifinality; Kruglanski et al., 2000) and the same goal may be served by more than one means (equifinality; Kruglanski et al., 2000). For example, the low-level means of studying over

the holidays could help a student achieve the goal of earning an extra honors degree or the goal of completing the minimum requirements for a degree. In addition, a higher-level goal to achieve a high course grade can be served by studying hard in a difficult course or by signing up for a relatively easy course. From a hierarchical point of view, we conceptualize the decision maker's motivation as the higher-level goals, and the choice of a more or a less risky option as at the lower (i.e., tactical) level (Scholer & Higgins, 2008; Scholer, Cornwell, & Higgins, in press).

Further, our approach to understanding the impact of decision makers' goals assumes that a motivational system is directive and purposive (e.g., goals as different desires, wishes, wants, and needs; Sorrentino & Higgins, 1996) in a manner that yields different tactical choices under different circumstances (including the current value state and the choice set). And these tactical choices are reflected in different risk preferences. For example, when the current value state is "−1" rather than "0," individuals with prevention goals will choose the more risky option when it is the only means to return to the status-quo "0," but they will switch to the less risky option when both the more and the less risky options can restore the status quo. Another concrete example can be seen in the context of dealing with perceived threats. Under conditions of nonthreat, like the status quo "0," prevention-focused individuals do not show greater negative bias toward out-group than in-group members (Stroessner, Scholer, Marx, & Weisz, 2015). However, if prevention-focused individuals perceive a threat to their own group like a "−1" (danger), they will show an increased negative bias toward outgroup members (to ensure safety and security). For example, when threat is low ("0"), White prevention-focused individuals do not advocate different treatment for a suspicious Arab versus White airline passenger. However, under conditions of heightened threat ("−1"), White prevention-focused individuals are more likely to advocate that an Arab individual should be subject to more invasive airport screening than a similarly suspicious White individual. In contrast, the preferences of promotion-focused participants were unaffected by this "0" versus "−1" threat variable (Stroessner et al., 2015).

This motivational approach is critical because it removes the assumption that if a decision maker chooses a more or a less risky option, it is because he or she likes this option. Instead, the motivational account argues that risk preference is a tactical choice and people flexibly shift their preference as a way to serve the underlying goals. Further evidence of the idea that the choice of the riskier option is truly tactical comes from participants' subjective evaluations of the options. Scholer et al. (2010) found that when the more risky option was the only way to restore the lost status quo, decision makers with a prevention goal did not like the more risky option more. Instead, they *disliked* the more risky option *less*. In other words, the more risky option is selected not because it is liked but because it is instrumental for serving the underlying prevention goal to restore the status quo. This provides evidence that when prevention-focused individuals are below the status quo, the more risky option is not attractive or liked to the extent that it provide benefits or gains. The key issue is not the different options' level of risk per se. Rather, the focus is on selecting the option that better serves the decision maker's goal to return to a safe "0" state. That is why, as discussed earlier, when *both* the more risky option and the less risky option serve the prevention goal to return to a safe "0" state, prevention-focused

decision makers choose the less risky option that has higher certainty of satisfying the goal. In addition, another study by Scholer et al. (2010) found that prevention-focused decision makers did *not* choose the more risky option when their current value state was a gain rather than a loss (37.9% under gain vs. 75.2% under loss). The more risky option did not serve their prevention goal because their current value state was already safe, and thus they were not motivated to take an unnecessary risk.

In sum, the above-mentioned evidence highlights how preference reversals can occur for the *same* motivational state of the decision maker (i.e., prevention goal) as a function of changes in the current value state and changes in the options in the choice set. It shows that identifying only the decision maker's goal is not enough to predict risk preference because whether a more or a less risky option can satisfy the goal also depends on the current value state and the choice set.

Interrelation Between Decision Maker's Goal and the Current Value State

Although knowing the decision makers' goal is not sufficient to predict risk preference, it provides a good starting point to identify and analyze whether the goal of the decision maker is satisfied or not under a current value state. Critically, the same current value state can be relevant to more than one motives or goals, but its significance can differ. Illustrating again with regulatory focus motivations, the status quo "0" (i.e., a decision maker is neither losing nor gaining money) is relevant to both promotion and prevention goals but its significance will vary. For those with prevention goals, this is a positive "non-loss" state that their goal is satisfied and they are motivated to maintain this value state against a worse "−1" state of loss. In contrast, for those with promotion goals, this is a negative "non-gain" state in which their goal is not satisfied and they are motivated to move away from this value state toward a better "+1" state of gain.

Further, the same objective change can lead to different risk preferences depending on the dynamics between the current value state and the decision maker's goal. Even when individuals have the same reference point regarding the current value state in relation to the initial (starting) value, the current value state may not hold the same psychological significance. In the previously discussed research on individuals with promotion goals (Zou et al., 2014), participants were informed that they had just gained \$20 in their investment. However, this gain was framed either as a *small progress* in one condition or as a *big progress* in the other. As a result of this framing, promotion-focused participants showed a distinct difference in risk preference despite the actual value of the gain being the same across conditions. Specifically, in the *big progress* condition they chose the less risky option, because their goal was satisfied under this value state and it was not worth losing the current value state by choosing the more risky option. By contrast, in the *small progress* condition promotion-focused participants chose the more risky option because their goal was not satisfied and thus it was worth taking the more risky option that offered the only chance to meet their goal.

Notably, in this study, we did not provide a choice set where both the more and the less risky options would enable the decision makers to make significant progress. Our theory would predict that when the less risky option can also satisfy the goal of making big

progress from the *small progress* state, the promotion-focused decision maker would prefer the less risky option instead of the more risky option because with the less risky option they could satisfy their goal of making clear progress with greater certainty. That is, decision makers do not necessarily prefer the more risky option when their goals are not satisfied. When both the more and the less risky options can satisfy their goals under a given value state, then decision makers would prefer the less risky option. Thus, the precise nature of the available options under a choice set—how each option relates to satisfying the decision maker's goal given the current value state—plays a critical role in influencing risk preference, as we discuss next.

Adding Choice Set Into the Mix

Thus far, we have considered the decision maker's goal (e.g., promotion vs. prevention), the current value state (e.g., gains vs. losses), and the dynamics between these two factors. To illustrate what happens when choice set is added into the mix, let's first keep the decision maker's goal constant. Depending on the current value state, decision makers form representations of the more and the less risky options in terms of their potentials to satisfy (success) or not satisfy (failure) their goal. For example, a prevention-focused decision maker in a current value state of “-1” could form three different representations of choice sets¹⁰: (a) only the more risky option can lead to a change from the current value state of “-1” back to the status quo “0”; (b) both the more and the less risky options can lead to a change from the current value state of “-1” back to the status quo “0”; and (c) neither option can lead to a change from the current value state of “-1” back to the status quo “0.” As mentioned earlier, Scholer et al. (2010) found that prevention-focused decision makers in the loss domain as the current value state prefer the more risky option when it is the only option that would allow them to return to the status quo “0”; prefer the less risky option when both available options would allow them to return to the status quo “0”; and are indifferent when neither option would allow them to return to the status quo “0.”

When the current value state is “-1,” decision makers with a prevention goal evaluate the choice set in terms of its capacity to return them to the status quo, “0.” But this is no longer the issue when a prevention-focused decision maker is currently at or above the status quo (in the domain of “0” status quo or “+1” gains as the current value state). Now the options in the choice set would be represented in terms of the possibility of moving from the current “0” or “+1” value state to below the status quo (i.e., to “-1.”) Again, there are three different possible representations of choice sets: (a) only the risky option has the possibility of giving up the status quo; (b) both available options have a possibility of giving up the status quo; and (c) neither option has the possibility of giving up the status quo. To the extent that the primary concern of prevention-focused decision makers is to maintain the status quo, we would predict that they would choose the less risky option when only the more risky option entails the possibility of going below the status quo. Indeed, we observed this pattern in the previous research. When neither option in the choice set has the possibility of going below the status quo, we have observed that prevention-focused decision makers would be indifferent (Scholer et al., 2010). What has not been tested is how they would react if both options entail a possibility of going below the status quo. We

predict that prevention-focused decision makers in this case would choose the option that has the smallest likelihood (i.e., least certainty) of going below, which is the less risky option.¹¹

Next, let's further illustrate this motivational framework of risk preference using promotion-focused decision makers as an example. The goal of promotion-focused decision makers is to make sufficient progress in gaining a “+1” value state. Thus, when they have *not* yet made sufficient progress, that is, when in either the “-1” or “0” state, they would evaluate each option in the choice set in terms of its possibility for gaining a “+1” value state. For the case of what happens when sufficient progress has not yet been made, previous empirical work has been conducted with only one type of choice set: only the risky option provides the possibility of making a big enough gain (Zou et al., 2014). In this case, it was found that promotion-focused decision makers prefer the risky option. In another study (Scholer et al., 2010), the promotion-focused decision makers were in the domain of “-1” and were offered a choice set where neither option provided the possibility for a big enough gain. In this case, promotion-focused decision makers showed indifference. Yet, the choice set for when sufficient progress has not yet made can vary in other ways, such that both the more and the less risky options provide the possibility of a big enough gain. We hypothesize that promotion-focused decision makers in this case would prefer the less risky option because that would satisfy the goal of making clear progress with greater certainty.

This dynamic for decision makers with a promotion goal would change once they have reached the big enough “+1” gain. At this “+1” current value state, they would evaluate the choice set based on how each option enables them to hold on to the progress that they have made. Again, a choice set may present three possibilities: (a) only the risky option has the possibility of giving up the “+1” gain; (b) both the more and the less risky options have the possibility of giving up the “+1” gain; and (c) neither option has the possibility of giving up the “+1” gain. In our previous work (Zou et al., 2014), we studied the case where right after the big enough gain, the participants were presented with choosing between a less risky option of 100% likelihood of no change from the current state (i.e., no possibility of giving up the “+1” gain) versus a more risky option of 50% chance to lose and 50% chance to gain the total amount of money that they currently possessed (i.e., 50% possibility of giving up the “+1” gain). Thus, only the more risky option had the possibility of giving up the “+1” gain. We found that once having reached the big enough “+1” gain, promotion-focused decision makers prefer the less risky option over the more risky option.

¹⁰ Notably, we simplified our design and theorization by using only two options in a choice set. But the same logic would apply to a range of options in the choice set, where the meaningful difference among the options would still be whether an option can lead to a sufficiently big change from the current value state into a new value state that satisfies the goal of the decision maker, and the certainty with which it would do so.

¹¹ Notably, research from FTT has shown that when the simple gist representation could not lead to a clear decision, participants would be more likely to rely on probability information to make decisions (Reyna & Brainerd, 1991). That is, when both options entail a chance to move into a “-1” value state, the decision maker would be likely to make the decision based on the probability information—choosing the option that has the smallest likelihood of going below—the less risky option.

What we haven't studied is the case where both the more and the less risky options have the possibility of giving up the "+1" gain, or the case where neither option has the possibility of giving up the "+1" gain. We hypothesize that in the former case of "both options could give up the gain" promotion-focused decision makers would prefer the less risky option to take as little chance as possible in giving up the gain (i.e., lowest likelihood of giving up the gain). In the latter case of "neither option would give up the gain" there would be indifference.

All Together Now: A Motivational Three-Factor Framework of Risk Preference

Using evidence from regulatory focus research, we have discussed the role in risk preference of three factors—the decision maker's goal, the current value state, the options in the choice set—and the interrelations among these three factors. Our three-factor framework starts with assessing the decision maker's goal. Then, we determine whether the decision maker's goal is satisfied or not satisfied given the current value state.

Consider first when the decision maker's goal is *not* satisfied given the current value state. In this case, the decision maker wants a change from the current value state. And a decision maker in this state is likely to represent the combination of options in the choice set in one of the following ways: (a) only the risky option provides the possibility of categorically improving the current value state to satisfy the goal; (b) both the more and the less risky options provide the possibility of categorically improving the current value state to satisfy the goal; or (c) neither option provides the possibility of categorically improving the current value state to satisfy the goal.

Consider next when the decision maker's goal *is* satisfied given the current value state. In this case, the decision maker wants to stay at the current value state (i.e., decision makers with a promotion goal in the current value state of "+1"; decision makers with a prevention goal in the current value state of "0" or "+1"). And a decision maker is likely to represent the combination of options in the choice set in one of the following ways: (a) only the risky option has the possibility of categorically giving up the current value state for a state that does not satisfy the goal; (b) both the more and the less risky options have the possibility of categorically giving up the current value state for a state that does not satisfy the goal; or (c) neither option has the possibility of categorically giving up the current value state for a state that does not satisfy the goal.

As mentioned earlier, [Figure 1](#) provides a summary of this motivational framework using existing empirical work from the regulatory focus research that we have reviewed. It also illustrates, more generally, how the three factors work together by following the logic of a motivational framework to determine risk preference in three steps: starting with the *decision maker's goal*, then analyzing, *given the current value state*, whether the goal is satisfied or not (as perceived by the decision maker given his or her goal), and then adding the significance of different option combinations in different choice sets given the decision maker's goal and the current value state. Under this motivational framework, risk preference is a function of the interrelations among the decision maker's goal, the current value state, and the choice set.

Applying the Motivational Framework of Risk Preference to Other Motivational Systems

In this section, we apply the motivational framework that we have outlined above to illustrate novel predictions through three motivational systems that have been previously linked to risk decision-making: achievement motivation, need for power and need for relational security. With this effort, we seek to illustrate how our motivational framework can reveal new patterns of risk preference depending on the dynamics among the decision makers' goal, the current value state and the choice set.

Achievement Motivation

The achievement motivation theory by McClelland and Atkinson (e.g., [Atkinson, 1964](#); [McClelland, 1951, 1961](#); [McClelland, Atkinson, Clark, & Lowell, 1953](#)) is one of the most influential motivational theories for studying risky decision making. Achievement motivation theory distinguishes those individuals whose motive to succeed is greater than their fear of failure (i.e., high achievers) and thereby anticipate pride from succeeding on the achievement task versus those whose fear of failure is greater than their motive to succeed (i.e., low achievers) and thereby anticipate shame from failing on the achievement task. For high achievers, pride from success is more significant than shame from failure. For low achievers, the opposite is true.

In the previous research on achievement motivation and risk preference, researchers have systematically investigated three different types of options in the choice set—task options that vary in difficulty. A low difficulty task is one where the probability of success is relatively high and the probability of failure is relatively low. A high difficulty task is one where the probability of success is relatively low and the probability of failure is relatively high. A moderate difficulty task falls between the low and high difficulty tasks. A good example of these options is the "ring toss" game originally used by [McClelland \(1958\)](#) in his studies of achievement motivation. In this experiment, participants were asked to throw rings onto a peg from a distance of their choice. At one extreme, they can choose to stand very near the peg, making the likelihood of success very high (i.e., low difficulty option). At the other extreme, they can stand very far away, making the likelihood of failure very high (i.e., high difficulty option). Choosing a distance between these two would entail selecting the moderately difficult option.

In this experimental paradigm, a high difficulty task, such as standing far away from the target, is a more risky option, whereas a low difficulty task, such as standing close to the target, is a less risky option. Findings show that high achievers, with their anticipation of pride from success, prefer the moderately risky task option (i.e., standing in the middle range to the target), where they believe they are likely to succeed and experience pride from doing better than others. On the other hand, low achievers with their anticipation of shame from failure avoid the moderately risky task, where they believe they are likely to fail and experience shame from doing worse than others.

What is interesting here is that the risk preference is driven by the moderately risky option (to approach or avoid) rather than by the high or low risky options. Among the three options in the choice set, the option that is most relevant to the goal of high

achievers for experiencing pride from success is to choose the moderately risky option. Notably, the option that is most relevant to the goal of low achievers for avoiding shame from failure is also the moderately risky option that they need to avoid choosing. Thus, the same option is most relevant for both the high and the low achievers, but the *meaning* of that option is not the same for both groups. Rather, the meaning of the moderately risky option differs because the high achiever decision-makers and the low achiever decision-makers have different goals—to achieve pride from success versus to avoid shame from failure, respectively. And this difference in decision maker's goal determines their risk preference to either choose this moderately risky option (to feel pride) or to avoid choosing it (to avoid feeling shame), respectively.

The original achievement motivation theory was silent regarding the variable of the current value state. Prior studies were typically conducted in a status-quo state, where participants are making the choice without currently experiencing success or failure. But what would happen if participants had already performed a moderately difficult task and had failed? Now their current value state is no longer “0” but is “-1” instead. Failure has special motivational significance for low achievers. For low achievers, what they care about is avoiding the shame from failure. Shame from failure is highly significant to them. Now that they are experiencing shame from failure, how would they treat the next task? We hypothesize that to succeed in avoiding any additional shame, they would avoid both the easy task and the moderate task, and, instead, choose the difficult task, the more risky option, because success on a difficult task would substantially reduce their shame feelings and failure on a difficult task would induce little, if any, additional shame given the difficulty of the task. It is the only option that satisfies their goal to avoid further shame given the current value state. Both the easy and the moderate options can produce additional shame from failure. Thus, the prior failure in a moderate task would motivate the low achievers to take on the more risky (difficult) option.

What if the current value state was “+1” after succeeding in performing a moderately difficult task on the first round? Success has special motivational significance for high achievers. The high achievers have just reached their goal—feeling pride from success. How could they retain this current value state? All of the options have some possibility of not succeeding. Given that they are currently feeling pride from success, they would now prefer the option that maximizes success—the low difficulty (low risk) option. Thus, after a prior success in a moderately successful task, high achievers would be particularly motivated to choose a low risk (i.e., easy) task to keep their feeling of pride from success.

Need for Power

Next, we will apply the motivational framework to examine the research on power and risk preference. The need for power is a fundamental motive that has been depicted in classic psychology theories (Keltner, Gruenfeld, & Anderson, 2003; Schultheiss, 2007). Past research has found that the psychological state of power has significant impact on risk preference. Whereas some research has shown that power is associated with risk taking (Anderson & Galinsky, 2006; Inesi, 2010), some other work has suggested that power could also lead to risk aversion (Maner,

Gailliot, Butz, & Peruche, 2007; Tetlock, 2002; Winter & Barenbaum, 1985). Further evidence suggests that this depends on the social hierarchy stability (Jordan, Sivanathan, & Galinsky, 2011): The unstable powerful and the stable powerless prefer the more rather than the less risky option. Under our motivational framework, the decision maker's goal is to obtain power, climbing up or staying at the top of the social hierarchy. The current value state is a function of two variables: whether the decision maker is at the bottom (powerless) or at the top (powerful) of the social hierarchy and whether the social hierarchy is stable or not, which results in four possible current value states (i.e., stable powerful, unstable powerful, stable powerless, and unstable powerless). The choice set includes a more risky option and a less risky option.

Although decision makers with a power goal prefer the more risky option under both the unstable powerful situation and the stable powerless situation, our model would argue that this preference is for different reasons. To be more specific, in one study the stability of hierarchy was manipulated through outcome contingency (see Jordan et al., 2011). Under an unstable hierarchy, the decision maker could get demoted or promoted along the hierarchy based on the outcome of the risk decision. However, under a stable hierarchy, the decision maker would stay the same regardless of the outcome of the risk decision. In an unstable powerful situation, their goal is satisfied at the moment but the decision makers are in the danger of losing their goal if the outcome of their decision turns sour. In this study (Jordan et al., 2011), the choice set included making a choice between Plan A, which presented a certainty of saving 2000 jobs, or Plan B, which presented a 1/3 probability that 6000 jobs would be saved, and a 2/3 probability that no jobs would be saved. We suspect that the unstable powerful participants would likely form a representation that the less risky option can only at best save less than half of the jobs, which were not good enough to satisfy their goal and keep them at the top of the power hierarchy. Thus, they preferred the more risky option as a result of a strong dislike of the less risky option.

The motivational mechanism for the stable powerless is different. They are motivated by a strong preference for the more risky option rather than a dislike of the less risky option. Under a stable hierarchy, individuals who want power but do not have it could not get any worse. Although a better outcome could not improve their social standing, choosing the more risky option sends a strong signal of rebellion—that they are not satisfied with the current situation. Indeed, this is what Jordan et al. (2011) assessed and found. One operationalization of their risk preference is *rebel hitting* (Wagenaar, 1988). When decision makers are in a stable powerless situation, they are more likely in the game of blackjack to hit when being explicitly instructed to stand—a risky choice.

In sum, the same risk preference can be driven by distinct motivational mechanisms. Unpacking a decision through the decision maker's goal, the current value state, and the choice set can enable us to understand the underlying dynamics about why people choose a more or a less risky option.

Need for Relational Security

Another example is research examining the relation between the need for relational security and risk-taking behavior to explore (approach potential gains and learning) while avoiding losing

security. Past research has shown that physical contact increases people's willingness to make risky financial decisions through an increased sense of security (Levav & Argo, 2010). Consistent evidence can also be seen in the classic findings that attachment engenders feelings of security and thereby increases the (animal and human) infant's tendency to engage in exploratory behavior in unfamiliar contexts and strange situations, which can be characterized as choosing a more risky option (Ainsworth, Blehar, Waters, & Wall, 1978; Harlow, 1958).

Under our motivational framework, the decision maker's goal is to maintain security while exploring, the current value state is whether the decision maker does or does not experience a secure attachment, and the choice set involves a more and a less risky option to maintain the security while exploring. The more risky option leads to an unfamiliar environment that involves more potential dangers while providing growth opportunities, whereas the less risky option leads to a familiar environment that involves less potential dangers but also less growth opportunities. Our analysis of these previous findings is that choosing the more risky option depends on whether it could lead to giving up the current value state of feeling secure. Our model would predict that if neither the more risky option nor the less risky option would lead to giving up security (i.e., both options satisfy maintaining security), then the decision maker would choose the risky option that affords the opportunity to explore. This is, indeed, consistent with previous findings.

What hasn't been tested in the previous literature is when the more risky option or both the more and the less risky options could lead to a loss of security. Our model would predict that, to reduce the likelihood of giving up the current secure value state, the decision makers with a high need for relational security would prefer a less risky option both when the more risky option is the only option that could lead to a loss of security *and* when both the more and less risky options could lead to a loss of security. What matters to decision makers with a high need for relational security is to establish a secure base for them to then seek exploration and growth.

General Discussion

Our review of the literature on risk preference identified three factors that we believe are critical for developing a motivational perspective to understand when and why people prefer a more or a less risky option: the decision maker's goal, the current value state, and the choice set. In this paper, we developed a motivational three-factor framework that articulates the interrelations among these three factors that give rise to various risk preferences. It explains not only why individuals differ in their risk preference within the same situation but also when an individual will shift his or her risk preferences across situations. Our framework differs from prior perspectives on risk preference by considering all three factors and by emphasizing how these three factors *work together* to determine risk preference. Thus, to make predictions about risk preference, one must assess the interrelations among these three factors. The decision maker's goal (e.g., promotion vs. prevention), affects the motivational significance of both the current value state and the available options. Then, the extent to which each of the available options in the choice set supports goal satisfaction, given the decision maker's goal and the current value

state, allows one to predict when and why people prefer a more or a less risky option.

Motivated Representation in the Decision-Making Process

A critical contribution of our framework is to articulate how the three factors—decision maker's goal, current value state, and choice set—work together. As illustrated in Figure 1, we articulate different types of *if-then* contingencies, starting from the decision maker's goal. The same current value state and the same choice set can have very different motivational significance (meaning and importance) as a function of the decision maker's goal. Further, various combinations of the current value state and the choice set can also have very different motivational significance depending on the decision maker's goal. It is the interrelations among these three factors that determine how well a given option would satisfy a decision maker's goal given the current value state.

This emphasis on the subjective meanings of representations complements prior research from the FTT paradigm, which highlights how quantitatively equivalent options lead to contrasting representations and meanings. While FTT research draws on research from memory and psycholinguistics (for a review see Reyna, 2012), our approach draws on research concerned with motivational systems. Our understanding of various motivational systems provides the analytical framework to understand how the decision-making context and the available options are represented.

From this motivational perspective, our framework highlights two insights on the psychological meaning of risk. First, people may take risks even if the risky option is not inherently valuable or the experience of risk itself is not particularly desired. Rather, people often take risks in the service of their goals. They do not need to like the risky choice but simply perceive it as better serving their goals than the alternative options in the choice set (Scholer et al., 2010). Second, our framework also illustrates that risk matters to the extent that it offers a higher likelihood—or sometimes the only possibility—of satisfying one's goals. Animals and humans alike will switch their risk preference depending on their current condition, and when both the high and the low risk option serve current goals, they will choose the option that can most reliably serve those goals (i.e., with higher certainty). In these situations, the option's riskiness per se is incidental, not central, to understanding the preference. What drives the preference for the more or the less risky option is how well it satisfies the decision maker's goal given the current value state.

Differentiating Intrinsic Preference Versus Instrumental Values

By placing motivation at the center of our proposal, we not only make novel predictions about when people will take risks, but also highlight the psychological mechanisms that underlie *why* people take risks. Past work has also examined this question, with different approaches highlighting risk as intrinsically valuable versus instrumental. Some approaches, such as Zuckerman's analysis of sensation-seeking (Zuckerman et al., 1978), have argued that there can be intrinsic value in risk-seeking. In other words, the people who take risks do so because they find it thrilling and fun; risk-seeking is about the desire for the risky option in and of itself.

A second class of approaches takes an instrumental approach. People do not choose the risky option because it is thrilling, but simply because it has the highest subjective expected utility. For example, prospect theory predicts that people will be risk-seeking in the domain of losses given, among other things, the shape of the value function. In this case, risky options are instrumental: they provide the potential for improvement with little (experienced) downside if more is lost. Other instrumental approaches have shown the ways in which risk-seeking may be fundamental to affirming or demonstrating a desired identity. Because risky options are sometimes more challenging, risk-seeking can reflect a desire to demonstrate to the self or others that one is competent or brave (Foster, Shenese, & Goff, 2009; Lakey, Rose, Campbell, & Goodie, 2008; Larrick, 1993).

Our motivational three-factor framework also has an instrumental perspective. However, as we have discussed above, our approach to instrumentality has very different characteristics than past work. From our perspective, risky options are tactical choices that are preferred or not depending on an individual's goal and the context of the decision (i.e., the current value state and the available options in the choice set). Our framework has a person by situation perspective: not a multiplicative interaction but the three factors working together to create a motivational product. In our framework, the person is characterized by his or her distinct goal (e.g., a promotion goal of making clear progress; a need for power; etc.). The situation is characterized both by the demands and opportunities facing the individual (e.g., currently above or below a status quo reference point; the precise set of options available to him or her). Importantly, the significance of a more or a less risky option (their meaning and importance) depends on both the decision maker's goal and the current value state as independent factors that together determine whether only the more risky option, both the more risky and the less risky option, or neither option, can satisfy the decision maker's goal given the current value state, and with what certainty.

An Integrative Approach to Choice Architecture

Our framework also provides alternative ways to improve the prediction of risky behaviors in naturalistic environments, thus leading to new insights on how to influence risk preference in everyday life. Previous research has tended to examine ways to improve choice architecture by focusing on the choice per se in isolation of other factors, such as reducing choice overload (Iyengar & Lepper, 2000), prechoosing a default option (Smith, Goldstein, & Johnson, 2013), or breaking options across short-term or long-term brackets (Read, Loewenstein, & Rabin, 1999). In this regard, our framework suggests that integrating the choice set factor with the other two factors—decision maker's goal and current value state—could enhance the effectiveness of choice architecture. As an example, consider reducing cigarette consumption. Read et al. (1999) suggested that it is better to bracket the consumption of cigarettes over the time frame of a year rather than some shorter timeframe because an individual might see each cigarette as inconsequential and bracketing the decision-frame over a year would make the costs more salient. Our framework would further suggest that various ways of highlighting the costs of an option might not be sufficient for someone who is currently healthy and in a state of pursuing immediate pleasure. To make the

bracket strategy more effective, our framework would suggest the value in also understanding the people's goal for the year that requires choosing now to reduce cigarette consumption. For example, for potential consumers with a goal to stay healthy (maintenance for a prevention goal), the campaign should focus on the costs of the cigarette consumptions of the past year, highlighting the loss that have occurred and that further delay of reducing cigarette consumption would incur irreversible health damage. However, for potential consumers with a goal to make gains in health (advancement for a promotion goal), the campaign should focus on the potential benefits of reducing smoking in the coming year, highlighting the big progress can be made on one's health by not smoking for a year.

A Domain-General Approach to Analyze Risk Across Contexts

Last but not least, our motivational framework provides flexibility to analyze risk preference across decision domains. Many behaviors that have typically been discussed as *risky* are not easily translated into probabilities and variances. For instance, an ambitious engineer may take the risk of leaving a well-paid secure job to start her own new venture. However, such behaviors can be readily analyzed through the lens of the motivational three-factor framework. In each situation, we can identify a goal (i.e., success at realizing an ambition), a current value state (i.e., secure job that is not a challenge), and the choice set of options (i.e., availability of entrepreneur opportunities). In this case, the engineer is likely to form a categorical representations of the more or the less risky option in terms of whether it can serve her goal to start a new venture. Further, this framework contributes to understanding how an individual could be risk-seeking in one domain but risk-averse in another domain. For example, an individual may have an ambitious career goal but is struggling to find a suitable career path. Given the goal and the current value state, the individual might take the option of moving away from family to a foreign country, which would be considered a risky behavior. At the same time, the same person might choose a less risky option when making investment decisions to ensure sufficient resources for the family at home. Further, our model also predicts that the same person could be either risk seeking or risk averse in the same domain, depending on the available options and the current state. For example, the same individual who is pursuing the career goal might choose to take a job in a successful family business if this job could satisfy the goal of meeting a challenge with more certainty (i.e., a less risky option that still satisfies the goal).

Concluding Comment

The first major motivational approach to risk preferences was published by Atkinson in 1957 in *Psychological Review* (Atkinson, 1957). Although this piece laid the foundation of a motivational analysis of risk preference, much of the focus in understanding risk decision making in the last six decades has been from the cognitive and economic perspectives. Although various motivational accounts have been proposed, a general motivational framework for understanding risk preference has been missing. The purpose of the current paper is to fill this gap by taking advantage of advances in motivation science that allow for the development of an over-

arching theoretical account that can push the motivational analysis of risk preference in a new direction.

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