**Risk Style, Regulatory Focus, and the Situation
in Risky Choice Decision Making**

by

Vanessa Johnson

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Approved by

Daniel Svyantek, Chair, Professor of Psychology
Ana Franco-Watkins, Assistant Professor of Psychology
Allison Jones Farmer, Associate Professor of Business
Philip Lewis, Professor of Psychology

Abstract

The present study investigated how two individual differences (risk style and regulatory focus) and three situational manipulations (order of problem context, order of frame, and order of chance) influenced participant behavior on risky choice decisions. Three hundred and thirty-six undergraduates completed the Domain-Specific Risk-Taking (DOSPERT) scale, the Regulatory Focus Strategies Scale (RFSS), and 20 risky choice decision problems. An overall framing effect was demonstrated, with the effect being stronger for men than women. Logistic regression analyses indicated no association between participant risk style and decision making. However, a significant relationship was identified between participant regulatory focus and decision making. The three situational difference variables all significantly predicted decision making as well. A supplementary analysis revealed a significant four-way interaction of regulatory focus, order of problem context, order of frame, and order of chance. Limitations and directions for future research are discussed.

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Introduction

Theoretical Foundation

Research on theoretical explanations for the relationship between individual personality characteristics and behavior has experienced several changing conceptions. Funder (2001) discussed this relationship within the context of the theoretical models of personality. The author outlined the classic personality paradigms (i.e., psychoanalytic, trait, behaviorist, and humanist) and the newer models of personality (i.e., social-cognitive, biological, and evolutionary) and recognized each approach for contributing findings of interest to the study of personality. Funder posited, however, that advancements in personality research beyond the existing theoretical boundaries require an integration of the discrete personality models noted above. He endorsed a theoretical structure known as the person-situation-behavior triad as the means for such an integration.

An analogy may be useful in explaining the person-situation-behavior triad. Personality as a whole can be conceptualized as a three-legged stool. The three legs of the stool are the person, the situation, and the individual's behavior. In other words, to adequately understand human personality, the situation, the person, and the behavior being performed must all be considered as an interrelated system as well as individually. Funder (2001) noted that existing personality research has typically concentrated on the person, with a much smaller proportion of studies attending to either the situation or the behavior. Adequate investigation using the person-situation-behavior triad model requires studies designed to incorporate all three aspects of the triad structure rather than more experimental studies investigating these aspects separately. The

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present study attempts to address Funder's call for this research by examining the relationship of individual differences (person) and situational manipulations (situation) on two types of risky choice decisions (behavior).

The present study will add to the personality literature by examining how two individual difference variables (i.e., risk style and regulatory focus) and three situational manipulations (i.e., order of problem context, order of frame, and order of chance/probability) affect two behaviors (financial and social responsibility decision making). The following sections describe how the person-situation-behavior triad is predicted to operate in the present study. The first section introduces the research of contextual framing in risky choice decision problems as a general frame for studying the person-situation-behavior triad. The second section presents the individual difference variables of risk style and regulatory focus and the specific situational manipulations utilized in the present study. The third section describes the expected relationships between the individual characteristics of the decision maker, the situational aspects of the decision problems, and the behavior of decision making. Finally, the hypotheses for the present study are presented.

The Person-Situation-Behavior Context

Three types of framing have been identified and explored during the past two decades of research. The general framing contexts are risky choice framing, attribute framing, and goal framing. Since the present study involves only risky choice framing, the other types of framing effects are described only briefly here.[1] The three forms of framing differ by the part of the problem that is being manipulated, what is being affected, and how the effect is being measured.

Risky choice decision framing. A risky choice decision problem involves a scenario that is presented as either a loss or a gain to the decision maker. The scenario presentation of a risky choice decision problem determines the frame for the problem. Each decision problem has two

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possible versions: a decision that is positively worded (i.e., gain frame) and a decision that is negatively worded (i.e., loss frame). Each version (gain and loss) has two options: one a sure thing (risk-averse) outcome and one a chance or probability of occurrence (risk-seeking) outcome. Each option has an equivalent expected value whether it is presented in the sure thing or probability format. However, in all four worded options the actual numerical outcome is the same. The only difference between these two presentations is the bias that is stimulated for the decision maker by the gain or loss frame. An example risky choice decision problem is shown in Appendix A. In the presentation of the decision and in the description of the two decision choices or outcomes, the wording of the problem focuses the reader on either how many people will be saved or how many people will die. Participants interpret people being saved as a gain (i.e., positive) and people dying as a loss (i.e., negative).

Over two decades ago, Tversky and Kahneman (1981) reported that when individuals dealt with decisions framed as a gain, they were risk-averse when choosing between the risk-seeking and risk-averse options. Tversky and Kahneman defined risk-averse behavior as preferring a riskless prospect (i.e., a sure outcome) over a risky prospect that has an equal or larger expected value. When presented with a problem framed as a loss, participants were found to be risk-seeking in their choices. The authors defined risk-seeking behavior as preferring a risky prospect over a riskless prospect that has an equivalent or lesser expected value. The example problem provided in Appendix A is from that initial study.

As indicated above, the two decision choices for each version of a risky choice problem are characterized as either risk-seeking or risk-averse. Options framed as gain frames promote risk-averse decisions while options framed as losses promote risk-seeking decisions (Tversky & Kahneman, 1981). In Appendix A, the sure outcome is Program A for both versions of the

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problem. This decision choice is worded as a definitive statement, indicating a sure outcome where only a portion of the potential disease victims will live/die. However, the outcome allows the decision maker to know exactly how many people will live/die. Alternatively, the Program B choice contains two probabilities or levels of chance. The inclusion of levels of chance in the decision choice suggests to the decision maker that the outcome is more fluid, or open to change, and is therefore more risky. In all of the studies reviewed by the present author, the tradeoff between risk and return for the two decision choices is equalized by the weighting of the gain/loss according to the level of chance for the problem (e.g., 1/6, 1/3, 1/2, 2/3, or 5/6). The purpose of that equalization is to limit the differences between the two outcomes to the riskiness of the choice.

As demonstrated by the selection rates cited from Tversky and Kahneman (1981), more participants were risk-averse when asked to determine how many lives would be saved (gain). However, more individuals made risk-seeking choices when the problem involved people dying (loss). The authors referred to this finding as a framing effect, and remarked on it as a psychological principle so clear cut as to indicate a predictable shift in preference. The framing effect has been defined as a systematic variation in individual risk preference when problems are presented with different contexts (or frames) but relatively equivalent outcome choices. Risky choice framing effects take place when participants' risk preferences vary depending on whether the problem choices are presented as positive or negative in nature (Kuvaas & Selart, 2004). By studying the choices made by decision makers, researchers can evaluate how risk preferences are affected by different aspects of the framing context.

Attribute framing. In attribute framing problems, the characteristics of an object or event are adjusted in order to study participants' appraisal of the item via either ratings of its

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attractiveness or yes/no judgments. Levin, Schneider, and Gaeth (1998) pointed out that regardless of the format by which participants evaluate the object or event, the response is still a measurement of favorability, and thereby a form of attribute framing. The occurrence of a more favorable appraisal when a key attribute of an object/event is expressed as positive and a less favorable assessment when that attribute is expressed as negative signifies a framing effect (Kuvaas & Selart, 2004). The advantage of this type of framing research is that when the problem is the only source of information about the object or event, study results reflect simple information processing differences between positive and negative encoding. The theoretical argument regarding these processing differences is that attribute framing effects take place because positive/negative encoding begets similar descriptive associations when information is retrieved (Levin & Gaeth, 1988). However, when other sources of information such as prior experiences are available regarding the item in focus, a more complex representation of information processing occurs. In such situations, the different pieces of information appear to interact or be averaged in some way by the individual, such that the influence of the attribute frame on decisions is reduced (Levin & Gaeth, 1988).

 Goal framing. In goal framing problems, the researcher either presents the consequences of a specific behavior in different ways or manipulates the implied goals for a behavior (Thorsteinson & Highhouse, 2003). Kuvaas and Selart (2004) described goal framing effects as differences in the appeal or influence of a message that emphasizes either positive or negative outcomes for the decision. For example, the wording in a pamphlet might highlight the consequences of quitting smoking in terms of either potential gains (e.g., walking up stairs is easier) or potential losses (e.g., developing lung cancer). By comparing the rates of behavior adoption or even the reported intent regarding the behavior in question across groups who were

presented with different goal frames, a researcher can determine whether the persuasive power of one presentation method is greater than another.

The information available about the three types of framing effects was a result of initial research efforts to investigate risky choice decision framing. Many scientists have replicated Tversky and Kahneman's (1981) findings and demonstrated the generalizability of those findings to varied situations and decision makers (Levin et al., 1998). Unfortunately, the cumulative results of these studies are inconsistent, with some studies reporting either failure to produce a framing effect or varying effect sizes when the framing manipulation was successful. Therefore, to reconcile the conflicting research outcomes, researchers began exploring the possibility of different types of framing and corresponding framing effects, as well as new explanations of the framing effect.

Models of decision making. The rational utility model and the weighted expected utility model were the dominant models of decision making for several years, but were eventually deemed insufficient to explain the diversity of framing research results. Researchers began to consider more intricate decision-making models that took into account the contribution of other variables (Fagley & Miller, 1987, 1997; Levin, Gaeth, Schreiber, & Lauriola, 2002; Zickar & Highhouse, 1998). The individual differences model of decision making appears to possess the greatest potential to incorporate both existing research findings and new variables such as situational characteristics. According to this model, characteristics that vary from person to person are expected to operate alone or in conjunction with other factors (e.g., situational constraints) to account for much of the variance in risky choice decision making. Though specific to the behavior of decision making, the theoretical predictions of the individual differences model are congruent with Funder's (2001) triad theory of personality.

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Once relevant individual difference characteristics have been pinpointed, future research can address why these variables are relevant to decision making and how they may interact to affect the choices we make. Existing research on individual differences in decision making is varied, with a large portion focusing on the risk-style or risk taking of the decision maker and the remaining body of literature encompassing several miscellaneous individual differences. Several of the latter individual differences include cognitive ability or "*g*," need for cognition, and information processing. Studies of these cognitive individual differences have encompassed several years of framing research, but their results failed to explain the framing effect initially identified by Tversky and Kahneman (1981). The variables of risk style and regulatory focus were therefore utilized in the present study to test the role of individual differences in Funder's (2001) model.

Risk Style and Regulatory Focus in Framing Research

Risk style. One of the most thoroughly investigated individual difference variables in decision making has been the risk-style or risk-taking propensity of decision makers. Since risky choice framing problems by definition require a decision between two choices with different risk levels, a logical extrapolation is that individual risk preference may operate in some way to affect risky choice decision making. After issuing a call for research on the characteristic in 1987, Fagley and Miller (1990) conducted two experiments to determine whether risk-taking propensity was associated with an occurrence of the framing effect. The authors did not find evidence to support the influence of risk style on decision making, but noted that the concurrent investigation of different types of framing problems (positive vs. negative conditions) may have hidden the impact of risk-taking propensity. However, two additional studies also failed to link risk style to framing effects. Elliott and Archibald (1989) adjusted their research design by

restructuring problems to elicit subjective frames by participants, but were still unable to demonstrate that risk preference affected receptiveness to framing. Using the same decision problems as in Fagley and Miller's (1990) study, Erker and Svyantek (1994) also found no evidence that risk style moderated framing effects on risky choices.

Two recent dissertations by Erker (2000) and Mahoney (2004) examined whether risk style, along with other individual difference variables, moderated the framing effect in risky choice decisions. Erker investigated the effects of risk style, personality, mathematics experience and attitudes, and gender on three sets of decision problems. The three sets of problems differed in contextual cues (i.e., story, ordered-gambles, and competitive context with gambling problems) and type of frame (i.e., gain or loss). Erker found a framing effect across the three sets of problems. Specifically, participants selected the sure-thing option significantly more often in response to gain-framed problems, but chose the risky option significantly more often when given loss-framed problems. The author reported that across the three sets of decision problems, the results supported the influence of risk style on decision choice. Decision choices varied for risk-averse versus risk-seeking participants across the gain versus loss frame. When faced with a gain frame, risk-seeking participants maximized their expected return in comparison to their risk-averse peers. Participants presented with loss-framed problems showed a reversed effect, such that risk-averse individuals minimized losses better than their risk-seeking counterparts. This trend appeared stronger in the more complex problems.

Mahoney (2004) utilized a within-subjects design to explore the moderating effects of risk style and thinking style (i.e., rational vs. experiential) on the framing effect. Individuals with strong risk preferences should logically be very resistant to decision choices that conflict with that risk-style. In other words, someone who is risk-seeking should consistently prefer a more

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risky choice, while someone with a low preference for risk should more often select the sure-thing option. The author hypothesized that participants scoring in the middle of the range on a risk assessment would be more vulnerable to framing effects. However, only risk-averse participants as measured by the Choice Dilemmas Questionnaire (CDQ) showed significantly larger framing effects versus risk-seeking individuals. Mahoney noted that since the nonsignificant effects could be due to study design, lack of experimental manipulation, or the measures themselves, future research was warranted regarding the role of risk style in risky choice decisions.

Zickar and Highhouse (1998) investigated the potential influence of risk preferences on decision making from a different angle. The authors used item response theory (IRT) to examine how participants responded to four risky-choice decisions. Zickar and Highhouse identified framing effects that supported Tversky and Kahneman's (1981) original findings. More important from the standpoint of individual differences theorists, Zickar and Highhouse labeled risk style as a latent construct that appeared to serve as a predictor of risky choice decisions. The authors warned, however, that since the classification of the construct was based on IRT item parameters, much additional research was needed in the form of construct validation and extended experimentation in order to establish the role of risk preference in risky choice decision making.

The conflicting results of the above six studies do not build a strong case for the moderating influence of risk style on framed decision making. However, Blais and Weber (2006) made the argument that such mixed findings are a function of measurement error, rather than an accurate reflection of the relationship between risk style and the framing effect. In a paper proposing the Domain-Specific Risk-Taking (DOSPERT) scale, the authors suggested that risk

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measures such as the CDQ have failed to account for distinctions between attitudes regarding risky activities and the willingness to actually engage in those endeavors in different situational contexts. Specifically, existing risk measures provide sum scores that (1) do not separate the individual perceptions of the risk of a behavior from the likelihood that the individual will perform the risky behavior and (2) do not assess potential differences in risk style across situations and domains (e.g., ethical, financial, health/safety, social, or recreational risks).

Since the majority of existing framing studies have utilized the CDQ or a similar measure of risk style, the concern articulated by Blais and Weber (2006) offers an explanation for the conflicting results of existing research. Zickar and Highhouse's (1998) conclusion regarding the role of risk preference in framing decisions might therefore be supported in future framing studies where risk style is measured using Blais and Weber's multidimensional measure. The present study will utilize a revised version of the DOSPERT scale to further investigate the role of risk in framed decision making. The revised scale was constructed by Blais and Weber (2006a, 2006b) using the original DOSPERT scale created by Weber, Blais, and Betz (2002). The revised scale is shorter than the original version and was validated with a more diverse sample in terms of age, culture, and educational range. The measure addresses the drawbacks of earlier risk measures by (1) using two subscales to differentiate between participant risk perceptions and tendency to take a specific risk and (2) describes situations or behaviors in five common content domains (i.e., ethical, financial, health/safety, social, and recreational) to assess variations in risk style across different situational contexts. Recent studies have reported both sufficient reliability (ranging from $\alpha = .71$ to $\alpha = .86$) and discriminant validity (through correlational analyses with measures of intolerance of ambiguity, social and recreational risk taking, sensation seeking, and self-reports of past risky behaviors).

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Regulatory focus. Regulatory focus has been the subject of numerous studies within the past five years, and its potential contribution to framing knowledge has been investigated in a handful of publications. Regulatory focus is a motivational principle whereby individuals experience either a promotion or prevention direction in their focus or attention (Higgins, 1998). A promotion focus can be defined as a concentration on achievement of some type of goal. Alternatively, a prevention focus involves an orientation to avoid losses. Regulatory focus may be operationalized as either an individual difference variable or a situational feature (Werth & Foerster, 2007), and studies have explored both avenues within a series of experiments.

One avenue of regulatory focus research has been the issue of regulatory fit. Researchers have produced evidence for an increase in the level of influence of messages whose regulatory focus matches or fits the focus style of the recipient (Keller & Bless, 2006; Latimer, Katulak, Mowad, & Salovey, 2005; Leone, Perugini, & Bagozzi, 2005). Put another way, when the regulatory focus of the situation (i.e., the message) fits the persistent motivational focus of the recipient, the influence of the message is enhanced. The second path of regulatory focus research involves the direct effect of this motivational principle on behavior. Several studies have demonstrated a link between regulatory focus and behaviors such as choices between stability and change, decision strategies in task performance and problem solving, and product evaluations (Crowe & Higgins, 1997; Friedman & Förster, 2001; Liberman, Idson, Camacho, & Higgins, 1999; Werth & Foerster, 2007). The present study will add to the existing literature by administering a dispositional measure of regulatory focus and evaluating the role of this individual difference characteristic in framing effects of risky choice decisions.

Specific versus general individual differences. The diverse individual differences described in the previous pages share a categorization as specific, as opposed to general,

individual difference variables. General individual difference variables such as the big five or five-factor model (McCrae & Costa, 1987) were considered as potential variables for the present study. However, theoretical and methodological arguments indicate that risk style and regulatory focus are the most likely individual difference predictors of the framing effect. In his discussion of personality, Funder (2001) articulated several differences between the two types of individual characteristics and their respective utility in predicting behavior. This information is summarized in the following paragraphs to further substantiate the utilization of the variables of risk style and regulatory focus in the present study.

Specific and general individual differences diverge first in their explanatory scope. General individual difference variables contribute to the breadth of a personality model by their inclusion of almost any personality construct. In other words, most personality constructs can be mapped to models such as the big five. Not every specific individual difference, on the other hand, can be extracted or derived from general individual difference variables. This distinction reflects the not quite diametric relationship of general and specific individual differences, despite some of the obvious opposing qualities of the two constructs.

For instance, general individual differences are theorized to be applicable across cultures, and have been identified as etics, while specific individual differences, or emics, are psychological elements limited to particular cultures (Peterson & Pike, 2002; Triandis, 1997). The terms "etic" and "emic" originate from the study of linguistics and refer to an orientation of place (i.e., many places versus a specific place). The universal nature of general individual differences adds value to the study of personality by enabling viable comparisons across cultures. Since specific individual difference variables are unique to certain cultures, their predictive power is limited to those populations.

When the context shifts from cultures to individuals, as in the present study, specific individual difference variables are more useful in predicting behavior than are their general counterparts. For example, specific individual differences serve as important indicators for clinicians when diagnosing personality disorders (Funder, 2001). General individual differences may provide insufficient detail for assessing personality disorders. While general individual differences encompass most personality constructs, the variables are not completely comprehensive. Omission of a relevant characteristic can produce an inaccurate or incomplete diagnosis for a patient in a therapeutic setting, or result in the hiring of the wrong job candidate in an organizational setting. In the experimental setting of the present study, an investigation of risky choice decision making should focus on specific individual differences as the most likely predictors of the framing effect. To this point, the present study will evaluate the degree to which the two specific individual differences of risk style and regulatory focus, along with the context of decision frames, predict the framing effect in risky choice decision making.

The Present Study

In summary, none of the existing literature suggests that a one-dimensional explanation of framing is likely. Instead, researchers have begun to explore both different operationalizations of existing variables and potential interactions of these variables in combination with situational characteristics. Utilizing the person-situation-behavior triad model of personality, the present study will extend this new vein of framing research by examining the effect of individual differences and situational aspects on the behavior of risky-choice decision making. The individual difference variables considered in the present study are risk style, with its two components of risk perception and willingness to take risk, and regulatory focus. The two individual differences are expected to operate as independent predictors of decision-making

behavior. In addition, three situational manipulations (order of problem context, order of problem frame, and order of level of chance) will also be examined as potential predictors of decision-making behavior. The present study is not intended to pinpoint the nature of a specific model for risky-choice decision making, but rather to establish that a predictive relationship exists between risk taking, regulatory focus, situational context, and behavior.

Situational contexts. The present study will manipulate three aspects of the situational context in several framed decision problems to investigate the person-situation-behavior triad. While all participants will receive all of the same problems, the order in which the problems will be presented will vary. The three situational aspects are the order in which the two problem contexts (social vs. financial) are presented, the order in which the two problem frames (gain vs. loss) are presented, and the order in which the level of chance of the problems progresses (low to high vs. high to low). Each of the different types of problems used in the present study is representative of typical problems utilized in prior framing research (Kühberger, 1998). The two problem contexts, or situational domains, involve decisions with either a social responsibility or a monetary focus. The gain versus loss context in a risky choice problem is the classic means to elicit a framing effect. Variations in the chance of occurrence of the outcome choices are also common manipulations in framing studies. The present study diverges from existing framing research by not only incorporating multiple framing contexts, problem domains, and probabilities in numerous decision problems, but also testing whether the order of presentation of those problem characteristics influences framed decision making.

Research Hypotheses

The initial framing study by Tversky and Kahneman (1981) suggested that decision makers are risk-averse when faced with gain/positively-framed problems, but risk-seeking when

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dealing with loss/negatively-framed problems. The decision problems utilized in the present

study will involve either a gain- or a loss-frame within either a monetary or social responsibility

situational context. The use of two types of framing contexts will produce a framing effect in the

decisions made by participants. This effect is expected to occur across both problem types and

regardless of the situational manipulations of either order of problem context or order of chance

progression.

> *Hypothesis 1a:* Overall, regardless of situational order manipulations, participants will be
> risk-averse in their decisions on positively framed problems.

> *Hypothesis 1b:* Overall, regardless of situational order manipulations, participants will be
> risk-seeking in their decisions on negatively framed problems.

The construct of risk style has been examined as a possible moderator of the framing

effect in many risky choice decision studies. Prior research on the relationship of risk style and

framed decision making has primarily defined risk preference by aggregating responses to risk

scenarios from different domains. By merely summing item scores from various risk domains,

existing measures such as the CDQ have failed to consistently assess the individual difference

variable for which they were tailored. A relatively new measure of risk style, the DOSPERT

scale, contains separate subscales to measure risk perceptions and willingness to take risk. An

interaction between these two scale scores is expected to occur in the present study. The

interaction variable of risk perception and willingness to take risk will predict framed decision

making.

> *Hypothesis 2:* Overall, regardless of situational order manipulations, the interaction of the
> risk style subscales (i.e., risk perceptions and willingness to take risk) will predict the
> risky choice decisions of participants.

Regulatory focus is the principle where individuals exhibit motivational concentration

toward either promotion or prevention. Individuals with a promotion focus tend to concentrate on

achievement of goals, while people with a prevention focus tend to try to avoid losses. The

concept of regulatory fit proposes that when a message or situation matches the regulatory focus

of an individual, the influence of that situation or message is amplified. Regulatory fit is

expected to be demonstrated in the present study. Regardless of the order of problem context, the

problem context/topic, or the order of frame, participants whose scores indicate a promotion

focus will make riskier decisions when the problem is positively framed, but display no risk

preference on negatively framed problems. Participants whose scores indicate a prevention focus

will be risk-averse in their decision making on negatively framed problems, but display no risk

preference on positively framed problems. This outcome is also expected to occur across all

orders of problem context, type of problem context/topic, or order of frame.

> *Hypothesis 3a:* Regardless of all order manipulations, participants with a promotion focus
> will make risk-seeking decisions on positively framed problems and display no risk
> preference on negatively framed problems.

> *Hypothesis 3b:* Regardless of all order manipulations, participants with a prevention
> focus will make risk-averse decisions on negatively framed problems and display no risk
> preference on positively framed problems.

All participants in the present study will receive the same decision problems, with no

differences in the content or structure of the problems themselves. However, the manipulations

of the order of three situational characteristics will be evaluated as potential predictors of risky-

choice decisions. The three procedural variables are presentation order of problem context,

presentation order of problem frame, and the progression of level of chance across problems. The

first two order manipulations are being conducted in order to control for the possibility of an

effect, but no relationship is expected between either order of problem context and decision

choice or between order of problem frame and decision choice. The order of level of chance is

expected to predict decision choice made under risk, but the direction of the relationship between

the two variables is unknown.

> *Hypothesis 4:* Regardless of order of problem context or order of problem frame, the progression order of the level of chance of decision problems (i.e., low to high level of chance versus high to low level of chance) will predict risky choice decisions, though no direction for the effect is specified.

METHOD

Participants

      The sample for the present study consisted of 336 undergraduate students at a large southeastern college in the United States. Participants received one hour of extra credit in exchange for their involvement in the study. The demographic questionnaire is provided in Appendix B. The gender distribution of the sample was 61.3% male ($n = 206$) and 38.7% female ($n = 130$). The majority of the participants were Euro American or White ($n = 300$, 89.3%). The ethnic breakdown for the remainder of the sample was as follows: African American or Black ($n = 24$, 7.1%), Asian American or Pacific Islander ($n = 3$, .9%), Latino/a or Hispanic American ($n = 2$, .6%), Multiracial ($n = 6$, 1.8%), and Other ($n = 1$, .3%). The last ethnic category of "Other" was defined by the participant as "Russian" in a follow-up, fill-in-the-blank question. The reader should note that the question "What ethnic group do you consider yourself to be?" required participants to self-categorize themselves based on their individual perceptions.

      The age of the participants ranged from 19 to 41 years, and the average age of the participants was 21 years ($SD = 1.81$). Few of the participants reported being either freshmen ($n = 1$, .3%) or sophomores ($n = 17$, 5.1%) in college. More than half of the sample were juniors in college ($n = 193$, 57.4%), and the remaining 37.2% of the participants were seniors ($n = 125$). The majority of participants were business majors ($n = 195$, 58.0 %). The rest of the sample was fairly diverse, with an additional twenty-three majors reported. The full distribution of college majors in the present sample is presented in Table 1.

Participants' average GPA was 3.06 (SD = .44), indicating a B average across college courses taken to date. The lowest reported GPA was 1.80 and the highest was 4.00, reflecting a sample whose GPA ranged from a C average to an A average, respectively. The sample was relatively homogeneous in terms of annual family income. An income of more than $80,000 per year was reported by 70.8% of participants (n = 238). Approximately sixteen percent (n = 55) of participants indicated a family income of $60,000 to $80,000 per year. The remaining 43 participants were split between a stated family income of $40,000 to $60,000 ($n$ = 19, 5.7%), $20,000 to $40,000 ($n$ = 15, 4.5%), and less than $20,000 per year ($n$ = 9, 2.7%). When asked whether the participant's hometown would be described as rural or urban, participants were almost evenly split (n = 151, 44.9% Rural and n = 185, 55.1% Urban).

Procedure

Data for the study was collected from several courses in the business department of a large southeastern university. Participation was voluntary, and occurred outside of regular class time. The paper-and-pencil surveys were administered in a classroom environment. Participants were provided with an information letter describing the study prior to participation (see Appendix C). The study required 45 to 55 minutes of the participant's time. Sign-in sheets were given to class professors so that they could assign the hour of extra credit in return for participation. All survey answers were anonymous, with no available connection between the arbitrary participant numbers and the sign-in sheet.

After being seated in the classroom, participants were given two packets. Each packet had a cover page indicating the order in which they should be completed (i.e., Packet 1 or Packet 2) and a participant number for matching the information between the two survey packets after the study was finished. Packet 1 contained 20 decision problems for each participant to complete.

Each decision problem required the participant to choose one of two decision options and then provide a confidence rating for the decision that was made. The scale for rating confidence in the decision choice had five anchors that ranged from 1 (not very confident) to 5 (very confident). The two individual difference measures for risk style and regulatory focus and the demographic survey were presented in Packet 2. During each administration, all participants finished and turned in Packet 1 before starting Packet 2. To avoid inadvertently affecting participant responses on the previous measures, the demographic survey was the last page in the second packet. After all participants had completed Packet 2 and signed in for their respective professors, the group was dismissed.

Measures

Risk style. The revised Domain-Specific Risk-Taking (DOSPERT) scale was used to assess the risk style of participants. The revised scale was constructed by Blais and Weber (2006a, 2006b) using the original DOSPERT scale created by Weber, Blais, and Betz (2002). The revised DOSPERT scale has ten fewer items than its precursor and was validated with a broader population in regards to age (i.e., adult vs. undergraduate students), culture (i.e., English, German, Italian, Dutch, and Spanish), and educational range. The measure consists of two subscales, with each subscale containing 30 items. Each test item describes a situation or behavior in one of five common content domains (i.e., ethical, financial, health/safety, social, and recreational).

The first subscale gauges participants' level of perception of risk (or perceived-risk attitude), and the second subscale determines the likelihood of taking the risk (or conventional risk attitude). The items for the two subscales are identical, but the instructions and response scales differ. The two subscales can be seen in Appendix D. The items for the two subscales are

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presented in the same order in Appendix D. However, the reader should note that when administered to participants, the items for each subscale were presented in different random orders.

On the risk perception subscale, participants used a 7-point Likert-type scale to rate how risky they perceived the described situations or behaviors to be. The seven response anchors ranged from 1 (not at all risky) to 7 (extremely risky). On the willingness to take risk subscale, participants used a 7-point Likert-type scale to indicate the likelihood that he or she would engage in the described behavior if in that situation. The seven response anchors ranged from 1 (extremely unlikely) to 7 (extremely likely). The two subscale scores were calculated by summing all item responses for the specific subscale. A higher score for the subscale indicates greater risk taking or greater perception of risk, depending upon which subscale the score represents.

Blais and Weber (2006a) reported internal consistency for the risk-taking subscale as ranging from .71 to .86 (mean α = .79), and .74 to .83 (mean α = .79) for the risk-perception subscale. These scores are comparable to the Cronbach's alphas reported by Weber et al. (2002) for risk taking (α = .84) and risk perception (α = .77). Test-retest reliability over a one-month period for the risk-taking subscale was reported as ranging from .72 to .80 for health, ethics, and recreational domains, but lower for the financial and social domains (.44 and .58, respectively). For the risk-perception subscale, test-retest reliability was similar, with higher correlations for the health, ethics, and recreational domains (.66, .67, and .56, respectively) and lower for the financial and social domains (.42 and .47, respectively).

Discriminant validity was demonstrated through the relationships of each risk subscale with other measures. A negative correlation between intolerance of ambiguity and social and

recreational risk taking ($r = -.30$ and $-.42$, respectively). All context domains in the risk-likelihood subscale had significant positive correlations with items assessing sensation seeking. Risk-taking intentions gathered from the subscale also correlated positively with self-reports of past risky behaviors in situations from the same five context domains as the subscale. Consistent gender differences have been documented for both subscales, with men perceiving situations as less risky than did women, as well as reporting higher likelihoods that they would take said risks in comparison to women's responses (Blais & Weber, 2006a; Weber et al., 2002).

Regulatory focus. The Regulatory Focus Strategies Scale (RFSS) was used to assess the regulatory focus of participants. Ouschan, Boldero, Kashima, Wakimoto, and Kashima (2007) designed the scale to assess an individual's regulatory focus of either promotion or prevention via their expressed opinions or strategies about achievement. The RFSS was developed and validated across three studies with Australian and Japanese undergraduate students. Since the RFSS has not been administered to a group demographically similar to the present sample, the current study provided an opportunity to appraise its appropriateness for American populations. The instrument consists of 14 items which can be viewed in Appendix E. Eight of the items (2, 4, 5, 8, 9, 10, 11, and 12) form the promotion focus subscale, with the prevention focus subscale consisting of six items (1, 3, 6, 7, 13, and 14). As in Ouschan et al.'s study, mean scores were calculated to represent the degree of endorsement of each regulatory focus strategy (i.e., for each subscale) for each participant. The subscale with the higher mean score indicates the individual's regulatory focus.

Participant responses for this measure are agreement ratings on a 5-point Likert-type scale. The five response anchors range from 1 (strongly disagree) to 5 (strongly agree). Ouschan et al. (2007) reported adequate reliability for the promotion subscale ($\alpha = .75$) and prevention

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subscale ($\alpha = .72$). The authors demonstrated convergent validity through significant positive correlations of other relevant motivation and self-regulation measures with the promotion subscale (i.e., Behavioral Activation Scale and measures of extraversion, optimism, and sensitivity to reward) and prevention subscales (e.g., Behavioral Inhibition Scale and measures of neuroticism, pessimism, and sensitivity to punishment). Lack of correlation ($r < |.10|$) between the promotion and prevention subscales during exploratory and confirmatory factor analyses and with measures of opposing motivations were used to demonstrate discriminant validity. No gender differences were found for either subscale.

Decision problems. Each participant received a set of 20 word problems which are presented in Appendix F. Each problem set contains five gain-framed social responsibility problems, five loss-framed social responsibility problems, five gain-framed financial problems, and five loss-framed financial problems. All of the decision problems required the participant to make a dichotomous choice between a risk-averse option and a risk-seeking option. These decision choices constitute the dependent variable in subsequent hypothesis testing. For all decision problems, the risk-averse and risk-seeking options were coded as "0" and "1" respectively. Any reported marginal means of risk-seeking behavior therefore have a possible range of 0 to 1.

Three situational aspects were manipulated in the decision problems: order of the context/topic of the problem (i.e., social responsibility problems first or financial problems first), the presentation order of frame (i.e., gain/positive first or loss/negative first), and the order of level of chance (i.e., high to low chance progression or low to high chance progression) for the series of problems (e.g., high to low progression: 5/6 to 2/3 to 1/2 to 1/3 to 1/6).

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The problem context is the topic of the problem scenario. Half of the decision problems involved a social responsibility context, while the other ten problems involved a monetary context. For the social context, participants were asked to decide how to treat virulent outbreaks of influenza. These problems are patterned after the classic Asian Disease problem that was used by Tversky and Kahneman (1981) and is presented in Appendix A. With the financial context, participants expressed a preference between two different investment strategies. This situational context describes downswings in individual company stocks that consequently require the participant to choose the better of two investment strategies. The problems for the financial topic are modeled after a personal money problem that was administered by Wang in 1996. The manipulation of order of problem context means that half of the participants received social problems before the monetary problems, while the other half of the sample viewed the financial problems first and the social problems second.

Regarding the type of frame (i.e., gain vs. loss), the decision options for the two types of frames were worded so as to present the participant with one of two goals. With the gain-framed problems, the options involved trying to achieve a positive outcome. With the loss-framed problems, the decision options required the participant to try to prevent a negative outcome. The manipulation of order of frame involved half of the sample receiving the gain-frame version of each problem before the loss-frame version, and the rest of the participants completing the loss-frame problem version before the gain-framed one.

The third situational manipulation involved the order of change in the levels of chance that were articulated for the decision outcomes (i.e., a high to low progression of chance vs. a low to high progression). One of five levels of chance (1/6, 1/3, 1/2, 2/3, or 5/6) was utilized to dictate the probability for the risk-averse option in each decision problem. The level of chance

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for the risk-seeking decision option was alternatively defined by subtracting the risk-averse

probability from 1. In other words, for each decision problem, the option with the lower level of

chance represents the risk-averse choice, while the option with the higher level of chance

represents the risk-seeking choice. The manipulation of order of change in the levels of chance

means that half of the participants received a set of problems whose progression of chance

ranged from high to low, while the second half of the sample viewed a set of problems whose

progression of chance ranged from low to high.

Analysis

The following hypotheses were proposed for the present study. Each set of hypotheses is

followed by the analysis that was used to test the veracity of those proposed hypotheses in the

present study.

> *Hypothesis 1a:* Overall, regardless of situational order manipulations, participants will be risk-averse in their decisions on positively framed problems.

> *Hypothesis 1b:* Overall, regardless of situational order manipulations, participants will be risk-seeking in their decisions on negatively framed problems.

In order to test Hypotheses 1a and 1b, two one-sample proportion tests were performed.

The first test determined whether participants were risk-averse in their decisions on positively

framed problems. If the test statistic is greater than the critical value of 1.65, given an alpha of

.05, then Hypothesis 1a was supported. The second test determined whether participants were

risk-seeking in their decisions on negatively framed problems. The test statistic for this analysis

was calculated using the same one-sample proportion test as with the test of Hypothesis 1a.

Again, if the test statistic is greater than the critical value of 1.65, given an alpha of .05, then

Hypothesis 1b was supported.

Hypothesis 2: Overall, regardless of situational order manipulations, the interaction of the risk style subscales (i.e., risk perceptions and willingness to take risk) will predict the risky choice decisions of participants.

Hypothesis 3a: Regardless of all order manipulations, participants with a promotion focus will make risk-seeking decisions on positively framed problems and display no risk preference on negatively framed problems.

Hypothesis 3b: Regardless of all order manipulations, participants with a prevention focus will make risk-averse decisions on negatively framed problems and display no risk preference on positively framed problems.

Hypothesis 4: Regardless of order of problem context or order of problem frame, the progression order of the level of chance of decision problems (i.e., low to high level of chance versus high to low level of chance) will predict risky choice decisions, though no direction for the effect is specified.

In order to test Hypotheses 2, 3a, 3b, and 4, three multiple logistic regression analyses were conducted. Logistic regression was more appropriate than ordinary least squares regression for testing these hypotheses because of the dichotomous nature of the dependent variable (i.e., decision choice). The first analysis tested Hypotheses 2 and 4 and utilized the decisions made on all 20 decision problems as the response variable. The analysis incorporated the two sum scores of the risk subscales as covariates and the three situational manipulations (order of problem context, order of chance progression, and order of frame) as factors. An Omnibus Likelihood Ratio Chi-Square indicated whether the model specified by the included independent variables was statistically significant (Meyers, Gamst, & Guarino, 2006). To identify the contribution of each of the independent variables for the prediction of risk-seeking behavior across all 20 decision problems, Wald Chi-Squares were calculated. Using an alpha of .05, the *p*-values for each independent variable indicated whether that variable was a significant predictor of risky choice decision making. The logistic regression analysis also generated parameter estimates that were used to construct the logistic regression equation and calculate the predicted probabilities of

risk-seeking behavior. Those individual coefficient values designated the direction of the relationship between each respective independent variable and the log-likelihood of risk-seeking behavior (Peng, Lee, & Ingersoll, 2002).

Two logistic regression analyses were required to test Hypotheses 3a and 3b. The first of these analyses utilized the decisions made on the 10 positively framed problems as the response variable. The second analysis utilized the decisions made on the 10 negatively framed problems as the response variable. Both of these logistic regression analyses included the variable of regulatory focus as the only factor. As with the logistic regression analysis used to test Hypotheses 2 and 4, Likelihood Ratio Chi-Squares generated in these two analyses acted as omnibus tests to determine whether a model specified by the inclusion of the categorical variable representing regulatory focus was statistically different from the model including only the intercept. For each of these analyses, Wald Chi-Squares were used to specify whether regulatory focus was a significant predictor of risk-seeking behavior across 10 decision problems (either the 10 positively framed problems or the 10 negatively framed problems). The logistic regression analyses also generated parameter estimates that were used to construct the two logistic regression equations for risk-seeking behavior when the decision problems were either positively or negatively framed.

RESULTS

Preliminary Analyses

To assess the internal consistency of the administered measures, Cronbach's alphas were computed for each of the instruments (see Table 2). The calculated alphas for the risk perception and risk taking subscales of the DOSPERT were .86 and .84 respectively. This level of reliability was consistent with earlier documented alpha levels (Blais & Weber, 2006a). For the prevention subscale of the RFSS, Cronbach's alpha was found to be .66, which was somewhat lower than the alpha of .72 found by Ouschan et al. (2007). The calculated reliability for the promotion subscale of the regulatory focus measure was also .66, and this level of internal consistency was again lower than the alpha of .75 reported by Ouschan et al. (2007). For this reason, scale values were also generated given the deletion of each individual subscale item. For both subscales, none of the potential item deletions were associated with an increase in the overall reliability score for the respective subscale. Since the reliability very closely approached the acceptable threshold for reliability estimates and removal of items would not have improved the internal consistency of the subscales, analyses were completed using the existing response data. The limitations and possible explanations for the reliability of the RFSS subscales are contemplated further in the Discussion section.

Means and standard deviations were also calculated for each of the instruments (see Table 2). For the RFSS scale, Ouschan et al. (2007) reported a mean score for the promotion subscale ($M = 3.52$, $SD = .53$) similar to the average promotion score in the present study ($M = 3.52$, $SD = .55$). Ouschan et al.'s mean prevention score ($M = 3.26$, $SD = .56$) was also similar to

the average prevention score in the present study ($M = 3.19$, $SD = .56$). For the DOSPERT, the average score for the risk perception subscale was 123.67 ($SD = 20.069$), and the mean score for the risk taking subscale was 110.96 ($SD = 22.22$). Overall subscale scores for the revised DOSPERT were not reported by Blais and Weber (2006b). However, the authors did provide descriptive statistics regarding the individual domains for each subscale. Similar statistics were calculated for the present sample and are presented in Table 3.

Blais and Weber (2006b) found that the highest mean domain level of risk perception was in the health/safety area ($M = 28.15$, $SD = 4.02$), while the present results showed the highest mean level of risk perception to be in the ethical domain ($M = 28.46$, $SD = 5.39$). The lowest mean level of risk perception reported by Blais and Weber was in the social domain ($M = 17.01$, $SD = 2.43$). The present results also showed the social domain to have the lowest mean level of risk perception ($M = 17.97$, $SD = 4.68$). For the risk-taking subscale, Blais and Weber found the highest domain mean to be in the social area ($M = 32.58$, $SD = 4.65$), and the same result was found in the present study ($M = 29.53$, $SD = 4.81$). The lowest mean level of risk taking found by Blais and Weber was in the ethical domain ($M = 16.92$, $SD = 2.42$), and the lowest mean level of risk taking in the present study was also in the ethical domain ($M = 14.82$, $SD = 5.69$). The descriptive statistics for the DOSPERT in the present study were more or less congruent with the analyses of Blais and Weber.

Hypothesis Testing

Hypotheses 1a and 1b. Hypotheses 1a and 1b were tested with two one-sample proportion tests. When testing Hypothesis 1a, the proportion of total risk-averse responses on positively framed problems to the total number of positively framed problems was .58. The results were statistically significant ($z = 3.02$, $p < .01$), and Hypothesis 1a was therefore

supported. For Hypothesis 1b, the proportion of risk-seeking responses on negatively framed problems to the total number of negatively framed problems was .56. The results were statistically significant ($z = 2.23$, $p < .05$), and Hypothesis 1b was therefore supported.

Hypothesis 2. Hypothesis 2 was tested using multiple logistic regression. The resulting Omnibus Likelihood Ratio Chi-Square was significant, [X^2 (6, $N = 336$) $= 115.17$, $p < .001$]. However, no significant main effects or interaction effects were identified for the DOSPERT scale. Hypothesis 2 was therefore not supported.

Hypotheses 3a and 3b. Hypotheses 3a and 3b were also tested through multiple logistic regression. The chi-square statistics for both of these hypotheses are also presented in Table 4. Due to the interrelatedness of the two hypotheses, the results of both analyses were needed to determine whether support was found for either hypothesis. The Omnibus Likelihood Ratio Chi Square for positively framed problems was significant, [X^2 (2, $N = 336$) $= 22.36$, $p < .001$]. The omnibus model test for negatively framed problems was also significant, [X^2 (2, $N = 336$) $= 22.68$, $p < .001$]. The predicted probabilities for risk-seeking behavior according to regulatory focus and problem frame can be viewed in Table 5.

For Hypothesis 3a, for a fixed problem order, order of progression of chance, and order of frame, having a promotion regulatory focus was associated with a 1.28 increase in the log of the odds of risk-seeking behavior on positively framed problems, [X^2 (1, $N = 336$) $= 11.90$, $p = .001$]. For a fixed problem order, order of progression of chance, and order of frame, having a promotion regulatory focus was associated with a .77 increase in the log of the odds of risk-seeking behavior on negatively framed problems, [X^2 (1, $N = 336$) $= 6.98$, $p = .008$]. Hypothesis 3a was therefore only partially supported, because while participants with a promotion focus did make risk-seeking decisions on positively framed problems, they also displayed a risk-seeking

preference on negatively framed problems. For Hypothesis 3b, for a fixed problem order, order of progression of chance, and order of frame, having a prevention regulatory focus was associated with a 1.06 increase in the log of the odds of risk-seeking behavior on positively framed problems, $[X^2 (1, N = 336) = 8.02, p = .005]$. The test statistic was not significant for prevention focus on negatively framed problems. Hypothesis 3b was therefore not supported, since participants with a prevention focus displayed no risk preference on negatively framed problems, but did demonstrate risk-seeking behavior on positively framed problems.

Hypothesis 4. Finally, Hypothesis 4 was tested using multiple logistic regression. The Omnibus Likelihood Ratio Chi Square was significant, $[X^2 (6, N = 336) = 115.171, p < .001]$. For a fixed order of progression of chance and order of frame, completing social problems before financial problems was associated with a .13 increase in the log of the odds of risk seeking behavior across all 20 decision problems, $[X^2 (1, N = 336) = 6.87, p = .009]$. For a fixed order of problem topic and order of frame, completing a set of decision problems with a high to low progression of chance rather than a low to high progression of chance was associated with a .14 decrease in the log of the odds of risk seeking behavior across all 20 decision problems, $[X^2 (1, N = 336) = 7.55, p = .006]$. For a fixed order of problem topic and order of progression of chance, completing gain problems before loss problems was associated with a .27 decrease in the log of the odds of risk seeking behavior across all 20 decision problems, $[X^2 (1, N = 336) = 30.84, p < .001]$. Hypothesis 4 was therefore only partially supported. While an unspecified effect for the progression order of chance was expected, neither of the other two situational manipulations were expected to be significant predictors of risky choice decision making. The chi-square statistics for Hypothesis 4 are shown in Table 6. The predicted probabilities for risk-seeking

behavior across the eight combinations of situational order manipulations can be viewed in Table 7.

    Supplementary Analysis. The present study was not formulated to specifically test Funder's personality model. However, a supplementary logistic analysis was conducted in order to assess whether the present data indicated preliminary support for Funder's (2001) person-situation-behavior triad model of personality. The prediction of risk-seeking behavior (social and financial) by a four-way interaction of the three situational manipulations (i.e., order of problem, order of chance, and order of frame) and the individual difference variable of regulatory focus was found to be significant, [X^2 (18, $N = 336) = 115.732, p < .001$]. The nine individual chi-square statistics for each significant parameter and the corresponding predicted probabilities for risk-seeking behavior are shown in Table 8. The marginal means estimates are presented in Table 9, and Figure 1 provides the graphical representations of the marginal means in Table 9. None of these mean comparisons were significantly different, but Table 9 and Figure 1 illustrate the trends that existed in the present data.

DISCUSSION

The purpose of the study was to examine how two individual differences (i.e., risk style and regulatory focus) and three situational manipulations (i.e., order of problem context, order of frame, and order of chance/probability) influenced participant behavior on risky choice decisions. The proposed hypotheses were presented within the context of Funder's (2001) triad model of personality and more specifically, the individual differences model of decision making. Within the experimental conditions of the present study, the two models share an expectation that individual characteristics and situational factors can significantly predict the behavior of risky choice decision making. The following paragraph summarizes briefly the results of the present study, while the implications of the findings are discussed in detail in the next section. Limitations of the present study and opportunities for future research are also reviewed.

The expected results of the present study included the identification of an overall framing effect and the prediction of risky choice decisions by measures of risk-taking propensity, regulatory focus, and the situational manipulation of order of progression of chance across problems. Results did indicate the presence of a significant framing effect, providing additional support for Tversky and Kahneman (1981). Risk-taking propensity, however, was not found to be a significant predictor of risky choice decisions. Regulatory focus did significantly predict decision making, though only partial support was found for the predicted relationship of regulatory fit in risky choice decision making. The situational manipulation of order of progression of chance across problems was found to be a significant predictor of risky choice decision making. However, the related hypothesis was only partially supported since, opposite to

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prediction, the two other situational manipulations of order of problem and order of frame were also significant predictors of decision choices. Finally, a supplementary analysis provided support for Funder's (2001) person-situation-behavior triad model of personality through the significant four-way interaction of the three situational manipulations and the individual difference of regulatory focus on social- and financial-primed risk-seeking behavior. The results of the supplementary analysis are of particular interest to personality researchers, since they offer an opportunity to consider the interrelated system of the situation, the person, and the behavior being performed.

Implications of Findings

    Overall framing effect. The present study predicted and found support for the occurrence of a framing effect, such that participants were risk-averse on gain-framed problems and risk-seeking on loss-framed problems. The effect was present regardless of either the problem topic or any situational manipulations, and is consistent with the choice shift found in Levin et al.'s (1998) review of framing research. Similar to Levin et al. (2002), the large sample size ($N = 336$) in the present study may have simply afforded sufficient power to detect the small to moderate effect (Kühberger, 1998) that is associated with framing research. However, upon further examination, a gender difference was identified regarding the strength of the framing effect. While both men and women displayed a significant preference for risk-averse responses on the gain-framed problems, only men demonstrated a significant preference for risk-seeking behavior on loss-framed problems. Gender differences in framing effects have been shown in earlier studies, but the results have not been consistent across studies. While one interpretation has been made that men may be more risk-seeking in general than women (Hudgens & Fatkin, 1985), the gender differences in framing effects shown in other studies (Fagley & Miller, 1990; Levin,

Snyder, & Chapman, 1988) have been inconsistent. The degree to which the gender makeup of the current sample may have influenced this effect is addressed further in the limitations section below.

Risk taking and decision making. Despite little prior support for a relationship between existing measures of risk preference and risky choice framing effects, the present study hypothesized that regardless of situational order manipulations, the interaction of the risk style subscales of risk perceptions and willingness to take risk would predict the risky choice decisions of participants. Blais and Weber (2006) made the argument that the historically mixed findings regarding risk style are due more to error in the measurement of risk than to a lack of relationship between risk style and the framing effect. The present study sought to investigate that possibility by using the DOSPERT scale to provide a more precise measurement of participants' attitudes and their willingness to actually take risk in different situations. However, consistent with earlier research (Elliott & Archibald, 1989; Erker & Svyantek, 1994; Fagley & Miller, 1990), the results of the present study fail to provide support for any relationship between risk style and risky choice decisions.

A potential explanation for the results of the present study and earlier research is that the behavior known as risky choice decision making has been inaccurately described or interpreted since its inception in research. Studies have not failed to properly operationalize variables. Instead, beginning with Tversky and Kahneman (1981), the use of the word "risk" in the name of the dependent variable may have caused a semantic generalization of the behavior in question. Risky choice decision making as it is commonly defined in framing studies, including the present one, may be a different behavior. Future research should investigate the possibility that framing

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effects associated with risky choice decisions reflect a behavioral process that is unrelated to risk as either a predictor or an outcome.

Regulatory focus and decision making. Regulatory focus is defined as principles or strategies according to which individuals are motivated to either promote goal achievement or prevent the occurrence of losses. Regulatory fit is a complementary theory which suggests that the matching of a situation to an individual's regulatory focus should strengthen the influence of the original situation or message. Regulatory fit was hypothesized to take place in the present study. Specifically, regardless of situational order manipulations, individuals with a promotion focus were expected to make risk-seeking decisions on gain-framed problems but display no risk preference on loss-framed problems (Hypothesis 3a). Similarly, participants with a prevention focus were expected to make risk-averse decisions on loss-framed problems but display no risk preference on gain-framed problems (Hypothesis 3b). However, only Hypothesis 3a was supported even partially, therefore failing to provide evidence of regulatory fit.

While regulatory fit was not demonstrated in this framing study, the support for regulatory focus as a predictor of risky choice decision making was of interest. In accordance with the overall framing effect, individuals with both a promotion and a prevention regulatory focus were, on average, more risk seeking on loss-framed problems than on gain-framed ones. However, within both gain- and loss-framed problems, participants with a promotion focus were, on average, more risk-seeking in their decision making than were their prevention-focus peers. One explanation for these findings is that regulatory focus plays the role in risky choice decision making that researchers have repeatedly attributed to risk style. That is, while there is some evidence for the susceptibility of both groups to the framing effect, promotion-focused individuals may be more risk-seeking overall compared to their prevention-focused peers

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because of their inclination to interpret situations as opportunities to act in support of a goal. Whether the goal is to either save lives/money or avoid the loss of life/money, the response by these individuals is similar.

Prevention-focused individuals, on the other hand, may be more risk-averse on gain-framed problems than their promotion-focused individuals for two reasons. First, the risk-seeking choice includes an outright loss possibility that is to be avoided. Second, the opportunity for any sure-thing gain is perceived as a much greater benefit by these individuals, stimulating a more risk-averse response to protect that gain. The question of why prevention focus was not significantly associated with a risk preference on loss-framed problems is puzzling. One option is to attribute the lack of an effect to measurement error, particularly considering the reliability of the RFSS in the present study. Another explanation may be that when faced with a loss-framed scenario, individuals predisposed to avoid losses may have simply balanced their risk-averse and risk-seeking responses in an effort to minimize their losses overall. Future framing studies that include assessments of participants' regulatory focus are needed in order to either replicate the present findings or determine whether measurement error better explains the present results.

Situational manipulations and decision making. Each of the participants in the study received the same 20 decision problems, but the order in which the problems were completed varied according to three situational manipulations. Two of the order manipulations, order of problem context and order of frame, were conducted to control for the possibility of an effect on decision choice, though one was not expected. The third situational manipulation, order of level of chance, was expected to predict risky choice decisions, but no direction for that relationship was hypothesized. The results of the analyses indicated, however, that all three situational manipulations significantly predicted risky choice decision making.

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The first situational manipulation, order of problem topic, involved whether participants completed either the social or the financial decision problems first. Participants who received social problems before the financial problems were found to be more risk-seeking in their decisions than were individuals who received financial problems before the social problems. The second situational manipulation, order of problem frame, involved whether participants received gain-framed or loss-framed problems first. Participants who received loss-framed problems before the gain-framed problems were found to be more risk-seeking in their decisions than were individuals who received the gain-framed problems first. For example, across all eight combinations of situational manipulations, individuals who were most risk-seeking were those who received problems in a low to high progression of chance with social problems that were loss-framed first. Conversely, the lowest relative risk-seeking behavior was observed for participants who received problems in a high to low progression of chance with financial problems that were gain-framed first.

Both the social problem context and the loss-frame context may have primed participants to be more risk-seeking throughout the rest of the decision problems. In their comparison of between- and within-subjects framing effects, Levin, Johnson, and Davis (1987) suggested that initial framing problems may establish a response baseline to which subsequent responses are oriented. Since the traditional social framing problem featured here has been associated in other studies with a more robust framing effect than alternative problem topics (Fagley & Miller, 1997; Kühberger, 1998; Wang, 1996), this explanation best explains the effect of the problem topic manipulation. Negatively-framed messages have previously been identified as having a stronger influence on decision makers' choices than positively-framed ones (Kühberger, 1995;

Levin et al., 1998; Meyerowitz & Chaiken, 1987; Schneider et al., 2001), supporting a similar interpretation of the effect of the frame order manipulation.

For the manipulation of order of chance, participants who received problems in an order of a low to high progression of chance were more likely to make risk-seeking decision choices in comparison to individuals who received problems in an order of a high to low progression of chance. The present study differed somewhat from previous studies by manipulating a wider range of probability levels across two different problem contexts and in combination with other situational manipulations. However, the results of the present study are consistent with earlier studies' findings where a low to high probability progression was sometimes associated with a greater shift in risk preference (Levin et al., 1987; Wang, 1996). Levin et al. suggested that a progressive increase in probabilities appears as a greater change to decision makers than does an equivalent decrease in probabilities. Progressive increases in probabilities of outcomes are similarly interpreted in the present study as indicative of increased salience of the outcome in question. That increase in outcome salience may have served to amplify the overall framing effect.

Supplementary analysis. A supplementary logistic analysis was conducted to evaluate whether the variable relationships in the present study were similar to what one might expect given Funder's (2001) person-situation-behavior triad model of personality. The present study was not formulated to specifically test Funder's personality model. An ideal test of the triad model would involve the observation of participant behavior in either a field setting or an assessment center. Nonetheless, the four-way interaction that was identified between the three situational manipulations (i.e., order of problem, order of chance, and order of frame) and the individual difference variable of regulatory focus did significantly predict risk-seeking behavior.

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Funder (2006) stated that each component of the triad personality model could be defined by the aggregation of the other two model elements. The author provided the example of a person's individual characteristics being the sum of all behaviors and situations throughout their lives. For the present study, the results supported Funder's proposition that a participant's observed behavior could similarly be defined in terms of the combination of the situational manipulations and regulatory focus. In the same publication, however, Funder also noted that in regards to personality research, higher order interactions are difficult to both identify and replicate. The relative uniformity or consistency of the four-way interaction in the present study may indicate a stable relationship. Nonetheless, future experimentation is needed to (1) lend strength to the specific person-situation interaction observed here in the prediction of decision-making behavior, (2) examine the degree to which each of the other two aspects of Funder's (2001, 2006) triad are predicted on the basis of their theoretical counterparts, and (3) test the overall fit of Funder's model to data collected in a field setting.

Limitations and Future Research

Limitations. The first limitation of this research involves the potential issue of single-source or common method bias. All data was collected using self-report measures. The individual difference measures for risk style and regulatory focus required participants to indicate their perceptions through ratings, and participant behavior was defined as the decisions individuals made on risky choice items. One could argue that all the findings of the present study could be a result of a systematic effect of common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, a comparative assessment with existing publications suggests that there is no greater risk of common method bias in the present study than in prior research. Since the methodology was similar to earlier framing research, the risk of single source

bias is acknowledged for, but not unique to, the present study. Future field studies are nonetheless recommended in order to address this limitation.

The second limitation of the present study is the nature of the sample. First, all of the participants were undergraduate students. The use of students in research is common, but concerns exist regarding the generalizability of their results to non-student populations. One might argue that student samples are restricted in the range of income, participant age, and experience. However, Kühberger (1998) found in his meta-analysis that while the majority of framing studies had been done with student samples, comparisons of student- to non-student-data did not indicate a difference in the occurrence of framing effects. Despite Kühberger's results, future studies are recommended to replicate the current findings, particularly regarding the association of regulatory focus and situational order manipulations to risky choice decision making.

The second issue regarding the sample concerns the gender makeup of the participants. The overall gender split of the university where the study was conducted is 51% men and 49% women. While the present results suggest a gender difference in risk-seeking behavior in loss-oriented situations, the finding may be due more to the makeup of the present sample ($n = 206$, 61.3% males and $n = 130$, 38.7% females) than a reflection of actual behavioral differences. The first possibility is that the women who chose to participate in the present study did not accurately represent other undergraduate women from this university. The second option is that an insufficient number of women participated in the study to supply enough power to detect a framing effect for females alone, particularly with loss-framed problems. Future studies with a more balanced gender makeup are needed in order to address this possibility.

The third limitation of the study was the relatively low reliability of the regulatory focus measure. The standard threshold for internal consistency is an alpha of .70. In the present study, the Cronbach's alphas of both the promotion focus subscale and the prevention focus subscale were .66. The level of difference between the acceptable reliability threshold and the regulatory focus subscales was only .04, but the difference between the present results and the alphas reported by the authors of the RFSS is of greater concern. Ouschan et al. (2007) obtained even higher levels of reliability for the promotion subscale (α = .75) and prevention subscale (α = .72). However, the RFSS was developed and validated with samples of Australian and Japanese undergraduates. One possible explanation for the divergence in reliability estimates is the cultural differences between the current sample and the validating samples. Future research is needed to assess the suitability of the RFSS for both American and non-student samples. The results of such research will help to determine whether the instrument is appropriate for framing studies.

Conclusion

The results of the present study offer support for Funder's (2001) person-situation-behavior triad model of personality and a continued need for risky choice framing research. The present study found no evidence that risk style contributes to the framing effect identified by Tversky and Kahneman (1981), but additional studies utilizing the DOSPERT are encouraged in order to replicate the present findings. Future research is also called for to validate the use of the RFSS with American samples in general, and specifically in framing studies. Regulatory fit did not take place in the current research, but regulatory focus was significantly associated with risk-taking behavior. Additional studies involving regulatory focus could clarify this relationship.

The impact of all three situational order manipulations on decision making was unexpected in this study, and provides an opportunity for future researchers to expand on Funder's (2001) person-situation-behavior triad model. The identification of a four-way interaction between the situational manipulations and regulatory focus lends further weight to the argument for additional research into Funder's model. Of particular interest is research that includes examinations of the maintenance of initial framing orientations over time, additional manipulations of order of chance within those framing scenarios, and repeated-measure risky choice framing studies that examine both the consistency of an individual's regulatory focus over time and the degree to which regulatory focus can be predicted by the situational characteristics and ensuing decision behavior.

While the present study does not provide any clear answers to the questions that exist in the current body of framing research, the consideration of both individual differences and situational manipulations as concurrent predictors of risky choice decision making does add some needed complexity to the existing literature. The use of two relatively new measures of risk and regulatory focus are noteworthy attempts to extend the study of risky choice framing. By collecting data from a moderately sized sample and across so many decision problems, the present study was also relatively uncommon in the available power to detect any effects. The day-to-day applicability of framing effects to individual decision making and business operations dictates the continued need for efforts in this vein of research.

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Footnotes

[1] For further detail, the reader may refer to Levin, Schneider, and Gaeth's (1998) comprehensive summary of the known types of frames and their methodological differences.

[2] For convenience, the nonsignificant predictors were omitted from the analysis when computing predicted probabilities.

APPENDIX A

The Asian Disease Problem (Tversky & Kahneman, 1981)

Problem: Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

Framed as a Gain (*N* = 152)
Program A: 200 people will be saved (72% chose this option)

Program B: 1/3 probability that 600 people will be saved, 2/3 probability that no people will be saved (28% chose this option)

Framed as a Loss (*N* = 155)
Program A: 400 people will die (22% chose this option)

Program B: 1/3 probability that no people will die, 2/3 probability that 600 people will die (78% chose this option)

APPENDIX B

Demographic Questionnaire

1. What is your gender? (circle one)

    a. Female
    b. Male

2. What ethnic group do you consider yourself to be? (circle one)

    a. African American or Black
    b. Asian American or Pacific Islander
    c. Euro American or White
    d. Latino/a or Hispanic American
    e. Native American or American Indian
    f. Multiracial
    g. Other (please specify): _____

3. How old are you? _____

4. What is your major? _____

5. What is your current grade point average (GPA)? _____

6. What year are you in college?(circle one)

    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior

7. Which of the following best indicates your family's annual income? (circle one)

    a. Less than $20,000 per year
    b. $20,000 to $40,000 per year
    c. $40,000-60,000 per year
    d. $60,000 to 80,000 per year
    e. More than $80,000 per year

8. Would you describe your hometown as rural or urban? (circle one)

    a. Rural
    b. Urban

APPENDIX C

INFORMATION LETTER
for a Research Study entitled
"Options in Decision Making"

You are invited to participate in a research study to assess your perceptions of different decision options. The study is being conducted by Vanessa Johnson, a graduate student under the direction of Professor Daniel Svyantek in the Auburn University Department of Psychology. You were selected as a possible participant because you are an Auburn University student and are age 19 or older.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to complete four (4) surveys. Your total time commitment will be approximately one (1) hour.

Are there any risks or discomforts? No risks or discomforts are associated with participating in this study.

Are there any benefits to yourself or others? No benefits are associated with participating in this study other than the compensation that you will receive. However, others may benefit from this research through improvements in training or coaching for better decision making.

Will you receive compensation for participating? To thank you for your time you will be offered one (1) hour of extra credit.

Are there any costs? No costs are associated with participating in this study.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable.   Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Psychology or the researchers.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by identifying your responses through an id number rather than any personal identifiers. Information collected through your participation may be published in a professional journal or presented at a professional meeting.

If you have questions about this study, *please ask them now or* contact either _____ by phone _____ or email at _____ or _____ at _____ or _____.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO.   YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

_____
Investigator's signature   Date

_____
Print Name

APPENDIX D

Domain-Specific Risk-Perception (Adult) Scale

People often see some risk in situations that contain uncertainty about what the outcome or consequences will be and for which there is the possibility of negative consequences. However, riskiness is a very personal and intuitive notion, and we are interested in **your gut level assessment of how risky** each situation or behavior is.

For each of the following statements, please indicate **how risky you perceive** each situation. Provide a rating from *Not at all Risky* to *Extremely Risky*, using the following scale.

1	2	3	4	5	6	7
Not at all Risky	Slightly Risky	Somewhat Risky	Moderately Risky	Risky	Very Risky	Extremely Risky

1. Admitting that your tastes are different from those of a friend.
2. Going camping in the wilderness.
3. Betting a day's income at the horse races.
4. Investing 10% of your annual income in a moderate growth mutual fund.
5. Drinking heavily at a social function.
6. Taking some questionable deductions on your income tax return.
7. Disagreeing with an authority figure on a major issue.
8. Betting a day's income at a high-stake poker game.
9. Having an affair with a married man/woman.
10. Passing off somebody else's work as your own.
11. Going down a ski run that is beyond your ability.
12. Investing 5% of your annual income in a very speculative stock.
13. Going whitewater rafting at high water in the spring.
14. Betting a day's income on the outcome of a sporting event.
15. Engaging in unprotected sex.
16. Revealing a friend's secret to someone else.
17. Driving a car without wearing a seat belt.
18. Investing 10% of your annual income in a new business venture.
19. Taking a skydiving class.
20. Riding a motorcycle without a helmet.
21. Choosing a career that you truly enjoy over a more secure one.
22. Speaking your mind about an unpopular issue in a meeting at work.
23. Sunbathing without sunscreen.
24. Bungee jumping off a tall bridge.
25. Piloting a small plane.
26. Walking home alone at night in an unsafe area of town.
27. Moving to a city far away from your extended family.
28. Starting a new career in your mid-thirties.
29. Leaving your young children alone at home while running an errand.
30. Not returning a wallet you found that contains $200.

Domain-Specific Risk-Taking (Adult) Scale

For each of the following statements, please indicate the likelihood that you would engage in the described activity or behavior if you were to find yourself in that situation. Provide a rating from *Extremely Unlikely* to *Extremely Likely*, using the following scale.

1	2	3	4	5	6	7
Extremely Unlikely	Moderately Unlikely	Somewhat Unlikely	Not Sure	Somewhat Likely	Moderately Likely	Extremely Likely

1. Admitting that your tastes are different from those of a friend.
2. Going camping in the wilderness.
3. Betting a day's income at the horse races.
4. Investing 10% of your annual income in a moderate growth mutual fund.
5. Drinking heavily at a social function.
6. Taking some questionable deductions on your income tax return.
7. Disagreeing with an authority figure on a major issue.
8. Betting a day's income at a high-stake poker game.
9. Having an affair with a married man/woman.
10. Passing off somebody else's work as your own.
11. Going down a ski run that is beyond your ability.
12. Investing 5% of your annual income in a very speculative stock.
13. Going whitewater rafting at high water in the spring.
14. Betting a day's income on the outcome of a sporting event.
15. Engaging in unprotected sex.
16. Revealing a friend's secret to someone else.
17. Driving a car without wearing a seat belt.
18. Investing 10% of your annual income in a new business venture.
19. Taking a skydiving class.
20. Riding a motorcycle without a helmet.
21. Choosing a career that you truly enjoy over a more secure one.
22. Speaking your mind about an unpopular issue in a meeting at work.
23. Sunbathing without sunscreen.
24. Bungee jumping off a tall bridge.
25. Piloting a small plane.
26. Walking home alone at night in an unsafe area of town.
27. Moving to a city far away from your extended family.
28. Starting a new career in your mid-thirties.
29. Leaving your young children alone at home while running an errand.
30. Not returning a wallet you found that contains $200.

APPENDIX E

Regulatory Focus Strategies Scale (from Ouschan, Boldero, Kashima, Wakimoto, & Kashima, 2007)

There are a number of different ways that we can achieve things important to us or avoid things that we don't want. Rate your agreement or disagreement for each statement using the following scale.

1 Strongly Disagree	2 Disagree	3 Neither Agree nor Disagree	4 Agree	5 Strongly Agree

1. Being cautious is the best way to avoid failure.
2. If you keep worrying about mistakes, you will never achieve anything.
3. To avoid failure, one has to be careful.
4. To achieve something, you need to be optimistic.
5. You have to take risks if you want to avoid failing.
6. To achieve something, it is most important to know all the potential obstacles.
7. To achieve something, one must be cautious.
8. To avoid failure, you have to be enthusiastic.
9. Taking risks is essential for success.
10. If you want to avoid failing, the worst thing you can do is think about making mistakes.
11. To achieve something, one must try all possible ways of achieving it.
12. The worst thing you can do when trying to achieve a goal is to worry about making mistakes.
13. Being cautious is the best policy for success.
14. To avoid failure, it is important to keep in mind all the potential obstacles that might get in your way.

APPENDIX F

Background Information

As you may have learned from recent news reports, extensive planning goes into public health preparation for the flu season. Unfortunately, the planning efforts are not always successful. In populated areas, many outbreaks of influenza or the flu have an initial phase in which about 3,000 people may be infected. Without treatment, public health officials expect that a percentage of these people may die with the flu.

During this phase, a variety of new treatments may be tried. Different flu strains have different levels of virulence. The following problems provide you with some of the difficult scenarios that health officials must consider when preparing for the flu season. For each of the twenty questions, please give your honest opinion as to which program of treatment should be followed.

Social Problems

1. Imagine that the community where you live is preparing for the outbreak of Flu Type A, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Gain Frame
Program A: 1,000 people will be saved.
Program B: 1/6 chance that all 6,000 people will be saved and 5/6 chance that none of the 6,000 people will be saved.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

2. Imagine that the community where you live is preparing for the outbreak of Flu Type A, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Loss Frame
Program A: 5,000 people will die.
Program B: 1/6 chance that none of the 6,000 people will die and 5/6 chance that all 6,000 people will die.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

3. Imagine that the community where you live is preparing for the outbreak of Flu Type B, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Gain Frame
Program A: 2,000 people will be saved.
Program B: 1/3 chance that all 6,000 people will be saved and 2/3 chance that none of the 6,000 people will be saved.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	**2**	**3**	**4**	**5**
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

4. Imagine that the community where you live is preparing for the outbreak of Flu Type B, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Loss Frame
Program A: 4,000 people will die.
Program B: 1/3 chance that none of the 6,000 people will die and 2/3 chance that all 6,000 people will die.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	**2**	**3**	**4**	**5**
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

5. Imagine that the community where you live is preparing for the outbreak of Flu Type C, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Gain Frame
Program A: 3,000 people will be saved.
Program B: 1/2 chance that all 6,000 people will be saved and 1/2 chance that none of the 6,000 people will be saved.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

6. Imagine that the community where you live is preparing for the outbreak of Flu Type C, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Loss Frame
Program A: 3,000 people will die.
Program B: 1/2 chance that none of the 6,000 people will die and 1/2 chance that all 6,000 people will die.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

7. Imagine that the community where you live is preparing for the outbreak of Flu Type D, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Gain Frame
Program A: 4,000 people will be saved.
Program B: 2/3 chance that all 6,000 people will be saved and 1/3 chance that none of the 6,000 people will be saved.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

8. Imagine that the community where you live is preparing for the outbreak of Flu Type D, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Loss Frame
Program A: 2,000 people will die.
Program B: 2/3 chance that none of the 6,000 people will die and 1/3 chance that all 6,000 people will die.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

9. Imagine that the community where you live is preparing for the outbreak of Flu Type E, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Gain Frame
Program A: 5,000 people will be saved.
Program B: 5/6 chance that all 6,000 people will be saved and 1/6 chance that none of the 6,000 people will be saved.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

10. Imagine that the community where you live is preparing for the outbreak of Flu Type E, which is expected to kill 6,000 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Loss Frame
Program A: 1,000 people will die.
Program B: 5/6 chance that none of the 6,000 people will die and 1/6 chance that all 6,000 people will die.

Which of the two programs (A or B) do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

Background Information

The recent downturn in the U.S. economy has been accompanied by even larger swings in the stock market. Many individual investors have had to decide how to deal with negative changes in their investments. The unpredictability of the market (even for professionals) makes it hard for many people to decide how to respond to stock market changes. However, data indicates that sometimes the only thing worse than making the wrong changes to your stock portfolio is not making a change at all. The following problems present you with situations that reflect some common recent investment dilemmas. For each of the following twenty questions, please decide which investment strategy should be followed.

Money Problems

1. Imagine that you have $12,000 invested in Company A stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

   Gain Frame
   Strategy A: $2,000 of your investment is saved
   Strategy B: 1/6 chance that the entire $12,000 investment will be saved, and a 5/6 chance that none of the $12,000 will be saved.

   Which strategy do you choose? _____

   How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

2. Imagine that you have $12,000 invested in Company A stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

   Loss Frame
   Strategy A: $10,000 of your investment is lost
   Strategy B: 1/6 chance that none of the $12,000 investment will be lost, and a 5/6 chance that all $12,000 will be lost.

   Which strategy do you choose? _____

   How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

3. Imagine that you have $12,000 invested in Company B stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

Gain Frame
Strategy A: $4,000 of your investment is saved
Strategy B: 1/3 chance that the entire $12,000 investment will be saved, and a 2/3 chance that none of the $12,000 will be saved.

Which strategy do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

4. Imagine that you have $12,000 invested in Company B stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

Loss Frame
Strategy A: $8,000 of your investment is lost
Strategy B: 1/3 chance that none of the $12,000 investment will be lost, and a 2/3 chance that all $12,000 will be lost.

Which strategy do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

5. Imagine that you have $12,000 invested in Company C stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

Gain Frame
Strategy A: $6,000 of your investment is saved
Strategy B: 1/2 chance that the entire $12,000 investment will be saved, and a 1/2 chance that none of the $12,000 will be saved.

Which strategy do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

6. Imagine that you have $12,000 invested in Company C stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

Loss Frame
Strategy A: $6,000 of your investment is lost
Strategy B: 1/2 chance that none of the $12,000 investment will be lost, and a 1/2 chance that all $12,000 will be lost.

Which strategy do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

7. Imagine that you have $12,000 invested in Company D stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

Gain Frame
Strategy A: $8,000 of your investment is saved
Strategy B: 2/3 chance that the entire $12,000 investment will be saved, and a 1/3 chance that none of the $12,000 will be saved.

Which strategy do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

8. Imagine that you have $12,000 invested in Company D stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

Loss Frame
Strategy A: $4,000 of your investment is lost
Strategy B: 2/3 chance that none of the $12,000 investment will be lost, and a 1/3 chance that all $12,000 will be lost.

Which strategy do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

9. Imagine that you have $12,000 invested in Company E stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

Gain Frame
Strategy A: $10,000 of your investment is saved
Strategy B: 5/6 chance that the entire $12,000 investment will be saved, and a 1/6 chance that none of the $12,000 will be saved.

Which strategy do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

10. Imagine that you have $12,000 invested in Company E stock. A downturn in the economy is occurring. You have two investment strategies that your broker has recommended to preserve your capital (The two strategies have the same associated commissions and fees):

Loss Frame
Strategy A: $2,000 of your investment is lost
Strategy B: 5/6 chance that none of the $12,000 investment will be lost, and a 1/6 chance that all $12,000 will be lost.

Which strategy do you choose? _____

How confident are you in the decision that you made? Please circle your answer from the choices below:

1	2	3	4	5
Not Very Confident	Somewhat Confident	Confident	Moderately Confident	Very Confident

APPENDIX G

Table 1

Distribution of College Majors

Major	*n*	%
Business	195	58.0
Building Science	45	13.4
Public Relations	15	4.5
Psychology	13	3.9
Engineering	12	3.6
Communications	8	2.4
Hotel and Restaurant Management	7	2.1
Apparel Merchandising	6	1.8
Spanish and International Trade	5	1.5
Computer Science	4	1.2
Health Promotion	4	1.2
Design	3	.9
Kinesiology	3	.9
Political Science	3	.9
Aviation Management	2	.6
Biomedical Sciences	2	.6
Professional Flight Management	2	.6
English	1	.3
Fine Art	1	.3
Healthcare Administration	1	.3
History	1	.3
Nursing	1	.3
Nutrition / HRMT	1	.3
Undeclared	1	.3

Table 2

Means, Standard Deviations, Reliability Analyses, and Correlations among Subscales of

DOSPERT Scale and RFSS

Instrument	*M*	*SD*	DOS-RP	DOS-RT	RF-Prom	RF-Prev
DOSPERT Risk Perception (DOS-RP)	123.670	20.069	.861	-.618**	.062	.127*
DOSPERT Risk Taking (DOS-RT)	110.964	22.217	-.618**	.842	.115*	-.078
RFSS Promotion (RF-Prom)	3.518	.551	.062	.115*	.656	-.067
RFSS Prevention (RF-Prev)	3.194	.564	.127*	-.078	-.067	.662

Table 3

Descriptive Statistics for DOSPERT Subscale Domains

	M	*SD*
Risk Perception		
1. Ethical	28.464	5.394
2. Financial	25.444	5.858
3. Health/Safety	27.807	6.245
4. Recreational	23.985	6.598
5. Social	17.970	4.678
Risk Taking		
1. Ethical	14.821	5.691
2. Financial	19.932	6.651
3. Health/Safety	21.958	7.482
4. Recreational	24.720	8.685
5. Social	29.533	4.805

Table 4

Logistic Regression Statistics for Hypotheses 3a and 3b

	Chi-Squares	β
Positive frame		
Omnibus test	X^2 (2, $N = 336$) = 22.36, $p < .001$	
Hypothesis 3a	X^2 (1, N = 336) = 11.90, $p = .001$	1.28
Hypothesis 3b	X^2 (1, N = 336) = 8.02, $p = .005$	1.06
Negative frame		
Omnibus test	X^2 (2, N = 336) = 22.68, $p < .001$	
Hypothesis 3a	X^2 (1, N = 336) = 6.98, $p = .008$	.77
Hypothesis 3b	Non-significant	N/A

Table 5

Predicted Probabilities of Risk-Seeking Behavior by Regulatory Focus and Problem Frame

	Mean Predicted Values	Predicted Probabilities	95% Confidence Interval
Promotion Focus Positively Framed Problems	4.4095	.4410	.4198 to .4623
Promotion Focus Negatively Framed Problems	5.9048	.5905	.5693 to .6113
Prevention Focus Positively Framed Problems	3.8678	.3868	.3597 to .4146
Prevention Focus Negatively Framed Problems	5.1570	.5157	.4875 to .5438

Table 6

Logistic Regression Statistics for Hypothesis 4

	Chi-Squares	β
Omnibus test	X^2 (6, N = 336) = 115.171, p < .001	
Order of problem	X^2 (1, N = 336) = 6.87, p = .009	.13
Order of chance	X^2 (1, N = 336) = 7.55, p = .006	- .14
Order of frame	X^2 (1, N = 336) = 30.84, p < .001	-.27

Table 7

Predicted Probabilities of Risk-Seeking Behavior across Situational Order Manipulations

Survey Version	Mean Predicted Values	Predicted Probabilities	95% Confidence Interval
Version 1 (Social First, High to Low Chance, Gain Frame First)	9.0700	.4535	.4298 to .4774
Version 2 (Social First, Low to High Chance, Gain Frame First)	9.7201	.4860	.4621 to .5100
Version 3 (Social First, High to Low Chance, Loss Frame First)	10.3875	.5194	.4954 to .5432
Version 4 (Social First, Low to High Chance, Loss Frame First)	11.0366	.5518	.5280 to .5755
Version 5 (Financial First, High to Low Chance, Gain Frame First)	8.5330	.4267	.4033 to .4504
Version 6 (Financial First, Low to High Chance, Gain Frame First)	9.1769	.4588	.4351 to .4827
Version 7 (Financial First, High to Low Chance, Loss Frame First)	9.8427	.4921	.4682 to .5161
Version 8 (Financial First, Low to High Chance, Loss Frame First)	10.4950	.5247	.5008 to .5486

Table 8

Supplementary Analysis: Predicted Probabilities of Risk-Seeking Behavior with the Four-Way Interaction of Problem Order, Chance Order, Frame Order, and Regulatory Focus

	Chi-Squares	β	Mean Predicted Values	Predicted Probabilities	95% Confidence Interval
Social before Financial High to Low Chance Order Gain before Loss Prevention Focus	X^2 (1, N = 336) = 32.001, $p < .001$	-.858	7.1333	.3567	.3045 to .4125
Social before Financial Low to High Chance Order Gain before Loss Prevention Focus	X^2 (1, N = 336) = 21.918, $p < .001$	-.643	8.1500	.4075	.3604 to .4564
Financial before Social High to Low Chance Order Gain before Loss Prevention Focus	X^2 (1, N = 336) = 23.519, $p < .001$	-.713	7.8125	.3906	.3387 to .4452
Financial before Social High to Low Chance Order Gain before Loss Promotion Focus	X^2 (1, N = 336) = 19.905, $p < .001$	-.571	8.500	.4250	.3832 to .4679

Table 8 (continued)

Supplementary Analysis: Predicted Probabilities of Risk-Seeking Behavior with the Four-Way Interaction of Problem Order, Chance Order, Frame Order, and Regulatory Focus

	Chi-Squares	β	Mean Predicted Values	Predicted Probabilities	95% Confidence Interval
Financial before Social High to Low Chance Order Loss before Gain Prevention Focus	X^2 (1, N = 336) = 7.379, $p = .007$	-.402	9.333	.4667	.4109 to .5233
Financial before Social High to Low Chance Order Loss before Gain Promotion Focus	X^2 (1, N = 336) = 4.974, $p = .026$	-.284	9.9231	.4962	.4533 to .5391
Financial before Social Low to High Chance Order Gain before Loss Prevention Focus	X^2 (1, N = 336) = 4.254, $p = .039$	-.348	9.600	.4800	.4116 to .5492
Financial before Social Low to High Chance Order Gain before Loss Promotion Focus	X^2 (1, N = 336) = 7.423, $p = .006$	-.331	9.6875	.4844	.4458 to .5231

Table 8 (continued)

Supplementary Analysis: Predicted Probabilities of Risk-Seeking Behavior with the Four-Way Interaction of Problem Order, Chance

Order, Frame Order, and Regulatory Focus

|	Chi-Squares	β	Mean Predicted Values	Predicted Probabilities	95% Confidence Interval
Financial before Social Low to High Chance Order Loss before Gain Prevention Focus	X^2 (1, N = 336) = 7.771, p = .005	-.391	9.3889	.4694	.4184 to .5211

Table 9

Supplementary Analysis: Marginal Means of Risk-Seeking Behavior for the Four-Way Interaction of Problem Order,

Chance Order, Frame Order, and Regulatory Focus

Order of Problem Topic	Order of Chance	Order of Frame	Regulatory Focus	*M*
Social before Financial	High to Low Chance	Gain before Loss	Prevention Focus	.36
			Promotion Focus	.51
		Loss before Gain	Prevention Focus	.52
			Promotion Focus	.56
	Low to High Chance	Gain before Loss	Prevention Focus	.41
			Promotion Focus	.55
		Loss before Gain	Prevention Focus	.56
			Promotion Focus	.53

Table 9 (continued)

Supplementary Analysis: Marginal Means of Risk-Seeking Behavior for the Four-Way Interaction of Problem Order,

Chance Order, Frame Order, and Regulatory Focus

Order of Problem Topic	Order of Chance	Order of Frame	Regulatory Focus	*M*
Financial before Social	High to Low Chance	Gain before Loss	Prevention Focus	.39
			Promotion Focus	.43
		Loss before Gain	Prevention Focus	.47
			Promotion Focus	.50
	Low to High Chance	Gain before Loss	Prevention Focus	.48
			Promotion Focus	.48
		Loss before Gain	Prevention Focus	.47
			Promotion Focus	.57

Figure 1

Marginal Means Plots of Risk-Seeking Behavior for the Four-Way Interaction of Problem Order,

Chance Order, Frame Order, and Regulatory Focus

**Panel A: Prevention Focus,
Social-Primed Decision Behavior**
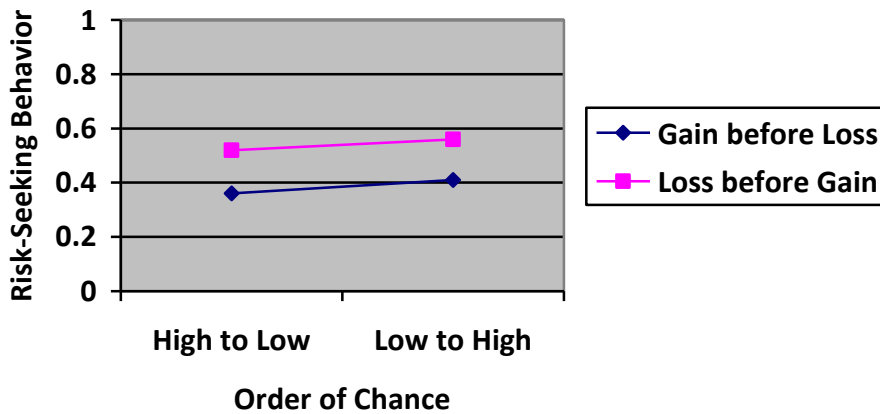
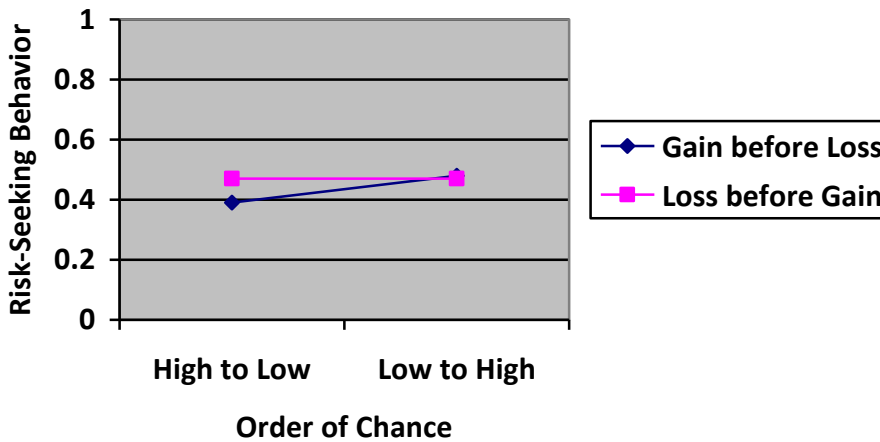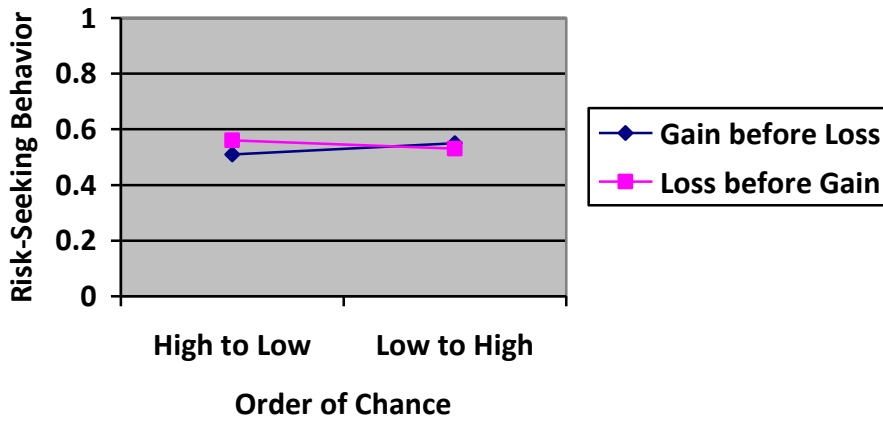**Panel B: Prevention Focus,
Financial-Primed Decision Behavior**

Figure 1 (continued)

Marginal Means Plots of Risk-Seeking Behavior for the Four-Way Interaction of Problem Order,

Chance Order, Frame Order, and Regulatory Focus

Panel C: Promotion Focus, Social-Primed Decision Behavior

Panel D: Promotion Focus, Financial-Primed Decision Behavior