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Gender Jeopardy in financial risk taking

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This article examines the joint effect of issue capability and gender on risk taking. Across three studies, the authors show that the effect of issue capability is moderated by gender, depending on the compatibility between the goal orientation of the decision maker and the nature of the decision task. For decisions that are mainly driven by achievement of gains (e.g., investment decisions), men's risk-taking propensity is more influenced by their levels of issue capability than women's because the nature of the decision task is consistent with men's agentic orientation focused on the self. Conversely, for decisions that are mainly driven by avoidance of losses (e.g., insurance decisions), women's risk taking is more sensitive to issue capability than men's because the nature of such decisions is consistent with women's communion orientation. The authors analyze the betting data from the Daily Double in the *Jeopardy!* game show (Study 1). The results show that gender moderates the effect of issue capability on the actual betting behavior in *Jeopardy!* In Study 2, the authors test the underlying mechanism through mediation analyses of the focus of attention. In Study 3, the authors manipulate the task nature and demonstrate that men's risk taking is more sensitive to issue capability in investment decisions, whereas women's risk taking is more sensitive to issue capability in insurance decisions.

Keywords: risk taking, financial decisions, gender, issue capability, goal orientation, agency–communion theory

Gender Jeopardy in Financial Risk Taking

Financial decisions are an important area in consumer research (e.g., Johnson, Tellis, and MacInnis 2005; Mandel 2003; Morrin et al. 2002; Zhou and Pham 2004) because they involve high stakes and consumers must make risky decisions with lifelong consequences. Such decisions are relevant for not only male but also female consumers (Orman 2007). Although the finance literature shows that women are relatively more risk averse than men in investment decisions (e.g., Jianakoplos and Bernasek 1998), we argue that gender effects in risk taking are largely contingent. Our central hypothesis is that risk taking between men and women systematically depends on their differential sensitivity to issue capability.

Issue capability is defined as "the extent to which decision makers perceive that they have the resources or skills to resolve an issue" (Mittal, Ross, and Tsiros 2002, p. 455). Empirical studies show that issue capability is positively associated with risk taking; specifically, people with high issue capability tend to take more risks than those with low issue capability (Krueger and Dickson 1994; Mittal, Ross, and Tsiros 2002; Whyte, Saks, and Hook 1997). On the basis of agency–communion theory (Bakan 1966), we postulate that men and women are differentially sensitive to issue capability. Specifically, an agentic orientation among men makes them sensitive to achievement of gains (e.g., investment decisions). In contrast, a communion orientation among women makes them sensitive to avoidance of losses (e.g., insurance decisions). Next, we review the related literature and present our hypotheses, which we then test in three studies. To improve external validity (Winer 1999), Study 1 tests our hypotheses by examining contestants' betting behavior in the television show *Jeopardy!* Studies 2 and 3 are experiments designed to enhance the internal validity and to test the underlying processes.

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ISSUE CAPABILITY, GENDER, AND RISK TAKING

Issue Capability and Risk Taking

Several studies have demonstrated that people with high capability take more risk and commit more resources to failing investments than those with low capability (Krueger and Dickson 1994; Whyte, Saks, and Hook 1997). Mittal, Ross, and Tsiros (2002) show that decision makers with high issue capability tend to put more effort into issues described as threats whereas less capable people put more effort into issues described as opportunities. They argue that this effect is driven by focus of attention (Lopes 1987; March and Shapira 1992). Specifically, Mittal, Ross, and Tsiros show that decision makers are more likely to focus on the upside potential of a situation under high capability than under low capability.

Gender and Risk Taking

It is well documented that men and women respond differently to risk. In a meta-analysis of 150 studies, Byrnes, Miller, and Schafer (1999) find that, in general, men are more willing to take risks than women. In investment decisions, Jianakoplos and Bernasek (1998) report that single women allocate less wealth to risky assets than single men of equal economic status (40% versus 46%). Similarly, a survey of health and retirement by Barsky and colleagues (1997) finds that women have lower risk tolerance than men. Powell and Ansic (1997) demonstrate that women prefer broader insurance coverage than men and avoid the currency market to prevent the potential loss from the fluctuation of exchange rate. More recently, Barber and Odean (2001) demonstrate that men are more active in trading common stock than women because they are more confident. Niederle and Vesterlund (2007) report that women tend to shy away from competition. However, note that all these studies document a main effect of gender on risk taking. In contrast to these studies, we posit a moderating role of gender on the relationship between issue capability and risk taking.

The Moderating Role of Gender on Issue Capability

The moderating effect of gender is supported by the agency–communion theory in gender differences (Bakan 1966). According to this theory, men are influenced by agentic goals that are primarily focused on the self, whereas women are influenced by communion goals that are primarily focused on social relationships and the coexistence of self and other. Bakan (1966, pp. 14–15) summarizes this distinction as follows:

> I have adopted the terms "agency" and "communion" to characterize two fundamental modalities in the existence of living forms, agency for the existence of an organism as an individual, and communion for the participation of the individual in some larger organism of which the individual is a part. Agency manifests itself in self-protection, self-assertion, and self-expansion; communion manifests itself in the sense of being at one with other organisms. Agency manifests itself in the formation of separations; communion in the lack of separations. Agency manifests itself in isolation, alienation, and aloneness; communion in contact, openness, and union. Agency manifests itself in the urge to master; communion in noncontractual cooperation....

In support of agency–communion theory, Carlson (1971) finds that men tend to express and represent the self, others, the physical environment, and the future in individualistic, objective, and external terms. In contrast, women tend to express these entities in interpersonal, subjective, and internal terms. In addition, Carlson finds that when reporting their emotional experiences, men predominantly follow self-focused agentic themes, such as achievement and aloneness, whereas women follow communal themes, such as social acceptance and dependence. Broverman and colleagues (1972) report that both college students and mental health professionals perceive such gender characteristics as favorable traits. In both family and work contexts, men tend to have higher self-ratings on agency-related characteristics, such as giftedness and power, and women have higher self-ratings on communion-related characteristics, such as likeability and morality (Stake 1992). Other researchers have linked Bem's (1974) sex role inventory and the personal attributes questionnaire (Spence, Helmreich, and Stapp 1974) to the agency–communion distinction and have found that men score higher on agentic characteristics, such as self-assertion, whereas women score higher on communal characteristics, such as interpersonal qualities (Helgeson 1994). These differences may translate into differential information-processing tendencies. For example, consistent with agency–communion theory, Meyers-Levy (1988) demonstrates that men rate a mouthwash more favorably when it features a self-oriented message ("the product kills germs and bacteria that cause decay, and it gently stimulates the gums") than when it features an other-oriented message ("the product provides pleasing fresh breath, and it prevents common staining of the teeth") (Meyers-Levy 1988, p. 524).

This gender difference is consistent with predictions from self-construal theory (Cross and Madson 1997). Specifically, people with a salient independent self are sensitive to gains and achievement, whereas people with a salient interdependent self are sensitive to losses and mistakes (Aaker and Lee 2001). Gain achievement is compatible with men's agentic orientation and independent self-view because gains and success enhance a person's performance and standing. Conversely, loss avoidance is compatible with women's communion orientation and interdependent self-view because losses and mistakes reflect failure in fulfilling a person's responsibilities and due diligence, which may affect the group's welfare and result in blame and alienation. Aaker and Lee (2001) demonstrate that under an independent prime, participants evaluated the Web site for Welch's Grape Juice more positively when it focused on maximization of gains (e.g., energy creation). Conversely, under an interdependent prime, the evaluation was more positive when the Web site highlighted loss prevention (e.g., disease prevention). Our key argument is that men primarily focus on the achievement of gains because of their agentic orientation and independent self-view, whereas women primarily focus on the avoidance of losses because of their communion orientation and interdependent self-view.

The difference in goal orientation influences how men and women approach risk because different natures of the decision task may invoke a focus on either gains or losses (Zhou and Pham 2004). For many tasks, such as investment

decisions, the overarching purpose is to make money. People are willing to take risk because of the prospect of gains, and seeking gains is more compatible with men's agentic orientation than with women's communion orientation. For example, Barber and Odean (2001) find that men are more active in trading common stock than women.

We argue that the compatibility between goal orientation and decision task increases sensitivity to issue capability because of increased engagement and the experience of "feeling right" (Avnet and Higgins 2006). Cesario, Grant, and Higgins (2004) examine the goal–task compatibility in terms of regulatory fit (Higgins 2000). They demonstrate that fit increases the persuasiveness of an after-school program proposal when participants think positively of the proposal. Conversely, when participants have unfavorable thoughts, the fit between goal orientation and task actually reduces the persuasiveness of the proposal. Similarly, Idson, Liberman, and Higgins (2004) find that the compatibility between goal orientation and choice characteristics leads to more extreme responses—that is, better feelings when promotion focus is coupled with a positive outcome but worse feelings when prevention focus is matched with a negative outcome. Following the same logic, we argue that increasing the compatibility between agency and communion goals and decision task increases people's sensitivity in decision making. This is particularly true of their sensitivity to issue capability because issue capability is instrumental in goal achievement (Krueger and Dickson 1994). For tasks that are driven by the achievement of gains (e.g., investment decisions), we argue that men will be sensitive to their level of issue capability when making risky decisions because their agentic orientation is compatible with maximization of gains. In other words, the compatibility between goal orientation and task nature increases the relevance of issue capability for men in their goal attainment. Conversely, women will be less sensitive to their issue capability in risky decisions that involve achievement of gains because their communion orientation does not focus on gain maximization. Given the low compatibility between goal orientation and task nature, issue capability in such a decision task should be less relevant for women in achieving their communion goals. More formally,

H_1: Gender moderates the effect of issue capability on risk taking in decisions that are driven by achievement of gains. Specifically, higher issue capability increases risk-taking tendency in men but not in women.

The Mediating Role of Focus of Attention

Underlying the predicted phenomenon in H_1 is the compatibility between men's agentic orientation and the task nature in maximization of gains. That is, because of their agentic goal orientation, men should be sensitive to the upside potential of a situation. To the extent that issue capability and upside focus are positively related (Mittal, Ross, and Tsiros 2002), we argue that men tend to focus more on the upside potential under high capability than under low capability. In contrast, women should be relatively less sensitive to upside potential because this is not consistent with their communion orientation. More formally,

H_2: Gender moderates the impact of issue capability on the decision maker's focus of attention in decisions that involve achievement of gains. Specifically, high issue capability increases the upside focus among men but not among women.

Conversely, a focus on the downside potential is inconsistent with the nature of decisions that are driven by gains (e.g., investment decisions). Thus, neither men's nor women's downside focus should be sensitive to issue capability because of the low compatibility between downside focus and the nature of the task in maximization of gains. A decision maker's focus of attention has been identified as a key mediator underlying the effect of issue capability on risk-taking behavior (Lopes 1987; March and Shapira 1992). Similarly, we argue that the joint effect of gender and issue capability on risk taking will be mediated by a focus on upside potential because of the compatibility between agentic orientation and the task nature of maximizing gains.

H_3: A focus on upside potential mediates the joint effect of issue capability and gender on risk taking in decisions that involve achievement of gains.

Next, we report a series of studies that test the moderating effect of gender and issue capability on risk taking. In Study 1, we examine contestants' actual betting behavior in the popular *Jeopardy!* game show. We complement this study with two experiments. In Study 2, we test the psychological mechanisms through mediation analyses. In Study 3, we test the moderating role of gender and issue capability in two different tasks—decisions that are driven by either maximization of gains (investment decisions) or minimization of losses (insurance decisions).

STUDY 1

We designed this study to test H_1 using data from the television show *Jeopardy!* It offers a unique opportunity to investigate our central research question by examining the contestants' betting behavior. The task is incentive compatible because the winner of each game receives his or her total score as a cash prize. Metrick (1995) uses the last round of *Jeopardy!* (i.e., Final Jeopardy) to study strategic betting behavior (i.e., gaming). As we explain subsequently, our study is different. Rather than examining the last round, we examine betting on the Daily Double in earlier rounds.

Jeopardy! *Game Show*

Each game has three contestants who compete in three rounds. The detailed rules are outlined in Trebek and Barsocchini (1990). The game format is similar for the first and second round; each round contains 30 questions that are organized in six general categories. Each question carries a dollar value between \$200 (\$400) and \$1,000 (\$2,000) in the first (second) round. A contestant must ring in to answer the question.[1] In addition, the contestants face risky decisions in three Daily Doubles, one embedded in the first round and two in the second round. The contestant who lands on the Daily Double question is given the opportunity to bet all or any part of the total winnings at his or her dis-

[1]The terminology is slightly different in the actual *Jeopardy!* show. The contestants are given statements (answers) on the board, and they must come up with the correct questions. As in the work of Metrick (1995), we adopt the conventional definitions of question and answer in this article to prevent confusion.

posal. The contestant has the opportunity to bet up to $1,000 ($2,000) in the first (second) round if he or she has not yet accumulated this amount. At the end of the second round, a contestant who has a negative score is automatically eliminated. The rest enter the last round, Final Jeopardy, which contains one question. Before they see the question, contestants are given the question category and asked to enter a bet (up to their total score). They are then given the question, which must be answered within 30 seconds. At the end of the game, the winner receives a cash prize equivalent to his or her total score. In addition, he or she gets the opportunity to compete again in the next game.

Method

Data. We assembled a data set consisting of 153 *Jeopardy!* game shows recorded from NBC between May 2003 and December 2003. We included only the shows with adult contestants (regular adult contestants and college students), because junior contestants (i.e., participants in kids or teen tournaments) typically do not make the type of risky investment decisions that are the focus of this article. Moreover, prior literature indicates that gender differences may depend on social and cultural interaction (Bussey and Bandura 1999), and evidence supports the notion that there may be few gender differences at an early age, possibly due to the lack of cultural experience (Slovic 1966).

In *Jeopardy!* contestants face two kinds of risky decisions: the bets in the three Daily Doubles and the bets in Final Jeopardy. We focus on the first and second Daily Doubles for two reasons. First, in Final Jeopardy, contestants are aware of their relative positions and can calculate the optimal wager to win the game. This introduces end-gaming behavior, which may obscure the effect of issue capability. Similarly, gaming behavior may also influence the bets in the last Daily Double because the game is close to the end.[2] In contrast, the contestants in the first two Daily Doubles do not tend to engage in such gaming behaviors, because the total score and the relative position of each contestant are far from being fixed. The primary objective is to accumulate as much money as possible; this is the case for all contestants. Therefore, the first and second Daily Doubles offer a better test of capability-related hypotheses.

Second, the lone question in Final Jeopardy comes from a brand-new category that is not included in the first two rounds. Thus, it is difficult to estimate the contestant's issue capability in Final Jeopardy on the basis of his or her earlier experience in the game. In contrast, there are five questions in the category that contains the Daily Double. As we discuss subsequently, it is possible to estimate the contestant's issue capability in the Daily Double on the basis of how well he or she answers the other questions in the same category. In summary, we analyzed the bets on the first two Daily Doubles because (1) they offer a cleaner test of issue capability that is free from end-gaming behavior and (2) it is possible to estimate issue capability in the question category.

Dependent variable. We used the amount of bet as a percentage of the original question value as the dependent variable (Bet%). For example, consider a question with the original value of $600. A contestant would demonstrate risk-seeking behavior if he or she bets $800 (Bet% = 133%). Alternatively, for a different Daily Double with an original value of $1,000, the contestant would be rather risk averse by betting only $800 (Bet% = 80%). This variable captures the risk-taking behavior of the contestants in the Daily Double. The Bet% variable is suitable because a contestant's risk-taking behavior may depend on the original question value.

Independent variables. We recorded the gender of each contestant (male = 1, and female = –1). In the data set, 66% of contestants who landed on the first and second Daily Doubles were men. This is not uncommon on the show; Trebek and Barsocchini (1990) note that more men apply for the show than women. Among applicants, approximately 70% are males and 30% are females. Importantly, men and women have the same percentage in passing the contestant quiz. Therefore, men and women are equally knowledgeable. The producers test more women to address the gender gap among applicants, so the gender ratio in the actual show is approximately 60% men and 40% women (Trebek and Barsocchini 1990).

On the basis of the difference in the number of applicants, it may be concluded that, in general, women are less risk seeking than men and therefore shy away from such television contests or that the women who do get selected for the show may be more risk taking than the average female in the general public. In other words, the women who appear in *Jeopardy!* may be more like men in terms of risk taking than typical women. However, this makes our hypothesis testing more conservative.

We operationalized issue capability (Cap) as the percentage of correct answers in the category before the contestant lands on the Daily Double. If the contestant answers more questions correctly in the Daily Double category, he or she should have higher perceived issue capability when making the bet. Recall that issue capability is defined as a person's ability to deal with tasks in a well-defined domain rather than people's general knowledge or overall intelligence. Thus, by definition, issue capability is task specific. *Jeopardy!* incorporates a wide variety of categories. A contestant may be good at the category "State Capitals" but less knowledgeable about "Opera." We use this measure because it reflects a contestant's ability in the category in which he or she enters a bet.

Control variables. We also include two control variables: cumulative winnings (Winnings) and position of the Daily Double question (DDPos). The first variable refers to the dollar amount the contestant accumulates before he or she bets on the Daily Double. In the first (second) Daily Double, the contestant may bet up to $1,000 ($2,000) if he or she has not yet earned this amount. This game rule makes the betting behavior less dependent on how much money a contestant has at the moment of the bet. However, the cumulative winnings may still influence how much money the contestant bets on the first two Daily Doubles. Therefore, it is prudent to control for the size of cumulative winnings in the model to have a cleaner test of the effects of gender and issue capability on risk taking. In terms of the second control variable, there are five questions in each category, and the position of the Daily Double question may affect the betting behavior. That is, contestants may

[2]In the data set, 85% of the third Daily Doubles fell into the last quarter of the game.

take more risk on easier questions that are located toward the top of the board. We specify and estimate the following regression model:

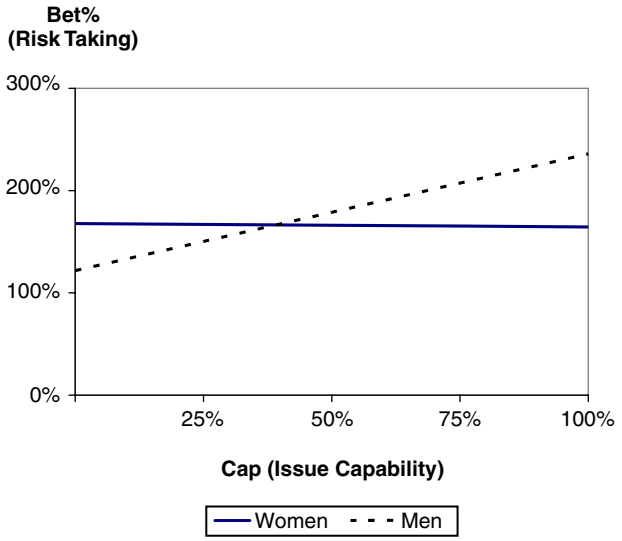
$$(1)\quad \text{Bet\%} = \beta_0 + \beta_1\text{Gender} + \beta_2\text{Cap} + \beta_3\text{Gender} \times \text{Cap} + \beta_4\text{Winnings} + \beta_5\text{DDPos} + \varepsilon.$$

Results

There were a total of 305 bets in the data set.[3] We subjected the main dependent variable, Bet%, to our regression model as specified in Equation 1 (R^2 = .26). Table 1 summarizes the results. First, the intercept was significant in the model (b = 3.31, F(1, 299) = 85.75, $p < .0001$), which indicates that, on average, contestants bet 331% of the original value of the question. The betting on the Daily Doubles was apparently driven by contestants' desire to increase their winnings beyond what they would normally get from the question. Thus, the nature of the Daily Doubles is mainly driven by achievement of gains.[4]

Second, the main effect of gender was not significant (b = –.23, F(1, 299) = 2.02, n.s.). Overall, male and female contestants made similar bets on the Daily Doubles. Third, issue capability had a significant, positive effect on risk-taking behavior (b = .55, F(1, 299) = 4.22, $p < .05$). Contestants with higher issue capability took more risks than those with lower issue capability. Most important, in support of H_1, there was a significant interaction between gender and issue capability (F(1, 299) = 5.09, $p < .05$). To explicate this interaction, we tested the slope of Cap for men and women separately (Figure 1). For male contestants, this slope was positive (b = 1.14) and significant (F(1, 299) = 15.60, $p < .0001$). Therefore, men's risk-taking behaviors on *Jeopardy!* were influenced by their levels of issue capability such that they were more risk seeking with high issue capability than with low issue capability. In contrast, the slope of Cap was not significant for female contestants (b = –.03, F < 1).

Figure 1
STUDY 1: THE INTERACTIVE EFFECT OF ISSUE CAPABILITY AND GENDER ON RISK TAKING IN *JEOPARDY!*



The two control variables were also significant. There was a significant effect of winnings with a positive slope (b = .00004, F(1, 299) = 5.66, $p < .05$). That is, contestants tended to take more risks when they had more money at their disposal. Conversely, position of the Daily Double question had a negative effect on risk-taking behavior (b = –.56, F(1, 299) = 56.08, $p < .0001$). Because this control variable captured the position of the Daily Double question in the category, this indicated that contestants tended to take more risks in easier Daily Double questions.

Issue capability refers to a person's perception of his or her capability to deal with the issue at hand. However, it could be argued that our measure of issue capability (Cap) captures objective capability rather than perceived capability. To address this issue, we constructed an alternative measure (Cap2) based on percentage of attempts in the category regardless of whether the answer is right or wrong.

[3]The first Daily Double was missing in one game because it was among unanswered questions left on the board.

[4]We conducted a survey with 38 respondents, asking them to allocate 100 points between the following two concerns if they were betting on the Daily Double: (1) gaining money and (2) avoiding losing money. We adapted this measure from the work of Zhou and Pham (2004). The results show that respondents focused more on gaining money (M = 59.61) than on avoiding losing money (M = 40.39; t = 2.91, $p < .01$). This suggests that the nature of Daily Doubles is consistent with the focus on gains.

Table 1
STUDY 1: PARAMETER ESTIMATES IN PREDICTING BET PERCENTAGE IN *JEOPARDY!*

	Model 1		*Model 2*	
Intercept	3.31**	(.36)	3.47**	(.35)
Gender (male = 1; female = –1)	–.23	(.16)	–.21	(.17)
Issue capability (Cap)	.55*	(.27)	—	—
Issue capability (Cap2)	—	—	.41	(.27)
Gender × issue capability	.59*	(.26)	.52*	(.26)
Winnings	.00004*	(.00002)	.00004*	(.00002)
DDPos	–.56**	(.07)	–.58**	(.07)
R^2	.26		.24	

*$p < .05$.
**$p < .01$.
Notes: Standard errors are in parentheses. In Model 1, we operationalized issue capability (Cap) as the percentage of correct answers in the category. In Model 2, we operationalized issue capability (Cap2) as the percentage of attempts in the category. Winnings = the dollar amount accumulated before betting on the Daily Double. DDPos = the position of the Daily Double question in its category.

Because contestants tend to ring in on questions for which they have high confidence, such attempts should be closely linked to perceived capability. Using Cap2 as the measure of issue capability, we reestimated the regression model specified in Equation 1. As Table 1 summarizes, the results are consistent across the two measures of issue capability.[5]

Discussion

Data from *Jeopardy!* demonstrate that compared with female contestants, male contestants' betting behavior is sensitive to their level of issue capability, given the high compatibility between the nature of decision task (the Daily Doubles) and their agentic orientation. This study is based on a naturalistic setting, which bolsters the generalizability of the findings. Nevertheless, the psychological mechanism underlying the observed results requires further elaboration, which we undertake in the next two studies.

STUDY 2

Method

Design and procedure. One hundred thirty-eight business students (82 females and 56 males) participated in return for partial credit.[6] The study followed a 2 (gender) × 2 (issue capability: high versus low) between-subjects factorial design. Participants were asked to imagine that they were planning to attend graduate school. Over the past few years, they had saved $20,000 to cover the tuition costs. They were considering various investment alternatives for their savings. We manipulated issue capability by describing the participants' history in financial investment. In the high-capability (low-capability) condition, participants were told that their track record in making risky investments was good (poor) and that they had outperformed (underperformed) the stock market in the past. Overall, their annual return on their previous investments had been 11% (3%), compared with the 7% average market return.

Measures. Participants were presented with two investment alternatives. As one option, they saw the following stock fund:

- 45% chance of generating a return of 16%,
- 10% chance of generating the average stock market return of 7%, and
- 45% chance of incurring a loss of 2% (i.e., a return of –2%).

The other option was a bank account that offered a guaranteed return of 4%. We evaluated risk-taking tendency as preference between these two investment alternatives. This method of measuring risk taking is consistent with prior literature (Mittal, Ross, and Tsiros 2002). We reasoned that more risk-seeking participants would prefer the riskier stock fund because it offered the potential of generating a higher return but had a possibility of a loss. In contrast, a modest return is guaranteed for the bank account. We measured the dependent variable, risk-taking tendency, as the likelihood that participants would invest in the stock fund on an 11-point scale (0 = "I would definitely not invest in the stock fund," and 10 = "I would definitely invest in the stock fund"). Next, participants reported their thoughts during the decision process on a separate page. Thus, coders were unaware of the gender of each participant and were blind to both the actual decision scenarios and the risk-taking-tendency responses. We used these cognitive response data to investigate the psychological processes underlying risk taking.

We also included the manipulation checks for issue capability and measures of risk perception on each investment alternative. We asked participants to rate their past investment performance compared with the average market return from –10 ("below average") to +10 ("above average") and their investment capability from –10 ("very low") to +10 ("very high"). We combined these two items to serve as the manipulation check of issue capability ($r = .66$, $p < .0001$). Regarding the risk inherent in the investment options, we also collected risk perception measures on two separate scales, one for each investment alternative (–10 = "not at all risky," and +10 = "very risky"). We collected the demographic variables at the end of the study.

Results

Manipulation checks. We submitted the manipulation check of issue capability to a 2 (issue capability: high versus low) × 2 (gender) analysis of variance (ANOVA). There was a significant main effect of issue capability ($F(1, 132) = 29.85$, $p < .0001$).[7] As we expected, participants in the high-capability condition rated their investment capability significantly higher than those in the low-capability condition ($M = 3.28$ versus $M = .05$). Neither the main effect of gender nor the gender × capability interaction was significant. Thus, the manipulation of issue capability was successful and not confounded with gender. Next, we examined participants' risk perceptions. Because each participant reported the risk perception of both investment options, we conducted a within-subject t-test to measure the relative riskiness of each option. The results showed that the stock fund was perceived as riskier than the bank account ($M = 1.64$ versus $M = –8.06$; $t = 22.39$, $p < .0001$).[8] Thus, the riskiness of the stock fund and the bank account is consistent with our expectations, and our measure of risk-taking tendency is appropriate.

Risk-taking tendency (H_1). We subjected the measure of risk-taking tendency to a 2 (issue capability) × 2 (gender) ANOVA. The overall model was statistically significant ($F(3, 134) = 3.55$, $p < .05$). First, the main effect of gender was not significant ($M_{females} = 6.06$ versus $M_{males} = 6.59$; $F(1, 134) = 1.12$, n.s.). Second, consistent with previous research (e.g., Krueger and Dickson 1994), there was a statistically significant main effect of issue capability. Participants in the high-capability condition demonstrated a

[5]As might be expected, the two issue capability measures were highly correlated ($r = .94$, $p < .0001$).

[6]Because we predict a stronger effect for men than for women, we intentionally oversampled women to increase our ability to detect an effect for them.

[7]Throughout the article, degrees of freedom may vary slightly across analyses within a study because of missing values on specific measures (e.g., manipulation checks).

[8]We calculated a risk perception difference score between the two investment options for each participant and then subjected this difference score to a 2 (issue capability) × 2 (gender) ANOVA. The results showed that the difference in risk perception between the two options was not influenced by either issue capability or gender. Thus, the difference in risk perception was not confounded by other variables.

greater risk-taking tendency than those in the low-capability condition (M = 6.71 versus M = 5.81; F(1, 134) = 6.39, $p < .05$). More important, there was a significant gender × capability interaction (F(1, 134) = 4.21, $p < .05$; see Figure 2). Simple effect tests indicated that male participants' risk-taking tendency was sensitive to issue capability ($M_{high\ capability}$ = 7.42 versus $M_{low\ capability}$ = 5.56; F(1, 134) = 8.79, $p < .01$). In contrast, issue capability did not significantly affect risk-taking tendency of female participants ($M_{high\ capability}$ = 6.16 versus $M_{low\ capability}$ = 5.96; F < 1). Thus, H_1 is supported.

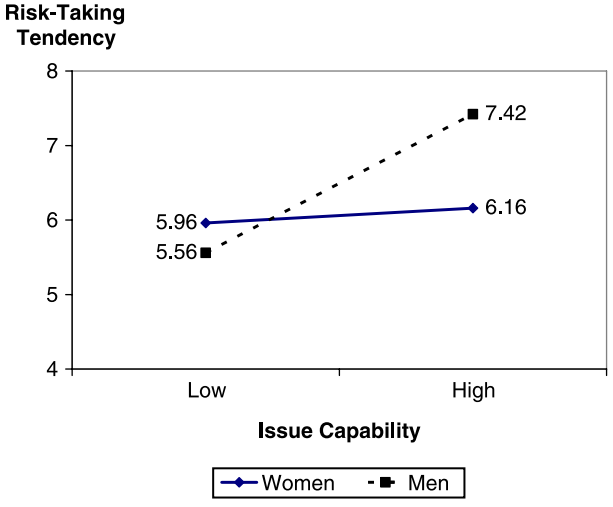
Focus of attention (H_2, H_3). Two coders classified the cognitive responses into three categories: (1) thoughts related to upside potential (47.48% of total thoughts), (2) thoughts related to downside potential (25.47%), and (3) others (27.04%). Cognitive responses typical of upside potential were, for example, "If I have a good chance at getting a high return on my stocks I could pay for grad school and have money still left over," and "I would invest because there is still a very high chance of generating a return of 16%." In terms of downside potential, some typical cognitive responses were, for example, "I am a little hesitant due to the possibility of losing 2%," and "After saving $20,000 worth of money, I don't like the gamble. Especially 45% chance loss of 2%." Initial agreement between the two coders was 87.42%, and disagreements were resolved through discussion.

We analyzed the number of upside-potential thoughts in a 2 × 2 ANOVA. The main effect of gender was not significant (F < 1); men and women were similar in the number of upside-potential thoughts generated. As we expected, there was a significant main effect of issue capability such that participants generated more upside-potential thoughts in the high-capability condition (M = 1.28) than in the low-capability condition (M = .90; F(1, 134) = 11.45, $p < .001$). Importantly, the effect of issue capability was qualified by a significant interaction between gender and capability (F(1, 134) = 5.91, $p < .05$), in support of H_2. Men's upside-potential thoughts were strongly influenced by their level of issue capability ($M_{high\ capability}$ = 1.52 versus $M_{low\ capability}$ = .76; F(1, 134) = 14.16, $p < .001$), whereas women's thoughts were unaffected ($M_{high\ capability}$ = 1.10 versus $M_{low\ capability}$ = .98; F < 1).

For thoughts related to downside potential, ANOVA results revealed a main effect of issue capability; participants in the low-capability condition generated more downside-potential thoughts (M = .69) than those in the high-capability condition (M = .49; F(1, 134) = 4.40, $p < .05$). However, neither the main effect of gender nor the interaction of gender and issue capability was significant.

Next, using the method that Baron and Kenny (1986) suggest, we conducted a test of mediation to examine whether upside-potential thoughts mediate the gender × capability interaction on risk-taking tendency (see the Web Appendix at http://www.marketingpower.com/jmraug08). We already established a significant gender × issue capability interaction on risk-taking tendency and a significant gender × issue capability interaction on the upside-potential thoughts (the mediator). When the number of upside-potential thoughts is added to the risk-taking tendency model, the gender × issue capability interaction becomes nonsignificant (F(1, 133) = 1.44, n.s.). In this final model, the number of upside-potential thoughts has a significant effect on risk-taking tendency (F(1, 133) = 21.78, $p < .0001$) with a positive coefficient (b = 1.17). That is, more upside-potential thoughts were associated with a greater risk-taking tendency. Therefore, consistent with H_3, upside-potential thoughts fully mediate the gender × issue capability interaction on risk taking (Sobel test: z = 2.16, $p < .05$).[9]

Figure 2
STUDY 2: THE INTERACTIVE EFFECT OF ISSUE CAPABILITY AND GENDER ON RISK TAKING IN INVESTMENT DECISIONS



Discussion

Study 2 provides insight into the processes underlying the interaction between gender and issue capability. The results show that upside-potential thoughts fully mediate the gender × issue capability interaction on risk taking. Specifically, the interaction occurs because men's focus on upside potential shifts along with their level of issue capability, whereas women's focus of attention is relatively stable.

Studies 1 and 2 examine decision tasks that are driven by a gain focus. Study 3 investigates two types of decisions—a decision on gain maximization (investment decisions) and a decision on loss minimization (insurance decisions). We

[9]We conducted a follow-up study with 250 business students (151 females and 99 males). We measured risk-taking tendency using a scale on which participants indicated their preference between two stock-based mutual funds. The more risky fund was identical to the stock fund in the main study, whereas the less risky fund had a 10% chance of generating a return of 16%, an 80% chance of generating the average market return of 7%, and a 10% chance of incurring a loss of 2% (i.e., a return of –2%). We counterbalanced the order of the investment riskiness. We also included direct measures of focus of attention. Specifically, we asked participants how important it was to achieve the maximum upside-potential return of 16% and how important it was to minimize the potential loss of 2% (for both items, –10 = "not at all important," and +10 = "very important"). We used these two items to measure focus on upside and downside potential, respectively. The results were similar to those in the main study; the focus on upside potential fully mediates the gender × issue capability interaction on risk-taking tendency.

argue that men's agentic orientation is compatible with decisions that involve gains, whereas women's communion orientation is compatible with decisions driven by prevention of losses because responsibility and prudence are essential in fulfilling communion goals. To the extent that the primary objective of insurance-related decisions is to avoid potential losses, we include them in our experiment. In other words, both the investment task and the insurance task address risk taking but with differing goal orientations. We still predict a gender × issue capability interaction in insurance decisions, but in the reverse direction. We argue that women will be more sensitive to issue capability in insurance decisions because the task nature is compatible with their communion orientation and their issue capability is instrumental in achieving their goal. Specifically, female decision makers should buy more insurance and take less risk under low issue capability than under high issue capability. In contrast, men should be less sensitive to issue capability in making insurance decisions because an insurance task is not compatible with their agentic orientation. More formally,

H_4: Gender moderates the effect of issue capability on risk taking in decisions that are driven by avoidance of losses (e.g., insurance decisions). Specifically, low issue capability decreases risk-taking tendency (i.e., increases insurance purchase) in women but not in men.

In essence, H_4 represents a reversal of H_1 by reversing the relationship between goal orientation and the nature of the decision task. Incorporating both H_1 (decision on gain maximization) and H_4 (decision on loss prevention), we predict a three-way interaction among gender, issue capability, and decision task on risk taking. Thus,

H_5: Decision task moderates the gender × issue capability interaction on risk taking. Specifically, men are sensitive to issue capability in decisions that involve achievement of gains, such as investment decisions, but women are not. Conversely, women are sensitive to issue capability in decisions that involve avoidance of losses, such as insurance decisions, but men are not.

STUDY 3

Method

Design and procedure. Participants were 217 business students (133 females and 84 males). This study used a 2 (issue capability: high versus low) × 2 (decision task: investment versus insurance) × 2 (gender) between-subjects design. We manipulated issue capability as in Study 2.

We manipulated decision task as a between-subjects factor. The investment task was identical to the one in Study 2, in which participants were presented with a stock fund and a bank account. They were asked to report the likelihood that they would invest in the stock fund (0 = "I would definitely not invest in the Stock Fund," and 10 = "I would definitely invest in the Stock Fund"). In the insurance task condition, participants were told that they had invested their savings in a stock-based mutual fund (i.e., the same stock fund as in the investment condition). They were told that the mutual fund company also offers investment insurance, which guarantees a minimum return on investment of 4%. They could earn a higher return if the performance of the stock fund was greater than 4%. The investment insurance was optional and cost $200 per year to cover their $20,000 invested in the stock fund. Participants in the insurance task condition were asked to indicate the likelihood that they would purchase the investment insurance (0 = "I would definitely not purchase the investment insurance," and 10 = "I would definitely purchase the investment insurance"). We reverse-coded this measure so that the higher number represents more risk taking.

We conducted a pretest of the decision task manipulation using a measure adapted from the work of Zhou and Pham (2004). We asked 45 participants to allocate 100 points between two concerns with respect to either the investment task or the insurance task: (1) whether they would achieve the potential high return and (2) whether they would avoid the potential loss. Participants focused more on achieving the potential high return in the investment task (M = 63.74) than in the insurance task (M = 40.91; t = 3.45, $p < .01$), and they focused more on loss avoidance in the insurance task (M = 59.09) than in the investment task (M = 36.26). Thus, the decision task manipulation is as we expected, such that the investment task is mainly driven by achievement of gains and the insurance task is mainly driven by prevention of losses.

Measures. The dependent variable is risk-taking tendency. In the investment task condition, we measured this as the tendency to invest in the stock fund. In the insurance task condition, we measured this as the tendency to purchase insurance (reverse coded). In addition, we included two manipulation checks after the dependent measure. To assess the manipulation of issue capability, we asked participants to rate their past investment performance (–10 = "below average," and +10 = "above average") and their investment capability (–10 = "very low," and +10 = "very high"). We combined these two items as the manipulation check of issue capability (r = .68, $p < .0001$). To assess the risk inherent in the decision task, we asked participants in the investment task condition to report their risk perception of investing in the stock fund and the bank account (–10 = "not at all risky," and +10 = "very risky"). Participants in the insurance task condition were asked to report their risk perception of investing in the stock fund with and without insurance (–10 = "not at all risky," and +10 = "very risky"). We collected demographic variables at the end.

Results

Manipulation checks. A 2 (issue capability: high versus low) × 2 (decision task: investment versus insurance) × 2 (gender) ANOVA revealed that only the main effect of issue capability was significant in the model ($F(1, 209) = 152.44$, $p < .0001$). Replicating our previous studies, the manipulation of issue capability was successful.

We conducted a within-subject t-test with the measures of risk perception. In the investment task condition, participants perceived it as significantly riskier to invest in the stock fund than to invest in the bank account (M = 3.15 versus M = –8.07; t = 25.20, $p < .0001$). A follow-up analysis revealed that the difference in risk perception between the stock fund and the bank account was not influenced by issue capability, gender, or their interaction (all Fs < 1). In the insurance task condition, participants perceived it as significantly riskier to invest in the stock fund without insurance than with insurance (M = 2.57 versus M = –3.68;

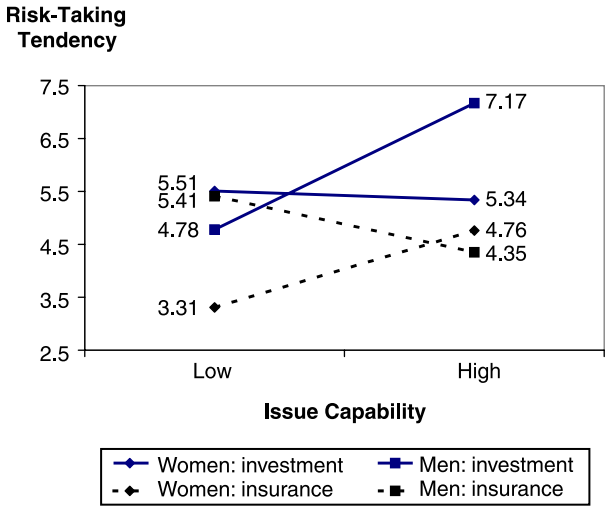
t = 9.39, $p < .0001$). Furthermore, the difference in risk perception due to insurance was not affected by issue capability, gender, or their interaction (all Fs < 1). Therefore, it is appropriate to measure risk-taking tendency using both the investment task and the insurance task.

Risk-taking tendency (H_1, H_4, and H_5). We conducted a 2 (issue capability: high versus low) × 2 (decision task: investment versus insurance) × 2 (gender) ANOVA, and the overall model was statistically significant (F(7, 209) = 6.00, $p < .0001$). The main effect of issue capability was marginally significant ($M_{high\ capability}$ = 5.43 versus $M_{low\ capability}$ = 4.65; F(1, 209) = 3.52, $p = .06$). The main effect of gender was also significant; that is, men were more risk seeking than women (M = 5.53 versus M = 4.72; F(1, 209) = 4.04, $p < .05$). In addition, there was a significant main effect of decision task (F(1, 209) = 12.81, $p < .001$); participants in the investment task condition took more risk than those in the insurance task condition (M = 5.73 versus M = 4.27). None of the two-way interactions were significant.

Per our prediction (H_5), there was a significant three-way interaction among gender, issue capability, and decision task (F(1, 209) = 13.38, $p < .001$; see Figure 3). To explicate the three-way interaction fully, we examine risk-taking tendency in the investment task and the insurance task separately. In the investment task condition, we observe a similar gender × issue capability interaction as in Studies 1 and 2 (F(1, 209) = 7.17, $p < .01$). Consistent with H_1, men exhibited greater risk taking in the high-capability condition (M = 7.17) than in the low-capability condition (M = 4.78; F(1, 209) = 10.07, $p < .01$). In comparison, women were insensitive to their issue capability in the investment task ($M_{high\ capability}$ = 5.34 versus $M_{low\ capability}$ = 5.51; F < 1).

The gender × issue capability interaction was also significant in the insurance task condition (F(1, 209) = 6.26, $p < .05$), but the direction of this interaction was reversed. Consistent with H_4, women were sensitive to issue capability, and they took more risk (i.e., were less likely to purchase insurance) in the high-capability condition (M = 4.76) than in the low-capability condition (M = 3.31; F(1, 209) = 5.38, $p < .05$). In contrast, men's risk-taking tendency in the insurance task was not significantly influenced by their level of issue capability ($M_{high\ capability}$ = 4.35 versus $M_{low\ capability}$ = 5.41; F(1, 209) = 1.82, n.s.).

Figure 3
STUDY 3: THE INTERACTIVE EFFECT OF ISSUE CAPABILITY AND GENDER ON RISK TAKING IN INVESTMENT AND INSURANCE DECISIONS



Discussion

Study 3 demonstrates that men are more sensitive to issue capability than women when making investment decisions because the task nature (maximizing gains) is compatible with their agentic orientation. In contrast, women are more sensitive to issue capability than men when making insurance decisions because the task nature (minimizing losses) is compatible with their communion orientation. Therefore, the direction of the gender × issue capability interaction is reversed by modifying the compatibility between task nature and goal orientation. Jointly, Studies 2 and 3 provide two sets of tests of the underlying mechanism. Study 2 examines the psychological process through mediation analyses, and Study 3 tests the same mechanism by manipulating the underlying relationship between goal orientation and decision task. Both methods consistently support the moderating role of gender and issue capability in risk taking as driven by the goal–task compatibility.

GENERAL DISCUSSION

In this article, we show that gender moderates the effect of issue capability on risk taking as a result of the compatibility between goal orientation and the nature of the decision task. Specifically, men are sensitive to issue capability in decisions that are driven by the achievement of gains (e.g., investment decisions), whereas women are sensitive to issue capability in decisions that are driven by the prevention of losses (e.g., insurance decisions). In Study 1, we demonstrate the gender × issue capability interaction using the betting data from the television show *Jeopardy!* Studies 2 and 3 manipulate issue capability to establish causality and enhance internal validity. In these experiments, we examine the psychological processes underlying the gender × issue capability interaction using both mediation and moderation methods (Spencer, Zanna, and Fong 2005). This boosts confidence in our conclusions, together with triangulation of contexts (investment, insurance, and betting in *Jeopardy!*), methodologies (experiment and real-world data), and measures (intentions and actual behavior).

Whereas previous studies have focused on the main effect of gender on risk taking (e.g., Jianakoplos and Bernasek 1998), our research underscores the interactive effect of gender and issue capability. We demonstrate that risk taking is more sensitive to issue capability when goal orientation matches the nature of the decision task. Thus, men are not always more risk seeking than women. Instead, both men's and women's risk taking is differentially sensitive to their issue capability under high versus low goal–task compatibility. Our study shows initial evidence of increased sensitivity in women's responses to risk taking in insurance decisions. However, additional research is needed to further our understanding of women's risk taking and its underlying processes. It would be especially useful to identify additional conditions that may influence goal–task

compatibility, leading to differential sensitivity among men's and women's responses to risk.

Our findings suggest that managers at investment firms should recognize that men and women are differentially sensitive to their perceived capability to handle risky decisions, depending on the goal–task compatibility. Men may be susceptible to the influence of historical returns of a mutual fund given their sensitivity and increased engagement in investment decisions.[10] Conversely, women are likely to be affected by the historical risk levels in an insurance context, which are informative in achieving their communion goal. Financial firms might improve the effectiveness of their marketing programs by tailoring their advertising appeals to different audiences, especially if these audiences have a different focus of attention. In addition, advertisements for investment (insurance) products that adopt an agentic (communion) frame should enhance the goal–task compatibility and therefore increase advertising effectiveness.

Policy makers may want to make consumers aware of their differential sensitivity in different types of risky decisions. Consumers may potentially improve the quality of their decisions by increasing the level of engagement, and thus sensitivity to issue capability, in specific domains. Specifically, female consumers should increase their sensitivity in investment decisions so as to maximize return given their level of capability. Likewise, male consumers should be more engaged in insurance decisions so as to select the optimal coverage given their expertise and associated risk exposure. Marketing scholars (e.g., Johnson, Tellis, and MacInnis 2005; Mandel 2003; Morrin et al. 2002; Zhou and Pham 2004) have begun to answer the call for research on decision making in investment and financial services (Bazerman 2001). We hope that our research stimulates further inquiries into this important aspect of consumers' long-term welfare.

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[10]We thank an anonymous reviewer for this suggestion.

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