Testing the Effects of Experience on Risky Decision Making

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Scholars have proposed that people are cognitively biased in making decisions under uncertainty. However, most participants in such studies have been university students and faculty with minimal real world business experience. The purpose of this study is to test whether the findings of prospect theory are generalizable to participants with business experience. Results based on 89 Executive MBAs and 143 fulltime MBAs showed that cognitive biases are strongly embedded in the minds of participants. In fact, in certain contexts, the more experienced people showed stronger cognitive biases than those with less experience. Theoretical contribution and practical implications are discussed.

INTRODUCTION

Classical economic theory holds that decision makers are rational utility maximizers. This means they rank risky options by the expected value of their outcomes and select the highest one (Day & Lord, 1992; March & Simon, 1958). However, studies have repeatedly shown that when confronted with risky decisions involving monetary outcomes, decision makers regularly violate the axioms of expected utility theory and exhibit bias in their choices (Allias, 1953; Kahneman & Tversky, 1979). For example, losses loom heavier than equivalent amounts of gains; low probabilities and certainty are over-weighted, whereas moderate to high probabilities are underweighted. In addition, decision makers are risk seeking in the context of losses and risk averse in the context of gains when probabilities are moderate or high. Conversely, they are risk seeking in the context of gains and risk averse in the context of losses when probabilities are low (Kahneman & Tversky, 1979; Wiseman & Gomez-Mejia, 1998). Put differently, decision makers' risk preferences are situational across decision making contexts (Budescu & Weiss, 1987). In addition, valuation of alternatives are not absolute, but based on the difference between absolute value and the value of a point of reference; where the latter may be altered with new information. Thus,

any positive value higher (lower) than the point of reference is evaluated as gains (losses). However, an induced change in the point of reference may alter perceived gains (losses) to perceived losses (gains).

In their seminal prospect theory article, Kahneman and Tversky (1979) used a variety of decision problems to demonstrate the effects of framing decision choices, certainty, weighting gains versus equivalent losses, and isolation effects on people's decision behavior. Subsequently, prospect theory has been the subject of numerous empirical tests and receives much support (e.g., Hsu, Wiklund, & Cotton, 2017; Kühberger, Schulte-Mecklenbeck, & Perner, 1999; Loehman, 1998; March & Shapira, 1992; Sullivan & Kida, 1995; Tanaka, Camerer, & Nguyen, 2016; Thaler & Johnson, 1990; Tversky & Kahneman, 1986; 1992). While the results of prospect theory predictions have been widely accepted, participants in these studies have often been undergraduate students with limited or no business experience (Budescu & Weiss, 1987; Kameda & Davis, 1990; Paese, Bieser, & Tubbs, 1993; Sitkin & Weingart, 1995; Tindale, Sheffey, & Scott, 1993). This has cast doubt on whether cognitive biases that have been well demonstrated in classroom surveys equally affect all kinds of people or that they are particular to inexperienced student. In other words, does experience lower the likelihood of cognitive biases?

The purpose of our study is to address this issue by examining the effects of human capital (i.e., business experience) on risky decision making involving monetary outcomes. More specifically, we compare the responses of decision makers with different levels of human capital to the empirical results of Kahneman and Tversky (1979) and Tversky and Kahneman (1981) studies. This study augments the generalizability of prospect theory. However, before delving into the comparison, we explain important components of prospect theory. Readers familiar with prospect theory may consider moving directly to the section entitled "Human Capital" below.

CONCEPTUAL DEVELOPMENT AND HYPOTHESES

Prospect Theory

Prospect theory describes choice under uncertainty. It uses cognitive psychology to explain predictable discrepancies between realized decision outcomes and rational outcomes. Kahneman and Tversky (1979) argue that decisions involve two separate stages: the editing stage and the evaluation stage. In the editing stage, information is coded, ordered, classified, combined, simplified, segregated, or canceled according to a certain decision heuristics. In the subsequent evaluation stage, decision makers assess the utility of gains and losses and assign subjective probabilities to each event, despite the available scientific probabilities.

To elaborate on the evaluation stage, the decision maker uses a point of reference and classifies the information accordingly. In particular, values inferior to the point of reference are viewed as losses, and values superior to the point of reference are viewed as gains. As an example, Bob, a manager at XYZ Company, was ecstatic for receiving a 15% raise in his salary: obviously, his point of reference (i.e., his expected raise) must have been less than 15%, say 8%. According to prospect theory Bob's elation reflected the difference between his expected 8% raise and the realized 15% raise. Sadly, however, Bob's elation turned into disappointment when he found out that the average raise among his peers had been 19%. The new information changes Bob's point of reference from 8% to 19%. Bob's disappointment pertains to the negative 4% (raise) below his newly induced point of reference. Conversely, viewed from *rational choice theory*, Bob's 15% raise should be evaluated positively, because with the new raise, he would be able to increase his wealth (by saving) or spending the raise on goods and services, thus increasing his utility.

Second, unlike rational choice theory's prediction, the decision maker's evaluation of losses and gains is asymmetrical. In general, losses loom heavier on the psyche than equivalent amounts of gains. For example, the displeasure of losing $1,000 exceeds the pleasure of winning $1,000. Third, there is a diminishing marginal utility of gains and losses. As gains (losses) increase, the perceived value of the incremental amounts of gains (losses) subsequently falls. Finally, the evaluation of probabilities of events

is predictably subjective. Prospect theory suggests that decision makers overweight low probabilities, underweight medium to high probabilities, and overweight certainty.

The first three predictions may be mapped in an "S-shaped" *value function,* illustrated below in Figure 1. The curve suggests that "value should be treated as a function in two arguments: the asset position that serves as the reference point, and the magnitude of the change (positive or negative) from that reference point" (Kahneman & Tversky, 1979: 277). As shown, gains from the point of reference (which is not necessarily zero) are evaluated in the second quadrant, whereas losses are evaluated in the third quadrant, where losses take more weight than equivalent amounts of gains. For example, a $2,000 loss corresponds to a greater amount of disutility (i.e., A') than the utility associated with a $2,000 gain (i.e., A). In addition, an increase in gains from $2,000 to $4,000 obtains less utility (i.e., BC) than the initial $2,000 gains from the point of reference (i.e., A). Similarly, an increase from -$2,000 to -$4,000 losses imposes less disutility (i.e., B'C') than the initial loss of -$2,000 (i.e., A').

Finally, the prediction that decision weights assigned to probabilities are subjective may be mapped in an S-shaped graph in Figure 2. As shown, the 45 degree dotted line illustrates the assumption under rational choice theory, where there is perfect equivalence between scientific (actual) probabilities and perceived probabilities. Whereas, the solid curve shows prospect theory's perceived probabilities for each of the corresponding scientific probabilities. As shown in the graph, probabilities less than 35% are assigned higher perceived weights than their corresponding scientific probabilities, whereas probabilities more than 35%, but less than 100%, are assigned lower perceived values than their corresponding scientific probabilities. For example, an 80% probability is perceived as if it were 60%, whereas a 15% probability is perceived as if it were 30%.

FIGURE 1
THE VALUE FUNCTION

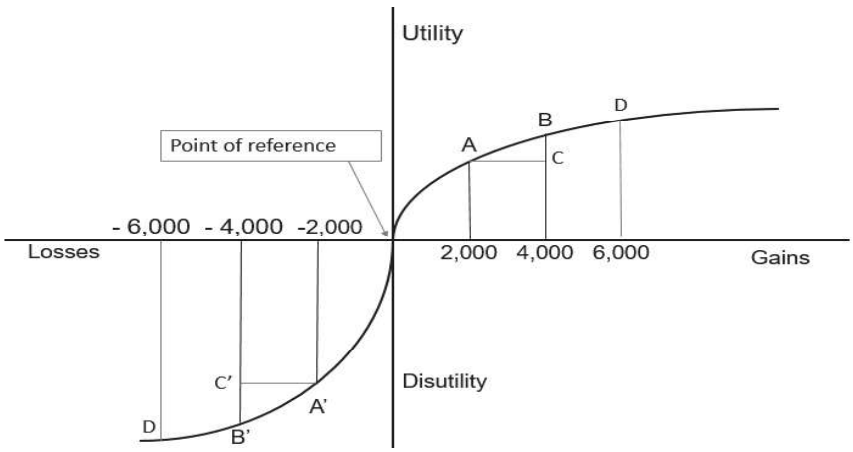
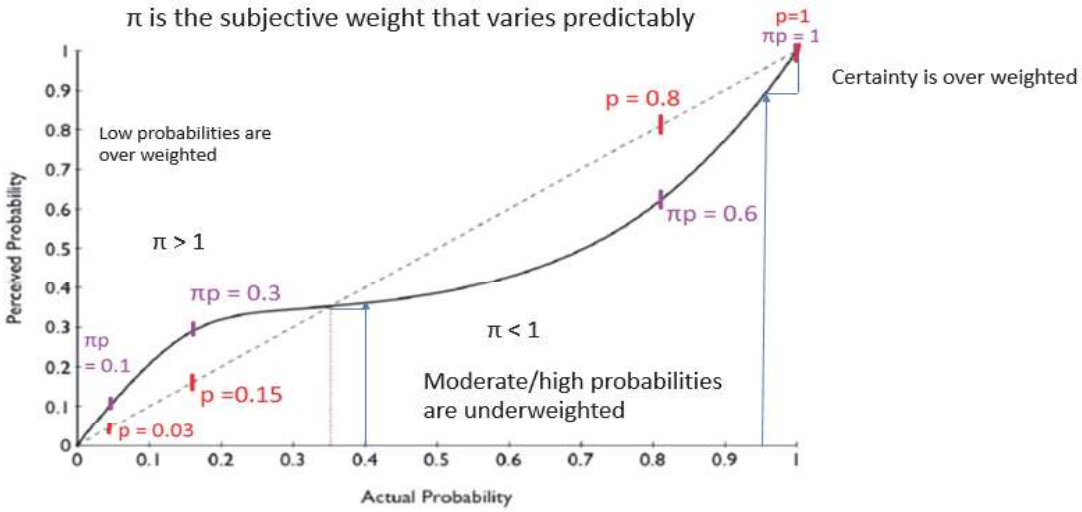


FIGURE 2
PROBABILITY WEIGHTING



The below formula captures the essence of the evaluation stage, where *V* is the expected utility of alternative outcomes to the decision maker. The formula is similar to the prediction of rational choice theory with two major differences. The similarity is that the formula is the product of probabilities of alternative outcomes (p_i) and the value of those outcomes (x_i). However, probabilities are not expressed as scientific probabilities (p_i), but as $\pi(p_i)$ where π is the perceived weights assigned to each scientific probability as illustrated in Figure 2. For example, the weight associated with 15% probability is 2, whereas the weight associated with 80% probability is 0.75. Second, each event (x_i) is weighted by the value v. For example, when (x_i) is negative, the weight is higher than when (x_i) is positive.

$$V = \sum \pi(p_i) v(x_i),$$

where i = 1,…, n,
π = weights assigned to each scientific probability
v = weights associated with the value of each event

Below we describe a number of important predictions of prospect theory. Following Kahneman and Tversky (1979) and Tversky and Kahneman (1981), we emphasize the certainty effect, framing effect, isolation effect, reflection effect, value function, and weighting effect.

The certainty effect. The certainty effect (Alaise, 1953; Kahneman & Tversky, 1979) is observed when decision makers disproportionally assign more weight to certain outcomes relative to uncertain ones. This phenomenon is independent of whether certainty refers to a positive or negative outcome. In this case, the decision maker may choose a certain gain which is worth less than the expected value of an alternative risky option (Kahneman & Tversky, 1979; Tversky & Kahneman, 1986). For example, a group of students chose the option of winning $3,000 with certainty (i.e., 100% probability) over the option of winning $4,000 with 80% probability. Note that the expected value of the second option exceeds the value of the first option by $200. The certainty effect is teased out when the above scenario is compared to a second scenario in which the same group of students was asked to choose between the options of winning $3,000 with 25% probability and winning $4,000 with 20% probability. Not surprisingly, an overwhelming majority of the students chose the latter option. Note that the only difference between the two scenarios is that the probabilities of the options in the first scenarios were reduced *proportionally* (weighted by 0.25) to obtain the probabilities of the same alternative values in the second scenario. The second option was chosen (as it should have been rationally) because decision makers were no longer psychologically influenced by the certainty effect of the first scenario.

The framing effect. Decision makers are also influenced by the way in which a given choice is presented (Kameda & Davis, 1990; Tversky & Kahneman, 1981). The importance of the framing effect lies in risk-taking behavior, as decision makers are predictably risk-seeking (risk-averse) in the context of losses (gains) when probabilities are moderate to high. Thus, if a given event is framed negatively, decision makers are predicted to take risk, and vice versa. Consider the familiar Asian flu example (Tversky & Kahneman, 1981) where the outbreak of the flu was expected to kill 600 people. The same medical solutions to the outbreak of the flu were framed positively for one group and negatively for another group. In particular, the proposition to the first group was: If solution A is adopted, 200 people will be SAVED. On the other hand, if solution B is adopted, there is 1/3 probability that 600 will be SAVED, and 2/3 probability that no people will be SAVED. Then 72% participants chose solution A, and 28% chose solution B. Thus, the majority preferred saving 200 people, and not took the risk of losing 600 people.

The proposition to the second group was framed negatively: If solution C is adopted, 400 people will DIE. If solution D is adopted, there is 1/3 probability that nobody will DIE, and 2/3 probability that 600 people will DIE. Note that solutions C and D obtain the same exact outcome as solutions A and B, respectively. Yet 22% of the second group chose solution C (as compared to 72% of the first group choosing solution A) and 78% of the second group chose solution D (as compared to 28% of the first group choosing solution B) (Kahneman & Tversky, 1979).

The isolation effect. Isolation effect refers to decision makers attempting to simplify choice between alternatives by ignoring components or characteristics that the alternatives share, thus focusing on components that clearly distinguish them (Kahneman & Tversky, 1979). Consider for example a now familiar choice: Choose between $3,000 with 25% probability and $4,000 with 20% probability. As discussed above a majority chose $4,000 with 20% probability option (which is the rational choice). We may revise the above scenario to a two-stage problem. The first stage involves a 75% probability of ending the game without winning or losing anything, and a 25% probability of moving to the second stage. In the second stage the decision maker must choose between winning $3,000 with certainty (100% probability) and winning $4,000 with 80% probability. An overwhelming majority chose winning $3,000 with certainty. But, upon careful examination, the $3,000 gain is not a certain option when the decision maker makes his/her choice before the first stage. And, the $4,000 gain does not come with an 80% probability for there is only a 25% chance that the decision maker reaches the second stage. So, the choice between $3,000 with 100 percent probability and $4,000 with 80% probability *is available only with 25% probability.* Thus, applying the 25% weight to the two alternative probabilities, the scenario is reduced to choosing between $3,000 with 25% probability and $4,000 with 20% probability. As shown above, the latter scenario results in a majority preferring $4,000 with 20% probability over $3,000 with 25% probability. Yet, in the two-stage problem, participants ignored the common attribute (i.e., the first stage) shared between the two options in the second stage (Kahneman & Tversky, 1979). In sum, the isolation effect occurs when decision makers discard components that choice alternatives share, focusing on differences only.

The reflection effect. The reflection effect focuses on the contrast between gain and loss contexts in decision making. More specifically, in support of the loss aversion argument, theorists find empirical evidence that gain contexts trigger risk aversion while loss contexts engender risk-seeking behavior (e.g., Kahneman & Tversky, 1979; Kühberger, et al., 1999; Loehman, 1998; March & Shapira, 1992; Sullivan & Kida, 1995; Tversky & Kahneman, 1986; 1992). That is, opposite contexts (gains vs. losses) cause risk-preference reversal or the reflection effect to occur. Consider the mirror (or reflection) image of the problem noted above (i.e., the choice between winning $3,000 with certainty and winning $4,000 with 80% probability): not shown in our results, a 65% majority of the people surveyed rejected the option of losing $3,000 with certainty in favor of losing $4,000 with 80% probability. Note that the expected loss associated with the chosen option exceeds the loss associated with the first option. Yet, individuals chose the option with a greater expected loss. The reason for the choice is again the certainty effect as well as the way people react to a loss relative to a gain. The certainty of losing $3,000 was over weighted relative

to the option of losing $4,000 with 80% probability (Budescu & Weiss, 1987; Kahneman & Tversky, 1979).

The value function and marginal effect. Kahneman and Tversky (1979) suggests that "value should be treated as a function in two arguments: the asset position that serves as reference point, and the magnitude of the change (positive or negative) from that reference point" (p. 277). Specifically, as discussed above, the value function is usually concave for gains and convex for losses; and is steeper for losses than for gains. In addition, the value function shows diminishing marginal effects in gains and losses (Kahneman & Tversky, 1979).

Consider, for example, a choice between option A: (25% chance of winning $6,000, and 75% chance of winning $0) and option B: (25% chance of winning $4,000, 25% chance of winning $2,000, and 50% chance of winning $0). A majority of the participants choose option B (Kahneman & Tversky, 1979) for, at the margin and given a 25% chance of winning, $6,000 is worth less than $2,000 plus $4,000 evaluated separately.

Now consider the converse of the above choice in the loss context: option A: (25% chance of losing $6,000, and 75% chance of losing $0) and option B: (25% chance of losing $4,000, 25% chance of losing $2,000 and 50% chance of losing $0). In this scenario, the majority choose option A (Kahneman & Tversky, 1979) for, at the margin, $6,000 in loss is less unpleasant than the sum of $2,000 plus $4,000 in losses, evaluated separately. The message here is: if you are giving $6,000 in bonus, recipients get more utility by dividing the bonus into a $2,000 and a $4,000. However, if you are demanding an unanticipated back payment, it would be more unpleasant to the payer to be asked for $2,000 and $4,000 separately. Asking for the entire $6,000 at once is less painful.

The weighting effect. The weights assigned to outcomes in the expected utility theory are the scientific probabilities associated with each outcome. However, the weights assigned to outcomes in prospect theory are subjective or perceived probabilities. In particular, outcomes with very low probabilities are assigned subjective weights higher than their respective scientific probabilities, whereas outcomes with higher probabilities are assigned subjective weights lower than their respectively probabilities (Kahneman & Tversky, 1979; Tversky & Kahneman, 1981).

In sum, the effects discussed above are predictable deviations from rational choice theory and are induced by mental shortcuts or heuristics in judgment and decision-making (Astebro & Elhedhli, 2006; Fiske & Taylor, 1991; Tversky & Kahneman, 1974). Heuristics are cognitive simplification mechanisms (or rules of thumb), applying accessible information (e.g., the status quo, past successful decision techniques) or generalization of limited information, which, in comparison to more thorough systematic examination, allow decision makers to utilize lower levels of cognitive resources (Chaiken, 1980; Fiske & Taylor, 1991).

Human Capital

Human capital is defined as the skills, knowledge, expertise, and education that an employee possesses (Becker, 1964). According to human capital theory, experience is considered an asset, as it allows individuals to be more productive (Becker, 1964). Managers with high levels of human capital are more capable of diagnosing problems, providing novel and useful solutions, thus improving performance. In addition, human capital theory argues that employees with elevated levels of human capital make better decisions in volatile or uncertain environments (Becker, 1964; Snell & Dean, 1992). Thus, there is a positive correlation between managerial experience and compensation (Milkovich & Newman, 1993; Tushman & Nadler, 1978).

The question is whether people with high levels of human capital are also exposed to the pitfalls of cognitive biases? Empirical findings assert that experts generally rely on highly mature, situation-dependent heuristics to aid in their decision-making (Day & Lord, 1992). This tendency may ensue from a plethora of decisions that managers must make, with little time to allocate to each important decision. Given time limitations and constantly changing circumstances, heuristics provide managers a means for accomplishing tasks, albeit at the risk of decision biases (Fiske & Taylor, 1991; Schwenk, 1986). Thus, in our first hypothesis, we suggest that experience will not necessarily mitigate decision biases.

Hypothesis 1: Managers with business experience will violate the axioms of expected utility theory across decision problems involving monetary outcomes.

Does an increase in experience affect decision biases? Literature suggests that organizational experts use heuristics more often than those with less expertise, thus resulting in faster decisions (Day & Lord, 1992; Sherman & Corty, 1984). In the face of uncertainty those with a higher level of human capital may rely on past experiences that, given the context, may be misleading (e.g., a past decision may not be appropriate for a current decision). Alternatively, those with more experience are employed at higher levels of the organization, and thus are generally assigned more complex tasks, likely resulting in a higher frequency of using heuristics in decision-making; and often not recognizing the pitfalls (Becker, 1964; Fiske & Taylor, 1991).

Failing to recognize the complexities of decision-making related to experience and the increased use of heuristics is likely a reason why people mistakenly believe more experienced individuals make better decisions. In other words, as experience increases, the reliance on heuristics may likely increase, resulting in a greater bias in the decision-making process. With this in mind, we further argue that an increased level of experience will intensify the decision biases explained above.

Hypothesis 2: Prior experience will increase the tendency to fall into decision biases proposed by prospect theory, when solving risky decision problems involving monetary outcomes.

METHODS

Sample and Procedures

We recruited 89 Executive MBAs and 143 full-time MBA students at a large southwest university to participate in our study. EMBA participants had a mean business experience of 17 years (a minimum of 10 years) and their average age was 42. Full-time MBA participants had a mean business experience of 3 years (a minimum of 2 years), with an average age of 24 years. With significantly different experience levels between EMBA and MBA students, we could examine whether more experience actually increase the tendency of decision biases.

Participants responded to 15 scenarios (scenario 2 has two versions, a and b, so each participant only responded to 14 scenarios; Table 1), which reflected the certainty effect, framing effect, isolation effect, reflection effect, value function, and weighting function of prospect theory. The scenarios are identical to those used in Kahneman and Tversky's research (Kahneman & Tversky 1979, Tversky & Kahneman, 1981). The questionnaires were distributed to participants as a course exercise before they knew anything about prospect theory. Participants were instructed that there was no right or wrong answers.

RESULTS

Each scenario had two options A and B (Option A=1, and Option B = 0). The mean of each scenario showed the percentage of participants choosing Option A (Table 1).

To test Hypothesis 1 (stating that managers with business experience are exposed to decision biases), we combined EMBA and Full-Time MBA responses, as the hypothesis does not distinguish between levels of experience. The results refuted the predictions of expected utility theory and were in favor of prospect theory across all 15 scenarios.

The Certainty Effect

In scenario 1, decision makers were asked to choose between Option A (winning $2,500 with 33% probability, winning $2,500 with 66% probability, winning $0 with 1% probability) and Option B (winning $2,400 with certainty). The expected value of Option A is $2,409 (i.e., $2,500 * 33% + $2,400 * 66% + $0 * 1%), $9 more than the value of Option B, which is $2,400. However, 71% of the participants chose the less valued but certain, Option B. Scenario 2 is derived from Scenario 1 by deducting a 0.66 chance of winning $2400 from Options A and B above. According to the expected utility theory, this should not change the pattern of preference. However, in both Kahnman and Tversky's (1979) and our

sample, participants reversed their preference in favor of Option A: the reason is that when a prospect changes from a sure gain to a probable one, its desirability decreases (Kahnman & Tversky, 1979).

Scenarios 3 and 4 followed a similar certainty effect pattern as observed in scenarios 1 and 2. Note that Options A and B of scenario 4 are derived from scenario 3 by dividing the original probabilities by 4. Whereas participants overwhelmingly preferred Option B in scenario 3 (i.e., $3,000 with certainty over 80% probability of $4,000), they changed to Option A in scenario 4 (i.e., $4,000 with 20% probability over 25% probability of $3,000). Consistently, certainty effect was also exhibited in Scenarios 5 and 6, with non-monetary outcomes.

The Framing Effect

Options in the framing effect scenarios (e.g., "is the glass half full or half empty") have identical outcomes but are framed differently. Scenarios 7a and 7b refer to an Asian disease that infects some but not all the people. Scenario 7a frames the outcomes of the two options positively: Option A: If program A is adopted, 200 people will be saved. Option B: If program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved. Note that the expected value of Option B is the same as the value presented in Option A. However, a majority of participants chose Option A (72% in Kahneman and Tversky's research and 58% in our research). Conversely, scenario 7b frames the two options negatively: Option A: If program A is adopted, 400 people will die. Option B: If program B is adopted, there is 1/3 probability that nobody will die, and 2/3 probability that 600 will die. A majority of participants chose Option B (78% in Kahneman and Tversky's research and 83% in our research). In short, when scenarios are presented positively, most participants avoid the risky option, but when scenarios are presented negatively, most participants choose the risky option.

The Isolation Effect

Scenarios 3, 4, and 8 combined demonstrate the isolation effect. Scenarios 3 and 4 show the certainty effect. As described above, participants in scenario 3 preferred $3,000 with certainty over 80% chance to win $4,000. Scenario 4 is derived from scenario 3, where the probabilities (80% and 100% probabilities) are divided by 4. Because in scenario 4 certainty is removed from Option B, participants preferred 20% chance of winning $4,000 over 25% chance of winning $3,000, which is rational. That said, scenario 8 is identical to scenario 4 with a difference in the way it is proposed. To wit, the scenario instructs the subjects that there is a two-stage game, where in the first stage, there is a 75% chance to end the game without winning anything and 25% chance to move into the second stage. If you reach the second stage you have a choice between Option A and Option B as described below. Note that the choice must be made *before the game starts* (i.e., before the outcome of the first stage is known). In Option A: there is 80% chance of winning $4,000, and 20% chance of winning $0. And, in Option B: winning $3,000 with certainty. Because the participants were instructed that they must choose between Options A and B before the start of the game, they should rationally apply the information that there is only 25% chance that the second stage is materialized, thus discounting the probabilities associated with Options A and B. In other words, the chance to win $4000 is 25% * 80% = 20%; and the chance to win $3000 is 25% * 100% = 25%. So, participants are actually choosing between a 20% chance to win $4000 (Option A) and a 25% chance to win $3000 (Option B). This is identical to scenario 4 as presented above, predicting that rationally participants should choose Option A. However, the majority actually chose Option B (74%). The reason is that they ignored (i.e., isolated) the probabilistic nature of the first stage and moved directly to the options presented in the second stage, identical to scenario 3. The main reason for doing so is that the outcome of the first stage is common between the two options.

The Reflection Effect

Scenarios 9 and 10 show the reflection effect, which demonstrate that gain contexts trigger risk aversion while loss contexts engender risk-seeking behavior. In other words, opposite contexts (gains vs. losses) cause a risk preference reversal (Kahneman & Tversky, 1979). Scenario 9 instructs that "you have just received $1,000 (as a gift) in cash (tax free). Choose between Option A: 50% chance of winning

$1,000, and 50% chance of winning $0, and Option B: Winning $500 with certainty, 100% chance." Scenario 10 instructs that "you have just received $2,000 (as a gift) in cash (tax free). Choose between Option A: 50% chance of losing $1,000, and 50% chance of losing $0, and Option B: Losing $500 with certainty, 100% chance." Table 1 shows that in scenario 9 a majority of the participants chose Option B (i.e., $500 with certainty) (84% in Kahneman and Tversky's research; and 75% in our research). The reason for the choice is again the certainty effect of a gain. However, in scenario 10 (a loss context) a majority (69% in Kahneman and Tversky's research; and 76% in our research) chose risky Option A. Note that scenarios 9 and 10 are identical in the overall value. To wit, the option value in scenario 9 is $1,500 (Option A = $1,000 + 0.5*1000; Option B = $1,000 + $500); the option value in scenario 10 is also $1,500 (Option A = $2,000 - 0.5*$1,000); Option B = $2,000 -$500. However, because the option value in scenario 10 is negative, whereas the option value in scenario 9 is positive (the mirror image of scenario 10), decision makers made different choices despite the fact that the two scenarios had identical values.

The Value Function

According to prospect theory (Kahneman & Tversky, 1979), the value function for changes of monetary outcome is normally concave in gains and convex in losses. That is, the marginal value of both gains and losses decreases with their magnitude. In scenario11, both options have an expected utility of $1500 gain. The choice in scenario 11 is between Option A: (25% chance of winning $6,000 and 75% chance of winning nothing) and Option B: (25% chance of winning $4,000, 25% chance of winning $2,000, and 50% chance of winning nothing). The majority of participants (82% in Kahneman and Tversky's research and 81% in our research) chose Option B. The reason is that because of the diminishing marginal utility of gains, the value of $6,000 with 25% was perceived to be less than the value of the sum of $4,000 and $2000 both with 25% chance evaluated separately.

Scenario 12 involves a loss context, with Option A: (25% chance of losing $6,000, and 75% chance of losing $0) and Option B: (25% chance of losing $4,000, 25% chance of losing $2,000, and 50% chance of losing $0). Both options have an expected value of -$1,500. A majority of participants (65% in Kahneman and Tversky's research and 58% in our research) choose Option A. In other words, because of the diminishing marginal utility of losses, $6,000 in loss is associated with less displeasure than the displeasure associated with $4,000 and $2,000 in loss evaluated separately.

The Weighting function

When people make choices among different prospects, low probabilities are often over-weighted. This phenomenon is illustrated in scenarios 13 and 14. Participants in scenario 13 are given the choice between Option A: (0.1% chance of winning $5,000, and 99.9% chance of winning $0) and Option B: (Wining $5 with certainty, 100% chance.) The expected value of the two options is $5; but a majority of participants (72% in both Kahneman and Tversky's and our research) chose Option A, the risky option. In other words, when probabilities of winning are low, like in gambling, decision makers favor the risky option over the certainty of the same expected gain: $5,000 with 0.1% probability is preferred to $5 with certainty. This is tantamount to buying a $5 ticket to win $5,000 in lottery. In other words, while the expected value of the two options is the same, the *perceived value* of 0.1% of $5,000 exceeds $5, as low probabilities are given higher subjective weights than their corresponding scientific probabilities.

Conversely, scenario 14 suggests that with low probability of losses decision makers favor a certain loss over an expected loss of the same amount. To wit, participants in scenario 14 are given the choice between Option A: (0.1% chance of losing $5,000, and 99.9% chance of losing $0) and Option B: (Losing $5 with certainty). The expected value of the two options is -$5, but a majority of the participants (83% in Kahneman and Tversky's and 69% in our research) chose Option B, the certain option, and they choose the certain loss and avoid the risk of losing $5,000 even with 0.1 percent probability. Because low probabilities loom heavy on the psyche, a majority of the participants perceive the expected loss to be more than $5,000.

Conforming to the assumptions of prospect theory, the above analyses showed that in all scenarios involving monetary outcomes, experienced managers' choice behaviors showed a similar pattern to those of undergraduate students or faculties in Kahneman and Tversky's research. This result suggests that human capital (i.e., experience) does not appear to set participants free from decision biases, thus failing to reject Hypothesis 1.

Hypothesis 2 states that an increase in experience will increase the tendency to fall into decision biases outlined in prospect theory (i.e., violating the expected utility theory) across risky decision problems involving monetary outcomes. We used independent sample T-tests to compare the responses of EMBA and MBA participants (more vs. less experience).

Results are listed in Table 2. T-tests on scenarios 1, 3, 5, 7a, 8, and 14 revealed significant differences between the responses of the two groups ($p < 0.10$) and that EMBA participants showed a stronger bias in their decisions. For instance in scenario 1, the majority chose Option B, which was certain. Furthermore, EMBA participants with more experience were significantly more likely to choose Option B than the less experienced MBA participants (80% vs. 66%). However, T-tests on scenarios 9, 10, and 13 failed to show a significant difference between the two groups, although the tests indicated a slightly stronger (albeit, insignificant) tendency of decision bias for EMBA than MBA participants. The remaining scenarios (2, 4, 6, 7b, 11, and 12) exhibited similar patterns between EMBA participants and Full-Time MBAs. Therefore, in a total of 15 scenarios (including the two versions in scenarios 7), 6 scenarios demonstrated that EMBAs showed more decision bias, despite their greater experience. Thus, we partially supported Hypothesis 2.

DISCUSSION

Previous research shows that prospect theory is supported in tests involving participants with low or no business experience (Budescu & Weiss, 1987; Kameda & Davis, 1990; Paese, et al., 1993; Sitkin & Weingart, 1995; Tindale, et al., 1993). This investigation is an effort to extend these findings. As hypothesized, contrary to what human capital theory might predict, we found that individuals who have more experience (i.e., EMBA and full-time MBA students relative to undergraduates) also exhibit behaviors predicted by prospect theory. Thus, the increased human capital (i.e., experience) does not make them more rational decision makers.

In addition, we do find evidence demonstrating that as business experience increases (i.e., comparing EMBA students with about 17 years of business experience to full-time MBA students with about two years of experience), decision makers appear to respond more strongly to the certainty effect (i.e., they become more biased in favor of certainty). Experienced decision makers generally manage complex and unpredictable situations and do not have unlimited time or resources to commit to their decisions. This may result in bounded rationality and consequently in relying on heuristics or mental shortcuts for making decisions (March & Simon, 1958; McCray, Purvis, & McCray, 2002; Cassar, 2006). That said, our tests are conservative because all participants were given the same scenarios, regardless of the level of experience. Our findings suggest that in their attempt to avoid uncertainty; highly experienced EMBAs are more likely to pursue certain over uncertain outcomes than participants with less experience. This implies that more experienced managers are more exposed to prospect theory's certainty effect.

The outcome of our analyses may seem counterintuitive; as they question the human capital argument adhered to by many organizations. That is, does hiring highly experienced individuals necessarily produce better outcomes? In reality, organizations often choose to hire those with more experience because they believe that such people are generally more productive, better decision makers, and generally more resistant to cognitive bias (e.g., framing effect, certainty effect) (Becker, 1964; Lepak & Snell, 1999; Lobo & Smole, 1999). However, as our results demonstrate, at least in the context of risky decisions involving monetary outcomes, which is the general context in which most managers operate, experienced decision makers are equally, if not more, exposed to decision biases.

We suggest that our findings have significant implications for both scholars and practitioners in that they provide an impetus to re-examine contemporary beliefs that experienced managers necessarily make

better decisions under uncertainty across all contexts. For example, organizations have continued to increase compensation for highly experienced managers over the past several years (Bebchuk & Grinstein, 2005). In fact, the ratio between average CEO compensation (e.g., those considered to have the most experience) to average worker compensation in North American has reached 120 to 1 in 2000. The ratio is 204 to 1 for the S&P 500, and that for the top 100 companies has reached 500 to 1 (e.g., Smith & Kuntz, 2013). Yet, we find that these experienced managers do and respond even more strongly than those with relatively less experience in some instances (e.g., certainty effect). Our findings may provide some support for scholars and practitioners who advocate for reducing pay disparity within organizations.

CONCLUSION

This investigation demonstrates that psychological factors (i.e., cognitive biases) shed further doubt on the assumed rationality of individuals regardless of their level of experience. We believe this provides the groundwork for interesting future research opportunities. It is our hope that this study lays the foundation for a more systematic and theoretical examination of this phenomenon and provides the motivation for such future research.

TABLE 1
RESULTS OF OVERALL EMBA & MBA PARTICIPANTS WITH COMPARISON TO PREVIOUS STUDIES

			Kahneman and Tversky's Studies 1-Kahneman & Tversky, 1979 2-Tversky & Kahneman, 1981				**Current Study**	
Scenarios	Expected value of Option A	Expected value of Option B	Source	Effect	N	Percentage of Option A	N	Percentage of Option A
Scenario 1 *Option A:* 33% chance of winning $2,500, 66% chance of winning $2,400, and 1% chance of winning $0. *Option B:* Wining $2,400 with certainty, 100% chance.	$2,409	$2,400	1	Certainty effect	72	0.18	232	0 .29
Scenario 2 *Option A:* 33% chance of winning $2,500, and 67% chance of winning $0. *Option B:* 34% chance of winning $2,400, and 66% chance of winning $0.	$825	$816	1	Certainty effect	72	0.83	232	0.66
Scenario 3 *Option A:* 80% chance of winning $4,000, and 20% chance of winning $0. *Option B:* Winning $3,000 with certainty, 100% chance.	$3,200	$3,000	1	Certainty effect	95	0.2	232	0.21
Scenario 4 *Option A:* 20% chance of winning $4,000, and 80% chance of winning $0.	$800	$750	1	Certainty effect	95	0.65	232	0.64

			Kahneman and Tversky's Studies 1-Kahneman & Tversky, 1979 2-Tversky & Kahneman, 1981				Current Study	
Scenarios	Expected value of Option A	Expected value of Option B	Source	Effect	N	Percentage of Option A	N	Percentage of Option A
Option B: 25% chance of winning $3,000, and 75% chance of winning $0.								
Scenario 5: Choose between options A and B: *Option A:* 50% chance to win a three-week tour of England, France, and Italy; and none with 50% chance. *Option B:* A one-week tour of England, with certainty, 100% chance.	-	-	1	Certainty effect	72	0.22	232	0.37
Scenario 6: Choose between options A and B: *Option A:* 5% chance to win a three-week tour of England, France, and Italy; and none with 95% chance. *Option B:* 10% chance to win a one-week tour of England; and none with 90% chance.	-	-	1	Certainty effect	72	0.67	232	0.73
Scenario 7a: Choose between options A and B: 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 estimates of the consequences of the programs are as follows: If program A is adopted, 200 people will be saved. If program B is adopted, there is 1/3 probability that 600 people will be	-	-	2	Framing effect	152	0.72	117	0.58

			Kahneman and Tversky's Studies 1-Kahneman & Tversky, 1979 2-Tversky & Kahneman, 1981				Current Study	
Scenarios	Expected value of Option A	Expected value of Option B	Source	Effect	N	Percentage of Option A	N	Percentage of Option A
saved, and 2/3 probability that no people will be saved. Which of the two programs would you favor? *Option A:* Program A. *Option B:* Program B.								
Scenario 7b: Choose between options A and B: 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 estimates of the consequences of the programs are as follows: If program A is adopted, 400 people will die. If program B is adopted, there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die. Which of the two programs would you favor? *Option A:* Program A. *Option B:* Program B.	-	-	2	Framing effect	155	0.22	115	0.17

			Kahneman and Tversky's Studies 1-Kahneman & Tversky, 1979 2-Tversky & Kahneman, 1981				Current Study	
Scenarios	Expected value of Option A	Expected value of Option B	Source	Effect	N	Percentage of Option A	N	Percentage of Option A
Scenario 8 Consider the following two-stage game. In the first stage, there is 75% chance to end the game without winning anything, and 25% chance to move into the second stage. If you reach the second stage you have a choice between option A and option B as described below. *Your choice must be made before the game starts* (i.e., before the outcome of the first stage is known). *Option A:* 80% chance of winning $4,000, and 20% chance of winning $0. *Option B:* Winning $3,000 with certainty, 100% chance.	$800	$750	1	Isolation effect	141	0.22	232	0.26
Scenario 9 You have just received $1,000 (as a gift) in cash (tax free). Choose between *Option A:* 50% chance of winning $1,000, and 50% chance of winning $0. *Option B:* Winning $500 with certainty, 100% chance.	$500	$500	1	Reflection effect	70	0.16	232	0.25

			Kahneman and Tversky's Studies 1-Kahneman & Tversky, 1979 2-Tversky & Kahneman, 1981				Current Study	
Scenarios	Expected value of Option A	Expected value of Option B	Source	Effect	N	Percentage of Option A	N	Percentage of Option A
Scenario 10 You have just received $2,000 (as a gift) in cash (tax free). Choose between Option A: 50% chance of losing $1,000, and 50% chance of losing $0. Option B: Losing $500 with certainty, 100% chance.	-$500	-$500	1	Reflection effect	68	0.69	232	0.76
Scenario 11 *Option A:* 25% chance of winning $6,000, and 75% chance of winning $0. *Option B:* 25% chance of winning $4,000, 25% chance of winning $2,000, and 50% chance of winning $0.	$1,500	$1,500	1	Value function & marginal effect	68	0.18	232	0.19
Scenario 12 *Option A:* 25% chance of losing $6,000, and 75% chance of losing $0. *Option B:* 25% chance of losing $4,000, 25% chance of losing $2,000, and 50% chance of losing $0.	-$1,500	-$1,500	1	Value Function & marginal effect	64	0.7	232	0.58
Scenario 13 *Option A*: 0.1% chance of winning $5,000, and 99.9% chance of winning $0.	$5	$5	1	Subjective Weighting Probabilitie	72	0.72	232	0.72

			Kahneman and Tversky's Studies 1-Kahneman & Tversky, 1979 2-Tversky & Kahneman, 1981				Current Study	
Scenarios	Expected value of Option A	Expected value of Option B	Source	Effect	N	Percentage of Option A	N	Percentage of Option A
Option B: Wining $5 with certainty, 100% chance.				s				
Scenario 14 *Option A:* 0.1% chance of losing $5,000, and 99.9% chance of losing $0. *Option B:* Losing $5 with certainty, 100% chance.	-$5	-$5	1	Subjective Weighting Probabilities	72	0.17	232	0.31

TABLE 2
T-TEST OF EACH SCENARIO BETWEEN EMBA AND MBA GROUPS

Scenarios		N	Mean	t-test	Overall Mean in Our Sample
Scenario 1 *Option A:* 33% chance of winning $2,500, 66% chance of winning $2,400, and 1% chance of winning $0. *Option B:* Winning $2,400 with certainty, 100% chance.	EMBA	89	0.2022	-2.4011*	0.29
	MBA	143	0.3427		
Scenario 2 *Option A:* 33% chance of winning $2,500, and 67% chance of winning $0. *Option B:* 34% chance of winning $2,400, and 66% chance of winning $0.	EMBA	89	0.5843	-1.9907*	0.66
	MBA	143	0.7133		
Scenario 3 *Option A:* 80% chance of winning $4,000, and 20% chance of winning $0. *Option B:* Winning $3,000 with certainty, 100% chance.	EMBA	89	0.1348	-2.3952*	0.21
	MBA	143	0.2587		
Scenario 4 *Option A:* 20% chance of winning $4,000, and 80% chance of winning $0. *Option B:* 25% chance of winning $3,000, and 75% chance of winning $0.	EMBA	89	0.5955	-1.0587	0.64
	MBA	143	0.6643		
Scenario 5: Choose between options A and B: *Option A:* 50% chance to win a three-week tour of England, France, and Italy; and none with 50% chance. *Option B:* A one-week tour of England, with certainty, 100% chance.	EMBA	89	0.2697	-2.5361*	0.37
	MBA	142	0.4296		
Scenario 6: Choose between options A and B:	EMBA	89	0.7079	-0.6737	0.73

Scenarios		N	Mean	t-test	Overall Mean in Our Sample
Option A: 5% chance to win a three-week tour of England, France, and Italy; and none with 95% chance. *Option B:* 10% chance to win a one-week tour of England; and none with 90% chance.	MBA	143	0.7483		
Scenario 7a: Choose between options A and B: 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 estimates of the consequences of the programs are as follows: If program A is adopted, 200 people will be saved. If program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved. Which of the two programs would you favor? *Option A:* Program A. *Option B:* Program B.	EMBA	45	0.7556	3.2273**	0.58
	MBA	72	0.4722		
Scenario 7b: Choose between options A and B: 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	EMBA	44	0.2955	2.5184*	0.17

Scenarios		N	Mean	t-test	Overall Mean in Our Sample
estimates of the consequences of the programs are as follows: If program A is adopted, 400 people will die. If program B is adopted, there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die. Which of the two programs would you favor? *Option A:* Program A. *Option B:* Program B.	MBA	71	0.0986		
Scenario 8 Consider the following two-stage game. In the first stage, there is 75% chance to end the game without winning anything, and 25% chance to move into the second stage. If you reach the second stage you have a choice between option A and option B as described below. *Your choice must be made before the game starts* (i.e., before the outcome of the first stage is known). *Option A:* 80% chance of winning $4,000, and 20% chance of winning $0. *Option B:* Winning $3,000 with certainty, 100% chance.	EMBA	89	0.2022	-1.7101†	0.26
	MBA	143	0.3007		
Scenario 9 You have just received $1,000 (as a gift) in cash (tax free). Choose between *Option A:* 50% chance of winning $1,000, and 50% chance of winning $0, and *Option B:* Winning $500 with certainty, 100% chance.	EMBA	89	0.1910	-1.6364	0.25
	MBA	141	0.2837		

Scenarios		N	Mean	t-test	Overall Mean in Our Sample
Scenario 10 You have just received $2,000 (as a gift) in cash (tax free). Choose between Option A: 50% chance of losing $1,000, and 50% chance of losing $0, and Option B: Losing $500 with certainty, 100% chance.	EMBA	89	0.7865	0.6642	0.76
	MBA	143	0.7483		
Scenario 11 *Option A:* 25% chance of winning $6,000, and 75% chance of winning $0. *Option B:* 25% chance of winning $4,000, 25% chance of winning $2,000, and 50% chance of winning $0.	EMBA	88	0.2045	0.4862	0.19
	MBA	140	0.1786		
Scenario 12 *Option A:* 25% chance of losing $6,000, and 75% chance of losing $0. *Option B:* 25% chance of losing $4,000, 25% chance of losing $2,000, and 50% chance of losing $0.	EMBA	89	0.5169	-1.6390	0.58
	MBA	142	0.6268		
Scenario 13 *Option A*: 0.1% chance of winning $5,000, and 99.9% chance of winning $0. *Option B*: Winning $5 with certainty, 100% chance.	EMBA	88	0.7386	0.3030	0.72
	MBA	143	0.7203		
Scenario 14 *Option A:* 0.1% chance of losing $5,000, and 99.9% chance of losing $0. *Option B:* Losing $5 with certainty, 100% chance.	EMBA	89	0.2360	-1.9937*	0.31
	MBA	143	0.3566		

**p < .01, *p < .05, †p < .10

REFERENCES

Allais, M. (1953). Le comportement de l'homme rationnel devant le risqué: Critue des postulats et axioms de l'Ecole Americaine. *Econometrica 21*, 503-546.

Åstebro, T., & Elhedhli, S. (2006). The effectiveness of simple decision heuristics: Forecasting commercial success for early-stage ventures. *Management Science*, *52*(3), 395-409.

Bebchuk, L. A., & Grinstein, Y. (2005). The growth of executive pay. *Oxford Review of Economic Policy, 21*(2), 283-303.

Becker, G. S. (1964). *Human Capital.* 1st ed. New York: Columbia University Press for the National Bureau of Economic Research.

Budescu, D. V. & Weiss, W. (1987). Reflection of transitive and intransitive preferences: A test of prospect theory. *Organizational Behavior and Human Decision Processes, 39,* 184-202.

Cassar, G. (2006). Entrepreneur opportunity costs and intended venture growth. *Journal of Business Venturing*, *21*(5), 610-632.

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39,* 752-766.

Day, D.V. & Lord, R.G. (1992). Expertise and problem categorization: The role of expert processing in organizational sense-making. *Journal of Management Studies, 29*, 35 - 47.

Fiske, S. T. & Taylor, S. E. (1991). *Social Cognition,* 2nd ed. New York: McGraw-Hill.

Hsu, D. K., Wiklund, J., & Cotton, R. D. (2017). Success, Failure, and Entrepreneurial Reentry: An experimental assessment of the veracity of self-efficacy and prospect theory. *Entrepreneurship: Theory & Practice, 41,* 19-47.

Kahneman, D. & Tversky, A. (1979). Prospect Theory: An analysis of decision under risk. *Econometrica, 47,* 263-291.

Kameda, T. & Davis, J. H. (1990). The function of the reference point in individual and team decision making. *Organizational Behavior and Human Decision Processes, 46,* 55-76.

Kühberger, A., Schulte-Mecklenbeck, M., & Perner, J. (1999). The effect of probabilities and payoff on framing: A meta-analysis and an empirical test. *Organizational Behavior and Human Decision Processes, 78,* 204-231.

Lepak, D. P., & Snell, S. A. (1999). The human resource architecture: Toward a theory of human capital allocation and development. *Academy of Management Review, 24,* 31-48.

Lobo, J. & Smole, D.P. (1999). Stratisfication and spatial segregation of human capital as determinants of metropolitan productivity in the United States. *Urban Studies, 39*, 529-547.

Loehman, E. (1998). Testing risk aversion and nonexpected utility theories. *Journal of Economic Behavior and Organization, 33,* 285-302.

March, J. G., & H. A. Simon (1958). *Organizations.* New York: Wiley.

March, J. & Shapira, Z. (1992). Variable risk preferences and the focus of attention. *Psychological Review, 99,* 172-183. Reprinted in J. March (Ed.), *The pursuit of intelligence in organizations.* Cambridge, Mass.:Blackwell,1999.

McCray, G. E., Purvis, R. L., & McCray, C. (2002). Project management under uncertainty: The impact of heuristics and biases. *Project Management Journal, 33*, 49-57.

Milkovich, G. T. & Newman, J. M. (1993). *Compensation,* 4th edition, Homewood, IL: Richard Irwin.

Paese, Bieser, & Tubbs, (1993). Framing effects and choice shifts in group decision making. *Organizational Behavior and Human Decision Processes, 56*, 149-165.

Schwenk, C. R. (1986). Information, cognitive biases, and commitment to a course of action. *Academy of Management Review, 11*, 298-310.

Sherman, S.J. & Corty, E. (1984). Cognitive heuristics. In Wyer, R.S. Jr. and Srull, T.K. (Eds.), *Handbook of Social Cognition.* Hillsdale, NJ: Erlbaum, 189-286.

Sitkin, S. B. & Weingart, L.R. (1995). Determinants of risky decisions-making behavior: A test of the mediating role of risk perceptions and propensity. *Academy of Management Journal, 38*, 1573-1592.

Smith, E., Kuntz, P. (2013). Disclosed: The pay gap between CEOs and employees. *Bloomberg Businessweek,* May 2.
Snell, S. A. & Dean, J. W. (1992). Integrated manufacturing and human resource management: A human capital perspective. *Academy of Management Journal, 35,* 467-504.
Sullivan, K., & Kida, T. (1995). The effect of multiple reference points and prior gains and losses on managers' risky decision making. *Organizational Behavior and Human Decision Processes, 64,* 76-83.
Tanaka, T., Camerer, C. F., & Nguyen, Q. (2016). Risk and time preferences: Linking experimental and household survey data from Vietnam. In *Behavioral Economics of Preferences, Choices, and Happiness* (pp. 3-25). Springer Japan.
Thaler R. H. & Johnson E. J. (1990). Gambling with the house money and trying to break even: The effects of prior outcomes on risky choice. *Management Science, 36,* 643-660.
Tindale, S. R., Sheffery, S., & Scott, L. A. (1993). Framing and group decision making: Do cognitive changes parallel changes? *Organizational Behavior and Human Decision Processes, 55,* 470-485.
Tushman, M. L. & Nadler, D. A. (1978). Information processing as an integrating concept in organizational design. *Academy of Management Review, 3*, 613-624.
Tversky, A. & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185,* 1124-1131.
Tversky, A. & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211,* 453-458.
Tversky, A. & Kahneman, D., (1986). Rational Choice and the Framing of Decisions. *Journal of Business, 59,* 251- 278.
Tversky, A. & D. Kahneman (1992): Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty, 5,* 297-323.
Wiseman, R., & Gomez-Mejia, L. (1998). A behavioral agency model of managerial risk talking. *Academy of Management Review, 23,* 133-153.