APPLICATIONS OF BEHAVIORAL ECONOMICS IN PHILANTHROPHY: UNDERSTANDING LOSS AVERSION AND RISK TOLERANCE IN GRANTMAKING

By John R. Ettinger, CEO of The Leona M. and Harry B. Helmsley Charitable Trust
ORCID ID: 0000-0001-5407-7327
John T. Ettinger, Associate, Lee Equity Partners
ORCID ID: 0000-0001-7382-0294

"*Never leave a birdie putt short*."
- - Traditional Golf Exhortation

It is demonstrable statistically that professional golfers are more accurate when they putt attempting to avoid bogey (a *loss* to par) than when they putt trying to make birdie (a *gain* to par), notwithstanding that the same amount (one stroke) is at stake. Also, in blatant disregard for the famous golf aphorism above, it can be shown that these highly experienced golfers putt the ball less hard in the case of birdie opportunities than they do when trying to avoid bogey. The fact that these surprisingly systematic patterns were found through a careful study of 2.5 million putts on the PGA Tour is certainly testament to academic thoroughness. More importantly, though, the imaginative researchers present this as evidence of: (a) in the case of the greater accuracy, the valuing of avoiding losses more than commensurate gains (loss aversion) and (b) in the case of the variations in the forcefulness by which putts are struck, the tendency to be "risk averse" in the domain of gains and "risk taking" in the domain of losses. [1] Given the countless hours golfers of this caliber spend seeking a metronome-like consistency to their stroke, these asymmetries in putting results go at least a little way to addressing the concern that "the greatest challenge facing behavioral economics is demonstrating its applicability in the real world." [2]

This paper considers how individuals incorporate in philanthropy unavoidable considerations of loss and risk in decisions which are made under conditions of uncertainty, albeit tested by means of a "laboratory" experiment employing hypotheticals based on grant-making choices. Are natural and fundamental behavioral patterns exhibited in personal decision-making carried over into decisions made in the philanthropic context, or do new behaviors emerge when one moves from personal choices to philanthropic ones?

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[1] Devin G. Pope and Maurice E. Schwertzer, "Is Tiger Woods Loss Averse? Persistent Bias in the Face of Experience, Competition and High Stakes," *American Economic Review* 101 (February 2011)
[2] Steven D. Levitt and John A. List, "Homo Economicus Evolves," *Science* 319 (2008)

FOUNDATION PHILANTHROPY AND SURVEY RESULTS

The ultimate question here is likely how we <u>want</u> people to act in making philanthropic decisions. Should foundations, for example, be "risk takers" so as to fund more uncertain steps that other sectors such as business and government will not undertake? This is a common outlook among those who emphasize the role of foundations in promoting "innovation" and see that function as requiring a heightened risk tolerance. Or should foundations be more actuarial with respect to risk, more risk neutral, and define their role as facilitating important work where other sectors do not because of conditions such as failures of the market mechanism, imperfect information and/or political or economic inequities. Admittedly, tying a non-actuarial, risk-taking profile uniquely to those emphasizing innovation while associating risk neutrality with "gap" strategic philanthropy is of course overstating the correlation. Risk-taking or risk-neutrality are associated with a variety of philanthropic philosophies. But there may be some truth to the dichotomy and, in any event, the question exists as to how we might hope people handle unavoidable risk and uncertainty in philanthropic decision-making.

This all raises difficult and debatable questions. However, a reasonable predicate to considering how people <u>should</u> act in making philanthropic decisions is to understand how they currently <u>do</u> make such decisions. Are decisions (both as to the "yes/no" of whether to proceed and as to amount when proceeding) generally made by reference to some (even unconscious) analytics of estimated final results (the probabilistic likelihood that the outcome of a grant will be successful), or by reference to some other factors or heuristics? These other factors or heuristics might include, for example (a) prior invested funds, (b) biases towards long-shots, absolute certainty or particular milestones for likelihood of success or (c) a preference for staying the course versus proactive change when either carries some risk of being wrong. A highly pertinent issue affecting grantmaking is whether people in this area react more strongly to losses than to gains, in the sense that they fear a loss of "x" more than the favor a gain of the same "x" amount. Accompanying these questions are issues of how, when facing possible gains from grantmaking success or losses from failed grants, people react to different levels of risk.

The fundamental premise of this analysis, then, in that focusing on how decisions are made can be an important step in determining how they can be improved. This in turn implies, assuming we can identify behavioral patterns (and compare them against some normative standards), that there are constructive approaches to modifying decision-making processes towards a more optimal direction. Accordingly, some of what follows attempts to consider how as a practical matter the findings here might be specifically used to that end.

Owing to the amount of survey data outlined and analyzed in this paper, and recognizing that some practitioners in the field of foundations may look more for succinct, practical guidelines without the statistical detail, a somewhat uncommon through hardly unique organizational structure is used. Thus, what follows immediately is this section essentially sets out in some reasonable detail "conclusions" suggested by the survey results. The theoretical framework, a description of the survey itself and an analysis of the specific survey data then follows. The "Conclusion" section at the end therefore will less recapitulate the overall results - - hopefully adequately summarized in this section - - and focus more on suggesting some possible practical implications a foundation philanthropist, or a student of foundations, might wish to consider or further research.

The results of the survey indicate that the foundation's staff approached risk in line with the predictions of traditional economic theory, including so-called Prospect Theory. Prospect Theory is a recent and important re-formulation of how individuals make decisions when facing uncertainty and it is more fully described below. The more specific results of the survey are:

- *Loss Aversion* - Loss aversion is defined more fully below, but generally it means that individuals dislike losses more than they like equivalent (in the sense of absolute value) gains. The group was generally loss averse in both the personal and professional context. The degree of loss-aversion was reduced in the philanthropic context, however.
- *Risk Aversion* –Risk aversion, again further analyzed below, is demonstrated when a party favors an assured result over a favorable gamble having equal or slightly higher expected value.[3] The same pattern of risk aversion in the personal context and reduced but evident risk aversion in the professional context was exhibited.
- *Implications of Loss and Risk Aversion* – These patterns are perhaps an interesting answer to the question of how professionals in the foundation world react to the fact that they are acting as agents rather than principals. Wholly consistent with reasonable boundaries of prudence and due care, the fact that they act as agents might lead to either greater risk-taking or more conservative allocations. The pattern would appear to be in the direction of the former. In both personal and professional contexts respondents were prepared to assume more risk as benefits increased. (In mildly technical terms, the pattern was generally monotonic, i.e., uniformly either increasing or decreasing [or at least staying the same] as the variable in questions increased). Behavior in the personal context

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[3] Loss aversion will thus tend to produce risk averse behavior in the case of locking in potential gains but risk seeking behavior when attempting to avoid a potential loss (see page 7).

reflected a statistically significant tendency when facing potential losses to move towards a "risk taking" position, and at least in some instances in the professional contexts there were suggestions of similar behavior. This presumably reflects an attempt to put off or defer loss realization in the hope that the situation will somehow improve. At the same time, loss and risk aversion were present in situations of potential gain. There was a tendency in this sense to "lock in" a potential gain even at the expense of possibly foregoing some upside. This was true in the personal context and to some extent in the questions testing philanthropic decision-making as well.

- *Relative Behavior* - There is some evidence that relative behavioral patterns carried over from the personal side to the professional one (i.e., those who were more risk-averse in their personal decisions were systematically more risk-averse in the professional context). To the extent a different decision calibration takes over when making philanthropic decisions, there is thus nonetheless some indication that the relative preference for risk remains the same from individual to individual in both personal and professional contexts.

- *Framing* – For these purposes, framing refers to whether specific results are, in a number of possible ways, cast explicitly as a "loss" or a "gain." Similar results, when stated explicitly as a "loss" for example produced markedly different decision-making patterns than when not so stated.

- *Sunk Costs* – Sunk costs refer to expenditures (of time, money or anything else of value) which have been previously incurred and are now unrecoverable. Therefore, sunk costs arguably should not have impact on decisions about future actions. Responses to a number of questions in both the personal and professional context, however, generally reflected undue significance being attributed to prior investment decisions rather than relevant future probabilities (the so-called "sunk cost" fallacy). An alternative analysis is offered in analyzing the philanthropic context questions, however, which may offer some support for the decision-making patterns.

- *Special Effects* - Responses also generally reflected an excessive tendency to make grants based on a long-shot possibility of success (the "possibility" effect). There was not a clear tendency, observed in some areas other than philanthropy, to over-value the last few percentage points to achieve absolute certainty (the "certainty" effect), although results were mixed here perhaps due to question design. The 50% level for the likelihood of success of a grant (where success became <u>A</u>s <u>L</u>ikely <u>A</u>s <u>N</u>ot, or ALAN) seemed also an important milestone in grantmaking decisions. This would seem understandable as a grant more likely to fail than to succeed is perhaps a hard choice for a grantmaker even in instances where because potential benefits are high the overall expected value is good.

- *Regret* – For these purposes regret is taken to mean the fear or fact of regretting an action that one takes. An emphasis here is on "action." Regret is distinguishable in this sense from the feeling one experiences when an unfavorable outcome results from inaction. There were signs that philanthropic decision-makers preferred to risk an error in judgment through a passive failure to act rather than taking action which might result in exactly the same disappointment. This is perhaps a quite interesting result in that it might create institutional interests directly at odds with normal human feelings of regret. It shows ways in which a program officer can behave in a risk averse manner that are hard to detect. As one experienced consultant has noted "Established programs tend to be extremely reticent to aggressively reallocate funds even if conditions change; it may be precisely for this concern about the greater regret one experiences for jumping at an opportunity and failing them for sitting tight and watching opportunity pass you by." [4]

BEHAVIORAL ECONOMICS AND PROSPECT THEORY

Economic analysis, importantly as modified in recent years by so-called Prospect Theory and its analysis of loss aversion and shifts in risk tolerance between gains and losses, would suggest that all of the above are perfectly normal human behavior and may in some cases be systematic patterns. Specific applications of Prospect Theory and behavioral economics reflected in the sunk cost fallacy, the possibility effect and the disposition effect would further explain such behavior and even in some cases predict it.

Prospect Theory, and related areas of behavioral economics, grew out of distressing problems at the very foundations of economic analysis. The issues concerned how the most basic economic unit - - the individual - - values money (or other economic interests) - - arguably the most basic economic issue. This is thus central to all other micro- and macro-theory in the area. For centuries, how individuals valued economic interests had been considered settled by Classic Utility Theory. This doctrine traces back quite specifically to a single landmark paper written by Daniel Bernoulli in 1738. Bernoulli's analysis postulates that economic agents determine the value of money (its "utility") and hence make decisions by reference to their final wealth state following the transaction or proposed transaction.

The infirmity in this fundamental tenet of economics emerged due to a growing body of evidence that Classic Utility Theory comported neither with actual behavior nor with

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[4] E-mail from Nathan Huttner of the Redstone Strategy Group, LLC dated January 22, 2015.

analytically defensible mathematics. On the side of actual behavior, field studies repeatedly demonstrated systematic behavior which did not follow the predictions of utility theory. This undermined attempts to argue that "on average" behavior was consistent with the standard economic assumptions of Classic Utility Theory even if no single individual was likely to be the purely economic actor described by the theory. To compound the problem, beginning perhaps with Paul Samuelson in 1963 [5] and concluding with a decisive refutation from Matthew Rabin in 2000 [6], the mathematics underlying Classic Utility Theory was shown to be generally unsupportable.

Various replacement frameworks were offered up over time for Classic Utility Theory, but the one gaining greatest acceptance has been Prospect Theory, as first articulated by Daniel Kahneman and Amos Tversky. [7] In its most general essence, Prospect Theory states that rather than making decisions with reference to final wealth states people evaluate decisions with respect to a salient reference point.

To appreciate the significance of this distinction, it helps to go back to the fact that Classic Utility Theory was borne out of the observation that people tend to dislike risk, and in choosing between a gamble and an amount equal to the gamble's expected value (e.g., the choice between (a) a flip of a coin where the person receives $10 for heads and $0 for tails and (b) $5 for sure) an individual will select the sure thing. In fact, individuals generally will choose a guaranteed result having somewhat less expected value than a gamble, thus paying a premium for certainty. Bernoulli's utility theory was designed to explain this aversion to risk. As noted, however, his utility analysis was ultimately recognized as inconsistent in important regards with both theory and practice.

Prospect Theory alternatively posits that rather than making decisions with reference to final wealth states, people evaluate decisions with respect to a case-specific salient reference point. A strikingly simple illustration of what is meant by "a salient reference point" would come from two individuals, each of whom has $10 today but one of whom had $0 yesterday while the other had $20. They are not equally happy, of course, but Bernoulli's theory, based on final wealth states, fails to account for this. Prospect Theory, focusing on the different reference points for the two individuals ($0 and $20), explains the difference in happiness by the change from these respective reference points. The reference-dependent theory of decision-making which follows from this simple illustration builds out to a full framework of considerable power both in theory

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[5] Paul Samuelson, "Risk and Uncertainty: A Fallacy of Large Numbers," *Science* 98 (1963)
[6] Matthew Rabin, "Risk Aversion and Expected-Utility Theory: A Calibration Theorem," Econometrica 68 (2000); Mathew Rabin and Richard H. Thaler, "Anomalies: Risk Aversion," *Journal of Economic Perspectives* 15 (2001)
[7] Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica* 47 (1979)

and practice. Importantly, it leads to two behavioral paradigms: The first is that people dislike losses more than they value gains equal in absolute amount, i.e., that they are loss averse. This is reflected in the familiar diagram below of value in the world of Prospect Theory, which is "asymmetrical" above and below the reference point (the origin) with a steeper slope for losses than for equivalent gains:
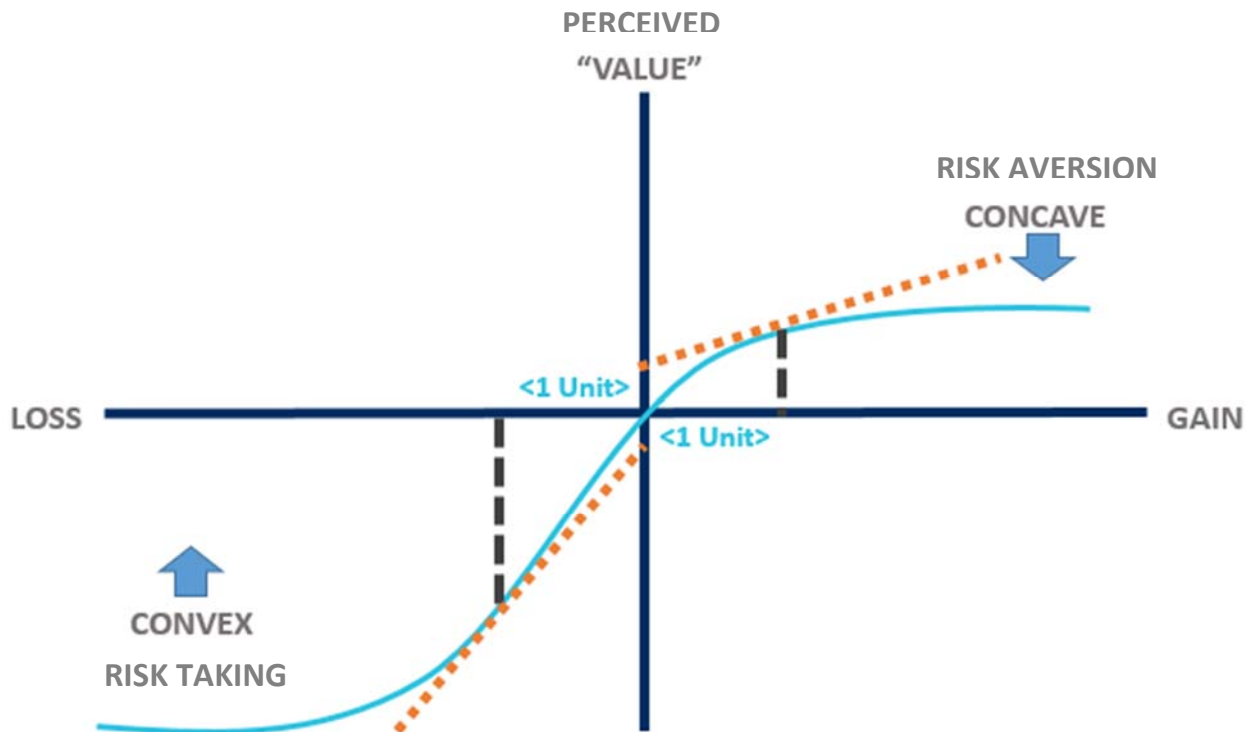
The second pattern, also reflected in the diagram above, is that people are risk-taking in the area of loss (reflected in the convexity of the curve in the domain of losses [thus, significant additional units of Loss produce only disproportionately small increased negative "Value"]) but concave in the case of gains [thus, disproportionately large increments in units of Gain are required to produce increases in positive "Value"]. Although this seriously oversimplifies the core of Prospect Theory and does not address most of the richness of the framework, it is for these purposes an adequate expression of the theory's basic tenets.

As noted above, there is (at least in the case of foundations) perhaps reasonable question about what patterns of behavior we should want to encourage. The now widely-encouraged approach of analyzing alternative philanthropic initiatives by reference to a risk-adjusted measure of potential benefit per dollar of investment (whether adopted in the more formalistic numerical sense or merely as a general philosophic approach), which is especially at the core of what is labeled by some as Strategic Philanthropy, implies rather strict risk and loss neutrality. The value function diagram above for adherence to this approach would be a straight, 45% line, positively

sloped and running through the origin. Alternatively, it is often suggested that the role of foundations - - perhaps as a result of the benefit accorded to these entities of tax-free accumulation - - is to take greater risk than private sector or governmental entities can frequently be expected to bear. In this regard, it is perhaps particularly interesting to consider whether parties in acting as agents or stewards for foundation money demonstrate the same patterns of behavior as they do with their own dollars. It is not obvious whether the fact that "it's not my money" would typically lead people to be more or less risk tolerant with funds not their own. It is also the case that least some of the behavioral patterns found to be common in Prospect Theory may not be thought desirable if evident in the philanthropic arena regardless of where one comes out in the risk neutrality vs. risk taking debate. The following attempts to offer some perspectives on the patterns of behavior by individuals involved in the area of foundation activities.

THE SURVEY

In order to study how individuals' loss and risk behavioral biases might affect the grantmaking decisions within a foundation, a survey was designed to test decision-making approaches in both the personal and the professional (philanthropic) contexts. An 18-question survey was administered to 73 employees of a major foundation. Participants were randomized into either Version X (36 respondents) or Version Y (37 respondents). The two versions of the survey differed with respect to 5 of the questions in order to permit statistical testing, within the limits imposed by sample size, of whether certain framing or differences in specific variables would alter the pattern of decision-making. The survey was administered to both staff members directly involved in grantmaking ("Program" staff) and to the other, non-Program staff to determine whether differences in decision-making patterns appeared, again constrained by sample size. The seniority of Program staff, as determined by job title, was also considered as a possible influencing factor on decisions.

Title breakdown (of Program staff who disclosed)			
Program Director	Program Officer	Program Associate	Assistant
5	11	8	8

The questions contained in the survey are set out in the **Appendix** to this note.

The p-values for many of the results in the professional context were not within the ranges (10%, 5% and 1%) generally considered as dispositive proof in the academic arena.[8] The 10%, 5% and 1% confirmation levels often sought in academic analysis may be a stricter standard than is practically required in some business contexts, where directional correctness in the range of 70% or 80% likelihood may suffice to be the basis for a course of action in an uncertain world.
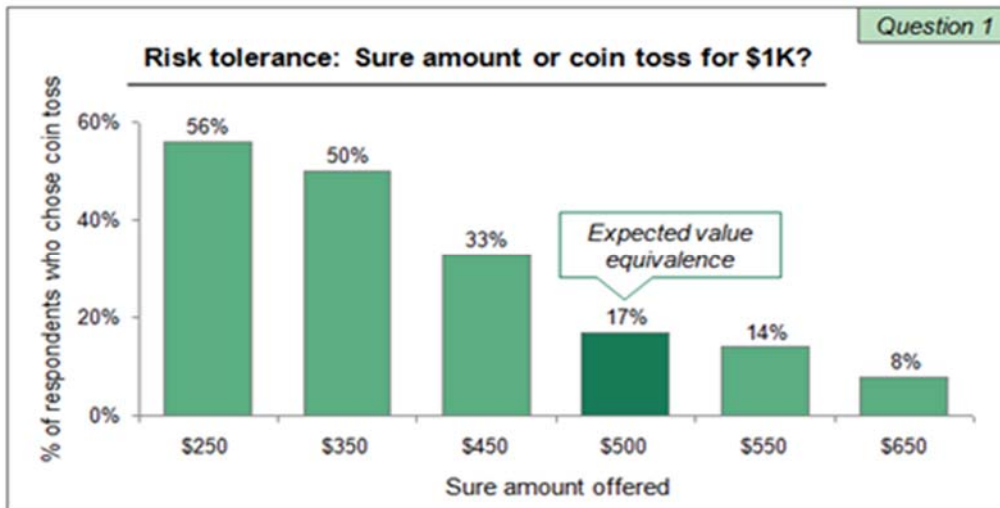
SURVEY RESULTS

Loss Aversion and Risk Tolerance: Personal Context

It is often said that "losses loom larger than gains" and thus as noted above individuals manifest a tendency to dislike losses more than they like equivalent (in the sense of absolute value) gains. This is loss aversion. Loss aversion among the survey group was clearly manifest to what might be considered a significant degree and at high levels of statistical significance in the personal context. In **Question 1**, for example, people were asked to choose between receiving a fixed amount of money ($X) or tossing a coin to win $1000 or $0, each with a 50% probability. Respondents selected certainty over the $500 expected value of the coin toss to the extent of a willingness to pay a significant premium for the avoidance of risk. As reflected in the chart below, respondents were thus five times as likely to select the "sure" $500 as to take the coin toss with the same expected value. Even at the "cost" of a $50 dollar charge for certainty, respondents were twice as likely to take a certain $450 rather than flip a coin for a possible $1000. At a guaranteed level of $350 participants were indifferent on average between the sure thing and the bet, thus indicating an average risk premium of $150 (or 30% of the expected $500) to avoid the possibility of no gain.

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[8] P-values measure the probability that the observed results of the sample confirm that the "null hypothesis" (which is generally the negative of the proposition of interest) is correct. Thus, P-values indicate the probability that the observed results are due to random variation from the "null hypothesis" rather than due to the hypothesis being tested. When testing the difference between two means (say, capital allocations under two different conditions) a p-value of 0.3 would indicate that there is only a 30% chance that the difference is due to random variation. A lower p-value therefore suggests a greater probability that an observed result is the product of the hypothesis being tested (it is incorrect, however, to equate a p-value of 0.3 with 70% certainty in the tested hypothesis—as in the courtroom, failure to prove guilt does not definitely establish innocence). P-values get lower as the result of either a stronger finding (e.g., a larger difference between two means), or as the result of a greater number of observations.

Question 1	Offered $250	Offered $350	Offered $450	Offered $500	Offered $550	Offered $650
Took coin toss	41 (56.2%)	36 (50.0%)	24 (33.3%)	12 (16.7%)	10 (13.9%)	6 (8.3%)
Took sure amount	32 (43.8%)	36 (50.0%)	48 (66.7%)	60 (83.3%)	62 (86.1%)	66 (91.7%)

Question 1

Risk tolerance: Sure amount or coin toss for $1K?

% of respondents who chose coin toss

- $250: 56%
- $350: 50%
- $450: 33%
- $500: 17% — Expected value equivalence
- $550: 14%
- $650: 8%

Sure amount offered

Loss aversion is also evidenced when people are more prone to avoid a choice "framed" as a loss than when presented with the same results but stated in non-loss terms. Loss aversion was thus manifest in the survey results for **Question 8**, where the Version X and Version Y split was used. The participants (Version X) who had the outcome framed as a loss ("losing $500") were more willing at a high level of statistical significance to assume risk by taking an offered gamble than those (Version Y) for whom the loss was not made explicit ("ending up with $1500"). See the chart below. This is notwithstanding that the two versions presented exactly the same gamble with identical expected monetary outcomes ($1500). The only difference was the explicit introduction of the terminology of "loss" in Version X.

Question 8	Loss frame	Non-loss frame	p-value
% of people who took the gamble	58%	27%	0.006

Question 8

Loss aversion: From $2,000 to $1,500

Loss frame: 58%
Non-loss frame: 27%
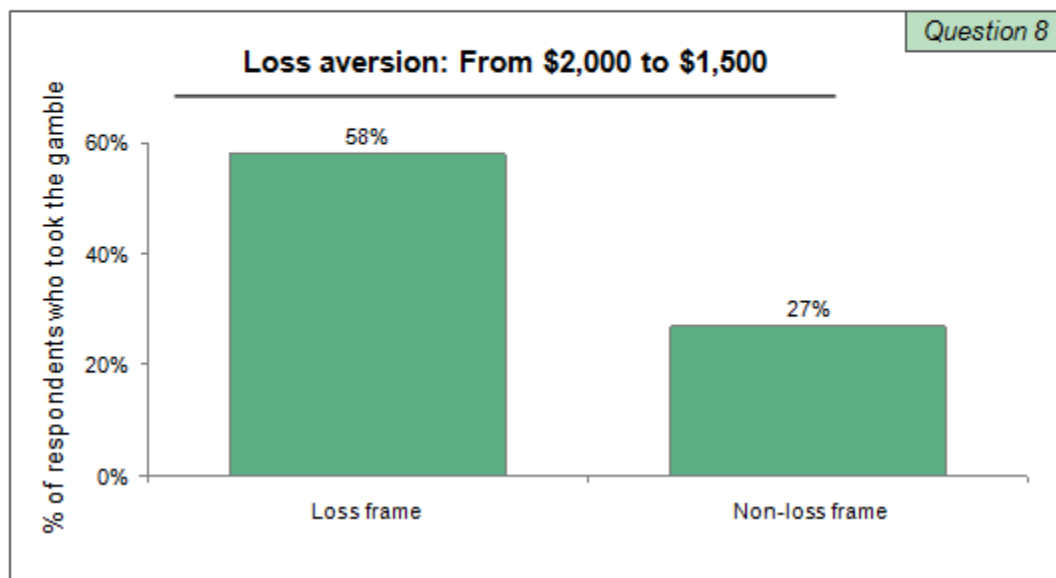
Similarly, participants were split in **Question 13** between those for whom the outcomes represented actual gains (Version X) and those for whom the outcomes would be actual losses (Version Y), though in each case the ultimate expected value was the same. As contrasted with **Question 8** then, this hypothetical involved actual gain or loss, not merely a difference in articulation. Again, the loss situation (Version Y) can be seen as engendering more disutility (and hence a greater willingness to gamble) than the gain situation (Version X). The statistical significance here is not as great, however, presumably reflecting the economics of the offered alternatives. (See **Appendix**)

Risk aversion is demonstrated when a party favors an assured result over a favorable gamble having equal or higher expected value. **Questions 9 and 16** (see **Appendix**) tested a participant's willingness to settle a legal case versus litigate. The questions were designed to test risk-aversion (or risk-taking). Thus, in **Question 16** the plaintiff-participant is offered either the opportunity to litigate which is estimated to carry a small chance of losing and receiving nothing (i.e., is likely to win), or to settle for an amount less than the expected value of litigating. A majority of the respondents choose to settle and thereby lock-in a certain gain. This exhibits risk-aversion when facing a potential gain situation. On the other hand, in **Question 9**, when the defendant-participant had only a small chance of winning or could pay an actuarially favorable settlement, a lesser percentage of participants choose to settle (i.e., on average the group was more "risk-taking" when faced with a loss, although a narrow majority were still slightly risk-averse).

The settlements hypotheticals illustrate an important point about how risk attitudes that are perfectly understandable in the case of individual actions may make for poor institutional policy.   It is understandable in the responses to **Questions 9** and **16** that an individual actor in his/her specific case may be willing to take a risk to avoid a likely loss, or may be prepared to lock-in a satisfactory gain. Businesses, governments and other entities, however, often have to confront possibilities of repeated litigation and therefore may adopt policies designed to avoid exactly this type of behavior, as the cost of repeatedly taking a course of action inconsistent with expected value maximization may become significant. This tension which at times exists between understandable individual behavior and acceptable institutional norms is worth keeping in mind below as the risk patterns in the professional context are considered. The near 50-50 willingness in both (**Question 9** and **16**) to accept non-expected value maximizing results might, in the professional context of professional philanthropy for example, be extremely costly over time for a foundation to tolerate even if it is understandable behavior in any one single case.

Question 14 (see **Appendix**) is another example where respondents were split between those with the possibly of gain (Version X) and those with the possibility of loss (Version Y), though in both cases with the same ultimate expected value. Again, the group were relatively more risk-taking when forced to confront a potential loss than when confronted with a possible gain.

Loss Aversion/Risk Tolerance: Professional Context

Indications of loss aversion in the professional context are also present in the responses of the foundation staff, though the extent of the loss aversion appears somewhat less. **Question 15** illustrates, in this regard, a higher comparative tolerance for loss (versus the personal context) while still exhibiting loss averse behavior. **Question 15** (see the chart below) designed as a companion to **Question 1** in the personal context, presents a choice between a 50% chance to achieve success with 1000 households or a guaranteed success with various numbers of households. This is thus essentially the same choice as offered in the earlier question in the personal context (though admittedly the "units" - - dollars or households - - vary, thus making exact comparisons imperfect). In the professional context, more than 3.5 times as many people chose to take the certain result rather than the actuarially fair chance to help 1000 households with a 50% likelihood of success (versus 5 times as many in the coin toss hypothetical). The risk premium, based on interpolation, appears to be on the order of $40 dollars (versus $150 in the coin toss case). At every level of certainty, however, there is somewhat greater tolerance for loss exhibited in the professional context, but loss aversion is the overall pattern in the professional philanthropic context as well.

Question 15	250 Households	350 Households	450 Households	500 Households	550 Households	650 Households
50% chance of improving 1K households	58 (84.1%)	55 (79.7%)	42 (60.9%)	16 (22.9%)	9 (13.0%)	6 (8.7%)
Improve X households with certainty	11 (15.9%)	14 (20.3%)	27 (39.1%)	54 (77.1%)	60 (87.0%)	63 (91.3%)

Risk tolerance: Sure impact or 50% chance of improving 1K households?

Question 15 (& Question 1)
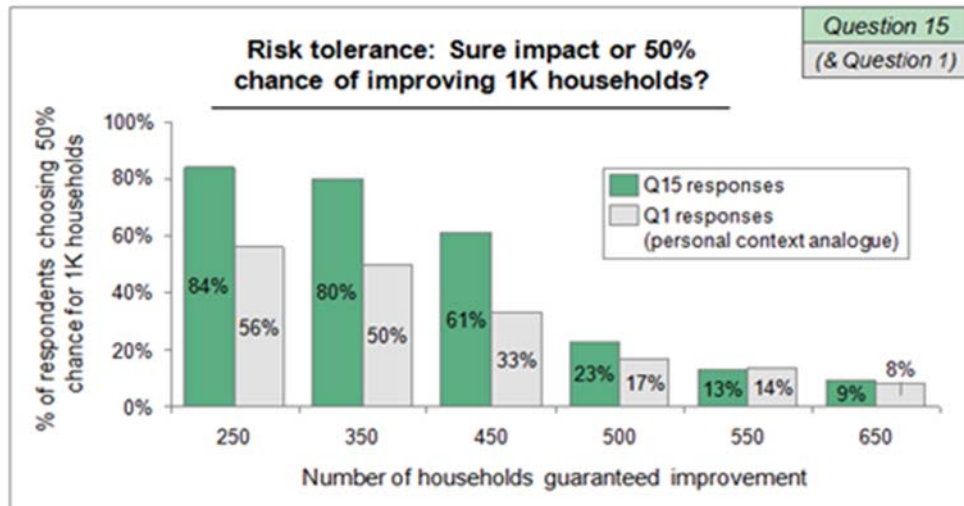
In general, and as economic theory and common sense would suggest, there is a monotonically increasing willingness on average to make a hypothetical grant as the likelihood of success increases as indicated in **Question 3**. (See **Appendix**) The group, on average, is approximately indifferent between making the grant or not when the grant is as likely as not to succeed. Perhaps interestingly, 10% of the staff would not make the grant even at a 70% likelihood of success and one in five would not proceed if it is 60-40 in favor of the grant succeeding. Whether the implied levels of certainty required by a material portion of the staff to proceed with a grant is consistent with innovative grantmaking is at least a reasonable question. It should be noted, though, that there are almost certainly worthwhile philanthropic activities that could bring an estimated success range consistent with these requirements for certainty, but it would involve only select types of opportunities in any grantmaking area. **Question 3** was principally intended as a baseline measure against which to compare some other results and is therefore analyzed below in greater detail.

Question 10 tested in the professional context whether "framing" issues were important as to whether identical results were expressed explicitly as "losses" or not. Thus, even though the two groups were presented with the identical likelihood of success and benefit, there was a notable difference in the willingness to proceed with a philanthropic infusion on capital depending on whether the anticipated results were explicitly framed as a loss. The extent of the effect and the level of statistical certainty,

however, was not high. (See **Appendix**) Although the p-value was short of dispositive, in view of the sample size of the split the directional strength of the results may be noteworthy.

Question 17 offers some indication that people are willing to "net" gains against losses in a traditional fashion. (See **Appendix**) Thus, the question asked respondents to express a preference between a portfolio which resulted in $2.4 million of grants achieving success versus a portfolio with $7 million of grants achieving success but $3 million producing no effect (i.e., in that sense being wasted expenditure). Participants were significantly more willing to invest in the latter portfolio. This suggests that people are willing to take on some grants which do not succeed so long as these grants are more than offset by successful grants.

A caveat about interpreting the responses to this question: There is some indication that respondents struggled with, or interpreted differently across the group, the element in the hypothetical of "Neutral" results. These were said to represent cases where "some progress [is] made, but you would definitely not make a similar grant again nor re-fund the current grant project." The appropriate mathematics of accounting for $17.6 million of Neutral grants in one case (with $2.4 million of successes) and $3 million in the other case (with $10 million successes and $7 million in failures) is at best debatable and may have troubled some of the group. Some appear to have attributed some positive value even to Neutral results while other did not. Although result patterns attempted to be captured by the concept of Neutral may comport reasonably well with actual experience, it is a difficult factor to capture in this context and may make the results here hard to interpret.

To take this point somewhat further a meaningful question arises as to whether actors in the philanthropic context treat expenditures which produce no effect (in that regard "unsuccessful" grants) as "losses". Clearly there is a loss in the form of an opportunity cost or waste. But for this sort of philanthropic activity unsuccessful grants result at worst in "no change" and the gain/loss dichotomy may be somewhat modified. Grants supporting medical research, to take one example, may be seen as involving this "type" of loss if unsuccessful. In this case there is no loss in the sense of a true negative, and in fact for many types of grants there is a reasonable expectation that experimentation resulting in no positive advances is a necessary and "successful" step towards the ultimate achievement of the desired goal. In some other types of philanthropic interventions, however, there may be the possibility that an unsuccessful grant produces a step backwards. A subsequent survey will test these situations to determine how such losses are treated for purposes of a netting against successful outcomes.

The Certainty, Possibility and ALAN Effects

At least one of the hypotheticals (**Question 6**) shows a strong inclination to make a slightly riskier grant (90% Likelihood of Success ["LOS"] vs 100%) when a materially better outcome was projected (6 months improvement in reading skills vs. only 3 months). (See **Appendix**) This suggests an absence of the "certainty effect" - - the willingness to pay a premium to eliminate the last few percent of uncertainty - - which has been noted in some other contexts. Two things, however, may be at work here. First, it may be that, at least in the philanthropic context, a 90% likelihood of success is sufficiently unusual so as to be equated with absolute as to imply certainty. [9] Also, a second factor may be that as **Question 6** was constructed the potential benefit of the only slightly less certain result, being twice the gain of the certain result, was viewed as a chance worth taking. A future survey will test whether slightly less certainty and reduced outcome differentials produce material changes in the result. **Question 11** is perhaps a better test for the certainty effect, but does not appear to support its existence. In this question, respondents were asked how much of a $10 million budget they would allocate toward a drug research program under various likelihoods of success. In interpreting the results of this question, a "line of best fit" was calculated (the "Regression Line") using the average allocation for each percentage chance of success and the actual results compared with each level of allocation expected as per the Regression Line. (The chart on page 17 summarizes the results reflected in the Regression Line analysis.) The responses show a strong linear relationship between chance of success and average allocation, with the certain 100% allocation sitting very close to the Regression Line (only 1% above).

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[9] This was the view expressed by several of the respondents in a focus group used to develop this questionnaire. An attitude of "in this world 90% is as good as it gets" may have influenced the responses here.

Question 11	Chance of success							
	5%	20%	35%	50%	65%	80%	95%	100%
Avg. allocation to drug research	$1.0M	$1.8M	$2.8M	$4.5M	$5.3M	$6.7M	$7.8M	$8.4M

Risk tolerance in research investment — Question 11
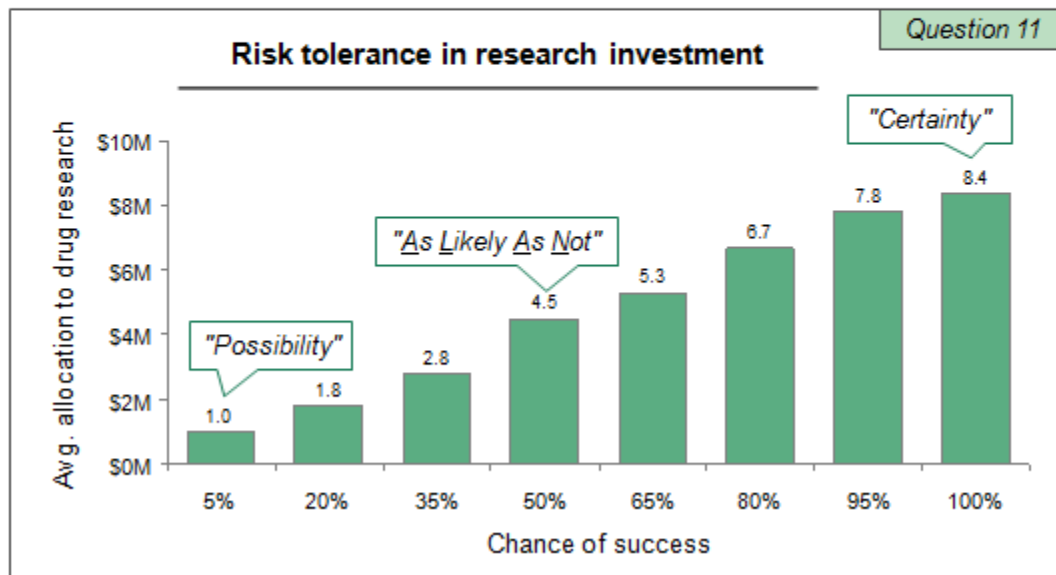
Question 11 also has things to say about other milestone points on the probability spectrum. At the other extreme of success spectrum, the so-called "possibility effect" may play a role in the group's philanthropic decision-making. This effect is said to occur when highly unlikely outcomes are weighted disproportionately more than an economically rational risk-adjusted allocation would suggest. Indeed, the allocation under a 5% chance of success was 35% above what the line would predict—a difference that is significant at the 10% level. The fact that the "possibility effect" explains why people buy lottery tickets, paying far more than the expected value for a small chance to win a large prize, perhaps suggests an inappropriateness of this common behavioral pattern in the context of philanthropy. There would also appear to be a disproportionally large allocation at the 50% level, when success becomes As Likely As Not ("ALAN"). The average allocation here was 5% above the line—not statistically significant, but directionally noteworthy. This ALAN effect is perhaps understandable in the philanthropic context where an individual can experience a quantum increase in comfort level when it is at least not more likely that the grant will fail. **Question 7** (see page 18) also exhibits the ALAN effect with sharp discontinuities increasing the willingness to proceed with the 50% likelihood of success is achieved, although the effect was absent in the results from **Question 3**.

Chance of success	"Expected" allocation	Actual allocation	Difference (% of allocation)	P-value
5%	$0.8M	$1.0M	.28 (35%)	0.09
20%	$2.0M	$1.8M	-.14 (-7%)	0.47
35%	$3.1M	$2.9M	-.28 (-9%)	0.24
50%	$4.3M	$4.5M	.20 (5%)	0.49
65%	$5.5M	$5.3M	-.18 (3%)	0.53
80%	$6.7M	$6.7M	.05 (1%)	0.87
95%	$7.9M	$7.8M	-.03 (0%)	0.91
100%	$8.3M	$8.4M	.12 (1%)	0.67

The Sunk Cost Fallacy

The tendency to allow past incurred costs to influence prospective decision-making when future costs should be given greater weight, or should be the sole consideration, is commonly known as the "sunk cost fallacy." It is taught as a business school object-lesson. Much research has demonstrated the irrational attachment of businesses and individuals based on prior investments to projects which should be the subject of reconsideration. Colloquially this is said to be "throwing good money after bad." Loss aversion may be seen as playing a role here in producing a refusal to admit and rationally analyze setbacks when doing so would be to admit a loss.

There were strong indications in the staff responses to various hypotheticals that sunk costs are an important determinant of personal behavior. **Question 2**, for example, is a much-studied analysis of whether people tend to sell stocks which have enjoyed gains at the expense of holding on to stocks which are losers in an attempt to defer the inevitable capital loss. Copious financial research suggest this is a traditional, albeit economically irrational, form of behavior and is so common as to have its own name of "the disposition effect." In a hypothetical designed to test this fact pattern, the staff did disproportionately sell the single stock which was performing well and held on to the worse-performing investments presumably in the hope that their losses would be made up over time. (See **Appendix**)

Question 4 is a version of another well-studied hypothetical in the literature of Prospect Theory. Here the question was whether people are more likely in the face of competing priorities to attend a conference if they had paid for their ticket than if the ticket was received for free. Again, a statistically significant number of respondents were more likely to attend if the ticket had been paid for notwithstanding that that cost was sunk and in that sense should not have been a basis for decision-making about the desirability of proceeding. The performance by the foundation staff on these
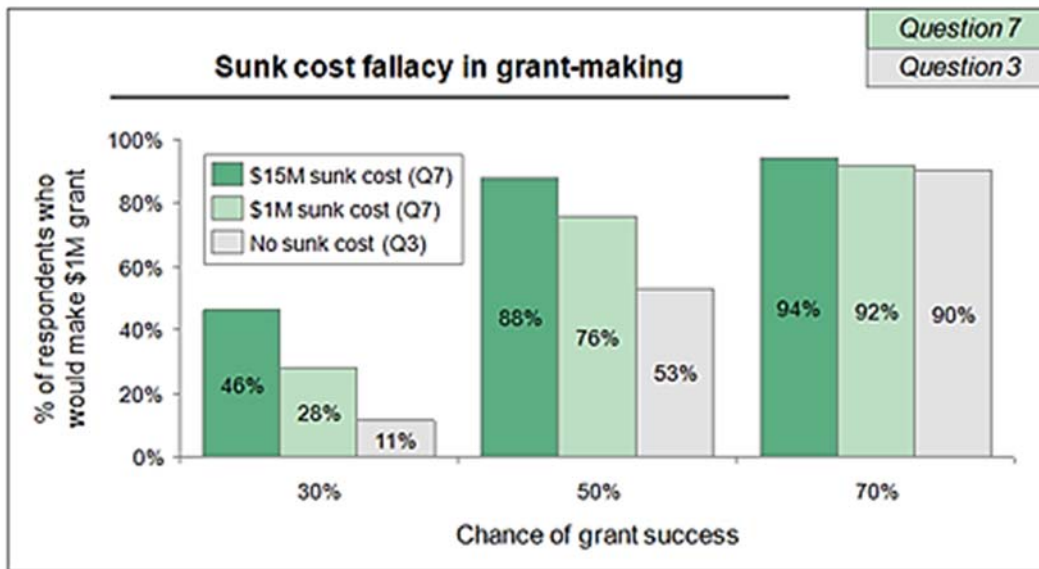
hypotheticals should be seen completely in accord with behavior previously observed among most people.

There is some indication that this tendency of the sunk cost fallacy is relevant in the professional context as well for the test group. **Question 7** is perhaps the clearest example and shows that compared to people who had spent less money, those who already spent more money on a program were more willing to invest additional money on it despite identical chances of success in the two instances. While not statistically significant, there were notable differences at the lower chances of success, in the direction of confirming sunk cost fallacy. At higher levels of success there was no discernable difference between decisions to either level of sunk cost. Again, these higher levels of success appear defined with reference to achievement of the ALAN effect milestone of 50%.

Chance of success	% who would make $1M grant		Difference in proportions	P-value
	$15M sunk cost	$1M sunk cost		
10%	20.6%	11.1%	9.5%	0.29
30%	45.7%	27.8%	17.9%	0.12
50%	88.2%	75.7%	12.5%	0.17
70%	94.1%	91.6%	2.5%	0.69
90%	97.1%	94.4%	2.7%	0.59
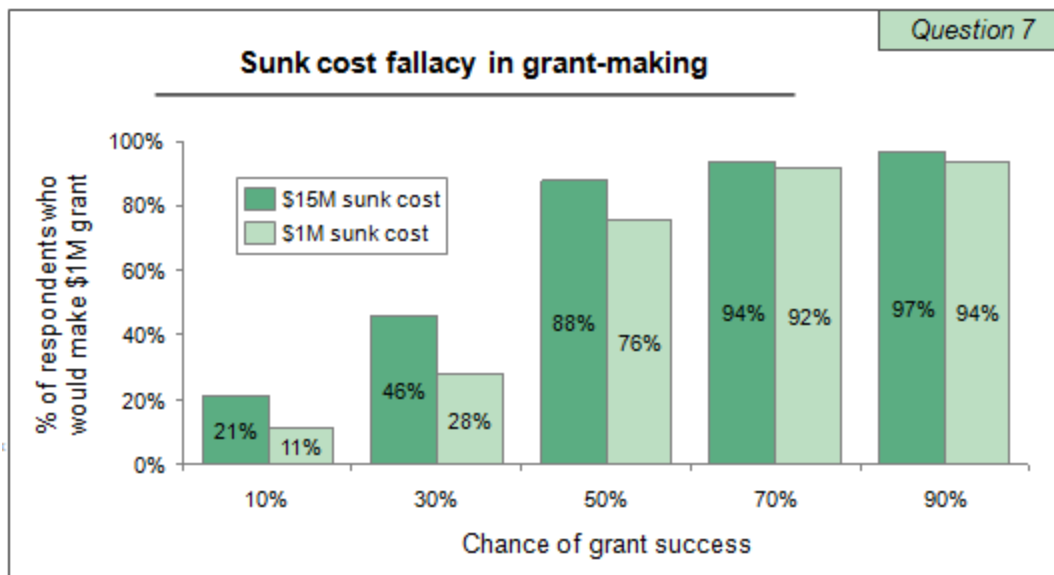
This is even more evident when contrasted with the risk-tolerance baseline created by **Question 3**, as indicated in the chart below. At each comparable level, where there was no previously incurred cost, the willingness to proceed with the grant was lower. The differences were statistically significant at the 5% level for the 30% and 50% LOS and significant at the 20% level for the 70% LOS, again suggesting sunk cost behavior.

Sunk cost fallacy in grant-making

Legend:
- $15M sunk cost (Q7)
- $1M sunk cost (Q7)
- No sunk cost (Q3)

Chance of grant success	$15M sunk cost (Q7)	$1M sunk cost (Q7)	No sunk cost (Q3)
30%	46%	28%	11%
50%	88%	76%	53%
70%	94%	92%	90%

Question 7
Question 3

This pattern may be seen as a more rational spending decision, however, if viewed from the perspective of a different economic framework. This would be to consider the investment as comparable to the purchase of an underwater stock or other security option. In other words, for an additional amount of expenditure in **Question 7** one could have the benefits of either a $1 million previous investment or a $15 million previous investment. Another $1 million dollars expenditure is purchasing the possibility of a $2 million success or a $20 million success, respectively, even though currently the likelihood of success is low. This is precisely why people will pay for currently underwater stock options. To the extent that a greater sunk investment creates a higher likelihood of willingness to make the investment this would, seen from this perspective, be rational decision-making.

Question 5 to the contrary, however, indicates that respondents who had already spent money on a poorly performing grantee (Version X) were <u>less</u> likely to make an additional grant than those (Version Y) who had never funded the grantee. (See **Appendix**) The estimated likelihood of success going forward is the same in each case. The difference here was statistically significant at the 10% level. This is a curious result in several regards. First, it arguably goes against prior observed results in other contexts and is inconsistent with the predictions of Prospect Theory. In this regard, it is inconsistent with the behavioral pattern reflected in **Question 7**, as well as in **Question 7** and **Question 3** considered together. Further, in neither case of Version X or Version Y did the level of conviction about making the grant on average reach the level of "Probably." For both versions of the question only 8% chose "Definitely" for an answer, with roughly an even split between "Definitely" and "Definitely Not." This is challenging to explain in light of the results of **Question 3** where 80% of the respondents indicate that they would proceed with a grant with the same level of certainty as was indicated in this question. It may be that for this level of expenditure (a $5 million expenditure by this

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foundation - - as with most - - being significant, as contrasted with $1 million in **Question 3**) the 40% likelihood of failure made some range of "Probably" answer a more comfortable zone for respondents. It also appears that respondents may have struggled with the phraseology of the question. The fact that in Version X the likelihood of success was said to apply also to previously invested amounts ("all funds granted to date") appears to have created some confusion and the results obtained here should be interpreted in that light.

Although admittedly speculative, for all of these sunk cost questions, it is at least arguable that the hypothetical nature of the choices if anything underestimates the effect of prior investments on future choices. For example, it is impossible to capture in such questions the emotional and practical difficulty of explaining to a grantee who has turned the battleship of their enterprise around based on prior funding that that funding will be ended. Strong arguments are usually advanced in such instances that success is just around the corner, and the real world grantor is unlikely to find it quite as easy to walk away from such real world situations as in the hypothetical context. Hypotheticals also perhaps cannot capture the institutional pressures (both from one's superiors and the "Monday Morning Quarterback" effect noted in other cases) militating against the willingness to admit that a grant previously recommended has proved a failure. Quite simply, and perhaps most importantly, it is likely that in actual practice a number of well-understood biases operate in the direction of causing a grantmaker to perceive higher likelihoods of success when significant funds have been invested already. While there may be factors which motivate actual decision-making in the other direction, it is easy to see why the results from these hypotheticals might tend towards a floor for the extent of this form of behavior.[10]

Question 18 provides some further interesting food for thought. When given an opportunity to invest in two different drugs, people allocated more money to a new, potentially more effective drug than one in which they already had spent money. The difference was significant at the 1% level (i.e., it is 99% certain that the difference was not due to random variations). On the one hand, this does suggest that people were not strongly influenced by the prior expenditure. Another way of interpreting the results, however, is that people were prepared to spend 2/3 as much money on average on a more poorly performing drug. Why were people not inclined to spend *all* of their money on the potentially better drug? It may be the case that this reflects simple risk-spreading by investing in multiple research efforts even if one has a lower potential benefit. Diversification is often seen as the "free lunch" for investors. On the other hand, the $15 million available here would be enough to guarantee that research could proceed on the drug with apparent greater potential benefit. Splitting the investment entails risk that research will not proceed, so one could see considerable influence from

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[10] See also footnote 15.

the sunk cost of the prior expenditure in influencing allocation. This will be tested in future research where the element of prior investment will be eliminated.
Regret

Neither Prospect Theory nor Classic Utility Theory takes into account the phenomenon of "regret." The fear of regret would appear to be a factor in many of the decisions that people make. **Question 12** (Version X) contrasts the case of a risky grant made by a person who rarely approves grants unless they have a high likelihood of success (Alex) versus someone who frequently approves risky grants if the outcome is desirable (Ralph). Not surprisingly, respondents uniformly concluded that Alex would experience a higher degree of regret if the grant proved unsuccessful. This result is in accord with traditional literature. However it is worth noting that this may represent another case where individual reaction patterns and institutional considerations are not aligned. From the institution's perspective, likely a stronger message should be directed to Ralph to re-consider his allocation analysis and possibly a message of support directed to Alex to ensure he does not tend towards an excessive aversion to risk. The regret factor and resulting motivational impulses at the individual level may work in exactly the opposite direction from institutional preferences. Version Y of this question presented the comparison between a grant officer (Sarah) who switched <u>away</u> from a grantee who ultimately succeeded and <u>to</u> a grant that ultimately ended up failing versus another officer (Alice) who <u>stayed</u> on a grant and watched it fail while the unfunded grant which had been considered ultimately succeeded. There was a 2-1 expectation that Sarah, the officer who acted, would experience more regret. This is consistent with a fairly well-documented phenomenon of people expecting to have a stronger emotional reaction (including regret) to an outcome that is produced by action than to the same outcome when produced by inaction. This at times goes as far as to suggest that people will passively pursue ethically questionable inaction rather than taking affirmative steps. [11] The question in the philanthropic context of course is whether or not this produces a bias in favor of inaction which would detrimentally affect a fair balanced analysis of alternative courses of action.

Cohort Analysis

One might expect to find systematically different responses for particular sub-segments of the respondent population. For example, Program staff might exhibit greater risk aversion than staff in support functions (finance, operations, investment, etc.) that are more removed from the actual grant-making process. However, there was no statistically significant difference in responses between program and non-program staff for any question (excepting **Question 4**). Similarly, one might expect different responses between senior and junior staff—perhaps those with more responsibility exhibit greater (or lesser) levels of risk aversion. Again, however, no statistically significant differences

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[11] Judith Jarvis Thomson, *The Trolley Problem*, 94 Yale Law Journal 1395 (1385).

can be seen for any question (excepting **Questions 1** and **6**). It is possible these results would change with more survey respondents—each cohort has only ~30 to 40 respondents, and random variation may obscure underlying discrepancies between groups. However, p-values were above 0.5 for most questions, indicating a very low likelihood that differences between cohorts are statistically meaningful. [12]

Personal versus Professional Behavior

The above results exhibit risk and loss aversion across a collective population in both personal and professional contexts. There is also evidence suggesting that *individual* preferences tend to carry over from one context to the next. That is, individuals who are risk averse (or more risk averse) in the personal context tend to be risk averse (or more risk averse) in the professional context, and vice-versa. **Question 1** and **Question 15**, which test for "risk premiums" in the personal and professional contexts, respectively, demonstrate some such consistency. The personal risk premiums calculated for each individual can be used to predict the professional risk premiums calculated for the same individual (and vice-versa). These results were significant at the 20% level—insufficient for dispositive academic proof, but strong enough to suggest a trend. This perhaps raises the provocative question of whether an "entrance exam" at the time new staff join a foundation based on simple personal risk questions could ever be developed that might give some insight as to the individuals predilections (in grantmaking, useful).

CONCLUSION

Summing up, it might be said that the staff demonstrated normal signs of both loss-aversion and risk-aversion, though to a somewhat lesser extent (and with a lesser degree of uniformity across the respondents as reflected in the lower degrees of statistical significance) in the cases of the grantmaking hypotheticals as opposed to those involving personal gain or loss. The greater relative risk tolerance in the professional context is consistent with other findings and theories regarding "agency effects" suggesting that people make riskier choices on behalf of others than for themselves. [13]

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[12] These analyses were conducted using ANOVA tests for differences in each question's standardized responses. First, responses for each question were standardized by taking the difference between the response and the mean and dividing that difference by the standard deviation. For multi-part questions, composite variables were created. Next, ANOVA tests were run to evaluate whether the mean standardized response varied a) between program and non-program staff; b) between senior and junior staff. For questions with both an X and Y variant (primarily sunk cost questions), two-way ANOVA tests were run using survey type (X or Y) as the second variable. Of the 36 total tests (2 for each question), only 3 returned p-values below .15—these positive results were likely the product of the large number of tests run, and likely do not reflect underlying differences between cohorts.

[13] Stone, Eric R., and Liz Allgaier "A social values analysis of self-other differences in decision-making involving risk" Basic and Applied Social Psychology, 30 (2008): 114-129. The analysis set forth above generally assumes that the

This, among other things, returns the analysis to consideration of how we <u>want</u> people to behave. Do we prefer adherence to an Expected Value risk-neutrality or should philanthropies aim to be "risk-takers" so as to do the more uncertain, more innovative steps that other sectors such as business and government will not undertake? Significantly, neither of these views suggests that risk-aversion is a desirable characteristic. It is also questionable whether asymmetries between risk-aversion and risk-taking where the latter is more manifest when facing the possibility of loss is desirable in the area of philanthropy. It is arguable, however, that the agency effects which appear to be motivating greater risk tolerance by foundation staff in their work context than in their personal behavior may be a socially desirable influence. In this regard, the existence of the entity of the foundation staffed by professional agents may be seen as socially useful. Further survey work testing individual responses with respect to their own philanthropy (whether individually or through a foundation they sponsor) might prove interesting to analyze decision-making patterns in philanthropic cases where it is "one's own money."

To the extent the results would suggest the existence of tendencies towards susceptibility to the so-called sunk cost fallacy, this is almost certainly a behavioral pattern which is to be discouraged in the philanthropic, and most other, contexts. An important distinction should be drawn, however, with instances where an explicit awareness exists that one is putting "good" money after "at least so far bad" money because of the leverage gained from paying a small option amount in the possibility of securing a much larger gain. In such cases the prior expenditure is relevant to the potential future result, and this is not the sunk cost paradigm. Distinguishing between the two cases may be difficult in practice but is critical.

The same can probably be said of the "possibility effect," in that the type of behavior which is behind the successful sales of lottery tickets may not something to be encouraged in the foundation world. The certainty effect does not come into play, although whether this effect is that important in the real world of philanthropy may be questionable, however, as total certainty (versus 90+%) is perhaps rarely the issue. On the other hand, to the extent an ALAN effect is a factor in actual philanthropy this would seem both reasonable to expect and defensible as a rough metric for action.

An intriguing possibility arises from the well-documented tendency of project managers to subconsciously substitute "best case" for what are intended to be base case scenarios

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"agency effect" in philanthropy reflects that individuals are more tolerant of risk because it is someone else's money in question. The monthly rent is not, directly, at stake. Alternatively, however, it is also possible of course that the effect occurs because that is what people believe -- - or institutionally are told - - should be the role of philanthropy. Studies comparing the results obtained at different foundations, or especially comparing foundations dominated by a living sponsor versus ones which are not, would be potentially interesting for this reason along with many others.

of the probability of success.[14] The tendency to see things through rose-colored glasses in initially assessing the riskiness of a proposal (especially as complemented by agency effects), may create a socially useful counterbalance to risk aversion. There is of course no certainty that this balance will not either under-shoot or over-shoot the mark, but this may be a relevant mechanism for further consideration and analysis.[15]

It should also be noted that "philanthropic losses" as considered here (in the context of waste) may be only one form of loss whose effect on behavior needs to be considered in the foundation arena. Behavior in the professional context may be meaningfully affected by different "types" of loss such as interventions, which do exist in reasonable numbers, which carry a risk of a loss in the sense of making things worse. The effect of possible "less than zero" results merits further consideration.

Also, the fact that the survey group demonstrated signs of lower levels of regret when failing due to inaction rather than actively managing to the same failure suggests that foundations might want to articulate a clear internal message against the creation of a systematic bias favoring inaction over action when either unavoidably entails risk.

Because the "re-set" which occurs when one moves to the philanthropic context still appears to leave in place a remainder of perfectly normal, human behaviors tending towards patterns we might hope to modify in philanthropy, the question arises of what can be done? One modest suggestion would be the use of a short list of questions (either explicitly or through culture creating messaging) a grant maker should consistently use as a lens when reflecting of his/her work. These questions might include, at minimum:

- Am I taking enough risk when there is the possibility of success?
- Am I taking too much risk when there is the possibility of failure?
- Prior invested funds: are they playing too big a role in my willingness to proceed?
- Am I allocating too much (even in small amounts) to "long shots"?
- Do I favor "staying the course" excessively over risking a switch to a different approach?
- Is the way I "frame" possible loss or gain affecting my decisions?

The survey findings reveal that the relative attitudes towards risk remain even when moving from the personal context to the world of philanthropy. That is to say that the

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[14] See Daniel Kahneman. 2011. *Thinking Fast and Slow*, New York: Farrar, Straus and Giroux. Chapter 23.
[15] The authors wish to thank Professor Philip Cook of Duke University who noted the importance of this tendency towards best case estimates as a potential counterbalance to risk aversion in this context. This could have a material impact on outcomes in the world of philanthropy as it relates to the effects of loss and risk aversion. Some of the behavioral patterns identified by the survey - - such as the influence of regret - - may operate in whole or significant part independent of loss or risk aversion, so the counterbalance may be less of a potentially positive effect here.

more risk averse among us in the personal context also tend to be the more risk averse ones in their philanthropy, notwithstanding that we on average all tend to be more tolerant of risk in the latter situation. This is not a surprising result. On the other hand, given that there appears to be a significant re-set when one moves from personal decisions to professional ones, the exact opposite result would not have been terribly surprising either. The re-set might have completely scrambled the deck. But it appears that it does not. Therefore, understanding an individual's general approach to things may be, within broad limitations, a reasonable predictor of behavior as a grant maker. Perhaps for analogous reasons many business rely on personality tests and analysis while considering hiring decisions. This is not necessarily to suggest that step for foundations (thought there is certainly nothing wrong in the case of those that wish to go that route). It is instead to suggest that helping individuals understand their own general personality profiles (whether or not those profiles are shared with the institution) may be potentially worthwhile. There are obviously a great many ways to do this and many available "tests." The salutary effects are likely to be even greater if there is a strong feedback system and clear institutional emphasis on how, at least with respect to risk and presumably other measurable elements as well, it is hoped that one performs.

On this issue of feedback, these results further emphasize the critical importance of strong institutional feedback loops within a foundation. There are at least two reasons for this. First, as repeatedly noted in in the survey responses, normal human tendencies may not lead in the direction of (or at least may not fully reach) the degree of risk-tolerance or at least neutrality we might want in our philanthropy. This appears relatively clear. Feedback and institutional direction can therefore be critical. The emerging study of "choice architecture" suggests ways in which bias can serve as a basis for corrective policy. Permission to fail, combined with institutional questioning (not prohibition) of "doubling down", may be significantly beneficial. Framing the issue for grant-makers as a "portfolio problem," with explicit permission to take on some number of riskier projects, may be a potentially useful approach.

A second, more elusive, importance of feedback may stem from the provocative question of "where is the risk" in foundation philanthropy? Essentially no one likes to fail. But as just noted human tendencies to deal with potential failure when confronting uncertainty may lead in the wrong direction. In all but the most extreme cases, foundations do not face risk in grantmaking in the most typical forms. There is no risk of total economic failure and consequent reorganization or liquidation of assets. Direct issues of life, death or health are not in question, at least with respect to the individuals comprising the foundation. If there are these direct issues, or any issues of well-being, they are borne at the grantee or beneficiary, not the funder, level. This is all to say that the behavior towards risk - - both avoiding it and taking it - - has to be <u>imposed</u> by the foundation itself - - through culture, governance, information dissemination, etc. This is

a case where the feedback loop itself defines the risk which the loop is designed to monitor.

Regardless of the position one takes on the debate of desirable normative standards in philanthropic activity, however, a premise of this analysis is that a reasonable predicate to promoting how people <u>should</u> act in making decisions is to understand how people <u>do</u> (at least absent other guidance) make such decisions. Focusing on how decisions are made can be an important step in determining how they can be improved. The results here suggest at least some behavioral tendencies worthy of consideration. Also, the authors hereby volunteer to undertake further analysis of the comparison of loss and risk-influenced behavioral patterns in philanthropy versus those which may be found on the golf course.

APPENDIX:

SURVEY

You are invited to participate in a research survey that explores how people make decisions in the absence of certainty. There are no right or wrong answers to any of these questions.

The survey is based on some of the findings from the growing field of behavioral economics. Daniel Kahneman, who won the Nobel Prize for Economics in 2002, was among the pioneers in this field. His book *Thinking, Fast and Slow* is a popular treatment of the foundational theories in this area.

Completing the survey is voluntary. You may choose not to complete the survey at any time. You may skip questions if you do not want to answer them. The survey is being conducted on an anonymous basis. No one will be able to associate your personal information with your answers. No personal information is requested or should be supplied. Completing the survey creates no risks for you. We expect to share outcomes of this research with you.

If you have any questions regarding this survey or its use please contact [name].

By clicking "YES" below you are agreeing to participate in the survey, which will follow. If you do not wish to participate please click "NO". Would you like to participate in the survey?

YES, I agree to participate in the survey.
NO, I do not wish to participate in the survey.

PRELIMINARY QUESTIONS

The following is a series of questions addressed in some cases to you generally and in some cases to you in your capacity as a staff member of a large Foundation. In the case of several of the questions, particularly those related to your Foundation work, you may feel that you have incomplete information. But such is often the case in life. Please answer the questions to the best of your ability based on the available information. The demographic questions below are for aggregate analysis and will not be used to identify you in any way.

Question A:
In which Trust department do you work?
a. Program
b. Finance and Operations
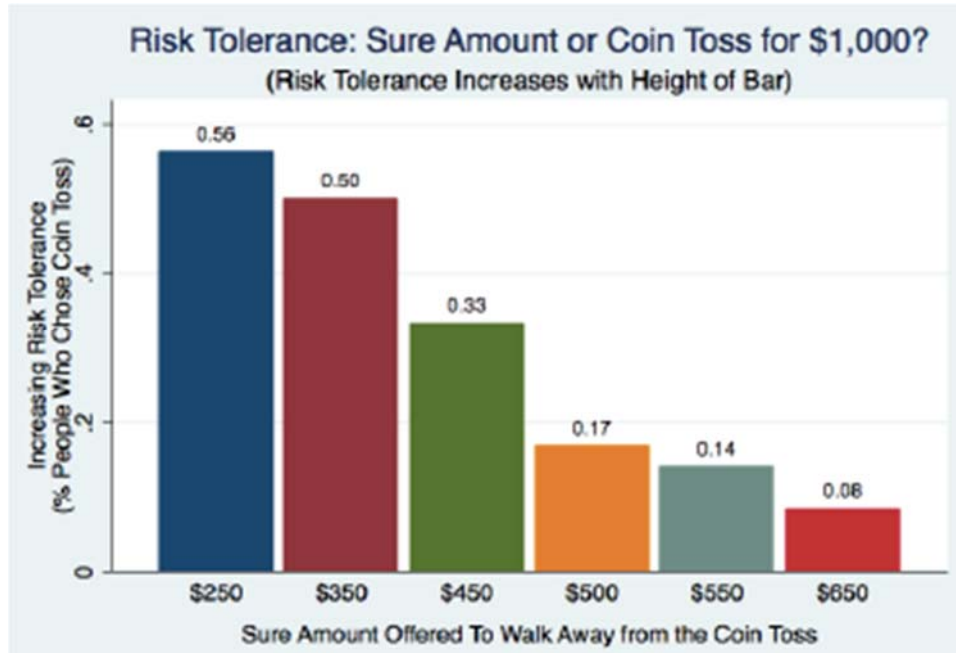c. Investments
d. Other

Question B:
What is your position title?
a. Program Director
b. Program Officer
c. Program Associate
d. Program Assistant/Administrative Assistant/Executive Assistant

Question 1

1a. Which do you prefer?
- A. Toss a coin. Heads you win $1000, tails you win nothing
- B. Get $250 dollars for sure

1b. Which do you prefer?
- A. Toss a coin. Heads you win $1000, tails you win nothing
- B. Get $350 dollars for sure

1c. Which do you prefer?
- A. Toss a coin. Heads you win $1000, tails you win nothing
- B. Get $450 dollars for sure

1d. Which do you prefer?
- A. Toss a coin. Heads you win $1000, tails you win nothing
- B. Get $500 dollars for sure

1e. Which do you prefer?
- A. Toss a coin. Heads you win $1000, tails you win nothing
- B. Get $550 dollars for sure

1f. Which do you prefer?
- A. Toss a coin. Heads you win $1000, tails you win nothing
- B. Get $650 dollars for sure

	Offered $250	Offered $350	Offered $450	Offered $500	Offered $550	Offered $650
Coin Toss	41 (56.2%)	36 (50%)	24 (33.3%)	12 (16.7%)	10 (13.9%)	6 (8.3%)
Took Sure Amount	32 (43.8%)	36 (50%)	48 (66.7%)	60 (83.3%)	62 (86.1%)	66 (91.7%)

Risk Tolerance: Sure Amount or Coin Toss for $1,000?
(Risk Tolerance Increases with Height of Bar)

Question 2

You own the three stocks listed below, all acquired on the same date as the prices indicated below. The values of the stocks currently are also indicated below. You need to raise $1,000 for a home renovation. The prices of all the stocks in recent weeks have been stable, and you have no special insights as to how they will perform in the future. Please indicate how much, if any, you will sell of each stock to raise the $1,000.

	Purchase Price	Current Price	Sell
Stock A	$5,000	$3,000	_____
Stock B	$5,000	$7,000	_____
Stock C	$5,000	$5,000	_____

Among People Who Sold Some of the Stock: The difference in average stocks sold between the poorly performing and well-performing stocks was significant at the 5% level. The difference in average stocks sold between the neutral and well-performing stock was significant at the 1% level.

	Average Amount of Stock Sold
Stock A ($3000)	$665.80
Stock C ($5000)	$673.90
Stock B ($7000)	$1061.86
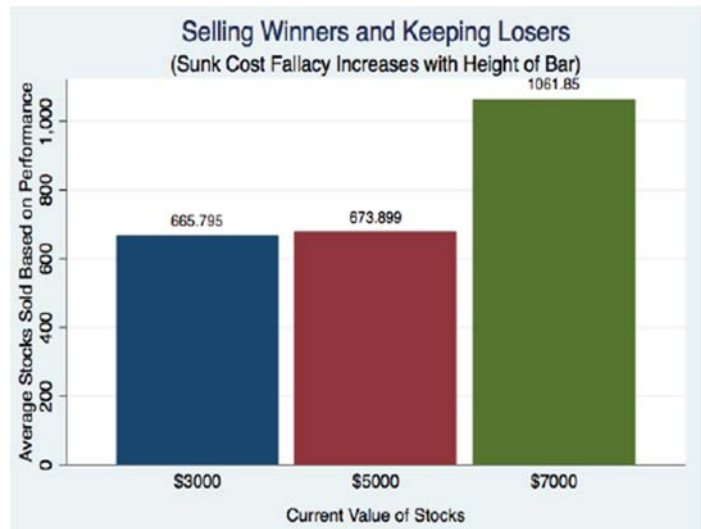
Among All Respondents: If we exclude outliers that sold more than $1000 (due to miscomprehension of the question) and examine averages across all respondents, we find statistical significance between the well-performing and neutral stock at the 1% level, as well as between neutral and poorly performing stock at the 5% level. The difference between the poorly performing and well-performing stock was significant at the 10% level.

	Average Amount of Stock Sold
Stock A ($3000)	$306.74
Stock C ($5000)	$143.59
Stock B ($7000)	$487.21

Question 3

You are the Program Director for Program X. Program X has an annual budget to spend on grants of $5 million. You have only $1 million left to spend on grants this year and you are offered the chance to make a grant of $1 million. You have no other grants currently under consideration but will retain the $1 million for next year if you don't spend it.

For the options below indicate if you would make the grant:

A = Yes   B = No

3a. There is a 50% chance that the grant will succeed and you will be very satisfied with the outcome, but also a 50% chance the grant will fail to achieve its targeted outcomes and you will have wasted in that sense the $1 million entirely.
    A. Yes
    B. No

3b. There is a 40% chance that the grant will succeed, but also a 60% chance the grant will fail.
    A. Yes
    B. No

3c. There is a 70% chance that the grant will succeed, but also a 30% chance the grant will fail.
    A. Yes
    B. No

3d. There is a 60% chance that the grant will succeed, but also a 40% chance the grant will fail.
    A. Yes
    B. No

3e. There is a 30% chance that the grant will succeed, but also a 70% chance the grant will fail.
    A. Yes
    B. No

	70% chance of success	60% chance of success	50% chance of success	40% chance of success	30% chance of success
Make a $1m Grant given X% chance of success	65 (90.3%)	56 (80%)	37 (52.86%)	21 (30%)	8 (11.4%)
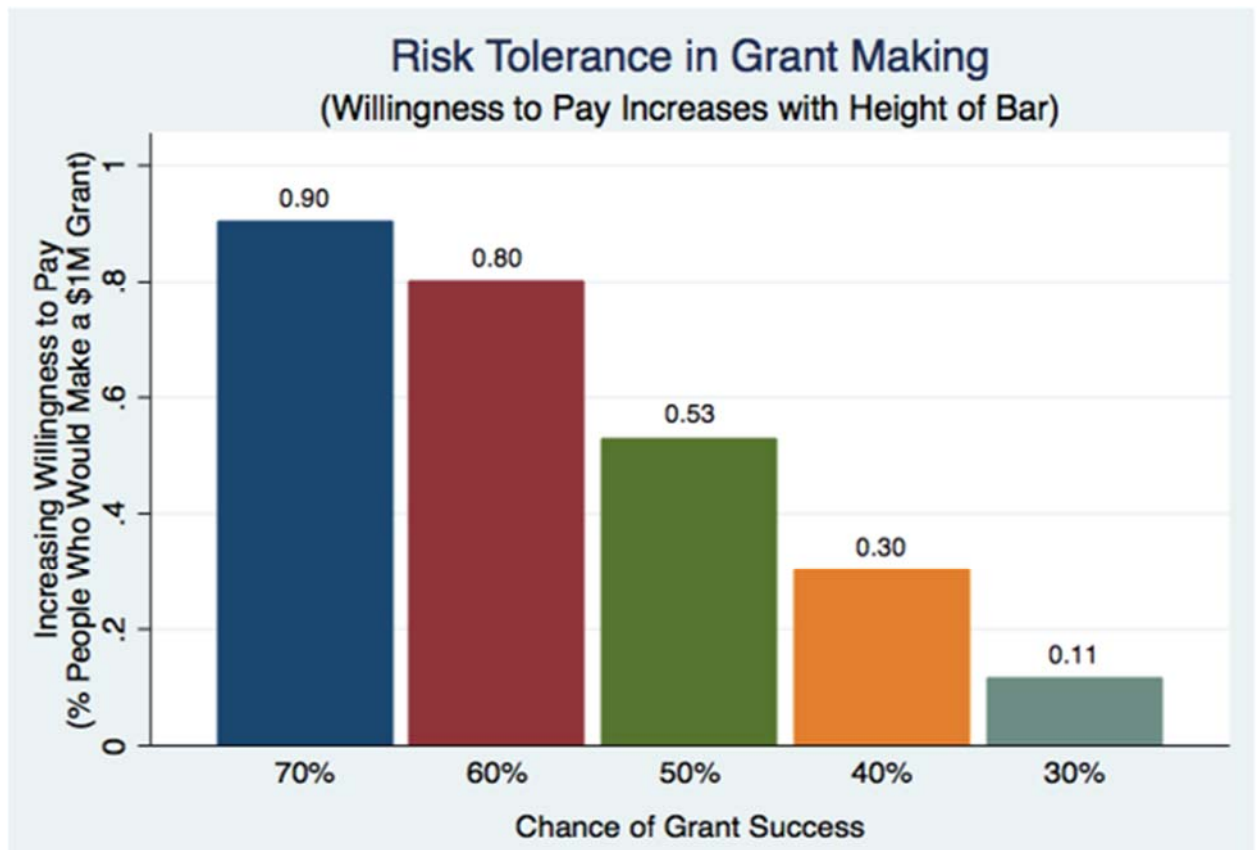
| VERSION X: FREE	VERSION Y: PURCHASED
You are a Program Officer for the Foundation's Conservation Program. You learn of an important conference to be held in your city and a friend from another foundation gives you a ticket worth $500 for free to the conference. The day before the conference you find that you have so much work to do that you question whether attending the conference is the best use of your time. Your Program Director tells you that he is indifferent as to whether you attend. Would you attend the conference?	You are a Program Officer for the Foundation's Conservation Program. You learn of an important conference to be held in your city and you buy a ticket for $500 to the conference. The day before the conference you find that you have so much work to do that you question whether attending the conference is the best use of your time. Your Program Director tells you that he is indifferent as to whether you attend. Would you attend the conference?
A. Definitely Not B. Probably Not C. Probably D. Definitely	A. Definitely Not B. Probably Not C. Probably D. Definitely

Purchased Ticket for $500 Average Response*	Given $500 Ticket for Free Average Response	Difference in Means	p-value
3	2.5	0.46	0.02

The numeric value of the responses corresponds to the following scale:

1 = Definitely Not Attend
2 = Probably Not Attend
3 = Probably Attend
4 = Definitely Attend
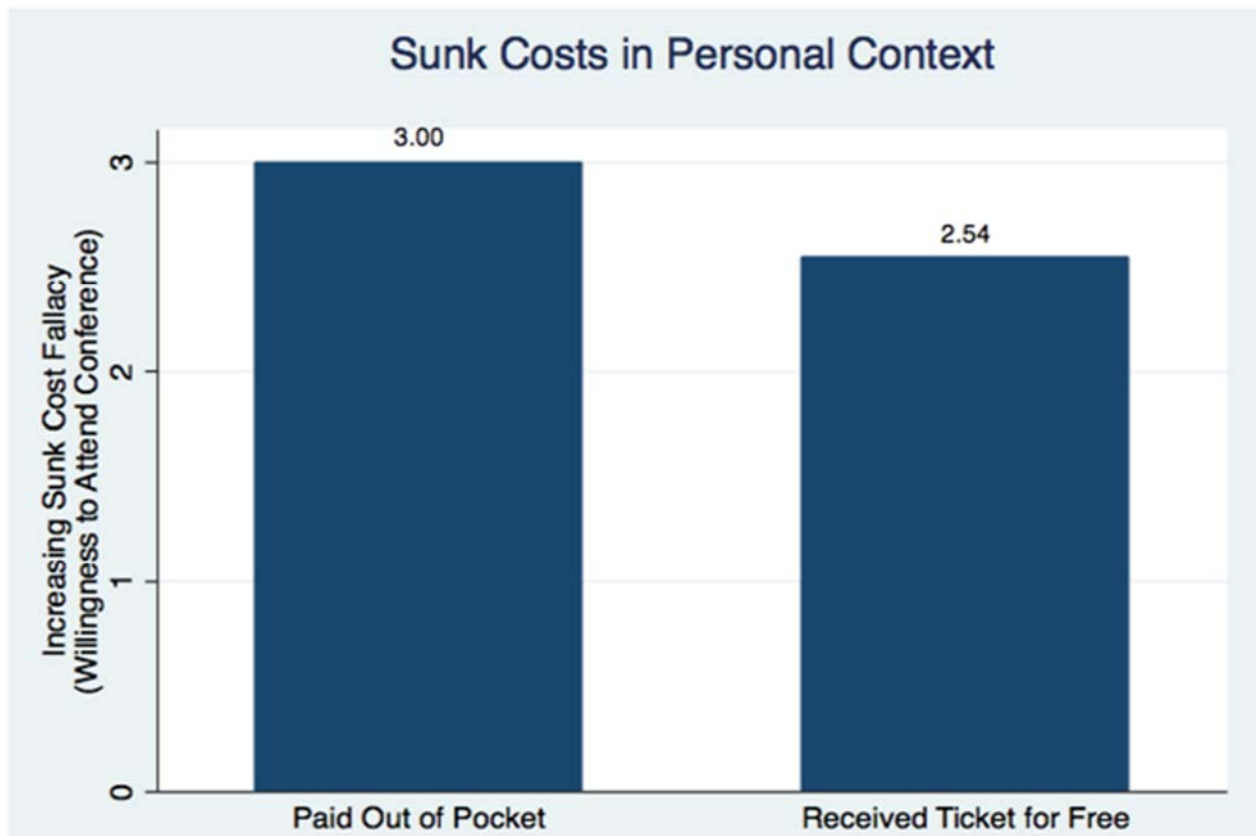
VERSION X: WITH SUNK COSTS

You are the Program Director for the Foundation's Elder Care Program. To date you have granted $10 million to Grantee A, but Grantee A, despite making some progress, has failed to achieve the desired outcomes. You have another $5 million to grant.

You are now asked to make another $5 million grant to Grantee A. You estimate is that with the additional $5 million grant there is a 60% chance that the Grantee will achieve the desired outcomes with respect to all funds granted to date, but a 40% chance that the failure to do so will continue. Will you make the additional grant to Grantee A?

    A. Definitely Not
    B. Probably Not
    C. Probably
    D. Definitely

VERSION Y: WITHOUT SUNK COSTS

You are the Program Director for the Foundation's Elder Care Program. You have $5 million to grant, and are asked to make a $5 million grant to Grantee A.

You estimate is that there is a 60% chance that the Grantee will achieve the desired outcomes, but a 40% chance that they will fail to do so. How likely are you to make the grant to Grantee A?

    A. Definitely Not
    B. Probably Not
    C. Probably
    D. Definitely

$10 Million Sunk Cost Average Willingness to Grant $5m*	No Sunk Cost Average Willingness to Grant $5m	Difference in Means	p-value
2.37	2.62	0.25	0.10

The numeric value of the responses corresponds to the following scale:

1 = Definitely Not Make the $5 Million Grant
2 = Probably Not Make the $5 Million Grant
3 = Probably Make the $5 Million Grant
4 = Definitely Make the $5 Million Grant
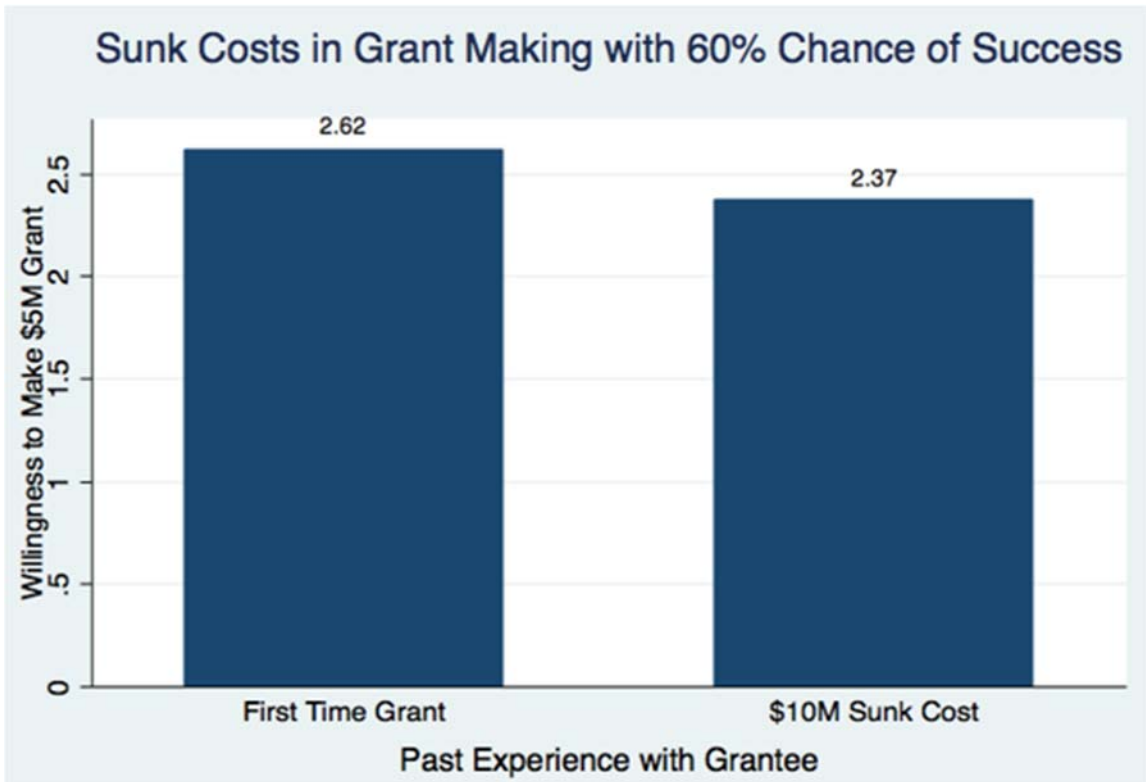
Question 6

You are the Program Director for the Foundation's Reading program. The program is designed to help support efforts to allow children to improve their reading skills. You are considering two interventions, each of which involves grants of $1 million.

Intervention A has proved effective in 100% of the classrooms in which it has been employed in advancing children's reading skills by an average of 3 months.

Intervention B has proved effective in 90% of the classrooms in which it has been employed in advancing children's reading skills by 6 months.
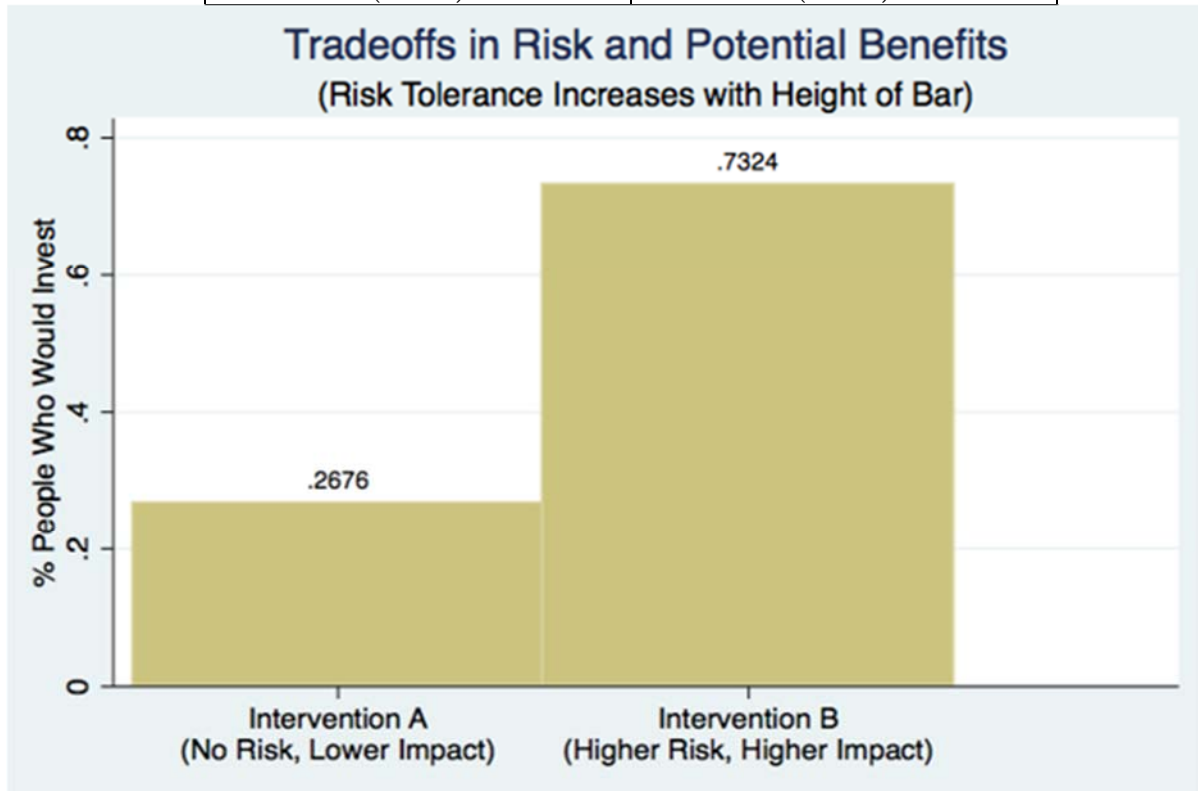
You have only $1 million to invest. In which Intervention do you invest?

A or B (Circle one)

General Risk Tolerance: Professional

	Classrooms Impacted	Impact
Intervention A	100%	3 month improvement
Intervention B	90%	6 month improvement

Intervention A	Intervention B
19	52
(26.8%)	(73.2%)

Tradeoffs in Risk and Potential Benefits
(Risk Tolerance Increases with Height of Bar)

VERSION X: $19M SUNK COST

You are the Program Director for the Foundation's Medical Devices Program. You have made a grant to develop a Scupper, which is a highly important medical instrument that is in serious need of improvement. The grant's goal is to produce a working prototype. The grant is for $19 million, $15 million of which was paid initially and the remaining four payments of $1 million at a time are to be paid upon achievement on schedule of four milestones.

The grantee is late on achieving Milestone 1 and is only partially successful in achieving the associated goal. But if the $1 million payment is not forthcoming, the project will have to be shut down. After considerable analysis, you conclude that there is a X% chance that the project will be successfully seen through to completion. Do you make the $1 million payment?

|	
A. X = 10%	YES/NO
B. X = 30%	YES/NO
C. X = 50%	YES/NO
D. X = 70%	YES/NO
E. X = 90%	YES/NO

VERSION Y: $5M SUNK COST

You are the Program Director for the Foundation's Medical Devices Program. You have made a grant to develop a Scupper, which is a highly important medical instrument that is in serious need of improvement. The grant's goal is to produce a working prototype. The grant is for $5 million, $1 million of which was paid initially and the remaining four payments of $1 million at a time are to be paid upon achievement on schedule of four milestones.

The grantee is late on achieving Milestone 1 and is only partially successful in achieving the associated goal. But if the $1 million payment is not forthcoming, the project will have to be shut down. After considerable analysis, you conclude that there is a X% chance that the project will be successfully seen through to completion. Do you make the $1 million payment?

A. X = 10%	YES/NO
B. X = 30%	YES/NO
C. X = 50%	YES/NO
D. X = 70%	YES/NO
E. X = 90%	YES/NO

Chance of Success	$15 Million Sunk Cost Proportion Making the Grant	$1 Million Sunk Cost Proportion Making the Grant	Difference in Proportions	p-value
10%	20.6%	11.1%	9.5% pt	0.29
30%	45.7%	27.8%	17.9% pt	0.12
50%	88.2%	75.7%	12.5% pt	0.17
70%	94.1%	91.6%	2.5% pt	0.69
90%	97.1%	94.4%	2.7% pt	0.59
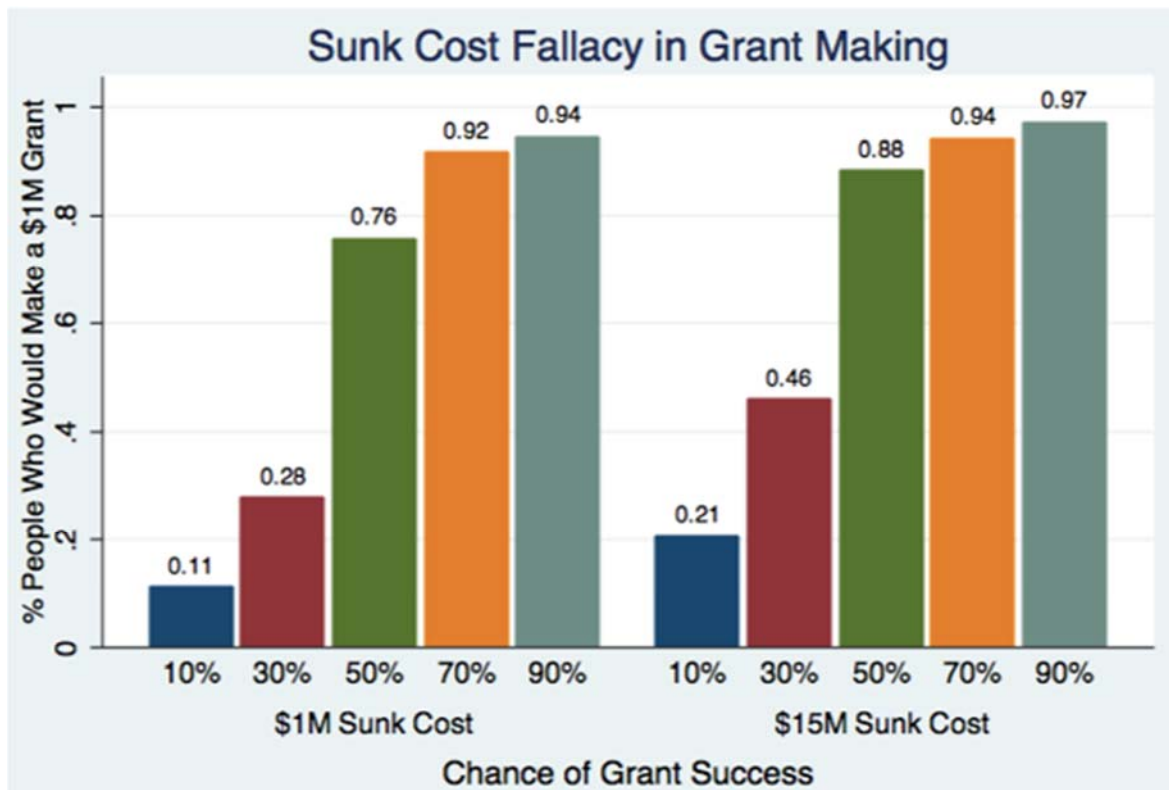
Question 8

| **VERSION X: Loss Frame**	**VERSION Y: No Loss Frame**
You have $2000, but you must choose either Option A or Option B:	You have $2000, but you must choose either Option A or Option B:
A. **Option A**: 50% chance you lose $1000, 50% chance you lose nothing	A. **Option A**: 50% chance that you are left with $1000, 50% chance that you are left with $2,000
B. **Option B**: Lose $500 with certainty	B. **Option B**: You're left with $1500 with certainty

Loss Aversion: Personal

|	Loss Frame	Non-Loss Frame	p-value
Percentage of People who Took the Gamble	58%	27%	0.006
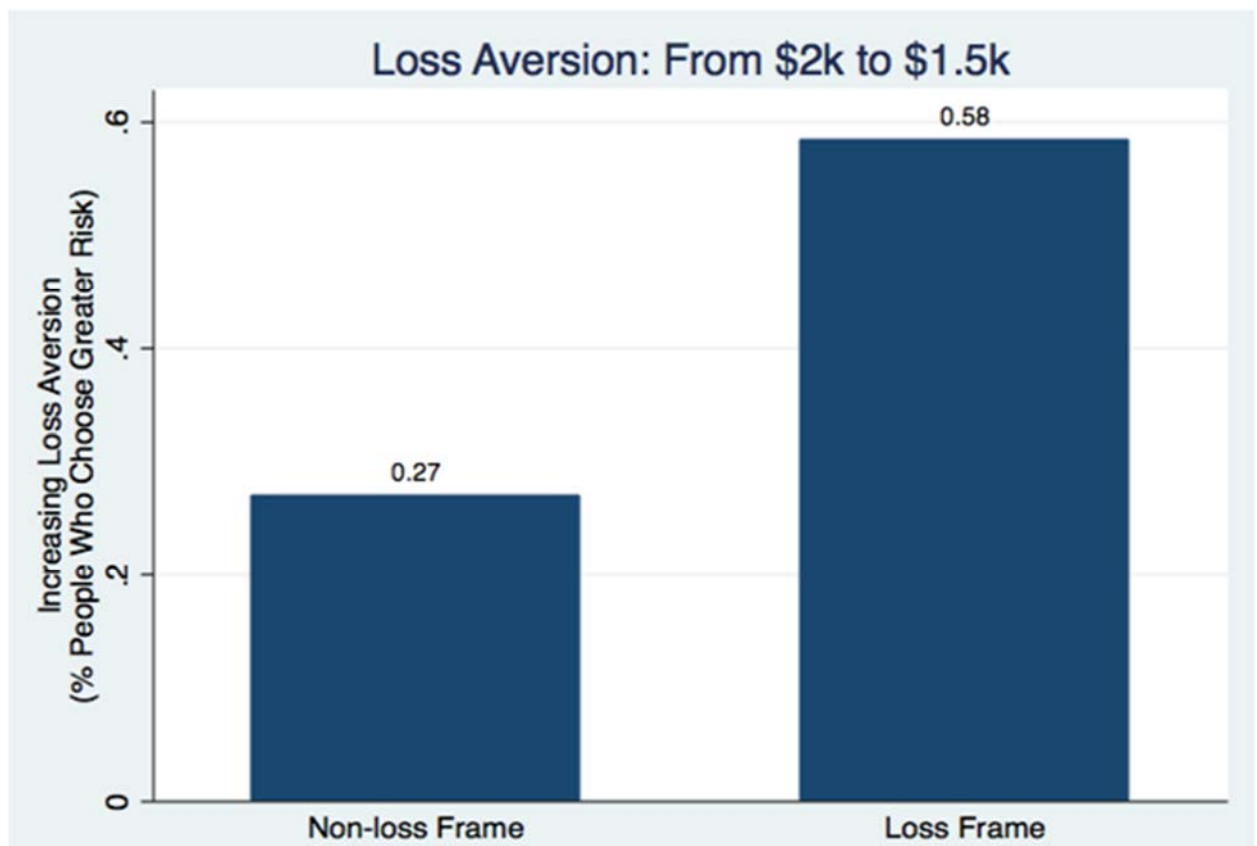
Question 9

You are involved in a court case in which you are being sued for $50,000 for having damaged someone's property. The case against you is a strong one, and your lawyer advises you that you are likely to lose. He does however feel that you have a 5% chance of winning and paying nothing. The party suing you offers to settle if you pay him $45,000.

Do you accept the settlement?   YES/NO

Loss Aversion: Personal

	5% chance of winning and paying none of the $50k lawsuit OR settle by paying $45,000	5% chance of losing and getting nothing in a $10k lawsuit OR settle for $9000	p-value
Percentage of People Who Would Settle	51.4%	62.5%	0.17

Loss Aversion: Court Settlements
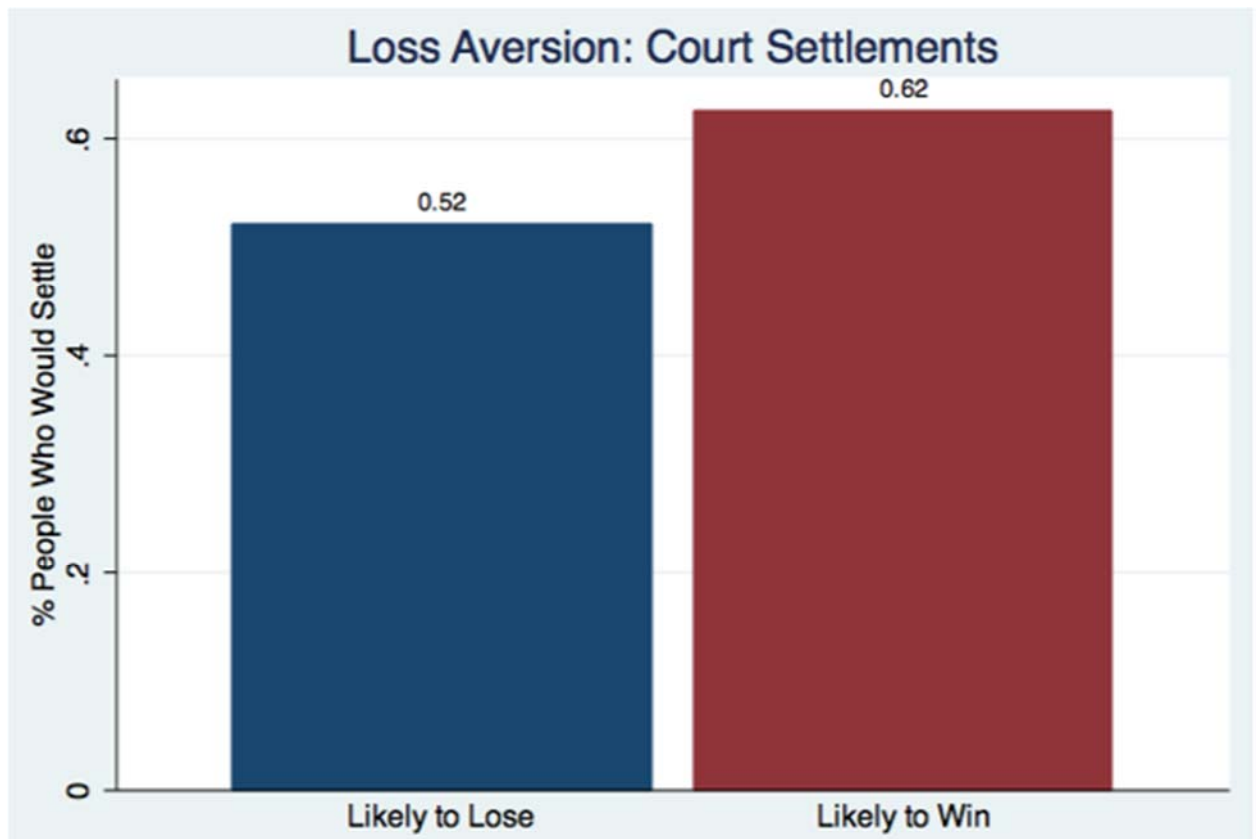
Question 10

VERSION X: Loss Frame

VERSION Y: No Loss Frame

You are the Program Director for the Foundation's Micro Aid program. The Micro Aid program is designed to help micro businesses arise and flourish. Micro businesses are small businesses with few employees (sometimes only a single owner-operator). In developing countries, microbusinesses are a very important sector because of the relative lack of formal sector jobs for the poor. Because microbusinesses are very risky, they have little or no access to regular banks for credit. Program Micro Aid is designed to extend loans to these businesses, though because of the risky nature of most of these businesses it is understood that many of these loans will not be repaid.

The program plans to extend $2 million of loans to help some villagers in a subsistence economy launch a small weaving business by making a grant of $2 million to Organization A.

There is a 50% chance that $1 million will be lost due to non-payment, and a 50% chance that $2 million will be repaid.

How likely are you to make this grant, on a scale of 1 (No chance) to 5 (Definitely!)

1 2 3 4 5

You are the Program Director for the Foundation's Micro Aid program. The Micro Aid program is designed to help micro businesses arise and flourish. Micro businesses are small businesses with few employees (sometimes only a single owner-operator). In developing countries, microbusinesses are a very important sector because of the relative lack of formal sector jobs for the poor. Because microbusinesses are very risky, they have little or no access to regular banks for credit. Program Micro Aid is designed to extend loans to these businesses, though because of the risky nature of most of these businesses it is understood that many of these loans will not be repaid.

The program plans to extend $2 million of loans to help some villagers in a subsistence economy launch a small weaving business by making a grant of $2 million to Organization A.

There is a 50% chance that $1 million will be repaid, and a 50% chance that $2 million will be repaid.

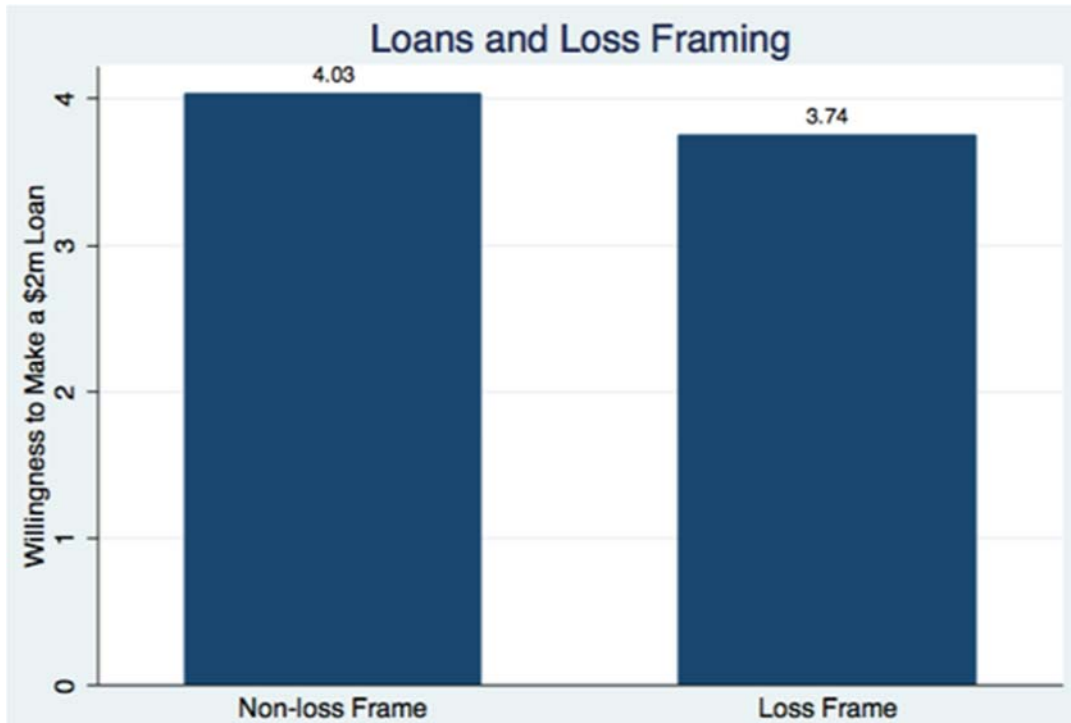How likely are you to make this grant, on a scale of 1 (No chance) to 5 (Definitely!)

1 2 3 4 5

Loss Frame Average Response*	Non-loss Frame Average Response	Difference in Means	p-value
3.74	4.03	0.29	0.197

The numeric value of the responses corresponds to the following scale on whether the respondent would make the grant:

1 = No Chance
2
3
4
5 = Definitely!

Question 11

You are the Program Director for the Foundation's Drug Development Program. XYZ3 is a serious and potentially life threatening disease on which the Foundation is focused. Because all experimental drugs have failed completely to treat the disease, you have spent no money to date on drug research for XYZ3 out of your $10 million annual budget. Instead, the Foundation has focused on helping people live with the disease and spends all $10 million a year on these programs. You are very pleased with the relief your programs have brought to those with the disease.

Now, however, you learn of a possible drug research breakthrough, which, if successful, would provide an effective cure for the disease. It is very risky, however, and the dollars you put into research will have to be taken out of your successful programs for living with the disease.

For each of the chances of success indicated below, how much of your $10 million would you allocate:

Chances of Success	Amount Allocated
a. 5%	$
b. 20%	$
c. 35%	$
d. 50%	$
e. 65%	$
f. 80%	$
g. 95%	$
h. 100%	$

	Chance of Success							
	5%	20%	35%	50%	65%	80%	95%	100%
Average Amount Invested in Drug Research	$1.04m	$1.8m	$2.8m	$4.5m	$5.3m	$6.7m	$7.8m	$8.4m
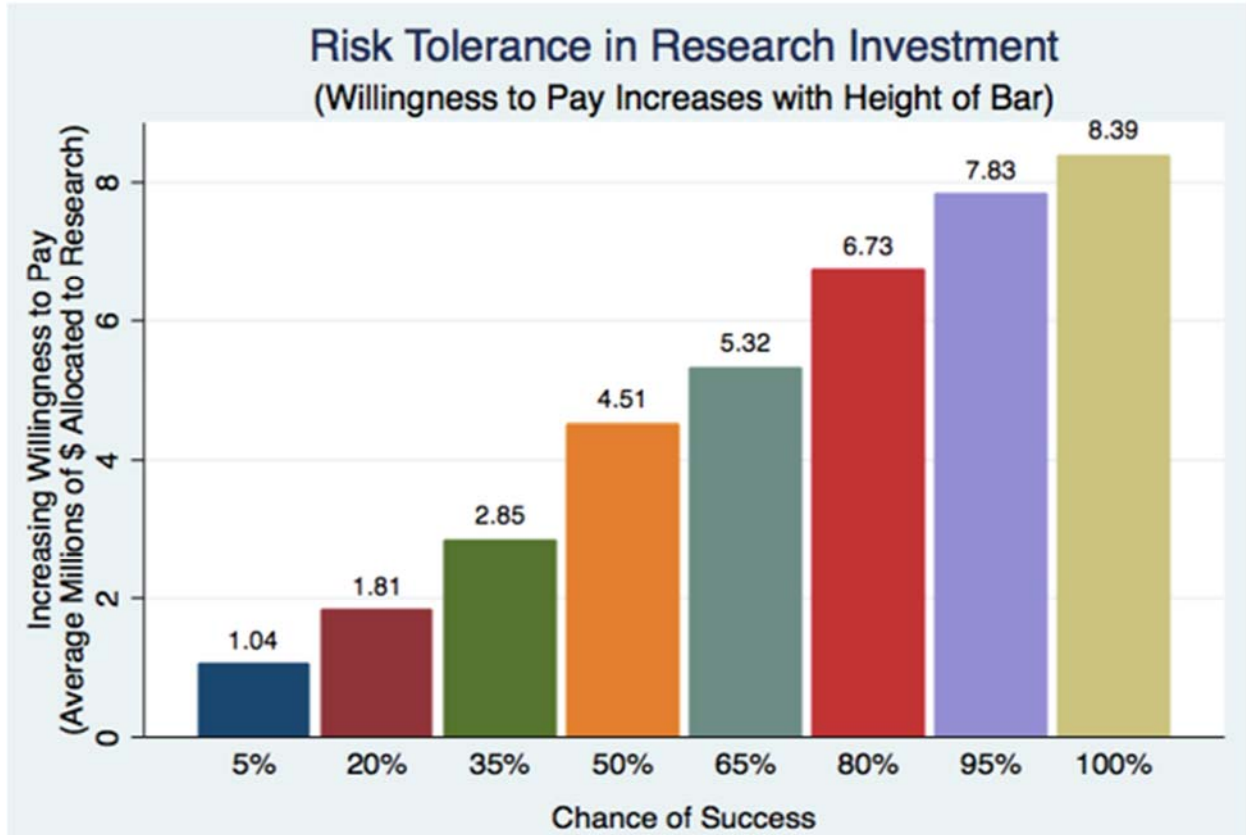
Question 12

VERSION X

Alex and Ralph are both Program Directors at the Foundation. Alex is very conservative in approving grants and rarely makes them unless he is confident of a high likelihood of success. Ralph frequently approves risky grants if the outcome is desirable. Both authorized a very risky grant in their respective areas of $7 million each. Both grants failed completely. Which of the two Program Directors do you think will experience greater regret over having made the grant?

Circle one: Alex   Ralph

VERSION Y

Alice and Sarah are both Program Directors at the Foundation. Alice has in the past supported Grantee A. During the past year she considered switching the funding to Grantee B whose desired outcomes are identical to Grantee A but whose approach is somewhat different. She decided against it and re-funded Grantee A. She now learns that Grantee B has enjoyed considerably more success and could have enjoyed that same success in applying the funding the Foundation did not offer.

Sarah has in the past supported Grantee C. During the past year she switched her funding to Grantee D, whose desired outcomes are identical to Grantee C but whose approach is somewhat different. She now learns that Grantee C enjoyed considerably more success and could have enjoyed that same success in applying the funding the Foundation withdrew. Which of the two do you think will experience greater regret over their decisions?

Circle one: Alice   Sarah

	Alex	Ralph	Alice	Sarah
Percentage of People Who Would Go for the Gamble	33 (94.29%)	2 (5.71%)	12 (32.43%)	25 (67.57%)
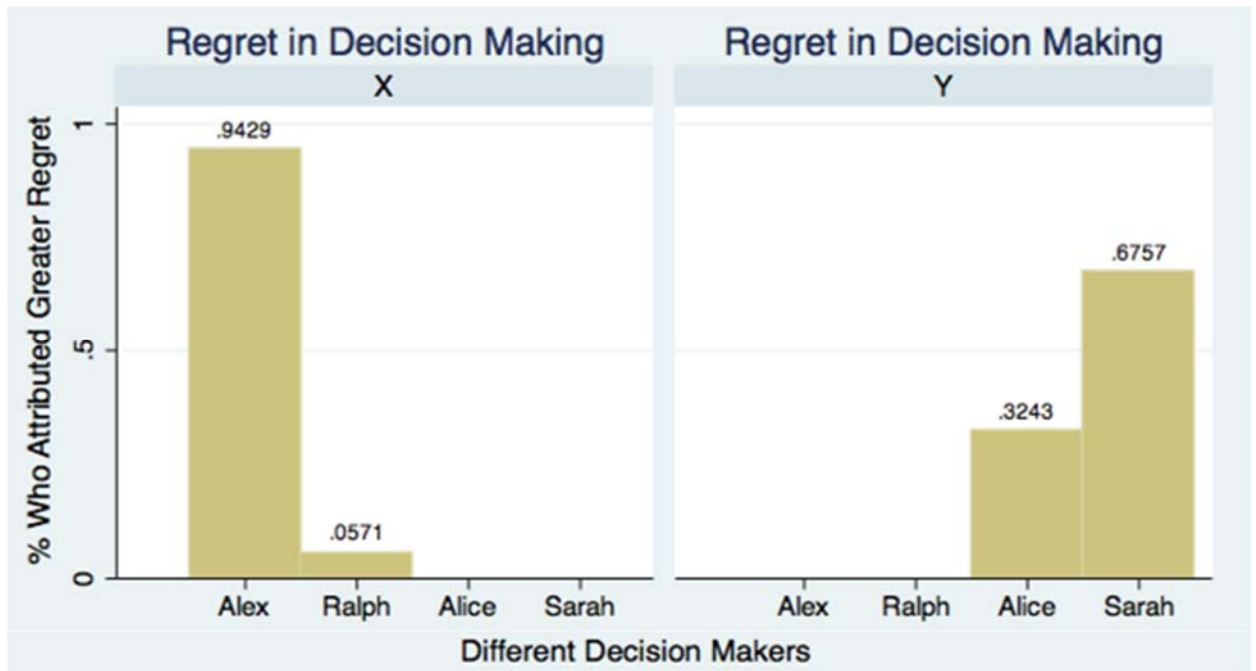
Question 13

VERSION X: $2M BASE WEALTH

Your current wealth is $2 million. (Congratulations!) You are offered the following choice. You <u>must</u> select either A or B. Please circle your choice:

A. You have a 50% chance that your wealth will remain $2 million and a 50% chance that your wealth will become $8 million

B. You have a 100% chance of your wealth becoming $4 million

VERSION Y: $8M BASE WEALTH

Your current wealth is $8 million. (Congratulations!) You are offered the following choice. You <u>must</u> select either A or B. Please circle your choice:

A. You have a 50% chance that your wealth will remain $8 million and a 50% chance that your wealth will become $2 million

B. You have a 100% chance of your wealth becoming $4 million

Loss Aversion: Personal

	Gain Frame	Loss Frame	Difference in Proportions	p-value
Percentage of People Who Would Go for the Gamble	41.67%	51.35%	11.78%	0.41

Risk Loss Aversion: Risk Preferences for Personal Wealth
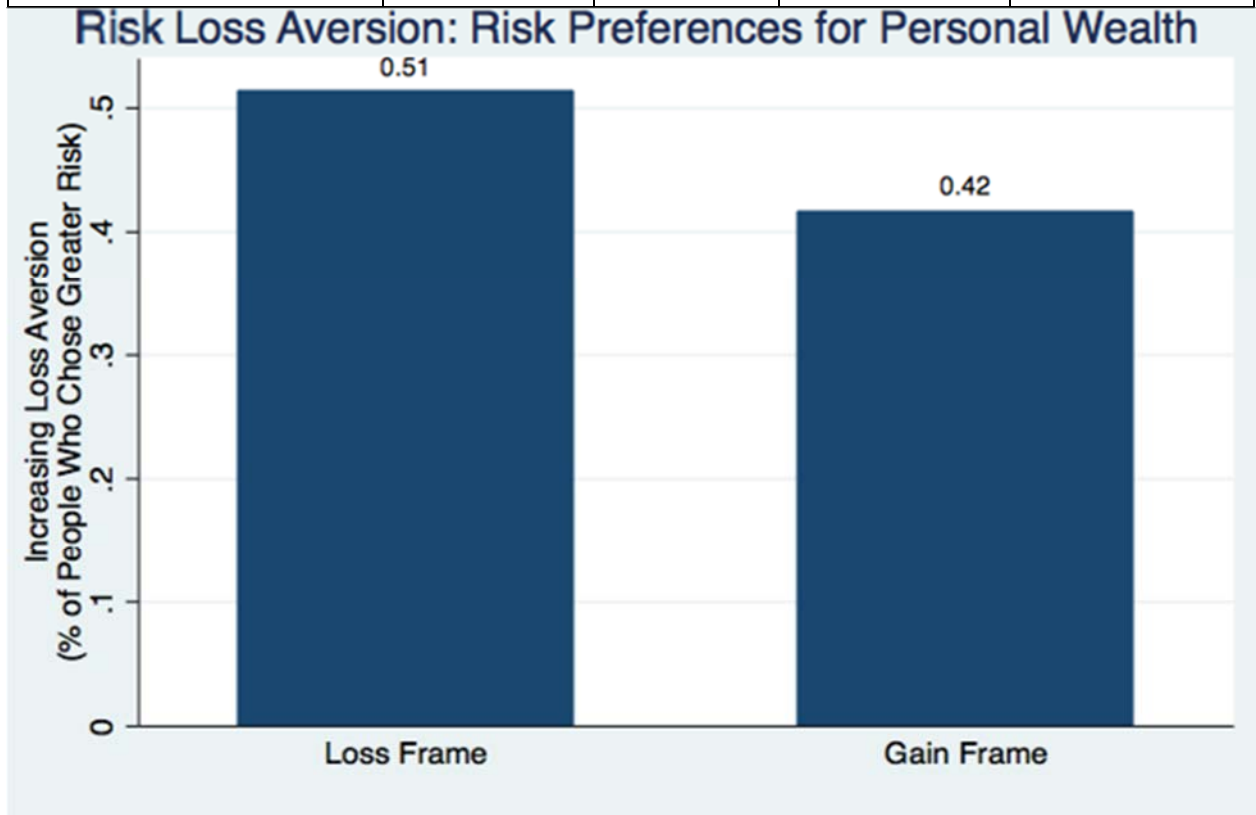
Question 14

VERSION X: Gain Frame	**VERSION Y: Loss Frame**
You are given $1000, but you must choose either A or B:	You are given $2000, but you must choose either A or B:
A. 50% chance to win another $1000	A. 50% chance to lose $1000, 50% chance to lose nothing
B. 100% chance to get another $500	B. 100% chance to lose $500

Loss Aversion: Personal

	Gain Frame	Loss Frame	Difference in Proportions	p-value
Percentage of People Who Chose Greater Risk	36.11%	47.22%	11.11%	0.35

Loss Aversion: Risk Preferences for Personal Wealth
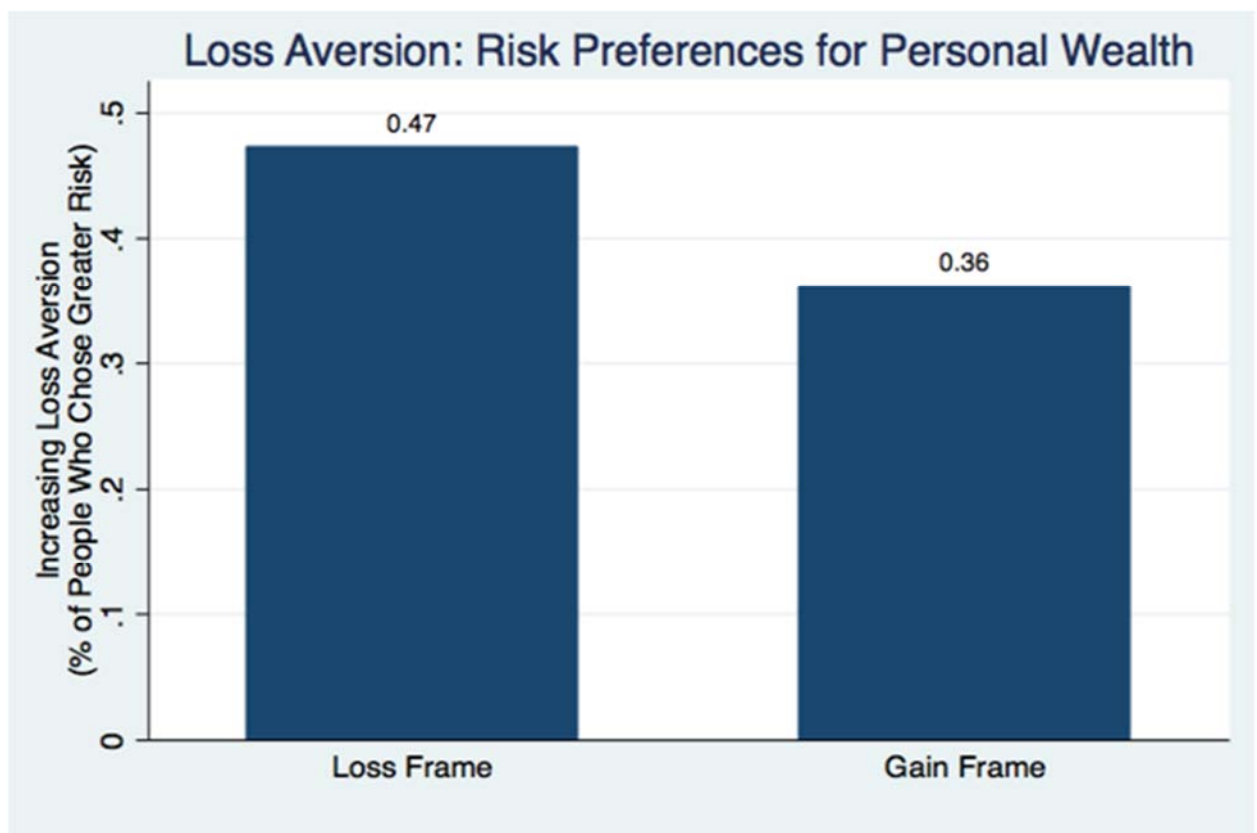
Question 15

You are the Program Director for Program X, and can use your remaining funding for the year to fund one of two organizations, Organization A and Organization B. Both serve your demographic of interest in ways that are consistent with the goals of Program X. Both would use the grant to reach 1,000 households in need of help to achieve the outcomes that Program X targets. But the programs differ in their probability of success:

Organization A has a 50% chance of adequately improving the outcomes of all 1,000 households, but a 50% chance of failing to improve any household's outcomes.

Organization B will improve the outcomes of N households with certainty.

Would you pick Organization A or Organization B, where

15a. $N = 250$
   A. Organization A
   B. Organization B

15b. $N = 350$
   A. Organization A
   B. Organization B

15c. $N = 450$
   A. Organization A
   B. Organization B

15d. $N = 500$
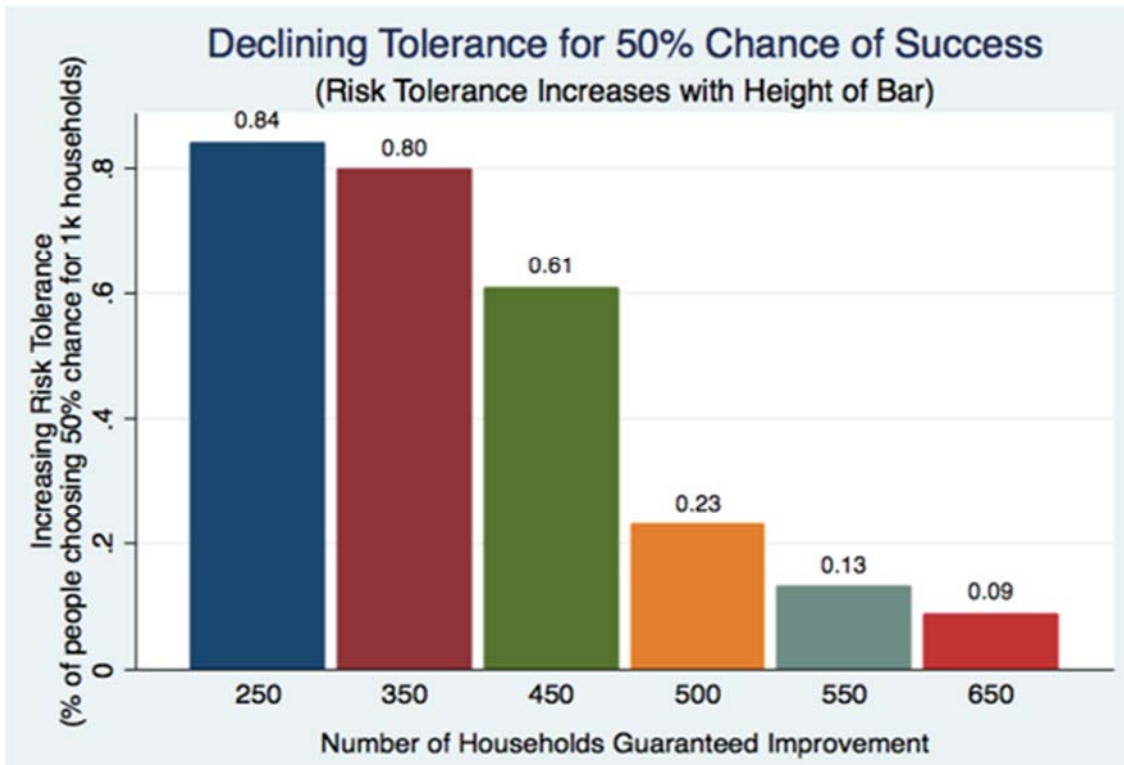   A. Organization A
   B. Organization B

15e. $N = 550$
   A. Organization A
   B. Organization B

15f. $N = 650$
   A. Organization A
   B. Organization B

	250 Households	350 Households	450 Households	500 Households	550 Households	650 Households
50% chance of improving 1000 households	58 (84.1%)	55 (79.7%)	42 (60.9%)	16 (22.9%)	9 (13%)	6 (8.7%)
Improve X household outcomes with certainty	11 (15.9%)	14 (20.3%)	27 (39.1%)	54 (77.1%)	60 (87%)	63 (91.3%)

Declining Tolerance for 50% Chance of Success
(Risk Tolerance Increases with Height of Bar)

Y-axis: Increasing Risk Tolerance (% of people choosing 50% chance for 1k households)

Number of Households Guaranteed Improvement	Value
250	0.84
350	0.80
450	0.61
500	0.23
550	0.13
650	0.09

Question 16

You are involved in a court case, suing John Smith for $10,000 for having damaged your property. According to your lawyer, the case is going extremely well and you certainly should expect to win. The lawyer reminds you, however, that judges and juries sometimes behave irrationally. "You have a 5% risk of losing" she tells you. The night before the verdict John Smith offers you $9,000 to settle. Do you accept the offer to settle?

YES/NO

[See Question 9]

You are a Program Director for the Foundation. You have made $20 million of grants for your program. Your grants are now all halfway to completion. You access the expected outcomes of the grants and classify them as to your confidence that they will ultimately be either:

1. Completely Satisfactory (i.e. outcomes achieved);
2. Completely Unsatisfactory (i.e. no progress made, money viewed as wasted);
3. Neutral (i.e. some progress made, but you would definitely not make a similar grant again nor re-fund the current grant project).

If you had your choice, which of the following two possible results of your assessment would you prefer:

Result 1: It is anticipated that: $2.4 million of the grants will be Completely Satisfactory and $17.6 million will be Neutral.

Result 2: It is anticipated that: $10 million of the grants will be Completely Satisfactory, $7 million being Completely Unsatisfactory and $3 million will be Neutral.

You would prefer (circle one):

A. Result 1
B. Result 2

General Risk Tolerance: Professional

Result 1 (Majority Neutral, Part Satisfactory Outcomes)	Result 2 (Majority Satisfactory, Part Unsatisfactory, and Part Neutral Outcomes)
18 (25.35%)	53 (74.65%)

Risk Preferences and Outcome Distributions
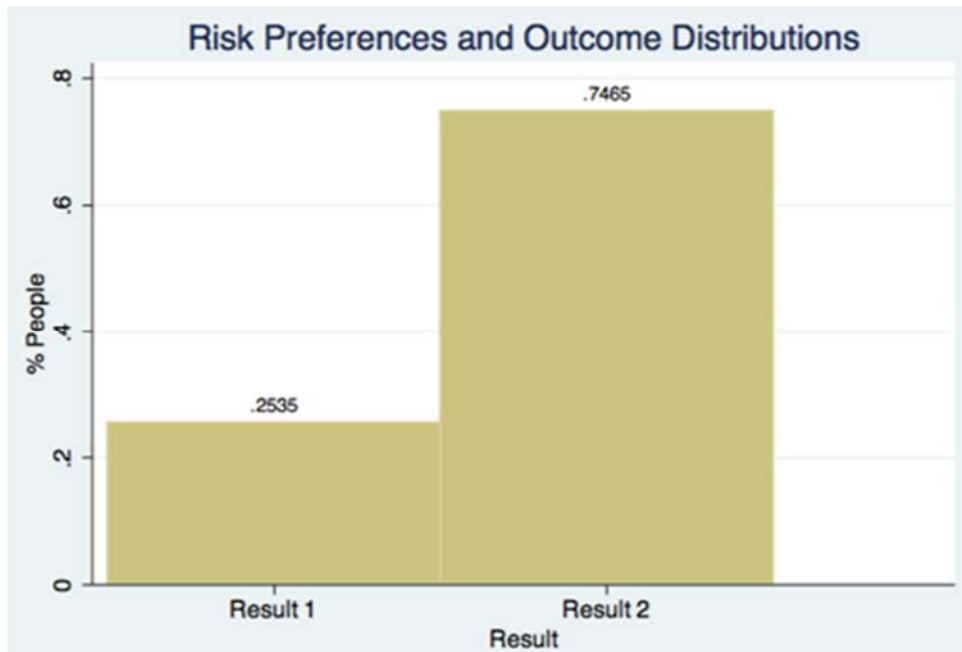
Question 18

You are the Program Director for the Foundation's Drug Development Program. You have invested $5 million in developing the drug Zitab. The grant is now behind schedule and the forecasts of the expected ultimate benefits are now less than at the initial planning stage. An additional grant of $15 million is required to give the project a chance, which you estimate as having a 50% chance of success.

An alternative $15 million grant could be made to begin and complete work on another drug Xylem. The expected benefits of Xylem look likely to be somewhat greater if it succeeds, and you estimate it as having a 50% chance of success.

You have only $15 million to invest. Both drug development programs will look for other sources of funding if you give them less than the requested $15 million or if you give them nothing.

Please indicate below how you would allocate the $15 million.

Zitab $_____   Xylem $_____

Sunk Cost Fallacy: Professional

	Zitab ($5 million sunk cost)	Xylem (potentially higher benefits than Zitab)	Difference in Means	p-value
Average Amount of Money Allocated to Each Drug	$5.49m	$8.82m	$3.33m	0.0037

Sunk Costs: Investing in Drug Research