

**Behavioral Economics and Microfinance:**  
A Study of Risk Preferences in Rural South Africa

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## Abstract

When deciding between safe and risky prospects, human decision-makers exhibit a number of framing effects. One of the most prominent of these effects, the *reflection effect*, is the tendency for decision makers to evaluate gambles relative to a reference point, and to act risk-seeking when prospects are framed as losses but risk-averse when identical prospects are framed as gains. This tendency is one of the primary predictions of Prospect Theory, the modified Expected Utility Theory that was proposed by Nobel laureates Daniel Kahneman and Amos Tversky. The present study seeks to closely replicate the work of the Nobel laureates in the cross-cultural setting of rural South Africa with subjects who are extremely poor. Using a similar choice problem to that of Kahneman and Tversky's Asian Disease Study, we show that subjects exhibit an alternate reversal of risk preferences depending on whether outcomes are presented as Gains or Losses. These results seem to suggest that poor South African women exhibit similar framing effects but that their risk preferences are the complete opposite of the Western Kahneman and Tversky subjects. This study therefore finds a skewed preference for risk and loss in its cross-cultural subjects and suggests that specific decision-making phenomena are not necessarily universal. The implications of this study are wide reaching, as they move closer to a theory of how poverty influences decision-making.

## **Introduction**

Over the past few decades, a new field of science has emerged that integrates theoretical research in economics with empirical research in psychology. By examining how people actually behave in decision scenarios, as opposed to merely how they ought to behave, behavioral economists have uncovered a wealth of data about human behavior that contradicts the predictions of traditional economic models. The implications of research in this field transcends economics, crossing over into neuroscience, sociology, political science, and any discipline concerned with how the human mind interprets information, evaluates risk, and makes decisions.

When faced with certain decision-making scenarios in both laboratory and field settings, humans have been shown to make consistent decisions that, when analyzed, appear to be economically "irrational" and unjustified. Behavioral economists have already found evidence that people tend to treat losses differently than comparable gains (Kahneman, D., Knetsch, J.L., Thaler, R. 1991). Such behaviors have been found in consumer behavior and in such fields as individual investing and real estate (Odean, 1998). There has been a tremendous amount of research in the past few decades uncovering similar decision-making biases by examining situations in which humans systematically violate the requirements of consistency and coherence in their decisions. A void in this wealth of data can be seen, however, in its cross-cultural sampling. Much of the data that behavioral economists have drawn from in their experiments have been the decisions of mostly students and local community members. And yet, a lot of theory has been projected on human beings as a species rather than on the local communities and cultures that are sampled.

The present study seeks to explore the influence of culture and socio-economic status on our economic risk preferences, examining whether a population of extremely poor women in

South Africa exhibit the same decision biases as those attributed to humans in the Western world by behavioral economists. Specifically, the purpose of this experiment is to explore whether this population of Small Enterprise Foundation Microfinance Bank borrowers in the Limpopo province exhibit the “framing effect,” the phenomenon in which the simple rewording of a decision scenario results in a dramatic reversal of the decision maker’s choice. This understudied population offers the potential for significant insight into understanding economic risk preferences of extremely impoverished individuals in an African collectivist culture, as well as an important contrast to the wealth of data on economic risk preferences that has already been uncovered in the individualistic West.

*1. The Decisions We Make and How We Make Them*

People are faced with decisions every day. A parent decides between going to his child's soccer game or working overtime in order to make more money, while a group of teenagers decide between going to the beach or the movies. Doctors must often make decisions in order to prevent deaths, sometimes at the expense of other lives. Government officials make decisions with considerably higher stakes such as whether or not to sign a bill on universal health care or whether or not to retaliate after a terrorist attack. No matter who we are, we all make important decisions each day that involve assessing a situation and picking an option deemed most beneficial for the present circumstances. The calculation that we make in a given scenario is oftentimes difficult to quantify. If I decide to go for a 5-mile run, for example, the basis for that decision could be made up of any number of considerations such as a fear of becoming overweight, an aversion to a sedentary life, or a propensity for activating pleasure centers of my brain. Though these considerations may be difficult to quantify, traditional and behavioral

economists have proposed theories that postulate the calculations we make in our daily decision-making scenarios.

Traditional economic models often employ Expected Utility Theory (EUT) as a normative theory for how people should act when faced with a decision. Based on a set of axioms that provide criteria for the rationality of choices, the model is a theory of utility for uncertain outcomes in which potential decisions are represented by a function of the payouts, the probabilities of occurrence, the different utility of the same payout to people with different assets or personal preferences, and risk aversion. (Neumann, J. & Morgenstern, 1953) The theory has been especially helpful for economists in explaining some scenarios that contradict the expected value criterion (which takes into account only the sizes of the payouts and the probabilities of occurrence) by also taking “risk aversion” into consideration. For example, suppose a gambler is choosing between a sure payoff of 100 dollars and a risky payoff with a 50% chance of \$200 and a 50% chance of \$50. Expected value tells us that the gambler should choose the risky option because the expected value is \$125 compared to the certain option with a \$100 payoff. While some gamblers are risk-seeking and choose the risky option with the higher expected value, others choose the prospect with a lower expected value because they are risk-averse and prefer the certain payoff. The expected utility model provides us with a more complete understanding of rational decision making than that of the expected value model. When faced with a choice, a rational decision-maker will prefer the prospect that offers the highest expected utility (Neumann, J. & Morgenstern, 1953).

Other economists subscribe to a different theory for evaluating rational decision-making. Awarded the Nobel Prize in Economics in 2002 for their work in Prospect Theory, Daniel Kahneman and Amos Tversky established a modified EUT so as to accommodate for risk. In

their seminal 1979 work, Kahneman and Tversky present several classes of choice problems in which preferences systematically violate the axioms of expected utility theory leading them to conclude that it is not an adequate descriptive model (Kahneman, D., & Tversky, A., 1979). The authors distinguish two phases in the decision-making process: an initial phase in which acts, outcomes, and contingencies are framed, and a subsequent phase of evaluation. In the initial phase of framing, possible outcomes of the decision are ordered following a heuristic, or rule of thumb. More specifically, people decide a specific reference point from which they consider anything lower as a loss and anything higher as a gain. In the evaluation phase, decision-makers compute a utility value based on the potential outcomes and the respective probabilities that they apply to those outcomes. They therefore choose the prospect that they anticipate will provide them with the highest utility.

In prospect theory, outcomes are expressed as positive or negative deviations (gains or losses) from a neutral reference outcome. The authors propose that the value function is commonly S-shaped, concave above the reference point and convex below it. Figure 1 illustrates the S-shaped value function as proposed in prospect theory. For example, the difference in subjective value between gains of \$5 and \$10 is greater than the subjective difference between gains of \$105 and \$110 (the same relation holds for corresponding losses). Additionally, the S-shaped value function suggests that the subjective response to losses is more extreme than the response to gains. Kahneman and Tversky call this phenomenon loss-aversion, and it implies that people experience more displeasure in losing a sum of money than pleasure in gaining the equivalent sum (Kahneman, D., Knetsch, J.L., Thaler, R. 1991).

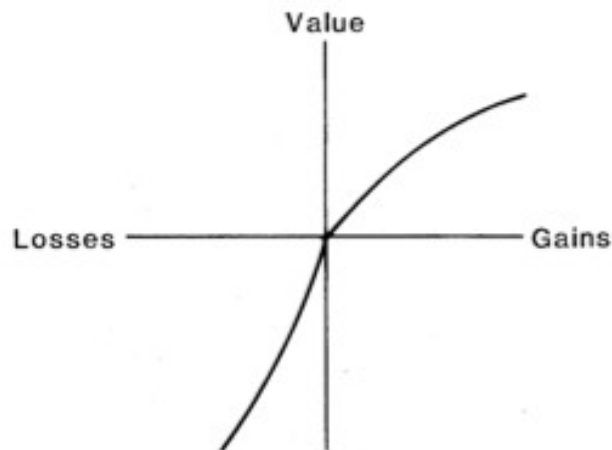


Fig. 1. A hypothetical value function.

Prospect theory also departs from EUT in how it treats probabilities. In EUT, the utility of an uncertain outcome is weighted by its probability. Prospect theory, however, assesses utility by multiplying the value of an uncertain outcome by a decision weight  $\pi(p)$ , which is a monotonic function of  $p$  but is not a probability. The weighting function  $\pi$  has unique properties such as a normalized scale where the function is not well behaved near the endpoints, overweighted low probabilities, and underweighted moderate and high probabilities (Kahneman, D., & Tversky, A., 1981). Prospect theory is an approximate, incomplete, and simplified description of the evaluation of risky prospects, but it performs as a better evaluator of rationality as it better accounts for the decisions that individuals make in choice problems that previously violated the axioms of EUT.

## 2. Behavioral Economic Phenomena: The Framing Effect, The Reflection Effect, & Loss Aversion

Behavioral economists tend to be most fascinated with anomalies in decision-making when people make the wrong decisions in similar ways. Three such phenomena that have direct relevance to the present study are the framing effect, the reflection effect, and loss aversion.

With their “Asian Disease Study”, Kahneman and Tversky illustrate the effects of the framing effect on decision-making. Most decision problems can be “framed”, or presented in a different way. Alternative frames for a decision problem can be compared to alternative perspectives on a visual scene. Rational choice theory requires that the preferences between options remain consistent and not reverse with changes of frame. However, the results of the Asian Disease Study show us the imperfections of human perception and decision-making in that changes of perspective often reverse the relative desirability of options. Kahneman and Tversky presented the following Asian Disease Study to students at Stanford University and at the University of British Columbia:

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

If program A is adopted, 200 people will be saved.

If program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved.

Which of the two programs would you favor?"

The vast majority of subjects (72%) opt for Program A, in which they are able to save a definite number of lives. In this way, subjects appear to be risk-averse, unwilling to gamble with human lives. On the other hand, the researchers uncovered a shocking finding when they administered an identical survey to a second group of subjects with the same hypothetical scenario but differently worded options:

"If program C is adopted, 400 people will die.

If program D is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die."



In this case, the vast majority of subjects (78%) opt for Program D, the risky gamble. Thus, a simple rewording of the decision maker's choices often drastically changes the subject's strategy, from risk-averse to risk-seeking. When the options are worded in terms of "lives lost" instead of "lives gained," people are willing to gamble with human lives. The fascinating aspect of this experiment is that all four programs are logically equivalent in that they have equal expected values. And yet, people dramatically reverse their risk-taking strategies depending on how the programs to combat the outbreak of the disease are framed. Kahneman and Tversky call this "the reflection effect," and argue that people are risk-averse in the positive domain and risk-seeking in the negative domain (Kahneman, D., & Tversky, A., 1979). This experiment has also been replicated with non-human primates in an attempt to uncover an evolutionary link for this sort of irrational decision-making. Researchers at Yale University have found evidence of the framing effect, the reflection effect, and loss aversion with their non-human primate subjects, suggesting that humans are evolutionarily irrational (Lakshminarayanan, V.R. et. al., 2011). Several subsequent experiments have uncovered what researchers consider to be similarly irrational behavior (see for example: Knetsch, J.L. 1989 & Kahneman, D., Knetsch, J.L., and Thaler, R.H. 1990 & Kahneman, D., & Tversky, A. 1979).

Kahneman and Tversky point to the fact that people exhibit loss aversion in decision-making scenarios and that this phenomenon also accounts for the reversal of decisions in the framing experiment. Loss aversion is the reason why the S-shaped curve in prospect theory is steeper for losses than for gains. Research suggests that if an individual is walking down the street and finds a \$10 bill, he would not be as happy as he would be sad if he lost a \$10 bill walking down the street. This is just one of many examples illustrating that losses loom larger than equivalent gains (Kahneman, D., Knetsch, J.L., Thaler, R. 1991). This type of behavior has

been exhibited in market settings (Klapper, D., Ebling, C., Temme, J., 2005) and in daily decisions made by everyone (Van Dijk, E. & Van Knippenberg, Daan 2005). The question remains though whether or not the phenomena of the framing effect, the reflection effect, and loss aversion are consistent in cross-cultural contexts.

### *3. The Extremely Poor and Their Decision-Making*

The 1990 World Development Report from the World Bank defined the “extremely poor” as people of the world who currently live on no more than \$1 per day per person. Sociologists, psychologists, and economists have tried to understand the economic lives of the poor. The fundamental belief across disciplines is if we can better understand the way the poor live, we can better assess their needs and build programs, organizations, and institutions to fill those needs. Development economists Abhijit Banerjee and Esther Duflo added to the discussion of the economic lives of the extremely poor by conducting household surveys in 13 countries around the world such as Cote d’Ivoire, Guatemala, and India. From this survey data, the authors drew conclusions about living arrangements, money allocation, asset ownership, education investment, health, and other aspects of the lives of the extremely poor. The study asks, for example, why there is so little specialization in the economic lives of the poor. The answer that they find is that there is excessive risk and time commitments that accompany specialization. Additionally, the poor cannot raise the capital they would need to run a more specialized and potentially lucrative business. The authors also ask why the poor do not invest more in education. They find that the poor are, by and large, going to primary school, but parents are not reacting to the low quality of these schools. Though the parents may recognize the benefit of investing in their children’s education, they are often illiterate themselves and have a hard time recognizing that their children are not learning much (Banerjee, A., & Duflo, E., 2007). Many of the decisions that the

extremely poor make in their daily life can be attributed to limited resources, lack of education, and a general fear of taking on additional risk. A big question that still remains is whether or not the extremely poor are rational in their decision-making.

Theories about the extremely impoverished populations of the world and their decision-making typically fall into one of two camps: those who regard the behaviors of the economically disadvantaged as calculated adaptations to prevailing circumstances, and those who view these behaviors as deviant. The first view presumes that poor people are highly rational and making well-informed and justified decisions. This camp assumes that poor people make few systematic errors and require little aid. The second view attributes a variety of psychological and attitudinal shortcomings to the poor that render their decisions misguided and impulsive. This camp assumes that the poor require almost a paternalistic form of guidance in order to make good decisions (Bertrand et. al., 2004). Others argue that the poor are somewhere in between rational and deviant in that they exhibit fundamental attitudes and natural proclivities, including weaknesses and biases, like those who are not impoverished. These experts argue that the poor are rational, but it is because the margins for error are so narrow that the decisions made by the poor often manifest themselves in more pronounced ways.

Currently, the debate on the rationality of the poor revolve around the phrases “poor but efficient” and “poor but neo-classical”. Popularized by Ted Schultz (1964), the “poor but efficient” school of thought argues that the poor certainly have bad lives but there is nothing special about them; they just do the best they can under the circumstances they find themselves in (Schultz, T., 1964). The poor are as productive as they can be given their capital, educational, and societal constraints. This school of thought forced economists to reject certain postulates of neo-classical economics. A new paradigm, “poor but neo-classical” (but not necessarily

efficient) therefore emerged to help define an empirical agenda and structure a vision of the world. This view suggests that while both the rich and poor are all perfectly rational, the markets left to themselves may not produce an efficient outcome (Duflo, 2006). “Poor but neo-classical” supporters therefore explore the structural constraints that poverty imposes on the decision-making of an unboundedly rational individual in an environment where information is incomplete.

#### *4. The Collectivist South African Culture*

The culture of collectivism in South Africa requires a brief summary in this introduction because it has an effect on the priorities and therefore the decision-making of South Africans. Studies show that when compared specifically with English speakers in South Africa, African-language speakers produce more interdependent and concrete self-descriptions (Eaton & Louw, 2000). This deeply ingrained proclivity surely has implications for decision-making scenarios. One study that looked at the allocation of old-age pensions by grandmothers in South Africa found that a portion of money was allotted to their grandchildren’s nutrition and education (Duflo, 2000). Another study looked at differences in ethical decision-making amongst American and South African marketers. The study compared the personal ethical ideologies of idealism and relativism, and found that the South Africans were more idealistic and less relativistic than their American counterparts (Singhapakdi et al., 1999). There are surely differences in cultural typology between the Western world and Africa. Collectivism, which can be defined as a society in which members view themselves as belonging to one or more groups that protect member interests in exchange for permanent loyalty, is deeply ingrained in African culture because of its tribal history. It is important to keep these cultural differences in mind when assessing the relevance and implications of this study’s findings.

5. *The Weirdest People in the World: Psychology Research in the West is Good Enough for the Rest*

Behavioral scientists routinely publish findings about human psychology in the world's top journals that are drawn from generally similar populations. Many of the experiments one can read in a psychology journal will draw subjects from universities or the local community. Researchers Henrich, Heine, and Norenzayan (2010) argue that most studies base their findings on samples from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies, and that these samples are not necessarily representative of the rest of the world's population. The authors argue that their colleagues' assumptions are flawed, and that there is in fact substantial variability in experimental results across populations. They go on to argue that WEIRD subjects are particularly unusual compared with the rest of the species (and frequently outliers) (Henrich et al., 2010). Nonetheless, this fact does not stop behavioral scientists from projecting their findings onto the world's population of decision-makers instead of merely the population or culture in which their experiments are conducted.

The present study seeks to offer a cross-cultural perspective on economic decision-making by replicating the Kahneman and Tversky methods of offering a decision-making scenario with equally logical options. But instead of presenting a scenario about disease, we present our subjects with a more context appropriate scenario involving gambling and monetary payoffs. As Esther Duflo puts it in her paper on the rationality of the poor, "There may be more to learn about human behavior from the choices made by Kenyan farmers confronted with a real choice than from those made by American undergraduates in laboratory conditions." (Duflo, 2006) The purpose of this study remains the same as that of the Kahneman and Tversky study in that we are interested in whether our subjects change their risk preferences when the potential

solutions are framed in terms of gains and losses. In addition, this study is interested in the slightly more important and uncertain question: Do Kahneman and Tversky falsely assert universality of their economic biases and phenomena? By replicating their framing effect study with an understudied population abroad, this study attempts to offer empirical support for the WEIRD theory.

## **Methodology**

### *1. The Experimental Subjects and The Field Setting*

This study takes place in the northern Limpopo province of South Africa. With one of Africa's largest economies, South Africa has a strong formal financial and manufacturing sector. It is a leading exporter of minerals and tourism is a key source of foreign exchange. Since the end of apartheid, the African National Congress party of the government has maintained control and has aimed to encourage black economic empowerment. With unemployment at 27%, the crime rate in South Africa is also very high. Moreover, HIV/AIDS has emerged as a significant problem in that nearly 20% of people aged 15-49 have been infected. The country does not have a national poverty line – but it is estimated that 27% of the population lives on less than \$2 per day and 8% live on less than \$1. The Limpopo province is the region with the highest poverty rate in South Africa.

In order to collect the data for this study, the researchers partnered with The Small Enterprise Foundation (SEF), a microfinance bank that began operations in 1992. SEF is the leading example of poverty-focused microfinance in South Africa, emphasizing micro-credit for enterprise and women's self-employment. Their mission is to enable the poor to increase their income through micro-credit for self-employment, and by assisting in the accumulation of

savings. They deliberately target and identify local relevant indicators linked to poverty reduction such as quality of housing, food adequacy, value of business assets, and savings. As of June 2008, SEF has 50,319 women clients with portfolio outstanding of R70.8 million (US \$9.2 million). SEF does not collect deposits, but it actively encourages clients to save in group accounts with the formal Banking system (total savings in group accounts is R9.5 million). (Small Enterprise Foundation, 2009) SEF's method of lending, called "group lending," is based off of the highly successful Grameen Bank in Bangladesh. Group lending means that clients are members of groups of four other borrowers with whom they must save, consult for advice, and receive/payback loans. Additionally, there is a social imperative to help other members of the group because if one individual struggles to pay her loan, each member of the group is punished with a lower loan for the next cycle.

In deciding where to conduct our field research, we had to target subjects that would be useful data points for both the present study and the R&D project we were working on for SEF. Their project was concerned with clients in branches with the greatest competitor bank presence as well as clients who were deemed "recently struggling" by the SEF data. After figuring out the branches with the greatest presence of SEF and their competitor bank, we compared branches based on recent dropout and arrears data. We decided that the Vuwani and Tlatja branches were the best places to focus our study because both branches had struggling clients but the two branches represent two different types of SEF clients. Vuwani provides insight into the issue of overindebtedness within the Northern zone among TCP clients, or clients without businesses who SEF targeted specifically because they were extremely poor. Tlatja provides a picture of the issue in the Central zone among MCP clients, or clients who came to SEF asking for a loan to expand their current business.

After deciding upon the target branches, we selected individual areas and centers based on the frequency of double clients (clients who are presently borrowing or at one point in time borrowed from both SEF and their competitor bank) and recent arrears. Before visiting centers to conduct our individual interviews, we prepared a list of 10-12 clients of interest based on several variables. Double clients were given priority, as were clients thought to be “single struggling” clients. Single struggling clients were defined as clients who met several criteria indicating a struggling business. These criteria included: a late loan cycle with a small loan, high cash and low stock, low savings value, low business value (compared to loan size), recent arrears, and/or a recent drop in loan size.

After consulting with the development facilitator (DF), or loan officer in charge of the centers we targeted, we scheduled times to attend the weekly center meetings. These meetings were typically held at a borrower’s hut. After traveling to the targeted centers on the appropriate days, we were introduced by our translator (few borrowers spoke English). We then took a role of borrowers with whom we were interested in speaking (it was not at all uncommon for targeted members to be absent from center meetings). We pulled the interviewees to a safe and private distance away from the rest of the group, where we commenced our in-depth interviews.

## *2. The Interviews: Methods of Experimentation*

Before we commenced with experimentation, we had our translator explain the purpose of the study to the subject. We explained that we are interested in better understanding how they make decisions with money. It was explained to subjects that we would be asking a few questions, and that they did not have to answer certain questions if they felt uncomfortable answering. We explained to the subjects that we would be discussing money, but that this money was not real and that they would not be paid or asked to pay the sum at the end of questioning.



We made sure that the subjects understood this important information and proceeded with experimentation.

A script for experimentation was written in English and presented to our translator to be read to the subject in her language (ex. Venda, Tsonga, Setswana, etc.). We kept our experimentation as standardized as possible given the language barrier. Subjects were presented with choices between safe and risky options that either represented a gain or loss from the initial reference point. Subjects were placed in either the Gains or Losses conditions randomly. The initial reference points were R0 and R200 in the Gains and Losses conditions, respectively. The expected value of each option was R100. This article includes all data collected in the series; we did not discard any individual data. Subjects in the Gains condition were prompted with:

“Suppose I have R200 in my pocket. (Experimenter takes R200 out of pocket and shows to subject). Again, whatever money you win will not actually be paid to you. You have two options:

Option A: I will give you R100. We will share R100 for you and R100 for me.

Option B: I will flip this coin (show coin). If it lands on heads (show heads), I will give you R200. If it lands on tails (show tails), I will not give you anything.

Do you understand? Which option would you choose? Why?”

Subjects in the Losses condition were prompted with:

“Suppose you have R200. (Experimenter takes R200 from his pocket and gives to subject). Again, this is not actually your money, but instead this is a game and I would like for you to imagine that you came to the center meeting today with R200 in your pocket. You have two options:

Option A: You must give me R100. We will share R100 for you and R100 for me.

Option B: I will flip this coin (show coin). If it lands on heads (show heads), you do not have to give me any money. If it lands on tails (show tails), you must give me R200.

Do you understand? Which option would you choose? Why?”

Data was then compiled in an excel spreadsheet in which all clients were given a unique identification number so as to ensure anonymity. The names and other identifiable information (eg. Center name, group name, etc.) were placed in a secure and password protected folder only accessible by the research team. Client responses were coded based on their decisions to “flip” or “not flip”. Subjects’ answers to the final question asking why they chose the decision that they did was coded separately.

## Results and Discussion

We began our analysis by averaging the data for various criteria that SEF uses to assess client progress and performance. These figures do not serve a specific purpose for the present study but rather provide future researchers with a better idea of who our subjects were and how successful their businesses were. Table 1 compares the overall averages of SEF borrowers in the Vuwani and Tlatja branches.

Table 1: This table provides averages for various criteria that SEF uses to assess client progress and performance. It presents a useful depiction of the present study's subjects and shows the slight differences that exist between the Vuwani and Tlatja branches.

<b>Profile All Vuwani</b>								
Category	Loan	Bvalue	Bsavings	Cash	Stock	PWR Score	Age	Years in Business
Value	1687	1197	276	160	708	41	50	10
<b>Profile All Tlatja</b>								
Category	Loan	Bvalue	Bsavings	Cash	Stock	PWR Score	Age	Years in Business
Value	2675	2000	284	503	981	N/A	49	11

Our more meaningful analysis compared our subjects’ preferences across the Gains and Losses framing conditions. As Figure 2 shows, when presented with a choice between safe and risky in the Gains condition, subjects preferred the risky option (65% chose to flip the coin). When presented with a choice between safe and risky in the Losses condition, subjects overwhelmingly preferred the safe option (81% chose not to flip the coin).

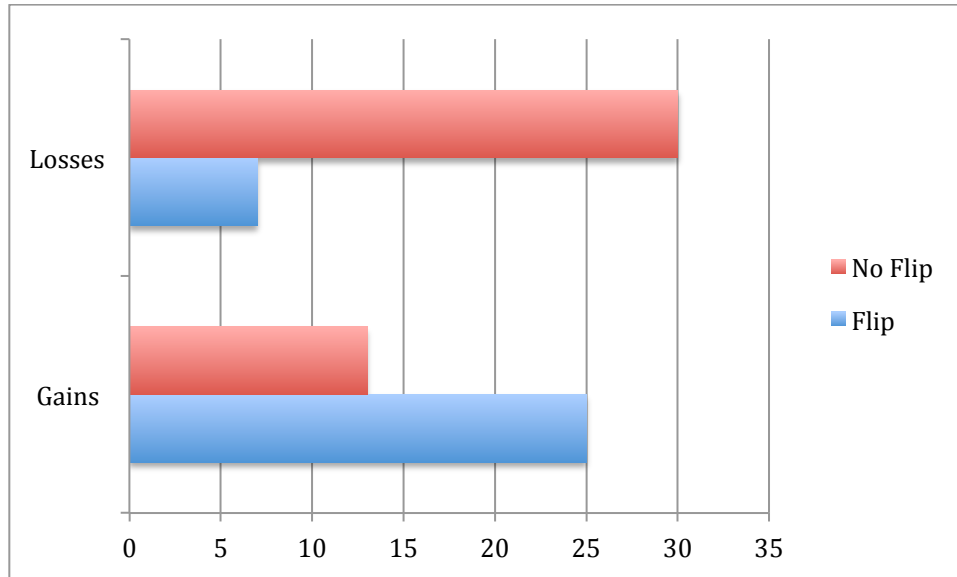


Figure 2: Visual depiction of subjects' choice preferences in the two conditions.

As Table 2 shows, N=75 with 38 subjects in the Gains condition and 37 subjects in the Losses condition. Additionally, we sampled 24 subjects from Vuwani and 51 subjects from Tlatja.

Table 2: This table shows the counts of decisions in the Gains and Losses conditions. There is clear evidence of both the framing and reflection effects. The parenthetical numbers represent the expected values.

N=75	Flip		No Flip		Totals
<b>Gains</b>	25	(16)	13	(21.5)	<b>38</b>
<b>Losses</b>	7	(16)	30	(21.5)	<b>37</b>
<b>Totals</b>	32		43		<b>75</b>

Consistent with the framing and reflection effects uncovered by Kahneman and Tversky, our subjects demonstrated a reliable switch in their risk preferences across the two conditions. Subjects were significantly more risk-seeking when the problems were framed as Gains and significantly more risk-averse when they were framed as Losses. The null hypothesis in this experiment was that the decision to flip or not flip the coin was independent of whether the

question was framed in terms of Gains or Losses. A chi-square analysis leads us to reject the null hypothesis due to the statistically significant difference observed in subjects' preferences in the Gains and Losses conditions ( $P$  value  $< .00005$ ,  $\chi^2=16.84$ ,  $df=1$ ).

Though the present data supports the existence of the framing and reflection effects uncovered by the Asian Disease Study, it also suggests that subjects were risk-seeking in the Gains condition and risk-averse in the Losses condition. These findings represent a complete switch from what the researchers found in the Asian Disease Study to be a basis for loss aversion. Kahneman and Tversky hypothesized that when the study was framed in terms of Gains, or lives saved, the prospect of certainly saving 1/3 of the lives was more attractive than the risky prospect of equal expected value. They argue that the basis for the switch from risk-averse in the Gains condition to risk-seeking in the Losses condition is that the prospect of certain death is less acceptable than the gamble that accompanies the possibility of saving those lives. "The preferences in problems 1 and 2 illustrate a common pattern," Kahneman and Tversky write, "Choices involving gains are often risk averse and choices involving losses are often risk taking." (Kahneman, D., & Tversky, A., 1981)

The present study finds little evidence of loss aversion. In fact, when the subjects in the Losses condition were asked to choose between the safe and risky prospects, an overwhelming number of them chose the safe prospect of definite loss. The subject of the present study (money) is different from the subject of the Asian Disease Study (lives). However, studies of loss aversion encompass the decisions we make with lives as well as money. In the present study, it is not necessarily true to say that the subjects did not exhibit loss aversion. It is more likely that the subjects were more comfortable with certain losses because the opportunity to share the money accompanies the certain loss. Surely, the concept of "sharing" deviates from the Kahneman and

Tversky study. But the reflection effect in the opposite direction is confirmed, and the concept of sharing adds a new dimension to the seminal framing effect phenomenon.

We attempted to better understand the decisions that our subjects made by analyzing their reasoning. After each subject made her decision to flip or not flip the coin, she was asked why she made the decision that she did. Though there was not enough significant data to code these responses, the words that some women chose to explain their decisions spoke to some potential criticisms of these findings. First, several women demonstrated an understanding of probability by saying, “Because I might win” or “Because I have a chance of winning all the money,” after choosing to flip the coin. Other women in a similar position justified their decision to gamble by saying, “Because R100 is too small and I need more money.” Women who chose not to gamble in the Losses condition justified their decision to share the money by saying, “I choose to share because I’m used to [sharing money with] my group-mates” or “Because [the translator] doesn’t have money and I want to share the money with him.” These responses seem to suggest that it was not the risk of losing everything that prompted a decision not to flip the coin, but rather an opportunity to financially help another person.

There are a couple of possible reasons why we see this sort of reversal from the Kahneman and Tversky findings. These subjects are considerably different from students at Stanford and the University of British Columbia. They are different in that they are older, they come from a collectivist culture, and they are borrowers from a microfinance bank that uses a group-lending model. One or all of these changed variables can potentially account for the dramatic reversal and absence of loss aversion. The age discrepancy is less compelling because Kahneman and Tversky have replicated this study with university faculty and physicians. But the collectivist culture and microfinance borrower variables still apply. Perhaps individuals in the

collectivist African culture were more inclined to share in the Losses condition because they view themselves as belonging to a larger group that protects and helps member interests. Or perhaps it has little to do with the collectivist culture variable and more to do with the fact that in the group lending format, “patching,” or sharing money with struggling members of the group because it is in the best interest of the entire group, is common. It may even be a practice that these borrowers are more used to than other borrowers of SEF because clients in Vuwani and Tlatja struggle more than other operating areas.

It is difficult to extrapolate these findings onto a broader conclusion about “the poor” and their decision-making. The reality is that the sample is too small and the subjects represent a single province in an entire country. A poor South African from Vuwani is not the same as a poor Brazilian from Rio de Janeiro. They each have their own unique sets of problems and skills. Nonetheless, there are essential features of poverty that remain constant all around the world. And it is from those specific features coupled with the data uncovered by this study that we will make our inferences.

Perhaps an absence of loss aversion stems from being used to the concept of loss. It is possible that we in the Western world are loss averse because we do not walk down the street each day and lose \$10. Our intense aversion to loss may be a product of how rarely in our lives we experience it. But in the case of the most impoverished people in the world, being conditioned to accept loss as a reality of daily life is almost a necessity for survival. When your family members are dying of HIV/AIDS, your fathers and brothers are leaving to go to Johannesburg to earn a better wage, or a natural disaster destroys your crops that represent the only potential income for your family of six, loss becomes something you just have to shrug off and move on from. Families in poor African communities tend to be larger than families in the

developed world. This is almost a way of hedging against the odds that some children will survive and some will perish. Though it is unfair (and even scientifically inappropriate) to make generalizable inferences about the emotions of the poor or how they feel about loss without empirical evidence, it is logical to suggest that the poor experience loss more frequently than common experimental subjects in the West. Most people in the West have the luxury of being averse to losses because losing tends not to be a part of everyday life. And it is possible that simply the quantity of losses experienced in one's life contributes to loss aversion.

These findings are among the first of their kind in a field that is mostly dominated by research in Western nations. It opens the door for more expansive and larger scale studies that can potentially change the way we think about the poor and their decision-making. As Duflo puts it, "The poor are different because they are desperate: Having nothing to lose, they cannot be made fully responsible for their actions. They cannot thus be given the same opportunities as others, and this explains the persistence of poverty." (Duflo, 2006) The implications of better understanding the inner workings of a poor individual's mind are far-reaching for historians, policy makers, economists, and anyone else concerned with making our world more equitable.

### **Limitations and Directions for Future Research**

It is important to recognize that this study's findings are elementary. They tell us little about why the poor make the decisions that they do and the sort of aid that would be most effective from agencies in the future. Our hope in presenting this experiment and our findings is that we excite an interest among behavioral economic researchers in cross-cultural poor populations so that we may move toward a better understanding of the poor and how to best provide financial and social services to them.

The limitations of these findings (and more generally this kind of research) can be seen in its scope of “the poor” and its controls for prior institutional experience. The subjects in this study were unique. They were generally middle-aged female clients of a microfinance bank in the northern province of South Africa. They are unique not just because of their geographic location in the world, but also because of their institutional experience with microfinance banks. As discussed earlier, with a loan from the Small Enterprise Foundation comes many requirements of group saving, group borrowing, and group loan payments. Though this study more generally attributes its differing results from the seminal Kahneman and Tversky study to the collectivist South African culture, this is a very limited conclusion. The fact of the matter is that any number of experiences could contribute to the observed risk preferences of our subjects.

Future studies in this field should better control for the sort of institutional experience that the present study ignored. Subjects should be asked in a survey about their experience with financial institutions (formal and informal) in the past, as well as their experience with other relevant institutions such as government social programs, the news media, and development non-government organizations. By controlling for these sorts of institutional experiences that influence decision-making biases, we can learn more about the poor and the decisions they make.

Another limitation of this study that poses an opportunity for future studies is the payoffs. In the Asian Disease Study, the initial reference point from which the subjects made their decisions was not zero. In the Gains condition of the Asian Disease Study, the options for intervention were framed in terms of lives saved, but the outcome if subjects did not intervene was the definite loss of 600 lives. In the present study, not playing has no effect on ones current financial position. In fact, there was no reason not to play the game in the Gains condition because there was no possibility of losing money. As subjects explained, they chose to gamble in



the Gains condition because R200 would mean significantly more to them and their family than R100, and there was no penalty for gambling. Future studies should change the initial reference point so that payoffs are framed in terms of money gained from a negative current financial position. For example, subjects could be explained a catastrophic event pertaining to their businesses that would result in the loss of R600 if no action is taken. In the safe condition, subjects could choose to receive R200 and in the risky condition, there could be a 1/3 probability of getting R600 and a 2/3 probability of getting R0. By changing the initial reference point to a negative current position, subjects may exhibit risk preferences that further validate the results of the present study or that provide cross-cultural support for Kahneman and Tversky's findings.

Future studies in this field should also aim to discover a threshold of payoff frames that alter the risk preferences of subjects. Making the payoffs R100 and R200 are dramatically different from making the payoffs R1,000 and R2,000. Subjects may be more likely to take a safe position in the Gains condition and a risky position in the Losses condition in the latter payoff scenario. Discovering the threshold for where the shift occurs could prove very useful for development agencies and financial institutions concerned with minimizing risk-seeking behavior. Microfinance banks, for example, could change their loan increase payoffs relative to where the threshold of risk-seeking behavior is exhibited if evidence of wasteful spending is observed after loan increases.

The findings of the present study are a first step in what we argue should be a movement in the behavioral economic literature. The direct implications of our findings on policy are limited, but the potential that our findings exhibit could be invaluable for a multitude of development agencies and the initiatives and projects that they undertake.

## **Conclusions**

The phenomena of the framing and reflection effects, in which humans switch from risk-seeking to risk-averse behavior depending simply on how the outcomes are presented, appear to have cross-cultural support. The impoverished borrowers of the Small Enterprise Foundation Microfinance Bank that we sampled chose a risky gamble over a safe alternative when the outcome was framed as a gain relative to an initial reference-point; in contrast they preferred the safe option when a payoff-identical outcome was framed as a loss. While these findings were consistent with those of Kahneman and Tversky's Asian Disease Study in that subjects switched their risk preferences when the frame of the scenario was changed from Gains to Losses, the specific risk preferences of these subjects were the complete opposite relative to the two conditions.

These results provide support for the arguments expressed by Henrich et. al. (2010) that our behavioral and psychological theory is biased towards the Western and developed nations that create them. We tend to assume universality of psychological phenomena even if our sample is a unique population of university students attending one of the most highly regarded institutions in the world. Assuming that the minds of college students and extremely impoverished women in Sub-Saharan Africa are exactly the same is simply poor science. Culture plays a major role in our decision-making by teaching us what we value and how much we are willing to risk for what we value. For the present study, culture plays a major role if the collectivist culture of South Africa influenced subjects' willingness to choose a definite loss in the gambling scenario. The imperative to help others in the community may have contributed to our subjects' willingness to share their individual assets.

According to development economist Esther Duflo, “What is needed is a theory of how poverty influences decision-making, not only by affecting the constraints, but by changing the decision-making process itself. That theory can guide a new round of empirical research, both observational and experimental.” The present work provides a foundation for that theory to emerge. We hope that opening the door to behavioral economic experimentation with some of the most marginalized individuals in the world can eventually influence better models for aid, financial services, and crisis intervention.

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