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BINARY LOTTERY PAYOFFS: DO THEY CONTROL RISK AVERSION?

by

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Abstract

Considerable evidence has accumulated which shows that the choice behavior of individuals exhibits systematic departures from expected utility maximization. The focus of the paper is to develop some measures of the extent to which utility maximization nevertheless remains a useful approximation. We do this by considering the extent to which individual choice behavior can be controlled, in the manner predicted by expected utility theory, by experimental designs which employ *binary lottery* payoffs in the manner of Roth and Malouf (1979) and Berg et al. (1986). The results of this study suggest that the gross features of risk preference can be reliably implemented, albeit with a non-negligible amount of error. Some errors were found to be systematic and can be attributed to subjects who did not know how to calculate the expected probability of winning the prize in a compound binary lottery. The knowledge of compound lotteries also played the role in determining which functional forms are easier to induce.

I. INTRODUCTION

Game theory takes as a starting point, for many purposes, the assumption that each player's objective is to maximize his expected utility payoff. In experimental work in recent years considerable evidence has accumulated which shows that the choice behavior of individuals exhibits systematic departures from expected utility maximization. This raises the question of how adequate is the assumption of expected utility maximization as a descriptive theory of choice. Another open issue in experimental work is related to the identification of subjects's preferences. I will try to develop some measures of the extent to which utility maximization nevertheless remains a useful approximation. The issue is to find if experimental methodology allows us to control the utility of players and allows us to measure the extent to which utility maximization is an "adequate" approximation of observed behavior.

In prior experimental work on individual choice authors [e. g. Allais, (1953), Kahneman and Tversky, (1979)] show that the choice behavior of individuals exhibits systematic departure from expected utility maximization. The experiments resulted in finding examples where expected utility is violated, but they do not give us much indication of the extent to which utility theory nevertheless may be a useful approximation. This study starts from a different point of view. We consider an experimental and statistical technique which -if subjects are at least approximate expected utility maximizers - will allow us to implement risk preferences and measure the deviation from the predicted behavior, i. e. from expected utility maximization. The technique which we used is the binary lottery technique of Roth&Malouf, (1979) and Berg et. al., (1986). If subjects are expected utility maximizers, this allows the experimenter to predetermine any functional form for subjects' utility function. If subjects are not expected utility maximizers this technique with the use of statistical tests allows us to capture and explain the deviation from expected utility maximization.

This paper is organized as follows. Section 1 describes the binary lottery technique, and discusses the relationship between expected utility and induced preferences. Section 2 concentrates on the design of the experiment, outlines the design of the lottery sets and the criteria for the selection of lotteries for the experiment, and explains the conduct of the experiment. Section 3 discusses the principal results from the experiment and raises methodological issues concerning the observability of induced preferences by experimental methods. Section 4 outlines the design of a follow up experiment that includes new lottery choices in order to study the sensitivity of the technique for inducing preferences to the functional forms of the induced utility functions. This addresses an issue that arose in the analysis of the data from the first experiment. Section 5 reports the results of the second experiment and evaluates the extent to which binary lottery payoffs can be used as an element of experimental design to successfully control risk posture. On the basis of the findings we conclude by considering the limitations of the present study in assessing the robustness of utility theory as a general theory of choice.

II. THE BINARY LOTTERY TECHNIQUE

The basic idea of the binary lottery technique[1] is that lotteries have prizes in "points" which in turn determine a subject's probability of winning one of two monetary prizes. Since there are only two prizes, expected utility maximizers who prefer the larger prize have, by definition of expected utility, preferences which are linear in the probability of winning the larger prize. So preferences which are risk averse, risk neutral, or risk preferring in points can be induced by making the function from points to probability concave, linear, or convex.

That is, in a binary lottery choice decision each subject i can win one of two monetary prizes, b or c ($b > c$). As there are only two prizes we can normalize each subject's utility so that $U(b) = 1$ and $U(c) = 0$. Then the expected utility of a (possibly compound) lottery L which gives a probability p of winning b and $(1 - p)$ of winning c is simply $U(L) = p$, so that utility is linear in p. A utility maximizer will therefore try to maximize the probability of getting the higher prize. Therefore we can introduce an intermediate commodity, "points", and exactly specify a subject's utility function for points, by specifying a function f from points to probability of winning the high prize b. That is, if $f(n)$ is a monotone function which transforms the number n of points which a subject wins in a lottery into his probability of winning the large prize b, then $f(n)$ is his expected utility for receiving n points. We want to control how linear is utility in points by making the curvature from points to probabilities concave (risk averse), convex (risk preferring), or linear (risk neutral). If subjects were perfect utility maximizers, the design was chosen to induce particular behavior of subjects (constant absolute and constant relative risk aversion, constant absolute and relative risk preferring behavior and risk neutrality).

[1] The idea is based on the works of Roth&Malouf, (1979) and Berg et al, (1986).

III. DESIGN OF THE EXPERIMENT

A Presentation of binary lottery technique on a computer screen

In the choice selection faced by the subjects in the experiment, there were pairs of binary lotteries to choose between like the one presented in Figure 1 A. There are two lotteries (lottery A and lottery B). Each lottery is of the form $\{n_1\ [f(n_1)]\ P_1\ ;\ n_2\ [f(n_2)]\ (1\text{-}P_1)\}$. where n_1 and n_2 are points, P_1 is the probability that n_1 is realized and similarly $(1\text{-}P_1)$ is the probability that n_2 is realized (where $0 \leq n_i \leq N$; $i=1,2$, $N=50$). Each point outcome n corresponds a probability of getting money $P(\$b \mid n) = f(n)$ with $P(\$b \mid N) = 1$[2] and $P(\$b \mid 0) = 0$ and this information is stated in the brackets. The induced behavior, i.e. f(n), is exactly specified with one of the following functions:

$f(n_i) = (1 - e^{-\beta n_i})/(1 - e^{-\beta 50})$ for constant absolute risk averse function with index of risk aversion $\beta=0.07365$, (and n_i is the number of points, $0 \leq n_i \leq 50$). (1)

$f(n_i) = (-1 + e^{\beta n_i})/(-1 + e^{\beta 50})$ for constant absolute risk preferring function with index of risk aversion $\beta=0.07365$, (and n_i is the number of points, $0 \leq n_i \leq 50$). (2)

$f(n_i) = (n_i/50)^{\beta}$ for linear function with $\beta = 1$, (and n_i is the number of points, $0 \leq n_i \leq 50$). (3)

Each subject received a table corresponding to the function f that applied to him, i.e. one of tables 1, 2, 3.

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[2] In the experiment the high prize b= \$10 and the small prize c =\$0.

Each lottery is also graphically presented with a wheel divided into two parts. Each part has a different color. The proportion of the wheel which is a given color is the probability of receiving the points which are associated with this color. For example, for lottery A, there is an 80% chance of getting 12 points and a 20% chance of getting 21 points. The function f(n) for this example is the constant absolute risk averse function with $\beta = 0.07365$. 12 points correspond to a 60.2% chance of getting $10, and if a subject happens to receive 21 points for lottery A then his chances of getting money would have been 80.7%. Similarly the information can be read for lottery B.

These are compound lotteries and the expected probability of winning money with lottery A is $EU_A = P(A) = 0.80*60.2+0.2*80.7 = 64.3$ and the expected probability of winning money with lottery B is $EU_B = P(B) = 0.90*20.3+0.10*99.6 = 28.23$. If a subject is an expected utility maximizer then he will choose lottery A for this example because $EU_A > EU_B$[3]. The chosen lottery is then conducted to determine the points he won. A random number between 1 and 100 is drawn which determines the points a subject won. The outcome of the lottery is presented by an arc which is drawn around the wheel. The position where it stopped indicates the color, and the number of points associated with the color. Then another random number between 1 and 100 is drawn and if this random number is less than the probability of winning money a subject wins $10, otherwise he gets $0[4].

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[3] More generally $EU_A = P_1 f(n_1) + (1 - P_1) f(n_2)$ and $EU_B = P'_1 f(n'_1) + (1 - P'_1) f(n'_2)$.

[4] Figure 2 A shows that the lottery fell in the 80% region. A subject received 12 points and had 60.2 percent of winning $10. Next, the random number 10 was drawn and since 10 is less than 60.2, he won the $10 in this example.

B Design of the lottery sets

Every subject is faced with only one induced utility function f(n). If we want to measure how linear is utility in probabilities, (i.e. the deviation from linearity) then the lottery pairs with which all subjects are presented should have certain properties. All 42 pairs of lotteries are selected in such a way that subjects who are assigned to different risk preferences, i.e. functions $f(n_i)$ face the same pairs of lotteries, each of the form $\{ n_1, P_1; n_2, (1-P_1)\}$, where points n_1, n_2 and corresponding probabilities P_1 and $(1-P_1)$ do not change between different induced preferences. However, changing the induced preferences $f(n_i)$ for each lottery pair $\{ n_1,[f(n_i)]\, P_1; n_2, [f(n_2)]\, (1-P_1)\}$, alters the choice selection predicted when subjects are perfect expected utility maximizers. The lotteries are constructed so that whenever a subject with a constant absolute risk averse induced function $f(n_i)$ is predicted to choose lottery A, a subject with a constant absolute risk preferring induced preferences $f(n_i)$ should choose lottery B for the same pair of lotteries of the form $\{ n_1, P_1; n_2, (1-P_1)\}$. And conversely, when the optimal choice for a subject with constant absolute risk averse induced preferences is lottery B, then lottery A is the optimal choice for a subject with constant absolute risk preferring induced preferences. For example, if we look at Figure 1 B and compare it to Figure 1 A then the only information which is changed are the numbers in square brackets, i.e. the function f(n). The constant absolute risk preferring function with $\beta=0.07365$ was used to generate the numbers in square brackets in Figure 1 B, while in Figure 1 A the numbers were generated using the constant absolute risk averse function. An expected utility maximizer with the constant absolute risk preferring function will choose lottery B in Figure 1 B, as $EU_A < EU_B$. The choice of an expected utility maximizer with the constant absolute risk averse function in Figure 1 A is lottery A. Similarly for all pairs of lotteries $L=1,\ldots,l$ in the experiment, when a number in the square brackets is generated with a constant absolute risk averse function and $EU_{Aj} > EU_{Bj}$ for some $j \in L$ then $EU_{Aj} < EU_{Bj}$ with a constant absolute risk preferring function, keeping points and probabilities of getting the points fixed between different risk preferences. If for $i \neq j$ and $i \in L$ $EU_{Ai} < EU_{Bi}$ with constant absolute risk averse function then $EU_{Ai} > EU_{Bi}$ for constant absolute risk preferring function. This is true for all i,j $\in$ L. For a risk neutral function half of the time the utility maximizer's choice coincides with the optimal selection of the constant absolute risk averse function and half of the time with the constant absolute risk preferring function.

The pairs of lotteries were also selected in such a way that the number of pairs of lotteries are evenly distributed from smaller to higher absolute differences in expected probability between lottery A and lottery B (i.e. EU_A - EU_B). More specifically, the difference in expected probability was divided into intervals of 5% from 0% to 35% and pairs of lotteries were selected in such a way that each interval should have an equal number of pairs of lotteries. However, because of the way the lotteries had to be constructed to fulfil the other requirements of the design[5], for the linear induced preference this requirement was not fulfilled and there were no pairs of lotteries in which the difference in expected probability was greater then 25 percent.

C Natural risk aversion for money

Prior to attempting to induce a particular risk posture we measured the natural propensity of subjects to take risk, i.e. the natural risk aversion of subjects. Consider three monetary amounts a, b, and c, with a > b > c. Then a measure of an individual's risk aversion on the domain of these three possible payoffs is the range of lotteries between a and c that a subject is willing to accept in preference to having the amount b for certain (i.e., the minimum probability of getting a rather than c that makes him like the lottery at least as much as the certain amount b). In comparing two individuals the individual

[5] Recall that whenever an expected utility maximizer with a constant absolute risk averse induced function chooses lottery A, a subject with a constant absolute risk preferring induced function chooses B and vice versa. This criteria has to be fulfilled for all 42 choices. Therefore, it was difficult to find at the same time equal number of choices for each interval and for the risk neutral function we failed to have choices for the difference larger than 25 percent.

i who is willing to accept the smaller range of lotteries (i.e. who has the higher minimum probability p_i) is said to be more risk averse and reflects the subjects' preference for money as a function of p.

The risk aversion of each subject was assessed by having him consider the sequence of choices presented in Table 4.

TABLE 4 THE SEQUENCE OF CHOICES GIVEN TO SUBJECTS TO TEST THE NATURAL RISK AVERSION FOR MONEY (I.E. MINIMUM PROBABILITY p_i)

\$5.00	for sure	<	>	95%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	90%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	85%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	80%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	75%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	70%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	65%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	60%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	55%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	50%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	45%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	40%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	35%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	30%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	25%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	20%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	15%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	10%	chance for	\$10.00	or	\$0.00
\$5.00	for sure	<	>	5%	chance for	\$10.00	or	\$0.00
		done						

use ▲ and ▼ to move up and down
use ◀ to select \$5.00 for sure or ▶ to select lottery

Players were asked to choose between receiving \$5 for certain or participating in a lottery that would give them \$10 with probability p and \$0 with probability 1 - p, with p decreasing as the sequence of choices progressed. Subjects were told that at the end of this part of the experiment one line of Table 4 would be chosen at random, and they would be paid the alternative they chose in that line (i.e., $5 or a lottery).

D Conduct of the experiment

Students enrolled in undergraduate classes at the University of Pittsburgh were given the opportunity to volunteer for the experiment[6]. No special skill or experience was required for participation. Subjects were told they would be paid $4.00 for showing up on time, and that they would have an opportunity to earn additional money in the experiment.

Subjects were randomly assigned to one of the induced preferences. Subjects could participate in only one of the sessions (for one induced preference). In each session 20 undergraduate volunteers were recruited and were seated at visually isolated computers. They were told that this is an experiment on individual choice, so each individual's earnings from the experiment are not influenced by the decisions of other subjects. They were also told that the experiment consists of two parts and that in each part they have to decide between pairs of alternatives, which will determine how much they earn in the experiment, i.e. at the end of each part one pair will be chosen at random and the alternative they chose will determine how much money they will make for that part of the experiment.

The instructions were handed to the participants and were read out loud[7] (See Appendix D). Three practice examples for the test of natural risk aversion were first presented on the screen (see Table 5 A) to familiarize the participants with various choices and the

[6] The data were collected from 25 through 31 May 1991.

[7] The instructions for all three sessions differ only for the probabilities for winning $10. This probabilities had to correspond to the appropriate risk condition (i.e. information in square brackets and corresponding Table 1-3).

mechanics of the computer.

TABLE 5 A COMPUTER DISPLAY OF THE THREE PRACTICE EXAMPLES TO TEST THE NATURAL RISK AVERSION

$ 2.00 for sure	< >	47% chance for $8.00 or $0.00
$ 2.00 for sure	< >	37% chance for $8.00 or $0.00
$ 2.00 for sure	< >	27% chance for $8.00 or $0.00
	done	

use ▲ and ▼ to move up and down
use ◄ to select $2.00 for sure or ► to select lottery

PRACTICE!

Subjects were instructed to select a lottery in the first and in the second row and a sure outcome of $2 in the third row (see Table 5 B).

TABLE 5 B COMPUTER DISPLAY OF THE PRACTICE EXAMPLES TO TEST THE NATURAL RISK AVERSION AFTER THE CHOICE SELECTION

$ 2.00 for sure	< >	47% chance for $8.00 or $0.00
$ 2.00 for sure	≤ ≥	37% chance for $8.00 or $0.00
$ 2.00 for sure	< >	27% chance for $8.00 or $0.00
	done	

use ▲ and ▼ to move up and down
use ◄ to select $2.00 for sure or ► to select lottery

Random Number = 77

Part I earnings $0.00

PRACTICE!

PRESS ANY KEY TO CONTINUE

The second row was chosen for payment and the practice "random" number 77, which was the same for all subjects, was higher then the 37% chance of getting $8, so they all earned $0 for the practice example.

Each player then made the 19 lottery choices in Table 4. One of the 19 choices was randomly selected by the computer. If the subject had chosen the certain outcome, he or she received $5, while if he or she had chosen the lottery, it was performed by the computer and the subject was paid according to the outcome. At the bottom of the screen, the random number is displayed along with the earnings for part I (Table 6).

Then the instructions were read concerning the induced preferences. In this part of the experiment subjects could again earn either $10 or $0. Subjects were introduced to binary lotteries. They were told that lotteries were expressed in terms of points and they will never receive points per se, points determined the probability of winning money. More points gave subjects a greater chance of winning $10. Subjects who were randomly assigned to the absolute risk averse preference were introduced to Table 1. The first column corresponds to the points a subject might earn. The maximum number of points he can earn is 50. The second column gives the probability of winning money. It was pointed out that an increase in the number of points when they have very few points increases their chances of winning the $10 more than an increase in the point total if they have a lot of points[8]. Similarly, subjects who were assigned to the absolute risk preferring function went through similar instructions, but were presented with Table 2 representing the risk preferring function $f(n_i) = (-1 + e^{\beta n_i})/(-1 + e^{\beta 50})$. This gave a different interpretation how an additional point received increases the likelihood of receiving $10. It was pointed out that the more points a subject had, the more an

[8] The more points a subject has, the less an additional point increases his chance of winning in the risk averse condition. For example, going from zero points to 10 points increases their chances of winning $10 from zero to 54%. Going from 30 points to 40 points increases their chances of winning $10 from 91% to 97% (an increase of 6%).

additional point increased his chance of winning[9]. Subjects who were faced with linear preferences were introduced to Table 3 and were told that each additional point increased the chance of winning $10 by 2 percent. Subjects were told that they will be faced with a number of choices, each consisting of two lotteries. They were told that their choice and the outcome of the lottery determine the points they get, which in turn determines their probability of getting $10. Then they are introduced to a pair of lotteries A and B. They learned how the lottery is conducted to determine the points they win, once the decision between lottery A and B is made. Subjects knew that they will never receive the points per se, and that the points they receive determine the probability of winning $10. They were neither told how nor asked to calculate the probability of winning $10 with lottery A and B. However, subjects knew that when they selected a lottery, a random number between 1 and 100 is drawn which determines the points they win. The points correspond to the probability of winning $10. Then another random number between 1 and 100 will be drawn and if this random number is less than the subjects' probability of winning $10 he will win $10. Three practice choices like the one shown in Figures 1 A - 1 C were conducted to familiarize subjects with the new lottery procedure. Each player then made 42 lottery choices. Each chosen lottery was immediately conducted and subjects knew the outcome of the lottery for each round. Subjects were told that only one of the 42 choices would be randomly selected for the payment. At the end, one of the 42 pairs of lotteries was randomly selected by the computer and the lottery from that pair that the subject had selected determined how much money he made for the second part of the experiment. The summary of the earnings was presented on the last display, separately for participating in the experiment, for the first part of the experiment, for the second part of the experiment and the total earnings in the experiment. Subjects were paid only on one choice in order to preserve the "binary-ness".

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[9] Going from zero points to 10 points increases their chances of winning $10 from zero to 2.8%. Going from 30 points to 40 points increases their chances of winning from 2.9% to 46.5% (an increase of 25.6%).

E Post experimental questionnaire and assessment of ability to evaluate compound lottery

At the end of the experiment subjects were asked to complete a questionnaire. They were told that the data will be kept strictly confidential and will be used only for research purposes. The information obtained were: student's status (undergraduate, graduate), gender, marital status, nationality, year of the last employment, year when entered the University, field of study, current annual income of the immediate family. For the questionnaire one from the 42 pairs of lotteries was presented again and subjects were asked to calculate the expected probability of winning $10 for each of a sample pair of lotteries, A and B (No instructions on computation of expected probabilities had been given) and this test question was to determine which subjects could perform the calculation.

IV. PRINCIPAL RESULTS FOR ALL THREE INDUCED PREFERENCES

A The impact of the difference in expected probability between lottery A and lottery B on subjects' selection of lotteries

Before we statistically measure subjects' induced preferences, it is worth observing the impact of the difference in expected utility i.e. of expected probability of winning money between lottery A and lottery B on subjects' selections of the lotteries. In each sample we have twenty observations for each of the forty two choices. We grouped the choices on the basis of the difference in expected probability of winning $10 (P(A)-P(B)). The differences ranges from 5% to 35% grouped in increments of 5% [10]. Then we examined the number of times subjects chose the predicted lottery for a given difference in expected probability and assigned the value m_i. The number of observations for each difference interval is denoted n_i. The empirical probabilities are $p_i = m_i/n_i$. Figure 3 graphically presents the empirical probabilities for each corresponding difference in expected probability. The pattern, that predicted lotteries are selected more frequently at higher differences in expected probability than at lower differences, is observed in all three samples. For example, at 5 percent difference in expected probability, subjects selected the predicted lottery in the risk preferring sample only 35 percent of the time, and 51 percent of the time in the risk averse and risk neutral samples. At 15 percent difference in expected probability, the chance of selecting the predicted lottery rises to 66 percent and 80 percent. At 35 percent difference, both risk averse and risk preferring sample show that subjects were 86 percent of the time selecting the predicted lottery. Figure 4 shows the empirical probabilities for each corresponding difference in expected probability for the disaggregated sample of subjects who knew and those who did not

[10] All choices which have a difference less or equal 5% were assigned value of 5%, for values more then 5% and less then equal 10%, all values became 10%, etc.

know how to calculate the expected probability[11]. The figure shows that subjects who knew how to calculate the expected probability were choosing the predicted choices approximately 10 percent more often then the subjects who did not know how to calculate the expected probability for constant absolute risk averse induced preferences and for risk neutral induced preferences. However, the difference between subjects who knew and did not know how to calculate the expected probability was negligible for the risk preferring induced preferences. What Figures 3 and 4 make clear is that, the pattern of selecting the predicted choices is very similar in all three samples, with a higher chance of deviating from the predicted lottery when the difference in expected probability within each sample is small. Even when the difference in expected probability is high, subjects were still making some unpredicted choices. And the pattern is the same regardless of whether subjects knew how to calculate the expected probability of winning which suggests that many subjects are not engaged in precise arithmetical calculations.

B Test if estimated coefficient equals the induced coefficient for each individual for all three induced preferences

Figures 3 and 4 suggest that subjects were not always consistent expected utility maximizers. However, in order to capture the deviation accurately for each subject we will first estimate the coefficient of risk aversion and compare it with the induced coefficient. The model specification is based on the experimental design where f(n) is known (see equations 1,2, and 3), as well as the choices which should have been selected if subjects were expected utility maximizers. By assuming the functional form f(n) used in the experiment, but not knowing the parameter β we can estimate the coefficient of

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[11] The subjects were grouped on those who knew and did not know how to calculate the expected probability on the answers from the questionnaire. This questionnaire was given to the subjects after they finished with the experiment. Each subject was asked to calculate the expected probability for a lottery A and lottery B (the example was taken from one of the 42 choices they made during the experiment and was the same one for all subjects. Appendix D includes the questionnaire with this example).

risk aversion β for each individual from the data and test if the difference between the estimated and induced coefficient is significant. This will give us a measure of how close is each individual to the behavior predicted by expected utility maximization. Let us introduce some notation. Consider the occurrence or non-occurrence of the event "a subject selects a lottery he is expected to select if he is an expected utility maximizer". We define a dichotomous random variable y which takes the value of 1 if the event occurs and 0 if it does not[12]. A subject choice is between lottery A and lottery B. We already defined EU_A and EU_B as the subject's induced expected utility associated with lottery A and lottery B respectively. However, for the estimation purpose the data has been arranged in such a way that lottery A represents the lottery which has to be chosen if a subject is an expected utility maximizer. Therefore, by convention the lottery which coincides with the expected utility hypothesis is now called lottery A. Assuming the same utility functions as the ones induced in the experiment, we define EV_{iA} as the i-th subject's *actual* "expected utility" associated with lottery A and EV_{iB} is the actual expected utility of lottery B. (That is, EV_i is the evaluation function of a subject who may not be a perfect expected utility maximizer.)

$$EV_{iA} = (p_{1A}\, f(n_{1A}) + (1- p_{1A})f(n_{2A}))\epsilon_{iA}$$

and (4)

$$EV_{iB} = (p'_{1B}\, f(n'_{1B}) + (1- p'_{1B})f(n'_{2B}))\epsilon_{iB}$$

where $f(n_j)$ for $j=1,2$ is the specification given in equations 1, 2, or 3, where n_j is number of points and β is the coefficient which is not determined and has to be estimated

[12] Though any other pair of real numbers could be used, the choice of 1 and 0 is especially convenient.

from the data and ϵ_{iA} and ϵ_{iB} are error terms associated with lottery A and lottery B[13]. The basic assumption is that the i-th subject chooses lottery A if $EV_{iA} > EV_{iB}$, i.e. if subject i is an expected utility maximizer and chooses lottery B if $EV_{iA} < EV_{iB}$, i.e. he is not expected utility maximizer. Defining $y_i = 1$ if the i-th subject chooses the lottery which coincides with the expected utility hypothesis and is now called lottery A, then

$$
\begin{aligned}
P(y_i = 1) \quad &= P(EV_{iA} > EV_{iB}) \\
&= P(\ln \epsilon_{iB} - \ln \epsilon_{iA} < [\ln\{p_{1A} f(n_{1A}) + (1- p_{1A})f(n_{2A})\} \\
&\quad - \ln\{p_{1B} f(n_{1B}) + (1- p_{1B})f(n_{2B})\}] \qquad (5) \\
&= F(X\beta) = F([\ln\{p_{1A} f(n_{1A}) + (1- p_{1A})f(n_{2A})\} \\
&\quad - \ln\{p_{1B} f(n_{1B}) + (1- p_{1B})f(n_{2B})\}]
\end{aligned}
$$

where F is the distribution function of $\epsilon_{iB} - \epsilon_{iA}$. In the estimations we assumed the normal and logistic distribution of $\epsilon_{iB} - \epsilon_{iA}$.

Forty two observations were used to estimate each subject's coefficient. Listed in Table 8, separately for the probit model and logit model, are the estimates of each individuals' induced risk preferences for all three sessions. Each row reports for each individual the estimated intercept α, the estimated coefficient of risk aversion β, the test statistic of the null hypothesis that the estimated coefficient is equal to the induced coefficient β_0, the test statistic of the null hypothesis that subjects are linear[14] in points for probit and logit models[15]. The estimates based on both the probit and logit models are very similar in

[13] The error term in this specification is not additive. We also investigated the alternative assumption that the error term is additive but the specification in equation 4 better represents the data.

[14] Linearity in points is tested using the functional form $f(n) = (n/50)^{\beta}$ in the estimation instead of the functional forms used to induce particular risk preferences in the experiment. Subjects are linear in points if $\beta = 1$.

[15] The likelihood ratio test for linearity is reported only for the probit model.

magnitude. Beginning with the data from the subjects for whom the constant absolute risk averse function was used to induce subject's behavior, we see that 15 out of 20 estimates of risk aversion lie within an estimated standard deviation and *for 15 out of 20 estimates the hypothesis* that the estimated coefficient equals the induced coefficient, i.e. β_0 = *0.07365 is not rejected at the five percent* significance level using a likelihood ratio test statistic (twice the difference of the log likelihood value). Turning to the constant absolute risk preferring session we see that 17 out of 20 coefficients of risk aversion are significantly different from zero and *14 of them are not significantly different from the induced coefficient of* $\beta_0=0.07365$. Similarly we find that 17 out of 20 coefficients are significantly different from zero for risk neutrality and the null hypothesis of $\beta = 1$ is rejected for 6 coefficients at the 5% level of significance. The estimates on induced risk preferences for all subjects for all sessions show that overall subjects did not deviate from expected utility maximization (see Table 9). The estimated coefficients of β were not significantly different from the induced coefficient for constant absolute risk averse and risk preferring preferences and risk neutral preferences. So on aggregate level the model performs fairly well. The same conclusion was reached when the estimation was performed separately for subjects who knew and subjects who did not know how to calculate the expected probability (see Table 14 A and 14 B, columns 1,3, and 5). The results indicate that risk aversion across individuals varies and that subjects' behavior is not completely homogeneous in terms of expected utility maximization. On the aggregate level subjects do not significantly deviate from the induced coefficient. However, the difference between the estimated coefficients and the induced coefficient gives an absolute deviation and can be used as an indication of how much to change the induced coefficient of the function f(n) to correct for non-linearity in probabilities. However, it is at this point not clear if some systematic pattern of behavior in the sample exists which will explain this deviation. The only systematic pattern which we observed to this point are presented in Figure 3 and 4 where the absolute difference in expected probability between the two lotteries had an effect on the choice selection.

C Test if subjects are linear in points

One test is to observe if subjects were ignoring the probabilities and evaluated instead the expected payoff in points. To test this hypothesis for constant absolute risk averse and risk preferring induced behavior the coefficients β were estimated using equation $f(n) = (n/50)^{\beta}$. If $\beta=1$ then they are linear in points and they ignore the information on probabilities. Indeed the likelihood-ratio test statistics in column 5 of Table 8 accept the hypothesis that some of the subjects who were not expected utility maximizers are linear in points. In the *risk averse session linearity in points* was *not rejected for four* subjects. In the *risk preferring session* from six subjects there were *two whose coefficient did not differ from* $\beta_0 = 1$[16]. However, the linearity hypothesis was always rejected for the subjects whose estimated coefficient of risk aversion was not significantly different from the induced coefficient. This test shows that some subjects were making choices taking as a criteria linearity in points but this could not be generalized as a systematic pattern of behavior in the whole sample.

D The impact of subjects' natural risk aversion for money on their induced preferences

However the relationship between subjects' natural risk aversion for money[17] and induced preferences might indicate some systematic behavior. We examined this hypothesis first by plotting the relationship between natural risk aversion and the

[16] Recall that in the risk neutral sample the induced coefficient β_0 is 1 and the LR test shows if the estimated coefficient β is significantly different from 1 and there were 6 subjects who deviated from the linearity hypothesis.

[17] Recall that this information was obtained in the first part of the experiment. The measure of subject's risk aversion is the minimum probability p_i of getting $10 rather than $0 that makes a subject indifferent between the lottery and the certain amount $5 (See Table 6). Subjects who had more then one switching point were assigned a missing value, because we were not able to identify their natural risk aversion.

estimated coefficients β (from Table 8). Figure 5 presents this relationship for the three induced conditions. The horizontal axis represents the values of natural risk aversion, measured by minimum probability p_i, and the vertical axis represents the estimated coefficients of risk aversion obtained from Table 8[18]. Looking at the risk preferring sample, we find no clear evidence that players with lower values of natural risk aversion (i.e. with lower minimum probability p_i) have lower values of the estimated coefficient of risk aversion, while players with higher values of natural risk aversion, have higher values of the estimated coefficient of risk aversion. However there is a bit more evidence of positive relationship between p_i and estimated coefficient for the risk averse sample and risk neutral sample. Also notice that subjects whose coefficients of risk aversion were significantly different from the induced coefficient (circle and white diamond) might have influenced the observed behavior in Figure 5.

At this stage, we want to test formally whether the relationship between minimum probability p_i and estimated coefficients exists in the data. Coefficient β is now replaced in equation (1,2, and 3) with $\beta=\beta_0+\beta_1*p_i$, where β_0 measures the effect of induced preferences and β_1 measures the effect of natural risk aversion[19]. The results[20] are

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[18] In the figure dots identify subjects who knew how to calculate the expected probability and their estimated coefficients were not significantly different from the induced coefficient. Circles represent subjects who knew how to calculate the expected probability but the estimated coefficient is significantly different from the induced coefficient. Black diamonds identify subjects who did not know how to calculate the expected probability and their coefficients were not significantly different from the induced coefficient, while white diamonds mark the subjects who did not know how to calculate the expected probability and their estimated coefficients were significantly different from the induced coefficient.

[19] However, we cannot make any prediction how the subjects who were excluded from the sample could have influenced the observed behavior. We will return to this issue later when we test the expected utility hypothesis for the total sample and for the reduced sample.

presented in columns 2, 4, and 6 in Table 10 and for the original model without natural risk aversion p_i (i.e. $\beta_1 = 0$) results are reported in columns 1, 3, and 5 in Table 10[21].

The results for the risk averse preferences and risk neutral preferences in columns 2 and 6 in Table 10 suggest that subjects' decisions were also influenced by their natural risk aversion, not only by the induced preferences. The estimated coefficient β for the induced risk averse preference (column 2) is determined by the effect of induced preferences ($\beta_0 = 0.045$) and by the effect of natural risk aversion ($\beta_1 = 0.048$). Similarly for the risk neutral induced preferences the induced preferences account for $\beta_0 = 1.918$ and the natural risk aversion $\beta_1 = -1.168$. The coefficients are statistically significant[22]. However, the estimate of natural risk aversion $\beta_1 = -0.036$ for risk preferring induced preferences is not statistically significant (see column 4 in Table 10) and the likelihood-ratio test supports the original model where $\beta_1 = 0$, i.e. the model without natural risk aversion.

We can address the question of whether this result represents the behavior of the whole sample or whether the result can be attributed to either subjects who did not know how to calculated the expected probability (diamonds in Figure 5) or subjects who knew how to calculate the expected probability (circle and dot in Figure 5). We examine these hypothesis by reestimating probit model of the form $\beta=\beta_0+\beta_1{*}p_i$, separately for the

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[20] In this estimation we include only subjects with identifiable natural risk aversion. In the absolute risk averse session 19 subjects were included, in the risk preferring session 15 subjects were considered and 14 subjects in the risk neutral session.

[21] The same estimation are done using logit model and the results are presented in Table 11 in columns 1, 3, and 5 for the model $\beta=\beta_0$ and in columns 2, 4, and 6 for the model $\beta=\beta_0 + \beta_1{*}p_i$. The estimates based on both the probit and logit models are similar in magnitude and sign and is supported by the Cox test.

[22] On the basis of likelihood-ratio test statistic (twice the difference of the log-likelihood value) the model with $\beta=\beta_0 + \beta_1{*}p_i$ better represent the data then the reduced model with $\beta_1 = 0$ for risk averse and risk neutral preferences. Under the null hypothesis that $\beta_1 = 0$, the test statistic is distributed as χ^2 with 1 degree of freedom.

subjects who did not know how to calculate the expected probability and the subjects who knew how to calculate the expected probability. The results are reported in Table 12 part A for the subjects who knew how to calculate the expected probability and in Table 12 part B for the subjects who did not know how to calculate the expected probability. Beginning first with part A, *for subjects who knew how to calculate the expected probability we find no evidence that natural risk aversion (as measured by the minimum probability p_i) influences the decision making. The estimated coefficient for the natural risk aversion β_1 is never significantly different from zero for subjects who had the notion of compound lottery, and the model without the natural risk aversion better represents the data.*

Consider now the estimates presented in part B, *which are based on the data from subjects who did not know how to calculate the expected probability. In contrast to the estimates presented in part A, the estimates of natural risk aversion become significant for the risk averse and the risk preferring sample. However in the risk neutral sample the effect of natural risk aversion is negative (β_1=-4.967) and insignificant. The model with β_1=0 (i.e. without natural risk aversion) was rejected and the model was accepted where natural risk aversion p_i has an impact on subjects decisions for the risk averse and risk preferring samples.*

Since we have no direct information about the natural risk aversion of those subjects who switched several times, this leaves open the question of whether the results are representative for the whole sample. We estimated the model without natural risk aversion (i.e. β_1 = 0) for the whole sample and the sample with subjects with identifiable natural risk aversion. The hypothesis is that the results between the two samples should not differ if we want to generalize the results about the risk aversion to the whole sample. On this basis we can conjecture how reliable are the above results concerning the impact of natural risk aversion. Recall that the estimated coefficient is not significantly different from the induced coefficient for the sample with subjects with identifiable natural risk aversion for the risk averse, risk preferring and risk neutral session (see Tables 9 and 10). Table 9 depicts the results of the likelihood-ratio tests that examine the significance of the departure from induced preferences for the whole sample. *For the constant absolute risk averse preferences, risk preferring preferences and risk neutrality the data from all subjects support the hypothesis that the coefficient of risk aversion equals the induced coefficients. This implies that excluded subjects did not influence the behavior and that decisions of subjects who did not know how to calculate the expected probability influenced the behavior. The decisions of subjects who did not know how to calculate the expected probability were driven by their natural risk aversion and they influenced the results for the whole sample.*

E The impact of subject's income on induced preferences

At this point it is useful to investigate more closely if other characteristics of subjects except natural risk aversion have also an effect on subject's decision making. From the questionnaire we obtain information on subjects' income[23]. We estimated the model where income and natural risk aversion have an effect on coefficient of risk aversion (i.e. $\beta = \beta_0 + \beta_1 * p_i + \zeta * I_i$), and the model where only income is a subject's attribute (i.e. $\beta = \beta_0 + \zeta * I_i$). The results are listed in Table 13. Coefficient ζ measures the income effect, while β_1 measures the effect of natural risk aversion and β_0 the effect of induced preferences. Our results show that income effect is not significant at all and that the model with natural risk aversion better represent the subjects' behavior in all three samples. Similarly other data collected from the questionnaire, like gender, marital status, nationality, field of study did not have any influence on the choice selection.

[23] In the questionnaire the current annual income of the immediate family was grouped in 5 categories: a) 0-10,000 b) 10,000-30,000 c) 30,000-50,000 d) 50,000-70,000 e) 70,000. Subjects had to circle the appropriate category. In the estimation a) translates to one, b) to two etc.

F Sensitivity of the results to the functional form used in the estimation

Because we can never deduce, from a finite set of choices, the exact forms of subjects' choice functions, we can never be sure that the data we study reflect actual subjects' behavior implied by the induced utility functions. Therefore we wanted to test how sensitive are the results to the functional form used in the estimation. This leads us to reestimate the data on constant absolute risk averse induced preferences and risk preferring induced preferences, by instead assuming constant relative risk aversion and risk preferring preferences. For the constant absolute risk preferring sample the log likelihood of -463.42 is smaller then log likelihood of -481.60 obtained when estimated with constant absolute risk preferring utility function, while for the constant absolute risk averse sample the log likelihood was -452.59 which is more then -446.45 obtained when estimated with constant risk averse functional form (see Table 9). In addition, we reestimated the data on constant absolute risk averse induced preferences and risk preferring induced preferences using constant relative risk averse and risk preferring functional form, separately for subjects who knew how to calculate the expected probability and for the subjects who did not know how to calculate the expected probability. Listed below in Table 14 A and 14 B, are summary statistics for the probit estimates. The five columns in Table 14 A list, estimates of the data on constant absolute risk averse induced preferences, on constant relative risk averse induced preferences, on constant absolute risk preferring induced preferences and on constant relative risk preferring preferences and on the risk neutral induced preferences for subjects who knew how to calculate the expected probability. Similarly, in Table 14 B the results are reported for subjects who did not know how to calculate the expected probability. Beginning with Table 14 A, it is clear that the original functional form (i.e. constant absolute risk averse and risk preferring functional form) better represents the data for subjects who knew how to calculate the expected probability. The value of log likelihood of -197.76 (column 1) is smaller then -216.90 (column 2) for the constant absolute risk averse induced preferences. The observed values of log likelihood in columns 3 and 4 show that data are better represented with the constant absolute risk preferring functional form. However, in Table 14 B for the subjects who did not know how to calculate the expected probability the data are better represented with constant relative risk preferring function for the constant absolute risk preferring induced preferences. The log likelihood of -208.04 in column 3 is larger then log likelihood of -206.76 in column 4. These results suggest that considerable care should be exercised in utilizing the data to discriminate among the models.

G Open issues from the first experiment

The analyses suggest that the gross features of risk preferences can be reliably implemented. However there is a non-negligible amount of error, some of it systematic (overall, the observed choices deviate less from risk neutrality than the predicted choices of perfect utility maximizers). For subjects who did not know how to calculate the expected probability the systematic error can be attributed to natural risk aversion. However, for subjects who knew how to calculate the expected probability, the natural risk aversion was not a significant factor. Further the induced absolute risk preferring behavior of subjects who did not know how to calculate the expected probability was better represented with the constant relative risk preferring function. In this respect the study shows that some utility functions (functional forms) might be easier to induce then others and that differences in subjects' understanding of compound lotteries may have an effect on how sensitive is the choice of induced preferences on elicitation of expected utility maximization. If we want to make any further conclusions about the sensitivity of particular functional forms, and in particular in relation to understanding of compound lotteries, it may be instructive to have a new study with completely new set of choices and new induced preferences.

V. A NEW EXPERIMENT DESIGNED TO TEST SENSITIVITY OF THE FUNCTIONAL FORM

A Design of a further experiment

The first study suggests that the results might be sensitive to the functional form of the utility function, due to subjects who did not know how to calculate the expected probability. Since the data fits better to constant relative risk preferring preferences then to the constant absolute risk preferences, it may be easier to induce constant relative risk postures. In order to understand why the data were sensitive to the functional form used, a new experiment included a new set of lotteries which controlled for absolute increase and relative increase in points, and two new functional forms (constant relative risk averse and risk preferring preferences). Let us explain what we mean by absolute and relative increase in points. First, a "base" pair of lotteries was chosen, each of the form $\{n_1\ [f(n_1)]\ P_1\ ;\ n_2\ [f(n_2)]\ (1-P_1)\}$, and two new pairs of lotteries. One new pair of lotteries will have an absolute increase in points Δ as compared to the base lottery, i.e. each lottery is related to the corresponding lottery in the original pair by an additive increase in points $\{(n_1 + \Delta)\ \ [f(n_1 + \Delta)]\ P_1\ ;\ (n_2 + \Delta)\ [f(n_2 + \Delta)]\ (1-P_1)\}$ and the other new pair of lotteries will each be related to the corresponding original lottery by a relative increase in points Δ $\{(n_1{*}\Delta)\ \ [f(n_1{*}\Delta)]\ P_1\ ;\ (n_2{*}\Delta)\ [f(n_2{*}\Delta)]\ (1-P_1)\}$. 21 pairs of lotteries were selected to capture subject's behavior concerning constant absolute risk aversion (absolute increase or decrease in points) and constant relative risk aversion (relative increase or decrease in points)[24]. In addition two new induced preferences were introduced: a constant relative risk averse function $f(n) = (n/50)^{\beta}$ where $\beta = 0.5$, and a constant relative risk preferring function $f(n) = (n/50)^{\beta}$, where $\beta = 1.5$. All together there were 55 completely new choices (pairs of lotteries) selected for the experiment.

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[24] These 21 choices are presented in Table 16 in groups of three (i.e, base lottery, an absolute increase or decrease in points, and a relative increase or decrease in points).

100 new students participated in this experiment, 20 for each of the five induced preferences. The procedure and the money rewards did not change. The instructions for two new induced preferences were not changed. Only the values in square brackets were changed, i.e. the probability of getting $10 (i.e. f(n)) because they have to correspond to the new functional forms used in the experiment. Therefore the instructions were accompanied with two new Tables, with Table 17 for subjects who participated in the constant relative risk averse session and with Table 18 for the subjects who were assigned to the constant relative risk preferring function.

In the second experiment, the difference in expected probability between the two lotteries (P(A)-P(B)) was controlled by dividing the difference into intervals of 5% from 0% to 35% and approximately equal number of pairs of lotteries were selected for each interval for all five induced preferences.

B Empirical result from the second study

The difference in expected probability between lottery A and lottery B had similar impact on subjects' decision making with the new set of lotteries and the two new functional forms when we compared the results with the first study. Figure 6 displays that subjects mostly tend to deviate from expected utility maximization when the difference in expected probability is small, which was the case also in Figure 4. This is true for the two new induced preferences as well. Again there is only slight (but systematic) variance between subjects who knew and those who did non know how to calculate the expected probability (Figure 7). In all five samples, subjects who knew how to calculate the expected probability chose the predicted choices slightly more often then subjects who did not know how to calculate the expected probability of winning money. This supports the hypothesis that subjects who knew how to calculate the expected probability were not involved in precise calculation, but it is important to observe that both groups have the same pattern of behavior, and the observation was replicated with a new set of lotteries and the two new functional forms.

On the individual level, the deviation of the estimated coefficient from the induced coefficient of risk aversion β resembles the subjects' behavior from the first study. The results are given in Table 19 for all five induced preferences f(n). In Table 19 A the estimated coefficient for the constant absolute risk averse preferences was significantly different from induced coefficient β_0=0.07365 for four subjects (out of twenty) based on the likelihood-ratio test statistic. Similarly, for the constant absolute risk preferring sample (Table 19 B) 5 estimated coefficients β were significantly different from the induced coefficient β_0= 0.07365. Six subjects significantly deviated from induced coefficient β = 1 (Table 19 C). The results for each subject for the two new induced preferences, the constant relative risk averse and risk preferring preferences show that seven subjects significantly deviated from the induced coefficient in the constant relative risk averse sample and four subjects in the constant relative risk preferring sample. Among 100 subjects who participated in the second experiment, eleven subjects were linear in points, and ignored the information about the probability of winning \$10 with a given number of points. Furthermore, for these subjects the estimated coefficient of risk aversion was significantly different from the induced coefficient. The results are reported in the fifth column of Table 19. Comparing the deviations from the induced coefficient on the individual basis did not retrieve any differences between the functional forms. It only showed that different lottery selection and new functional forms did not alter the behavior already observed in the first experiment on the individual level. The estimated coefficient of risk aversion β for all subjects for all five induced preferences show that on average subjects did not deviate from expected utility maximization (Table 24).

The estimated coefficients of risk aversion for each individual were then used together with the natural risk aversion (p_i) to test if the deviation from the expected utility can be explained in some systematic way. In Figure 8 the natural risk aversion (p_i) is plotted against the estimated coefficient of risk aversion for each individual. The pictures are almost a replica of the first study. This result therefore shows that the new choice of lotteries and the two new selected induced preferences did not change the observed relationship in the first study between natural risk aversion and estimated coefficient of induced preferences[25]. The results of the effect of natural risk aversion on decision making are listed in Table 20 for the probit model and in Table 21 for the logit model, respectively. Beginning with the constant absolute risk averse preferences, we found that natural risk aversion (p_i), β_1 = 0.081 does not have a significant effect, and that the effect of induced preferences was β_0 = 0.194 and is significant. In the constant absolute risk preferring session, the parameters (β_0=0.092, β_1=-0.078) were significant at the 5% test level. Similarly for the risk neutral session the parameters are (β_0=1.480, β_1=-1.012) and are significantly different from zero. The constant relative risk preferring session shows the significant effects of induced preferences β_0=2.037 and of natural risk aversion β_1= -1.254. For the constant relative risk averse session, the estimated coefficient β_1=-0.306 for the natural risk aversion (p_i) is not statistically significant[26].

However, at this point it is important to observe if knowing or not knowing how to calculate the expected probability have any influence on decision making. *In all five induced preferences the decisions of subjects who knew how to calculate the expected probability were not influenced by natural risk aversion (p_i). This result is reported in Table 22 A. In contrast, decisions of subjects who did not know how to calculate the expected probability were significantly influenced by natural risk aversion in the constant absolute and relative risk preferring samples and in the risk neutral sample (see Table 22 B). However, for the constant absolute and constant relative risk averse samples, the coefficient β_1 is not significant.* These estimated coefficients are consistent with the

[25] Recall that in the first experiment, some subjects were excluded from the sample because we could not identify their natural risk aversion. In this study, 6 subjects were excluded from the sample in the constant absolute risk averse session, 5 in the risk neutral session, 3 in the constant relative risk averse session, and 1 in the constant relative risk preferring session. However, all subjects in the constant absolute risk preferring session had identifiable natural risk aversion.

[26] Note that the model with natural risk aversion (p_i), i.e. $\beta=\beta_0 + \beta_1 * p_i$ is better represented with the data then the original model where $\beta=\beta_0$. The log likelihood is smaller for all five induced preferences.

results in Table 20 and 21. When natural risk aversion had a significant effect on decisions for subjects who did not know how to calculate the expected probability then the same effect was found for the whole sample for the particular induced preferences. However the significant effect of natural risk aversion was never observed for subjects who knew how to calculate the expected probability[27].

C Sensitivity of the results to the functional form used

Before analyzing the set of lotteries with absolute and relative increase in points it is worth observing which functional form is better represented with the data separately for the subjects who knew and for subjects who did not know how to calculate the expected probability. Tables 25 A and 25 B show that the choice selection of subjects who knew how to calculate the expected probability is the best explained using the same functional form in the estimation as the one to induce particular behavior. However, for subjects who did not know how to calculate the expected probability the results differ. The constant absolute risk averse induced preferences are better represented with the constant relative risk averse function (column 2 in Table 25 B), and constant absolute risk preferring induced preferences are better represented with constant relative risk preferring function (column 4 in Table 25 B).

It is clear from both studies that subjects who did not know how to calculate the expected probability made the results sensitive to the functional form used in the estimation. *The results on the 21 lotteries which were designed to capture subject's behavior concerning constant absolute risk aversion by absolute increase or decrease in points and constant relative risk aversion (percentage increase in points) support the previous findings that the choice function of subjects who did not know how to calculate the expected probability is better represented with constant relative risk posture independently of the*

[27] The estimates of the income effect were not significant and the results are presented in Table 23 for all induced preferences.

lottery selection. Absolute risk averse and risk preferring functions are not better represented with data when an absolute increase or decrease in points is considered. The results are presented in Table 26 for all subjects, in Table 27 A for subjects who knew how to calculate the expected probability and in Table 27 B for subjects who did not know how to calculate the expected probability. The data from subjects who did not know how to calculate the expected probability are better represented with relative risk averse and risk preferring functions.

VI. CONCLUSION

In both studies the design chosen to induce particular behavior for this experiment (constant absolute and constant relative risk aversion, constant absolute and constant relative risk preferring behavior, and risk neutrality) show that the models perform fairly well on the aggregate level. On aggregate, subjects did not significantly deviate from the induced coefficient and this result is supported also when the test is performed separately for subjects who knew how to calculate the expected probability and subjects who did not know how to calculate the expected probability. However the difference in expected probability of winning money (P(A) - P(B)) influenced subjects' choice selection. The pattern of selecting the predicted choices is very similar for all samples, with a higher chance of deviating from the predicted lottery when the difference in expected probability within each sample is small. Even when the difference in expected probability is high, subjects were still making some unpredicted choices. And the pattern is the same regardless of whether subjects knew how to calculate the expected probability of winning which suggests that most subjects are not engaged in precise arithmetical calculations.

One hypothesis is that subjects were ignoring the probabilities and evaluated instead the expected payoff in points. Some subjects were making choices taking as a criteria linearity in points but this could not be generalized as a systematic pattern of behavior for all subjects in the whole sample. This brings us to the question of whether the observed deviation can be attributed to some systematic pattern of behavior. However, the experiment was designed to control for those variables that seemed to have a potential impact on induced preferences, namely current annual income of subjects, gender, marital status, nationality, age and field of study. The results indicate that the differences from the expected utility maximization cannot be attributed to any of these variables.

However, the design of the experiment also permits a test of the relationship of individuals' (natural) risk aversion for money and their behavior in the binary payoffs lotteries. Perfect utility maximizers with given points to probability function would all behave the same way in the binary lotteries, i.e. their natural risk aversion would have no influence. The observed relationship was positive, i.e. the higher a subject's natural risk aversion, the higher was his estimated coefficient of risk aversion in the binary payoffs lotteries, for some of the induced preferences. However when the estimations were performed separately for subjects who knew how to calculate the expected probability and subjects who did not know how to calculate the expected probability we observed that the decisions of subjects who did not know how to calculate the expected probability were influenced by their natural risk aversion and they influenced the results for the whole sample. For subjects who knew how to calculate the expected probability we found no evidence that natural risk aversion influences the decision making.

To the extent that natural risk aversion explains the deviations from expected utility for subjects who did not know how to calculate the expected probability, there is some reason to expect that the sensitivity of the functional forms used in the experiment can be attributed to subjects who did not know how to calculate the expected probability. Our data lend support to the hypothesis that the difficulty of inducing some functional forms is related to the differences in knowledge of compound lotteries. The results suggest that inducing constant relative risk preferences may be more successful than constant absolute risk preferences for subjects who did not know how to calculate the expected probability, while responses of subjects who knew how to calculate the expected probability were not sensitive to the functional forms used in the experiment. In this view 21 lotteries which were designed to capture subjects' behavior concerning constant absolute risk aversion by absolute increase or decrease in points and constant relative risk aversion (percentage increase in points) support the previous findings that the choice function of subjects who did not know how to calculate the expected probability is better represented with constant relative risk posture independently of the lottery selection. However we did not find an explanation of why constant relative risk averse and risk preferring functions are easier to induce for subjects who did not have the knowledge of compound lottery.

In contrast to the aggregate behavior, when the estimation was performed on the individual level, individual's coefficient of risk aversion shows that independently of the functional form used to induce particular behavior, approximately 20 percent of subjects significantly deviated from the induced behavior. The results indicate that risk aversion across individuals varies and that subjects' behavior is not completely homogenous in terms of expected utility maximization. Furthermore, the deviation from the expected utility maximization was observed among both subjects who knew and subjects who did not know how to calculate the expected probability. However, the difference between the estimated coefficient and the induced coefficient gives an absolute deviation and can be used as an indication of how much to change the induced coefficient of the function f(n) to correct for non-linearity in probabilities.

Finally, we consider what implications the results of this experiment have for the ongoing assessment of the extent to which utility maximization is an adequate approximation. Because no set of lotteries can be confidently regarded as a random sample from "choice space", there is a limit to how much a study of this kind can be viewed as more than suggestive in assessing the robustness of utility theory as a general theory of choice. These results, nevertheless lend support to the notion that utility maximization may be a useful approximation, with non-trivial predictive power, at least in binary lottery choices.

However another use of these results is for assessing binary lottery payoffs as an element of experimental design. That is, regardless of the adequateness of the utility maximization approximation in general choice situations, it is sometimes desirable in an experimental environment to test hypothesis which depend on the risk aversion of the participants, and to control that risk aversion for this purpose using binary lotteries. The results of these studies suggest in this respect, that the gross features of risk preferences can be reliably implemented, albeit with a nonneglegliable amount of error. Some errors were found to be systematic and can be attributed to subjects who did not know how to calculate the expected probability. The subjects' understanding of compound lotteries played a role in determining which functional forms are easier to induce.

To summarize, the results presented here suggests that subject's understanding of compound lotteries may play an important role in inducing subjects' preferences. So this evidence suggests that testing subjects' knowledge of compound lottery before conducting an experiment might be valuable when examining predictions of the game-theoretic models. The results also suggest that instructing subjects in how to evaluate compound lotteries may increase the effectiveness of binary lottery designs, although we have not directly attempted to test this hypothesis in the present study[28].

Our results do show that expected utility theory has predictive power, and that the binary lottery technique is useful in controlling for subjects risk posture.

[28] Another hypothesis is, that post experimental test of subjects understanding of compound lotteries served to select those who would not have behaved as utility maximizers even if they had learned to evaluate compound lotteries.

APPENDIX A

TEST FOR HETEROSKEDASTICITY

Heteroskedasticity causes parameter estimates from logit and probit models to be inconsistent. Because we were using cross-section data to estimate these models, it is a problem which is likely to be encountered. In the model we assumed that ϵ_t in equation (6) are distributed normally (i.e. $\epsilon_t \sim N(0, \exp(2Z_t\,\gamma))$. Here Z_t is time trend. When $\gamma = 0$ ϵ_t will be N(0,1) and (6) will yield the ordinary probit model when distribution of errors F is assumed to be normally distributed. The LR test of the hypothesis that $\gamma = 0$ will test the ordinary probit against the heteroskedastic alternative.

For the first experiment, the actual likelihood ratio test for the constant absolute risk averse sample is 0.24, LR test for the constant absolute risk preferring sample is 1.12 and for the risk neutral sample 0.86. The hypothesis of β_2 is not rejected at 5% test level.

For the second experiment, the actual likelihood ratio test for the constant absolute risk averse sample is 1.32, LR test for the constant absolute risk preferring sample is 0.44, for the risk neutral sample LR is 2.06, for the constant relative risk averse sample it is 3.18 and for the constant relative risk preferring sample LR test is 0.06. Again the heteroskedasticity hypothesis is rejected.

APPENDIX B

LIST OF TABLES

TABLE 1 F(n) AS PRESENTED TO SUBJECTS IN THE ABSOLUTE RISK AVERSE CONDITION

Total Points	Probability of Winning Money	Increase in Probability	Total Points	Probability of Winning Money	Increase in Probability
0	0.0%	.			
1	7.3%	7.3%	26	87.5%	1.2%
2	14.1%	6.8%	27	88.5%	1.0%
3	20.3%	6.2%	28	89.5%	1.0%
4	26.2%	5.9%	29	90.5%	1.0%
5	31.6%	5.4%	30	91.3%	0.8%
6	36.6%	5.0%	31	92.1%	0.8%
7	41.3%	4.7%	32	92.9%	0.8%
8	45.7%	4.4%	33	93.6%	0.7%
9	49.7%	4.0%	34	94.2%	0.6%
10	53.5%	3.8%	35	94.8%	0.6%
11	57.0%	3.5%	36	95.3%	0.5%
12	60.2%	3.2%	37	95.8%	0.5%
13	63.2%	3.0%	38	96.3%	0.5%
14	66.0%	2.8%	39	96.8%	0.5%
15	68.6%	2.6%	40	97.2%	0.4%
16	71.0%	2.4%	41	97.6%	0.4%
17	73.3%	2.3%	42	98.0%	0.4%
18	75.3%	2.0%	43	98.3%	0.3%
19	77.3%	2.0%	44	98.6%	0.3%
20	79.1%	1.8%	45	98.9%	0.3%
21	80.7%	1.6%	46	99.2%	0.3%
22	82.3%	1.6%	47	99.4%	0.2%
23	83.7%	1.4%	48	99.6%	0.2%
24	85.1%	1.4%	49	99.8%	0.2%
25	86.3%	1.2%	50	100.0%	0.2%

TABLE 2 F(n) AS PRESENTED TO SUBJECTS IN THE ABSOLUTE RISK PREFERRING CONDITION

Total Points	Probability of Winning Money	Increase in Probability	Total Points	Probability of Winning Money	Increase in Probability
0	0.0%	.			
1	0.2%	0.2%	26	14.9%	1.2%
2	0.4%	0.2%	27	16.3%	1.4%
3	0.6%	0.2%	28	17.7%	1.4%
4	0.8%	0.2%	29	19.3%	1.6%
5	1.1%	0.3%	30	20.9%	1.6%
6	1.4%	0.3%	31	22.7%	1.8%
7	1.7%	0.3%	32	24.7%	2.0%
8	2.0%	0.3%	33	26.7%	2.0%
9	2.4%	0.4%	34	29.0%	2.3%
10	2.8%	0.4%	35	31.4%	2.4%
11	3.2%	0.4%	36	34.0%	2.6%
12	3.7%	0.5%	37	36.8%	2.8%
13	4.1%	0.4%	38	39.8%	3.0%
14	4.7%	0.6%	39	43.0%	3.2%
15	5.2%	0.5%	40	46.5%	3.5%
16	5.8%	0.6%	41	50.3%	3.8%
17	6.4%	0.6%	42	54.3%	4.0%
18	7.1%	0.7%	43	58.7%	4.4%
19	7.9%	0.8%	44	63.4%	4.7%
20	8.7%	0.8%	45	68.4%	5.0%
21	9.5%	0.8%	46	73.8%	5.4%
22	10.5%	1.0%	47	79.7%	5.9%
23	11.5%	1.0%	48	86.0%	6.3%
24	12.5%	1.0%	49	92.7%	6.7%
25	13.7%	1.2%	50	100.0%	7.3%

TABLE 3 F(n) AS PRESENTED TO SUBJECTS IN THE RISK NEUTRAL CONDITION

Total Points	Probability of Winning Money	Increase in Probability	Total Points	Probability of Winning Money	Increase in Probability
0	0.0%	.			
1	2.0%	2.0%	26	52.0%	2.0%
2	4.0%	2.0%	27	54.0%	2.0%
3	6.0%	2.0%	28	56.0%	2.0%
4	8.0%	2.0%	29	58.0%	2.0%
5	10.0%	2.0%	30	60.0%	2.0%
6	12.0%	2.0%	31	62.0%	2.0%
7	14.0%	2.0%	32	64.0%	2.0%
8	16.0%	2.0%	33	66.0%	2.0%
9	18.0%	2.0%	34	68.0%	2.0%
10	20.0%	2.0%	35	70.0%	2.0%
11	22.0%	2.0%	36	72.0%	2.0%
12	24.0%	2.0%	37	74.0%	2.0%
13	26.0%	2.0%	38	76.0%	2.0%
14	28.0%	2.0%	39	78.0%	2.0%
15	30.0%	2.0%	40	80.0%	2.0%
16	32.0%	2.0%	41	82.0%	2.0%
17	34.0%	2.0%	42	84.0%	2.0%
18	36.0%	2.0%	43	86.0%	2.0%
19	38.0%	2.0%	44	88.0%	2.0%
20	40.0%	2.0%	45	90.0%	2.0%
21	42.0%	2.0%	46	92.0%	2.0%
22	44.0%	2.0%	47	94.0%	2.0%
23	46.0%	2.0%	48	96.0%	2.0%
24	48.0%	2.0%	49	98.0%	2.0%
25	50.0%	2.0%	50	100.0%	2.0%

TABLE 6 COMPUTER DISPLAY OF CHOICES GIVEN TO SUBJECTS TO TEST THE NATURAL RISK AVERSION FOR MONEY (i.e. minimum probability p_i) AFTER THE CHOICE SELECTION

$5.00	for sure	<	>	95%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	90%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	85%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	80%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	75%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	70%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	65%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	60%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	55%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	50%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	45%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	40%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	35%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	30%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	25%	chance for	$10.00	or	$0.00
$5.00	for sure	<u><</u>	<u>></u>	20%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	15%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	10%	chance for	$10.00	or	$0.00
$5.00	for sure	<	>	5%	chance for	$10.00	or	$0.00

done

Random number = 75
Part I earnings $ 5.00

PRESS ANY KEY TO CONTINUE

TABLE 7 THE FORTY-TWO LOTTERY CHOICES GIVEN TO SUBJECTS TO CONTROL RISK AVERSION--FIRST EXPERIMENT

LOTTERY A		LOTTERY B	
Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, 1-P_1)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, 1-P_1)
10	78%	2	47%
38	22%	39	53%
22	78%	2	50%
28	22%	45	50%
17	33%	3	22%
29	67%	42	78%
29	67%	7	61%
31	33%	50	39%
2	28%	17	78%
34	72%	22	22%
13	77%	2	67%
14	23%	43	33%
12	28%	27	78%
44	72%	32	22%
19	77%	8	67%
20	23%	49	33%
15	81%	1	58%
27	19%	38	42%
22	81%	8	58%
34	19%	45	42%
1	75%	14	78%
47	25%	15	22%
6	75%	1	72%
32	25%	49	28%
7	61%	21	94%
48	39%	46	6%
9	64%	1	44%
38	36%	45	56%
19	14%	3	36%
21	86%	39	64%
3	56%	21	94%
48	44%	44	6%

TABLE 7 (cont'd).

LOTTERY A		LOTTERY B	
Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)
6 48	47% 53%	20 23	14% 86%
1 42	61% 39%	15 40	94% 6%
2 41	31% 69%	21 31	94% 6%
1 49	53% 47%	26 39	86% 14%
5 45	47% 53%	20 44	81% 19%
1 50	75% 25%	9 23	6% 94%
12 22	86% 14%	4 46	69% 31%
5 25	44% 56%	2 48	64% 36%
10 38	64% 36%	15 18	19% 81%
4 49	64% 36%	26 29	97% 3%
2 34	50% 50%	12 14	25% 75%
17 25	64% 36%	8 37	56% 44%
5 40	50% 50%	1 44	53% 47%
11 47	75% 25%	20 35	97% 3%
10 18	97% 3%	1 27	39% 61%
20 25	75% 25%	10 39	67% 33%
5 35	39% 61%	11 22	6% 94%

TABLE 7 (cont'd).

LOTTERY A		LOTTERY B	
Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)
4	56%	1	72%
23	44%	42	28%
20	97%	11	39%
28	3%	37	61%
11	75%	1	67%
16	25%	30	33%
10	39%	16	6%
40	61%	27	94%
11	56%	8	72%
30	44%	49	28%
15	97%	2	39%
27	3%	40	61%
10	75%	5	67%
12	25%	19	33%
7	39%	15	6%
49	61%	31	94%
5	56%	1	72%
28	44%	50	28%

TABLE 8 Parameter Estimates of Induced Behavior for Each Individual--FIRST EXPERIMENT
(Values in Parenthesis are Standard Errors)

A. CONSTANT ABSOLUTE RISK AVERSE INDUCED BEHAVIOR: $f(n_i) = (1 - e^{-\beta n_i})/(1 - e^{-\beta 50})$

	PROBIT ESTIMATES				LOGIT ESTIMATES		
Subject	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=0.07365$	LR Test for Linearity $H_o:\beta=1$ $f(n_i) = (n_i/50)^\beta$	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=0.07365$
1	-5.34 (7.30)	0.086* (0.030)	-2(-5.02+4.60)=0.84	66.40[r]	-8.85 (12.94)	0.090* (0.036)	-2(-5.21+4.68)=1.06
2	-1.16 (3.58)	0.006 (0.181)	-2(-28.96+20.68)=16.56[r]	2.80	2.93 (3.87)	-0.056 (0.045)	-2(-27.75+19.15)=17.2[r]
3	-1.18 (1.45)	0.076** (0.044)	-2(-24.07+24.07)=0.00	14.56[r]	-2.06 (2.47)	0.073** (0.039)	-2(-24.08+24.07)=0.01
4	-4.36 (7.99)	0.053* (0.007)	-2(-8.24+8.17)=0.14	43.06[r]	-4.21 (4.88)	0.053* (0.007)	-2(-8.48+8.44)=0.08
5	-2.48 (6.48)	0.140 (0.220)	-2(-5.68+3.97)=3.42	41.48[r]	-4.43 (13.74)	0.143 (0.268)	-2(-5.84+4.73)=2.22
6	-4.33** (2.59)	0.039* (0.013)	-2(-22.78+21.74)=2.08	6.72[r]	-7.62 (4.30)	0.039* (0.013)	-2(-22.75+21.58)=2.34
7	-3.07* (0.87)	0.084* (0.001)	-2(-10.97+10.83)=0.28	31.73[r]	-5.45 (5.44)	0.085* (0.039)	-2(-10.99+10.83)=0.32
8	-6.69* (3.23)	0.019* (0.007)	-2(-27.98+25.95)=4.06[r]	1.80	-10.61 (10.03)	0.018* (0.009)	-2(-27.99+26.04)=3.9
9	-1.10 (4.19)	0.023 (0.058)	-2(-29.07+28.67)=0.80	16.08[r]	-1.89 (8.24)	0.005 (0.021)	-2(-29.07+25.33)=7.48[r]
10	-3.29* (0.97)	0.084* (0.031)	-2(-10.59+10.47)=0.24	28.67[r]	-5.33 (5.44)	0.086* (0.034)	-2(-10.86+10.71)=0.32
11	-10.50* (5.25)	0.059* (0.006)	-2(-7.71+6.45)=2.52	50.82[r]	-19.17** (9.62)	0.058* (0.006)	-2(-7.94+6.56)=2.76
12	-1.74* (0.48)	0.113* (0.019)	-2(-12.54+11.89)=1.30	24.82[r]	-2.96 (4.98)	0.115 (0.109)	-2(-12.68+11.92)=1.52
13	-8.36 (6.32)	0.068* (0.009)	-2(-5.75+5.67)=0.16	40.08[r]	-14.69 (10.63)	0.068* (0.009)	-2(-5.95+5.86)=0.15
14	-1.58 (5.71)	0.018 (0.068)	-2(30.11+27.73)=4.76[r]	0.62	15.78 (52.80)	-0.007 (0.021)	-2(-30.01+27.75)=4.52[r]
15	-8.39* (3.18)	0.035* (0.007)	-2(-20.45+16.99)=6.92[r]	14.32[r]	-14.72* (5.69)	0.035* (0.007)	-2(-20.52+16.89)=7.26[r]
16	-5.34 (7.30)	0.087* (0.030)	-2(-5.02+4.60)=0.84	46.40[r]	-8.85 (12.94)	0.090* (0.036)	-2(5.21+4.68)=1.06
17	-8.28* (4.14)	0.058* (0.007)	-2(-9.79+8.76)=2.06	36.18[r]	-14.38** (7.29)	0.057* (0.007)	-2(-10.03+8.97)=2.12
18	-4.44* (2.59)	0.060* (0.012)	-2(-14.98+14.69)=0.58	25.74[r]	-7.26 (4.45)	0.06* (0.01)	-2(-15.06+14.84)=0.44
19	-16.33** (8.88)	0.006* (0.003)	-2(-28.90+26.76)=4.28[r]	0.58	-27.22 (52.67)	0.006 (0.012)	-2(-28.91+26.72)=4.57[r]
20	-5.34 (7.30)	0.087* (0.030)	-2(-5.02+4.60)=0.84	19.82[r]	-8.85 (12.94)	0.090* (0.036)	-2(-5.21+4.68)=1.06

*Estimates significantly different from 0 at 5% test level; **Estimates significantly different from 0 at 10% test level; [r] Estimate significantly different from the null hypothesis.

TABLE 8 Parameter Estimates of Induced Behavior for Each Individual--FIRST EXPERIMENT
(Values in Parenthesis are Standard Errors)

B.CONSTANT ABSOLUTE RISK PREFERRING INDUCED BEHAVIOR:$f(n_i)=(-1+e^{\beta n_i})/(-1+e^{\beta 50})$

	PROBIT ESTIMATES				LOGIT ESTIMATES		
Subject	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o$ $=0.07365$	LR Test for Linearity $H_o:\beta=1$ $f(n_i)$ $=(n_i/50)^\beta$	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o$ $=0.07365$
1	1.89* (0.48)	0.068* (0.011)	-2(-13.19+13.18)=0.02	16.08^r	3.42* (0.98)	0.065* (0.011)	-2(-13.45+13.42)=0.06
2	5.12 (2.51)	0.017* (0.006)	-2(-26.95+26.19)=1.52	5.98^r	8.24** (4.20)	0.017* (0.006)	-2(-26.95+26.20)=1.50
3	-5.69* (2.51)	-0.021* (0.006)	-2(-28.96+25.64)=6.64^r	19.22^r	-1.12 (1.47)	-0.021* (0.009)	-2(-28.98+25.42)=7.12^r
4	0.85* (0.41)	0.052* (0.017)	-2(-26.94+26.90)=0.08	35.46^r	1.37 (0.78)	0.051* (0.017)	-2(-26.95+26.91)=0.08
5	2.45* (1.23)	0.028* (0.009)	-2(-26.93+26.36)=1.14	9.03^r	4.05** (2.09)	0.027* (0.009)	-2(-26.95+26.34)=1.22
6	1.45 (0.37)	0.071* (0.012)	-2(-15.83+15.83)=0.00	8.36^r	2.60* (0.76)	0.071* (0.013)	-2(-15.54+15.53)=0.02
7	-1.48 (1.63)	-0.012 (0.034)	-2(-29.11+25.13)=7.96^r	3.60^r	-0.36 (2.54)	-0.014 (0.055)	-2(-29.14+25.60)=7.08^r
8	3.99* (1.13)	0.056* (0.008)	-2(-6.21+6.07)=0.28	5.40^r	8.38 (6.28)	0.053 (0.104)	-2(-6.09+5.95)=0.28
9	1.92* (0.59)	0.050* (0.009)	-2(-20.92+20.73)=0.38	28.32^r	3.18* (1.05)	0.049* (0.009)	-2(-21.07+20.88)=0.38
10	-0.67 (0.49)	-0.065* (0.029)	-2(-31.86+27.47)=8.78^r	12.90^r	1.12 (1.43)	0.002 (1.515)	-2(-31.46+27.88)=7.16^r
11	0.78 (3.53)	-0.016* (0.004)	-2(-23.88+20.89)=5.98^r	20.40^r	1.72* (0.61)	0.016* (0.003)	-2(-23.92+21.02)=5.8^r
12	5.86* (2.03)	0.022* (0.005)	-2(-23.65+22.52)=2.26	34.50^r	9.98* (3.71)	0.022* (0.005)	-2(-23.69+22.57)=2.24
13	-1.17 (1.95)	-0.024 (0.065)	-2(-23.52+17.43)=12.18^r	3.28	-5.05 (5.87)	-0.004 (0.023)	-2(-24.82+17.59)=14.46^r
14	-1.43 (0.91)	-0.037 (0.059)	-2(-28.07+21.02)=14.10^r	3.56	-0.41 (1.95)	-0.067 (0.800)	-2(-28.07+21.89)=12.36^r
15	0.39* (0.10)	0.222* (0.051)	-2(-14.79+13.50)=2.58	5.00^r	0.59 (0.86)	0.251 (0.323)	-2(-14.96+13.69)=2.64
16	1.16* (0.31)	0.080* (0.014)	-2(-16.99+16.97)=0.04	6.24^r	1.89* (0.55)	0.082* (0.015)	-2(-16.99+16.98)=0.02
17	1.28 (0.32)	0.107* (0.019)	-2(-8.29+8.04)=0.50	8.62^r	2.26 (5.23)	0.109 (0.188)	-2(-8.28+8.07)=0.42
18	1.07 (0.49)	0.051* (0.014)	-2(-25.96+25.89)=0.14	11.93^r	1.66* (0.80)	0.051* (0.014)	-2(-25.99+25.93)=0.12
19	0.64 (0.16)	0.173* (0.038)	-2(-10.12+9.68)=0.88	7.54^r	0.88 (0.66)	0.222 (0.155)	-2(-9.94+9.57)=0.74
20	3.00* (1.43)	0.026* (0.008)	-2(-26.75+26.04)=1.42	28.66^r	4.72 (2.32)	0.026* (0.008)	-2(-26.74+26.06)=1.36

*Estimates significantly different from 0 at 5% test level; **Estimates significantly different from 0 at 10% test level; ^{r} Estimate significantly different from the null hypothesis.

TABLE 8 Parameter Estimates of Induced Behavior for Each Individual--FIRST EXPERIMENT
(Values in Parenthesis are Standard Errors)

C. RISK NEUTRAL INDUCED BEHAVIOR: $f(n_i) = (n_i/50)^{\beta}$

	PROBIT ESTIMATES			LOGIT ESTIMATES		
Subject	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_0:\beta=\beta_0=1$	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=1$
1	4.12 (1.63)	0.482* (0.188)	-2(-28.36+24.14)=8.44[r]	6.84* (2.87)	0.480* (0.185)	-2(-27.19+24.17)=6.04[r]
2	5.75* (1.32)	0.625* (0.144)	-2(-28.09+29.08)=1.98	0.75 (0.92)	0.479* (0.230)	-2(-28.89+28.04)=1.70
3	0.87 (0.72)	2.732 (1.528)	-2(-28.96+29.05)=0.18	0.31 (1.32)	2.368 (6.152)	-2(-28.64+28.02)=1.24
4	2.83 (2.31)	0.925 (0.902)	-2(-28.61+28.28)=0.66	3.12 (2.06)	0.937* (0.215)	-2(-28.45+27.37)=2.16
5	5.19* (1.50)	0.696* (0.123)	-2(-25.88+21.99)=7.78[r]	0.35 (2.67)	0.471 (1.994)	-2(-26.23+23.71)=5.04[r]
6	3.19* (1.34)	0.781* (0.135)	-2(-26.69+25.59)=2.2	0.41 (2.34)	0.438 (1.801)	-2(-27.38+25.42)=3.92
7	20.00** (10.89)	0.543* (0.074)	-2(-24.68+21.69)=5.98[r]	0.62 (1.38)	0.365 (1.429)	-2(-24.64+20.09)=9.10[r]
8	2.22 (1.71)	1.79* (0.53)	-2(-24.81+15.74)=18.14[r]	3.31 (2.52)	1.762* (0.535)	-2(-23.19+18.11)=10.16[r]
9	5.91* (1.87)	0.971* (0.307)	-2(-28.87+27.70)=2.34	1.58 (1.12)	0.863* (0.411)	-2(-28.56+27.04)=3.04
10	3.55 (3.92)	0.816* (0.400)	-2(-28.15+27.12)=2.06	5.29* (2.18)	0.771* (0.347)	-2(-28.89+27.86)=2.06
11	5.11 (7.76)	0.751* (0.248)	-2(-28.98+28.77)=0.42	0.57 (1.78)	0.483 (2.129)	-2(-27.59+27.56)=0.06
12	9.04* (4.09)	1.105* (0.059)	-2(-14.82+13.26)=3.12	1.14* (0.17)	1.013** (0.596)	-2(-14.92+13.99)=1.86
13	2.02 (1.49)	1.754* (0.526)	-2(-24.98+17.94)=14.08[r]	0.36 (1.38)	1.822* (0.372)	-2(-22.68+17.84)=9.68[r]
14	0.22 (0.86)	0.821 (0.737)	-2(-29.09+28.84)=0.50	0.62 (1.38)	0.782* (0.355)	-2(-28.64+28.09)=1.10
15	1.95 (1.14)	0.989* (0.219)	-2(-27.08+27.07)=0.02	0.62 (1.38)	0.801** (0.422)	-2(-27.80+27.76)=0.08
16	1.08 (0.93)	0.834* (0.393)	-2(-28.65+28.58)=0.14	1.79 (1.53)	0.826* (0.384)	-2(-28.95+28.56)=0.78
17	3.46* (1.37)	0.818* (0.148)	-2(-25.88+25.02)=1.72	1.01* (0.05)	0.998* (0.233)	-2(-26.79+25.82)=1.94
18	1.95 (1.26)	0.935* (0.213)	-2(-27.40+27.35)=0.10	1.00 (0.94)	0.651 (0.904)	-2(-27.49+26.42)=2.14
19	1.24 (1.03)	1.508* (0.537)	-2(-27.45+25.55)=3.80	2.06 (1.69)	1.511* (0.528)	-2(-26.84+25.51)=2.66
20	1.17* (0.43)	2.315* (0.261)	-2(-26.12+24.00)=4.24[r]	0.86* (0.039)	2.658* (0.071)	-2(-27.85+24.31)=7.08[r]

*Estimates significantly different from 0 at 5% test level; **Estimates significantly different from 0 at 10% test level; [r] Estimate significantly different from the null hypothesis.

TABLE 9 PARAMETER ESTIMATES OF RISK AVERSION FOR ALL SUBJECTS FOR ALL THREE INDUCED PREFERENCES--FIRST EXPERIMENT

(Values in parenthesis are standard errors.)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-\beta n_i})/(1-e^{-\beta 50})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{\beta n_i})/(-1+e^{\beta 50})$		C. Risk Neutral Induced Preferences $f(n_i) = (n_i/50)^{\beta}$	
	PROBIT	LOGIT	PROBIT	LOGIT	PROBIT	LOGIT
α	-1.505* (0.279)	-2.856* (0.517)	1.593* (0.506)	2.578* (0.734)	1.290* (0.226)	2.152* (0.452)
β	0.073* (0.008)	0.069* (0.007)	0.046* (0.009)	0.030* (0.007)	1.012* (0.068)	0.917* (0.086)
log likelihood	-446.45	-443.63	-481.60	-481.80	-562.45	561.01
N	840	840	840	840	840	840

*Estimates significantly different from zero at the 5% test level.

TABLE 10 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION (PROBIT MODEL) --FIRST EXPERIMENT

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-(\beta 0+\beta 1 * pi)ni})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{(\beta 0+\beta 1 * pi)ni})$		C. Risk Neutral Induced Preferences, $f(n_i)=(n_i/50)^{\beta 0+\beta 1 * pi}$	
	(1)[a]	(2)	(3)[a]	(4)	(5)[a]	(6)
α	-1.596* (0.280)	-1.597* (0.283)	1.383* (0.512)	1.434* (0.513)	1.244* (0.269)	1.289* (0.273)
β_0	0.0741* (0.008)	0.045* (0.014)	0.054* (0.012)	0.074* (0.020)	1.114* (0.089)	1.918* (0.374)
β_1	--	0.048* (0.022)	--	-0.036 (0.022)	-	-1.168* (0.514)
log-likelihood	-406.98	-403.04	-346.16	-344.57	-390.70	-387.31
N	798	798	630	630	588	588

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.
a) The model with $\beta_1 = 0$.

TABLE 11 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION (LOGIT MODEL)--FIRST EXPERIMENT

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-(\beta 0+\beta 1*pi)ni})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{(\beta 0+\beta 1*pi)ni})$		C. Risk Neutral Induced Preferences, $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$	
	(1)[a]	(2)	(3)[a]	(4)	(5)[a]	(6)
α	-3.104* (0.533)	-3.115* (0.538)	2.298* (0.876)	2.393* (0.884)	2.023* (0.442)	2.097* (0.449)
β_0	0.070* (0.007)	0.040* (0.013)	0.053* (0.012)	0.074* (0.021)	1.110* (0.089)	1.927* (0.374)
β_1	--	0.048* (0.021)	--	-0.038 (0.024)	--	-1.177* (0.514)
log-likelihood	-403.54	-401.51	-346.15	-344.59	-390.67	-387.28
N	798	798	630	630	588	588

*Estimates significantly different from zero at the 5% test level.

**Estimates significantly different from zero at the 10% test level.

a) The model with $\beta_1 = 0$.

TABLE 12 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION (PROBIT MODEL)-- FIRST EXPERIMENT

A. Subjects Knew How to Calculate the Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i) = (1-e^{-(\beta 0+\beta 1*pi)ni})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i) = (-1+e^{(\beta 0+\beta 1*pi)ni})$		C. Risk Neutral Induced Preferences, $f(n_i) = (n_i/50)^{\beta 0+\beta 1*pi}$	
	(1)[a]	(2)	(3)[a]	(4)	(5)[a]	(6)
α	-2.622* (0.422)	-2.743* (0.462)	1.159 (0.632)	0.219 (0.177)	2.075* (0.389)	2.142* (0.382)
β_0	0.071* (0.007)	0.028 (0.026)	0.061* (0.021)	1.094 (0.879)	1.132* (0.075)	-0.553 (0.669)
β_1	--	0.069 (0.042)	--	-2.223 (1.743)	--	2.982 (1.856)
log-likelihood	-149.60	-148.37	-183.39	-172.48	-178.34	-177.84
N	378	378	336	336	378	378

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.
a) The model with $\beta_1 = 0$.

TABLE 12 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION (PROBIT MODEL)--FIRST EXPERIMENT

B. Subjects Did Not Know How to Calculate the Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i) = (1-e^{-(\beta 0+\beta 1 * pi)})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i) = (-1+e^{(\beta 0+\beta 1 * pi)}$		C. Risk Neutral Induced Preferences, $f(n_i) = (n_i/50)^{\beta 0+\beta 1 * pi}$	
	(1)[a]	(2)	(3)[a]	(4)	(5)[a]	(6)
α	-1.160* (0.387)	-1.211* (0.401)	1.159 (0.678)	1.750* (0.831)	0.548 (0.382)	0.721** (0.376)
β_0	0.074* (0.015)	0.023 (0.023)	0.058 (0.021)	0.079* (0.026)	1.036* (0.276)	5.152 (3.033)
β_1	--	0.078* (0.039)	--	-0.059* (0.029)	--	-4.967 (3.762)
log-likelihood	-242.89	-240.22	-163.79	-160.34	-202.41	-199.41
N	420	420	294	294	210	210

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.
a) The model with $\beta_1 = 0$.

TABLE 13 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES, NATURAL RISK AVERSION AND INCOME ON CHOICE SELECTION (PROBIT MODEL)--FIRST EXPERIMENT

(Values in parenthesis are standard errors)

Coefficient	Constant Absolute Risk Averse Induced Preferences $f(n_i) = (1-e^{-(\beta_0+\beta_1 * p_i + \zeta * I_i) n_i})$			Constant Absolute Risk Preferring Induced Preferences $f(n_i) = (-1+e^{(\beta_0+\beta_1 * p_i + \zeta * I_i) n_i})$			Risk Neutral Induced Preferences $f(n_i) = n_i^{\beta_0+\beta_1 * p_i + \zeta * I_i}$		
	1	1a	1b	2	2a	2b	3	3a	3b
α	-1.647* (0.309)	-1.640* (0.299)	-1.642* (0.302)	0.144 (0.112)	0.113 (0.093)	1.434* (0.567)	1.290* (0.273)	1.242* (0.267)	1.289* (0.273)
β_0	0.036* (0.016)	0.071* (0.015)	0.036* (0.014)	1.134 (0.854)	-0.164 (0.133)	0.080* (0.023)	1.925* (0.389)	1.125* (0.334)	1.918* (0.374)
β_1	0.057* (0.022)	--	0.057* (0.027)	-2.045 (1.520)	--	-0.054* (0.026)	-1.179* (0.541)	--	-1.169* (0.514)
ζ	0.0001 (0.002)	0.0007 (0.021)	--	-0.073 (0.059)	-0.119 (0.104)	--	-0.0002 (0.004)	0.002 (0.461)	--
log likelihood	-390.58	-393.36	-390.58	-316.25	-316.34	-308.88	-387.31	-390.33	-387.31
N	770	770	770	546	546	546	546	546	546

*Estimates significantly different from zero at the 5% test level.

**Estimates significantly different from zero at the 10% test level.

a) The model with $\beta_1 = 0$.

b) The model with $\zeta = 0$.

TABLE 14 TEST OF THE SENSITIVITY OF THE FUNCTIONAL FORM (PROBIT MODEL) --FIRST EXPERIMENT

A. Subjects Knew How to Calculate the Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i) = (1-e^{-\beta n_i})/(1-e^{-\beta 50})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i) = (-1+e^{\beta n_i})/(-1+e^{\beta 50})$		C. Risk Neutral Induced Preferences, $f(n_i) = (n_i/50)^{\beta}$
	(1)	(2)[a]	(3)	(4)[b]	(5)
α	-1.976* (0.403)	104.77 (121.90)	1.675* (0.743)	0.517* (0.239)	2.068* (0.347)
β	0.071* (0.008	0.011 (0.133)	0.042* (0.011)	2.480* (0.737)	1.112* (0.069)
log-likelihood	-197.76	-216.90	-272.59	-281.27	-208.44
N	378	378	336	336	378

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.
a) Estimated with a constant relative risk averse function $f(n_i) = (n_i/50)^{\beta}$.
b) Estimated with a constant relative risk preferring function $f(n_i) = (n_i/50)^{\beta}$.

TABLE 14 TEST OF THE SENSITIVITY OF THE FUNCTIONAL FORM --FIRST EXPERIMENT

B. Subjects Did Not Know How to Calculate the Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i) = (1-e^{-\beta n_i})/(1-e^{-\beta 50})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i) = (-1+e^{\beta n_i})/(-1+e^{\beta 50})$		C. Risk Neutral Induced Preferences, $f(n_i) = (n_i/50)^{\beta}$
	(1)	(2)[a]	(3)	(4)[b]	(5)
α	-1.160*	13.78*	1.534*	0.688*	0.865*
	(0.387)	(40.45)	(0.693)	(0.275)	(0.301)
β	0.074*	0.060	0.050*	2.306*	0.841*
	(0.015)	(0.190)	(0.014)	(0.565)	(0.123)
log-likelihood	-242.89	-251.30	-208.04	-206.76	-345.25
N	420	420	294	294	210

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.
a) Estimated with a constant relative risk averse function $f(n_i) = (n_i/50)^{\beta}$.
b) Estimated with a constant relative risk preferring function $f(n_i) = (n_i/50)^{\beta}$.

TABLE 15 THE FIFTY-TWO LOTTERY CHOICES GIVEN TO SUBJECTS TO CONTROL RISK AVERSION--SECOND EXPERIMENT

LOTTERY A		LOTTERY B	
Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, 1-P_1)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, 1-P_1)
2	50%	31	5%
41	50%	21	95%
39	10%	1	45%
26	90%	49	55%
44	95%	5	5%
20	5%	45	95%
1	70%	23	80%
50	30%	9	20%
22	65%	4	75%
12	35%	46	25%
25	95%	2	40%
5	5%	48	60%
10	65%	18	95%
38	35%	15	5%
4	75%	29	90%
49	25%	26	10%
14	30%	2	60%
12	70%	34	40%
25	45%	8	35%
17	55%	37	65%
11	45%	35	75%
47	55%	20	25%
34	10%	8	30%
22	90%	45	70%
15	80%	5	55%
20	20%	30	45%
1	60%	15	25%
47	40%	14	75%
6	5%	1	35%
32	95%	49	65%
15	55%	25	80%
40	45%	30	20%

TABLE 15 (cont'd).

LOTTERY A		LOTTERY B	
Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, 1-P_1)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, 1-P_1)
9	95%	1	80%
38	5%	45	20%
21	40%	3	65%
19	60%	39	35%
3	25%	44	5%
48	75%	21	95%
8	55%	23	80%
45	45%	30	20%
1	60%	15	95%
42	40%	40	5%
28	30%	2	55%
22	70%	45	45%
2	45%	16	80%
28	55%	19	20%
29	95%	3	60%
17	5%	42	40%
31	45%	7	45%
29	55%	50	55%
17	45%	27	80%
43	55%	32	20%
2	35%	22	85%
34	65%	17	15%
27	80%	4	45%
32	20%	48	55%
19	90%	20	55%
25	10%	48	45%
32	40%	12	30%
27	60%	44	70%
3	55%	19	90%
31	45%	25	10%
8	55%	20	95%
49	45%	19	5%
4	55%	7	90%
10	45%	8	10%

TABLE 15 (cont'd).

LOTTERY A		LOTTERY B	
Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)
27	15%	1	55%
15	85%	38	45%
14	55%	25	90%
34	45%	29	10%
7	85%	21	95%
48	15%	46	5%
7	20%	1	75%
10	80%	40	25%
6	80%	12	55%
45	20%	15	45%
2	55%	16	90%
35	45%	19	10%
21	35%	5	40%
25	65%	35	60%
7	55%	21	90%
40	45%	24	10%
12	40%	31	35%
48	60%	36	65%
8	20%	1	75%
12	80%	48	25%
9	40%	1	45%
20	60%	35	55%
14	95%	2	50%
13	5%	43	50%
10	55%	24	90%
43	45%	27	10%
14	40%	6	45%
25	60%	40	55%
10	90%	2	50%
38	10%	39	50%
12	40%	2	45%
26	60%	46	55%
6	65%	23	35%
48	35%	20	65%

TABLE 15 (cont'd).

LOTTERY A		LOTTERY B	
Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)
3	55%	20	90%
44	45%	24	10%
1	80%	7	55%
40	20%	10	45%
10	40%	26	35%
40	60%	30	65%
15	55%	31	90%
43	45%	37	10%
6	75%	12	20%
45	25%	15	80%

TABLE 16 THE SELECTED 21 CHOICES TO CAPTURE SUBJECT'S BEHAVIOR CONCERNING CONSTANT ABSOLUTE AND RELATIVE RISK AVERSION

	LOTTERY A		LOTTERY B	
	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)
		The First Group of Lottery Pairs		
b	5	55%	15	80%
	30	45%	20	20%
a	15	55%	25	80%
	40	45%	30	20%
r	8	55%	23	80%
	45	45%	30	20%
		The Second Group of Lottery Pairs		
b	1	75%	7	20%
	40	25%	10	80%
a	6	75%	12	20%
	45	25%	15	80%
r	1	75%	8	20%
	48	25%	12	80%
		The Third Group of Lottery Pairs		
b	2	55%	16	90%
	35	45%	19	10%
a	10	55%	24	90%
	43	45%	27	10%
r	3	55%	20	90%
	44	45%	24	10%
		The Fourth Group of Lottery Pairs		
b	2	45%	16	80%
	28	55%	19	20%
a	17	45%	27	80%
	43	55%	32	20%
r	4	45%	27	80%
	48	55%	32	20%

TABLE 16 (cont'd).

	LOTTERY A		LOTTERY B	
	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)	Total Points (n_1, n_2)	Probabilities of Getting Points (P_1, $1-P_1$)
		The Fifth Group of Lottery Pairs		
b	19	90%	20	55%
	25	10%	48	45%
a	2	90%	3	55%
	8	10%	31	45%
r	7	90%	7	55%
	9	10%	18	45%
		The Sixth Group of Lottery Pairs		
b	12	40%	31	35%
	48	60%	36	65%
a	5	40%	21	35%
	35	60%	25	65%
r	10	40%	26	35%
	40	60%	30	65%
		The Seventh Group of Lottery Pairs		
b	1	45%	9	40%
	35	55%	20	60%
a	6	45%	14	40%
	40	55%	25	60%
r	2	45%	12	40%
	46	55%	26	60%

b - the basic pair of lotteries
a - an absolute increase/decrease in points as compared to the base lottery
r - a relative increase/decrease in points as compared to the base lottery

TABLE 17 F(n) AS PRESENTED TO SUBJECTS IN THE RELATIVE RISK AVERSE CONDITION

Total Points	Probability of Winning Money	Increase in Probability	Total Points	Probability of Winning Money	Increase in Probability
0	0.0%	.			
1	14.1%	14.1%	26	72.1%	1.4%
2	20.0%	5.9%	27	73.5%	1.4%
3	24.5%	4.5%	28	74.8%	1.3%
4	28.3%	3.8%	29	76.2%	1.4%
5	31.6%	3.3%	30	77.5%	1.3%
6	34.6%	3.0%	31	78.7%	1.2%
7	37.4%	2.8%	32	80.0%	1.3%
8	40.0%	2.6%	33	81.2%	1.2%
9	42.4%	2.4%	34	82.5%	1.3%
10	44.7%	2.3%	35	83.7%	1.2%
11	46.9%	2.2%	36	84.9%	1.2%
12	49.0%	2.1%	37	86.0%	1.1%
13	51.0%	2.0%	38	87.2%	1.2%
14	52.9%	1.9%	39	88.3%	1.1%
15	54.8%	1.9%	40	89.4%	1.1%
16	56.6%	1.8%	41	90.6%	1.2%
17	58.3%	1.7%	42	91.7%	1.1%
18	60.0%	1.7%	43	92.7%	1.0%
19	61.6%	1.6%	44	93.8%	1.1%
20	63.2%	1.6%	45	94.9%	1.1%
21	64.8%	1.6%	46	95.9%	1.0%
22	66.3%	1.5%	47	97.0%	1.1%
23	67.8%	1.5%	48	98.0%	1.0%
24	69.3%	1.5%	49	99.0%	1.0%
25	70.7%	1.4%	50	100.0%	1.0%

TABLE 18 F(n) AS PRESENTED TO SUBJECTS IN THE RELATIVE RISK PREFERRING CONDITION

Total Points	Probability of Winning Money	Increase in Probability	Total Points	Probability of Winning Money	Increase in Probability
0	0.0%	.			
1	0.3%	0.3%	26	37.5%	2.1%
2	0.8%	0.5%	27	39.7%	2.2%
3	1.5%	0.7%	28	41.9%	2.20
4	2.3%	0.8%	29	44.2%	2.3%
5	3.2%	0.9%	30	46.5%	2.3%
6	4.2%	1.0%	31	48.8%	2.3%
7	5.2%	1.0%	32	51.2%	2.4%
8	6.4%	1.2%	33	53.6%	2.4%
9	7.6%	1.2%	34	56.1%	2.5%
10	8.9%	1.3%	35	58.6%	2.5%
11	10.3%	1.4%	36	61.1%	2.5%
12	11.8%	1.5%	37	63.7%	2.6%
13	13.3%	1.5%	38	66.3%	2.6%
14	14.8%	1.5%	39	68.9%	2.6%
15	16.4%	1.6%	40	71.6%	2.7%
16	18.1%	1.7%	41	74.3%	2.7%
17	19.8%	1.7%	42	77.0%	2.7%
18	21.6%	1.8%	43	79.8%	2.8%
19	23.4%	1.8%	44	82.6%	2.8%
20	25.3%	1.9%	45	85.4%	2.8%
21	27.2%	1.9%	46	88.2%	2.8%
22	29.2%	2.0%	47	91.1%	2.9%
23	31.2%	2.0%	48	94.1%	3.0%
24	33.3%	2.1%	49	97.0%	2.9%
25	35.4%	2.1%	50	100.0%	3.0%

TABLE 19 Parameter Estimates of Induced Behavior for Each Individual--SECOND EXPERIMENT
(Values in Parenthesis are Standard Errors)

A. CONSTANT ABSOLUTE RISK AVERSE INDUCED BEHAVIOR: $f(n_i) = (1-e^{-\beta n_i})/(1-e^{-\beta 50})$

	PROBIT ESTIMATES				LOGIT ESTIMATES		
Subject	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=0.07365$	LR Test for Linearity $H_o:\beta=1$ $f(n_i)=(n_i/50)^\beta$	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=0.07365$
1	-2.87* (0.79)	0.051* (0.008)	-2(-27.06+26.45)=1.22	22.61^r	-5.17* (1.55)	0.049* (0.008)	-2(-27.20)+26.48)=1.44
2	-0.72* (0.32)	0.075* (0.020)	-2(-34.71+34.71)=0.00	14.55^r	-1.12* (0.52)	0.076* (0.022)	-2(-34.74+34.73)=0.02
3	-0.88* (0.29)	0.084* (0.018)	-2(-31.39+31.37)=0.18	13.39^r	-1.39* (0.49)	0.087* (0.019)	-2(-31.32+31.29)=0.06
4	-1.47* (0.39)	0.077* (0.012)	-2(-26.25+26.24)=0.02	25.34^r	-2.48* (0.73)	0.077* (0.013)	-2(-26.27+26.26)=0.02
5	-0.36** (0.19)	0.108* (0.038)	-2(-35.66+35.54)=0.24	4.28^r	-0.55** (0.29)	0.111* (0.041)	-2(-35.69+35.57)=0.24
6	-0.80** (0.48)	0.057* (0.019)	-2(-35.80+35.77)=0.06	27.11^r	-1.38 (0.77)	0.058* (0.019)	-2(-35.82+35.79)=0.06
7	-0.95 (0.73)	0.003 (0.009)	-2(-36.02+31.00)=10.04^r	0.98	0.996 (0.612)	0.004 (0.003)	-2(-35.82+30.09)=11.46^r
8	-19.71* (6.81)	0.011* (0.003)	-2(-35.28+28.97)=12.62^r	0.36	-3.38* (1.23)	0.011* (0.003)	-2(-35.34+29.05)=12.58^r
9	-1.58* (0.37)	0.118* (0.017)	-2(-13.13+12.21)=1.84	26.80^r	-2.94 (3.35)	0.115 (0.078)	-2(-13.10+12.17)=1.86
10	-4.48** (2.26)	0.053* (0.012)	-2(-38.70+38.13)=1.14	21.85^r	-1.56 (2.61)	0.023 (0.026)	-2(-38.02+37.89)=0.26
11	-3.67* (1.41)	0.030* (0.007)	-2(-34.50+32.98)=3.04	15.63^r	-6.13* (2.48)	0.029* (0.007)	-2(-34.53+33.04)=2.98
12	-1.15 (0.91)	0.187 (0.497)	-2(-6.87+5.090)=3.56	5.54^r	-1.38 (6.19)	0.327 (1.379)	-2(-6.74+5.19)=3.10
13	-7.64* (2.08)	0.032* (0.005)	-2(-25.69+23.78)=3.82	8.94^r	-12.81* (3.76)	0.033* (0.005)	-2(-25.96+23.91)=4.10^r
14	-9.43* (2.95)	0.021* (0.004)	-2(-32.39+28.27)=8.24^r	19.91^r	-16.17* (5.40)	0.021* (0.004)	-2(-32.48+28.32)=8.32^r
15	-1.15 (1.13)	0.089 (1.051)	-2(-39.19+38.12)=2.14	8.45^r	0.57 (1.40)	0.091 (0.146)	-2(-37.49+37.03)=0.92
16	-2.57 (2.01)	0.019 (0.012)	-2(-37.48+37.03)=0.90	16.00^r	-4.44 (3.55)	0.018 (0.012)	-2(-37.49+37.04)=0.90
17	-0.29* (0.09)	0.206* (0.055)	-2(-30.90+30.25)=1.30	9.26^r	0.65 (1.25)	0.105 (1.254)	-2(-34.94+34.01)=1.86
18	-1.16 (3.08)	0.186* (0.039)	-2(-8.85+7.02)=3.66	6.52^r	-2.25* (0.63)	0.176* (0.038)	-2(-8.90+6.98)=3.84
19	-1.16 (0.61)	0.032 (0.076)	-2(-39.12+38.11)=2.02	5.17^r	-1.29 (0.92)	0.037* (0.032)	-2(-39.45+38.11)=2.68
20	-1.16 (0.51)	0.003 (0.063)	-2(-39.11+35.14)=7.94^r	9.63^r	-1.19 (0.75)	0.002 (0.095)	-2(-39.12+34.12)=10.00^r

*Estimates significantly different from 0 at 5% test level; **Estimates significantly different from 0 at 10% test level; ^{r} Estimate significantly different from the null hypothesis.

TABLE 19 Parameter Estimates of Induced Behavior for Each Individual--SECOND EXPERIMENT
(Values in Parenthesis are Standard Errors)

B. CONSTANT ABSOLUTE RISK PREFERRING INDUCED BEHAVIOR $f(n_i)=(-1+e^{\beta n i})/(-1+e^{\beta 50})$

	PROBIT ESTIMATES				LOGIT ESTIMATES		
Subject	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=$ 0.07365	LR Test for Linearity $H_o:\beta=1$ $f(n_i)=(n_i/50)^{\beta}$	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=$ 0.07365
1	2.58*	0.049*	-2(-23.61+23.19)=0.84	22.44^r	4.41*	0.049*	-2(-23.69+23.27)=0.84
	(0.65)	(0.007)			(1.24)	(0.008)	
2	14.66*	0.012*	-2(-32.47+28.21)=8.52^r	3.08	25.34*	0.012*	-2(-32.54+28.31)=8.46^r
	(4.72)	(0.003)			(8.78)	(0.003)	
3	-0.89	-0.050*	-2(-39.46+36.39)=6.14^r	0.08	-1.59	-0.048	-2(-39.71+36.37)=6.68^r
	(0.55)	(0.019)			(2.44)	(0.047)	
4	-0.56	-0.006	-2(-42.12+39.35)=5.54^r	16.02^r	-1.16	-0.004	-2(-42.76+38.09)=9.34^r
	(0.42)	(0.031)			(1.39)	(0.042)	
5	3.12*	0.012	-2(-38.89+37.10)=3.58	15.58^r	5.92	0.007	-2(-38.12+37.79)=0.66
	(1.35)	(0.054)			(3.03)	(0.038)	
6	1.00*	0.074*	-2(-27.88+27.88)=0.00	8.14^r	1.57*	0.078*	-2(-27.84+27.84)=0.00
	(0.27)	(0.013)			(0.47)	(0.015)	
7	-4.84	0.014**	-2(-38.00+36.43)=3.14	29.26^r	-7.70	0.014	-2(-38.00+36.46)=3.08
	(3.11)	(0.007)			(12.59)	(0.018)	
8	1.10	0.210*	-2(-33.27+32.56)=1.42	5.37^r	-0.25*	0.213*	-2(-33.89+33.51)=0.76
	(1.57)	(0.036)			(0.10)	(0.073)	
9	-1.87*	-0.038*	-2(-38.02+34.98)=6.08^r	7.16^r	-3.37	-0.036**	-2(-38.02+34.95)=6.14^r
	(0.87)	(0.011)			(3.13)	(0.022)	
10	1.34*	0.083*	-2(-19.73+19.69)=0.08	6.02^r	2.09*	0.087*	-2(-19.95+19.88)=0.14
	(0.32)	(0.012)			(0.56)	(0.015)	
11	0.66*	0.069*	-2(-33.89+33.89)=0.00	32.12^r	1.03*	0.071*	-2(-33.93+33.93)=0.00
	(0.27)	(0.018)			(0.43)	(0.019)	
12	4.44*	0.051*	-2(-13.38+12.62)=1.52	13.47^r	7.89**	0.052*	-2(-13.24+12.51)=1.46
	(1.13)	(0.006)			(4.17)	(0.012)	
13	-3.78	0.014	-2(-38.07)+36.93)=2.28	5.71^r	-6.49	0.014	-2(-38.06+36.89)=2.34
	(2.78)	(0.009)			(11.51)	(0.021)	
14	2.72*	0.031*	-2(-33.44+32.37)=2.14	9.62^r	4.39*	0.032*	-2(-33.39+32.37)=2.04
	(0.97)	(0.007)			(1.66)	(0.007)	
15	1.79	0.079*	-2(-34.98+34.63)=0.70	6.46^r	-1.05	0.083	-2(-35.12+35.02)=0.20
	(1.84)	(0.031)			(2.48)	(0.059)	
16	2.49*	0.028*	-2(-35.06+34.35)=1.42	10.15^r	4.09*	0.028*	-2(-35.09+34.41)=1.36
	(1.09)	(0.008)			(1.86)	(0.008)	
17	2.45*	0.043*	-2(-27.81+27.44)=0.74	5.81^r	4.59*	0.041*	-2(-27.79+27.31)=0.96
	(0.68)	(0.007)			(1.40)	(0.007)	
18	16.12*	0.005*	-2(-37.36+34.75)=5.22^r	4.10^r	38.30*	0.004*	-2(-37.25+34.26)=5.98^r
	(8.10)	(0.002)			(18.41)	(0.002)	
19	1.75*	0.106*	-2(-8.24+8.06)=0.36	11.28^r	-5.03	0.083*	-2(-8.12+8.06)=0.12
	(0.50)	(0.019)			(3.26)	(0.028)	
20	10.12*	0.012*	-2(-35.32+32.11)=6.42^r	0.15	17.79*	0.012*	-2(-35.34+32.15)=6.38^r
	(3.76)	(0.004)			(7.09)	(0.004)	

*Estimates significantly different from 0 at 5% test level; **Estimates significantly different from 0 at 10% test level; ^{r}Estimate significantly different from the null hypothesis.

TABLE 19 Parameter Estimates of Induced Behavior for Each Individual--SECOND EXPERIMENT
(Values in Parenthesis are Standard Errors)

C. RISK NEUTRAL INDUCED BEHAVIOR $f(n_i) = (n_i/50)^\beta$

	PROBIT ESTIMATES			LOGIT ESTIMATES		
Subject	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_0{:}\beta=\beta_0=1$	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o{:}\beta=\beta_o=1$
1	1.15	0.403	-2(-38.12+34.82)=6.60[r]	0.91	0.461	-2(-38.11+33.78)=8.62[r]
	(0.96)	(0.706)		(0.84)	(0.325)	
2	-0.72	0.531	-2(-38.00+37.79)=0.42	1.17	0.523	-2(-38.00+37.79)=0.42
	(0.90)	(1.147)		(1.43)	(0.886)	
3	1.34	0.603	-2(-37.77+37.02)=1.50	2.16	0.606**	-2(-37.77+37.02)=1.50
	(0.92)	(0.392)		(1.52)	(0.341)	
4	1.87*	1.101*	-2(-34.89+34.73)=0.32	3.07	1.094*	-2(-34.90+34.75)=0.30
	(0.79)	(0.165)		(1.62)	(0.199)	
5	5.27*	0.768*	-2(-32.38+30.79)=3.18	1.79*	0.766*	-2(-32.48+31.46)=2.04
	(1.88)	(0.085)		(0.33)	(0.085)	
6	5.52*	0.759*	-2(-32.39+30.45)=3.88	2.15*	0.755*	-2(-32.52+30.58)=3.88
	(2.11)	(0.097)		(0.96)	(0.098)	
7	1.49	0.842*	-2(-36.92+36.69)=0.46	2.41	0.843*	-2(-36.92+36.69)=0.46
	(0.91)	(0.221)		(1.57)	(0.239)	
8	1.88*	1.152*	-2(-34.55+34.13)=0.84	3.09	1.159*	-2(-34.57+34.11)=0.92
	(0.74)	(0.156)		(1.78)	(0.215)	
9	2.85*	0.589*	-2(-36.70+33.65)=6.10[r]	4.97	0.584*	-2(-36.71+33.51)=6.40[r]
	(1.01)	(0.194)		(1.56)	(0.198)	
10	0.61	0.507	-2(-38.12+37.89)=0.46	-0.98	0.506	-2(-38.12+37.89)=0.46
	(0.90)	(0.686)		(1.46)	(1.105)	
11	1.06	3.734	-2(-38.09+33.57)=9.04[r]	0.42	3.588	-2(-38.09+34.52)=7.14[r]
	(0.81)	(6.194)		(0.89)	(5.594)	
12	1.69	1.321	-2(-36.88+36.88)=0.00	1.42	1.431*	-2(-36.89+35.98)=1.82
	(1.03)	(1.272)		(1.37)	(0.579)	
13	1.86*	1.403*	-2(-33.21+30.99)=4.44[r]	2.96**	1.429*	-2(-33.15+31.04)=4.22[r]
	(0.93)	(0.229)		(1.61)	(0.257)	
14	1.12	0.681**	-2(-37.71+37.32)=0.78	1.82	0.684	-2(-37.71+37.32)=0.78
	(0.89)	(0.364)		(1.42)	(0.410)	
15	0.44	5.484	-2(-34.16+21.02)=26.28[r]	1.59	3.062	-2(-34.12+21.12)=26.00[r]
	(0.31)	(3.286)		(1.08)	(1.378)	
16	3.47*	0.785*	-2(-34.04+32.46)=3.16	1.87*	0.792*	-2(-34.00+32.44)=3.12
	(1.17)	(0.113)		(0.20)	(0.099)	
17	1.65*	1.190*	-2(-34.97+34.50)=0.94	2.80**	1.188*	-2(-34.92+34.44)=0.96
	(0.68)	(0.18)		(1.47)	(0.228)	
18	1.36	5.792	-2(-37.93+30.61)=14.64[r]	0.37	5.683	-2(-37.93+30.74)=14.38[r]
	(0.84)	(9.268)		(0.63)	(8.011)	
19	2.55*	0.993*	-2(-33.86+33.86)=0.00	4.10**	0.989*	-2(-33.95+33.94)=0.02
	(0.99)	(0.127)		(2.09)	(0.124)	
20	0.49	0.763	-2(-38.02+37.97)=0.10	-0.79	0.763	-2(-38.02+37.96)=0.12
	(0.87)	(0.665)		(1.43)	(0.779)	

*Estimates significantly different from 0 at 5% test level; **Estimates significantly different from 0 at 10% test level; [r] Estimate significantly different from the null hypothesis.

TABLE 19 Parameter Estimates of Induced Behavior for Each Individual--SECOND EXPERIMENT
(Values in Parenthesis are Standard Errors)

D. CONSTANT RELATIVE RISK AVERSE INDUCED BEHAVIOR $f(n_i) = (n_i/50)^\beta$

	PROBIT ESTIMATES				LOGIT ESTIMATES		
Subject	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=0.5$	LR Test for Linearity $H_o:\beta=1$	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=0.5$
1	0.14	0.947	-2(-38.07+38.01)=0.12	11.15^r	1.11	1.194*	-2(-38.06+37.42)=1.28
	(0.12)	(0.659)			(1.31)	(0.586)	
2	1.65*	0.271	-2(-20.58+11.79)=17.58^r	32.71^r	3.40	0.200	-2(-20.64+11.40)=18.48^r
	(0.57)	(0.259)			(5.14)	(0.254)	
3	0.89	0.937	-2(-38.12+37.63)=0.98	4.06^r	2.99	1.050*	-2(-37.64+36.22)=2.84
	(0.55)	(0.929)			(2.00)	(0.203)	
4	2.97	0.075	-2(-37.79+37.70)=0.18	7.81^r	14.00	0.244	-2(-37.79+37.69)=0.20
	(1.72)	(1.883)			(11.34)	(0.203)	
5	7.01*	0.654*	-2(-24.74+23.93)=1.62	20.08^r	13.74*	0.627*	-2(-23.85+23.19)=1.32
	(1.78)	(0.117)			(3.37)	(0.121)	
6	2.46*	0.645*	-2(-35.08+34.91)=0.34	9.92^r	3.92**	0.647*	-2(-35.13+34.97)=0.32
	(1.18)	(0.196)			(1.97)	(0.201)	
7	6.81*	1.036*	-2(-36.54+23.84)=25.40^r	0.10	11.99*	1.023*	-2(-36.55+23.81)=25.48^r
	(1.91)	(0.071)			(3.77)	(0.069)	
8	1.10	1.222*	-2(-38.12+36.27)=3.70	4.61^r	1.78	1.219*	-2(-38.12+36.28)=3.68
	(0.78)	(0.308)			(1.29)	(0.310)	
9	1.81**	1.226*	-2(-37.96+33.51)=8.90^r	1.36	3.10**	1.216*	-2(-37.96+33.45)=9.02^r
	(0.93)	(0.270)			(1.61)	(0.257)	
10	0.58	1.199	-2(-38.11+37.62)=0.98	6.14^r	-0.92	1.204	-2(-38.11+37.61)=1.00
	(0.83)	(0.701)			(1.33)	(0.707)	
11	1.58	0.168	-2(-37.73+37.65)=0.16	5.91^r	2.60	0.162	-2(-37.73+37.66)=0.14
	(1.17)	(1.609)			(2.05)	(1.632)	
12	7.59*	0.912*	-2(-33.52+25.25)=16.54^r	2.23	12.00*	0.912*	-2(-33.59+25.43)=16.32^r
	(3.08)	(0.055)			(5.47)	(0.057)	
13	0.89*	2.712	-2(-37.94+33.77)=8.34^r	6.62^r	-0.13	2.712	-2(-37.93+33.82)=8.22^r
	(0.21)	(2.123)			(0.34)	(2.317)	
14	0.21	2.779	-2(-37.29+36.83)=0.92	4.34^r	-0.34	2.771	-2(-37.29+36.82)=0.94
	(0.55)	(4.718)			(0.88)	(4.641)	
15	2.47*	3.168	-2(-35.55+33.09)=4.92^r	8.27^r	1.13	2.312	-2(-35.55+31.79)=7.52^r
	(0.48)	(1.614)			(1.04)	(1.316)	
16	3.62*	0.835*	-2(-34.44+31.89)=5.10^r	2.38	6.30*	0.839*	-2(-34.41+31.77)=5.28^r
	(1.06)	(0.099)			(1.97)	(0.096)	
17	6.35*	0.566*	-2(-25.75+25.59)=0.32	20.25^r	11.25*	0.544*	-2(-25.52+25.45)=0.14
	(1.69)	(0.099)			(3.12)	(0.101)	
18	3.55*	0.605*	-2(-32.50+32.29)=0.42	8.03^r	5.81*	0.612*	-2(-32.59+32.35)=0.48
	(1.31)	(0.156)			(2.24)	(0.157)	
19	1.67	0.958	-2(-38.11+38.09)=0.02	9.00^r	0.90	0.969	-2(-38.09+37.86)=0.46
	(1.50)	(1.559)			(1.45)	(0.613)	
20	1.25	0.209	-2(-21.40+20.14)=2.52	7.48^r	2.80	0.213	-2(-20.67+19.56)=2.22
	(1.27)	(0.314)			(2.26)	(0.255)	

*Estimates significantly different from 0 at 5% test level; **Estimates significantly different from 0 at 10% test level; r Estimate significantly different from the null hypothesis.

TABLE 19 Parameter Estimates of Induced Behavior for Each Individual--SECOND EXPERIMENT
(Values in Parenthesis are Standard Errors)

E. CONSTANT RELATIVE RISK PREFERRING INDUCED BEHAVIOR $f(n_i) = (n_i/50)^{\beta}$

	PROBIT ESTIMATES				LOGIT ESTIMATES		
Subject	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_0:\beta=\beta_0=1.5$	LR Test for Linearity $H_o:\beta=1$	Constant α	Estimated Coefficient of Risk Aversion (β)	LR Test $H_o:\beta=\beta_o=1.5$
1	2.43 (1.56)	1.564* (0.375)	-2(-24.13+24.11)=0.04	13.90^{r}	4.04 (2.68)	1.622* (0.414)	-2(-23.96+23.88)=0.16
2	0.87 (0.72)	1.607* (0.675)	-2(-34.85+34.80)=0.10	3.98^{r}	1.51 (1.21)	1.576* (0.621)	-2(-34.80+34.79)=0.02
3	1.07 (0.86)	0.841* (0.337)	-2(-37.96+37.35)=1.22	9.94^{r}	1.74 (1.40)	0.839* (0.334)	-2(-37.96+37.34)=1.24
4	1.12 (0.81)	2.945* (1.392)	-2(-22.33+18.40)=7.86^{r}	4.46^{r}	2.19 (1.41)	2.777* (1.091)	-2(-22.15+18.31)=7.68^{r}
5	1.53** (0.84)	1.640* (0.367)	-2(-29.87+29.76)=0.22	11.85^{r}	2.49 (1.43)	1.641* (0.378)	-2(-29.97+29.87)=0.20
6	0.48 (0.76)	1.515 (1.123)	-2(-37.29+37.29)=0.00	33.81^{r}	-0.78 (1.22)	1.509 (1.112)	-2(-37.29+37.28)=0.02
7	6.84* (2.24)	1.129* (0.057)	-2(-24.56+20.99)=7.14^{r}	0.22	11.91* (4.16)	1.134* (0.062)	-2(-24.31+20.96)=6.70^{r}
8	2.37* (0.98)	0.724* (0.183)	-2(-38.04+34.99)=6.10^{r}	2.64	3.93* (1.69)	0.719* (0.184)	-2(-38.04+34.98)=6.12^{r}
9	4.12 (2.91)	0.308 (0.376)	-2(-36.71+32.07)=9.28^{r}	4.16^{r}	0.178 (0.389)	0.318 (1.988)	-2(-36.69+31.87)=9.64^{r}
10	4.23** (2.29)	1.723* (0.317)	-2(-13.56+12.94)=1.24	6.52^{r}	7.48** (4.15)	1.735* (0.302)	-2(-13.62+12.94)=1.44
11	2.49* (1.06)	1.069* (0.180)	-2(-34.24+32.95)=2.58	7.78^{r}	4.29* (1.93)	1.068* (0.173)	-2(-34.25+32.87)=2.76
12	1.33 (0.75)	1.184* (0.265)	-2(-36.04+35.76)=0.56	5.04^{r}	2.22 (1.28)	1.169* (0.257)	-2(-36.05+35.75)=0.60
13	0.25 (0.72)	1.571 (2.064)	-2(-37.85+37.85)=0.00	32.26^{r}	0.40 (1.15)	1.572 (2.067)	-2(-37.86+37.85)=0.02
14	2.32* (0.87)	1.380* (0.269)	-2(-28.56+28.44)=0.24	8.12^{r}	4.34* (1.73)	1.343* (0.236)	-2(-28.47+28.26)=0.42
15	0.21 (0.80)	1.133 (1.701)	-2(-38.08+38.07)=0.02	10.34^{r}	-0.34 (1.27)	1.131 (1.688)	-2(-38.08+38.06)=0.04
16	3.49* (1.34)	1.307* (0.179)	-2(-25.04+24.62)=0.84	4.92^{r}	6.35* (2.44)	1.297* (0.162)	-2(-24.98+24.49)=0.98
17	1.53 (0.88)	0.955* (0.226)	-2(-37.17+36.48)=1.58	6.36^{r}	2.50 (1.47)	0.952* (0.222)	-2(-37.17+36.37)=1.60
18	1.17 (0.95)	1.019* (0.295)	-2(-37.41+36.93)=0.96	9.04^{r}	1.86 (1.54)	1.022* (0.298)	-2(-37.42+36.94)=0.96
19	2.79** (1.47)	1.274* (0.192)	-2(-29.02+28.56)=0.92	7.28^{r}	4.59** (2.52)	1.292* (0.204)	-2(-28.96+28.59)=0.74
20	0.89 (0.85)	1.254 (0.445)	-2(-36.85+36.77)=0.30	15.10^{r}	1.42 (1.38)	1.259* (0.455)	-2(-36.85+36.78)=0.14

*Estimates significantly different from 0 at 5% test level; **Estimates significantly different from 0 at 10% test level; ^{r} Estimate significantly different from the null hypothesis.

TABLE 20 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION (PROBIT MODEL) -- SECOND EXPERIMENT

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-(\beta0+\beta1*p)\|n_i\|})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{(\beta0+\beta1*p)\|n_i\|})$		C. Risk Neutral Induced Preferences $f(n_i)=(n_i/50)^{\beta0+\beta1*p}$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^{\beta0+\beta1*p}$		E. Constant Relative Risk Preferring Preferences $f(n_i)=(n_i/50)^{\beta0+\beta1*p}$	
	(1)[a]	(2)	(3)[a]	(4)	(5)[a]	(6)	(7)[a]	(8)	(9)[a]	(10)
α	-0.157* (0.065)	-0.172* (0.018)	1.566* (0.145)	1.394* (0.0383)	1.069* (0.227)	1.082* (0.221)	1.726* (0.227)	1.732* (0.226)	1.345* (0.189)	1.346* (0.189)
β_0	0.175* (0.042)	0.194* (0.024)	0.039* (0.002)	0.092* (0.097)	0.876* (0.084)	1.480* (0.231)	0.695* (0.061)	0.892* (0.295)	1.273* (0.069)	2.037* (0.327)
β_1	--	0.081 (0.084)	--	-0.078* (0.024)	--	-1.012* (0.399)	--	-0.306 (0.500)	--	-1.254* (0.507)
log-likelihood	-471.19	-468.55	-680.87	-672.78	-559.96	-556.18	-621.83	-617.56	-700.77	-697.51
N	770	770	1100	1100	825	825	935	935	1100	1100

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.
a) The model with $\beta_1 = 0$.

TABLE 21 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION (LOGIT MODEL) -- SECOND EXPERIMENT

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-(\beta 0+\beta 1*pi)ni})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{(\beta 0+\beta 1*pi)ni})$		C. Risk Neutral Induced Preferences $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$		E. Constant Relative Risk Preferences $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$	
	(1)[a]	(2)	(3)[a]	(4)	(5)[a]	(6)	(7)[a]	(8)	(9)[a]	(10)
α	-0.386* (0.042)	-0.260 (0.155)	2.578* (0.734)	2.374* (0.663)	1.724* (0.372)	1.755* (0.362)	2.809* (0.381)	2.823* (0.379)	2.208* (0.321)	2.211* (0.321)
β_0	0.190* (0.017)	0.211 (0.150)	0.039* (0.006)	0.094* (0.019)	0.876* (0.084)	1.485* (0.232)	0.697* (0.061)	0.905* (0.292)	1.272* (0.069)	2.057* (0.331)
β_1	-	0.083 (0.156)	--	-0.083* (0.025)	--	-1.020* (0.402)	--	-0.323 (0.496)	--	-1.286* (0.512)
log-likelihood	-471.62	-468.23	-680.85	-672.20	-559.94	-556.11	-620.79	-617.48	-700.62	-697.26
N	770	770	1100	1100	825	825	935	935	1100	1100

*Estimates significantly different from zero at the 5% test level.

**Estimates significantly different from zero at the 10% test level.

a) The model with $\beta_1 = 0$.

TABLE 22 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION (PROBIT MODEL) --SECOND EXPERIMENT

A. Subjects Knew How to Calculate Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-(\beta 0+\beta 1*pi)ni})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{(\beta 0+\beta 1*pi)ni})$		C. Risk Neutral Induced Preferences $f(n_i) = (n_i/50)^{\beta 0+\beta 1*pi}$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$		E. Constant Relative Risk Preferring Preferences $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$	
	(1)[a]	(2)	(3)[a]	(4)	(5)[a]	(6)	(7)[a]	(8)	(9)[a]	(10)
α	-0.399* (0.045)	-0.329 (0.178)	1.692* (0.613)	1.499* (0.515)	1.208* (0.453)	1.215* (0.442)	2.910* (0.386)	3.149* (0.378)	1.758* (0.336)	1.780* (0.341)
β_0	0.087* (0.023)	0.160 (0.087)	0.047* (0.010)	0.104* (0.028)	1.004* (0.145)	1.561* (0.413)	0.728* (0.058)	2.083* (0.959)	1.345* (0.099)	2.183* (0.490)
β_1	--	0.009 (0.074)	--	-0.086 (0.067)	--	-0.891 (0.636)	--	-1.796 (1.331)	--	-1.418 (0.896)
log-likelihood	-285.62	-285.54	-210.53	-209.87	-147.53	-146.06	-200.08	-198.14	-226.09	-224.42
N	496	495	385	385	220	220	330	330	440	440

*Estimates significantly different from zero at the 5% test level.

**Estimates significantly different from zero at the 10% test level.

a) The model with $\beta_1 = 0$.

TABLE 22 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION ON CHOICE SELECTION (PROBIT MODEL) --SECOND EXPERIMENT

B. Subjects Did Not Know How to Calculate Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-(\beta 0+\beta 1*pi)ni})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{(\beta 0+\beta 1*pi)ni})$		C. Risk Neutral Induced Preferences $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$		E. Constant Relative Risk Preferring Preferences $f(n_i)=(n_i/50)^{\beta 0+\beta 1*pi}$	
	(1)[a]	(2)	(3)[a]	(4)	(5)[a]	(6)	(7)[a]	(8)	(9)[a]	(10)
α	-0.054*	-0.275	1.142*	1.483*	1.031*	1.045*	1.191*	1.202*	1.155*	1.152*
	(0.012)	(0.362)	(0.517)	(0.600)	(0.264)	(0.253)	(0.279)	(0.283)	(0.233)	(0.232)
β_0	0.054*	-0.102	0.041*	0.073*	0.817	1.538*	0.659*	1.602**	1.223*	1.864*
	(0.022)	(0.144)	(0.012)	(0.024)	(0.107)	(0.268)	(0.118)	(0.883)	(0.095)	(0.445)
β_1	--	0.018	--	-0.058*	--	-1.279*	--	-1.795	--	-1.038**
		(0.151)		(0.029)		(0.480)		(1.767)		(0.526)
log-likelihood	-184.43	-182.32	-460.67	-457.48	-411.63	-408.81	-409.68	-409.49	-469.90	-467.89
N	275	275	715	715	605	605	606	605	660	660

*Estimates significantly different from zero at the 5% test level.

**Estimates significantly different from zero at the 10% test level.

a) The model with $\beta_1 = 0$.

TABLE 23 PARAMETER ESTIMATES OF THE EFFECT OF INDUCED PREFERENCES, NATURAL RISK AVERSION AND INCOME ON CHOICE SELECTION (PROBIT MODEL)--SECOND EXPERIMENT

(Values in parenthesis are standard error)

Coefficient	Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-(\beta_0+\beta_1\gamma_i+\zeta I)n_i})$			Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{(\beta_0+\beta_1\gamma_i+\zeta I)n_i})$			Risk Neutral Induced Preferences $f(n_i)=(n_i/50)^{\beta_0+\beta_1\gamma_i+\zeta I}$			Constant Relative Risk Averse InducedPreferences $f(n_i)=(n_i/50)^{\beta_0+\beta_1\gamma_i+\zeta I}$			Constant Relative Risk Preferring Induced Preferences $f(n_i)=(n_i/50)^{\beta_0+\beta_1\gamma_i+\zeta I}$		
	1	1a	1b	2	2a	2b	3	3a	3b	4	4a	4b	5	5a	5b
α	-0.166 (0.095)	-0.163** (0.084)	-0.158 (0.092)	1.038* (0.328)	1.266* (0.406)	1.137* (0.353)	1.065* (0.220)	1.275* (0.306)	1.082* (0.221)	1.817* (0.231)	1.817* (0.229)	1.788* (0.231)	1.198* (0.212)	1.205* (0.206)	1.158* (0.209)
β_0	0.117 (0.138)	0.202 (0.161)	0.214 (0.149)	0.135* (0.035)	0.043* (0.017)	0.110* (0.027)	1.223* (0.318)	1.265 (0.147)	1.480* (0.231)	0.649* (0.325)	0.392 (0.288)	1.054* (0.269)	1.334* (0.482)	0.761* (0.379)	1.965* (0.416)
β_1	0.105 (0.154)	--	0.083 (0.155)	-0.119* (0.039)	--	-0.099* (0.034)	-1.043* (0.386)	--	-1.012* (0.399)	-0.249 (0.458)	--	-0.482 (0.457)	-0.829 (0.651)	--	-1.188** (0.651)
ζ	0.023 (0.026)	0.019 (0.143)	--	-0.003 (0.003)	0.001 (0.022)	--	0.081 (0.063)	-0.257 (0.237)	--	0.109 (0.064)	0.146 (0.470)	--	0.119 (0.061)	0.139 (0.608)	--
log likelihood	-467.84	-468.15	468.37	-529.38	-537.54	-530.13	-555.24	-562.93	-556.18	-577.61	-577.68	-578.92	-571.56	-572.37	-573.60
N	756	756	756	880	880	880	825	825	825	880	880	880	880	880	880

*Estimates significantly different from zero at 5% test level.
**Estimates significantly different from zero at 10% test level.
a) The model with $\beta_1 = 0$.
b) The model with $\zeta = 0$.

TABLE 24 PARAMETER ESTIMATES OF RISK AVERSION FOR ALL SUBJECTS FOR ALL FIVE INDUCED PREFERENCES--SECOND EXPERIMENT

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-\beta n_i})/(1-e^{-\beta 50})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{\beta n_i})/(-1+e^{\beta 50})$		C. Risk Neutral Induced Preferences $f(n_i) = n_i^\beta$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)= (n_i/50)^\beta$		E. Constant Relative Risk Preferences $f(n_i)= (n_i/50)^\beta$	
	PROBIT	LOGIT	PROBIT	LOGIT	PROBIT	LOGIT	PROBIT	LOGIT	PROBIT	LOGIT
α	-1.072* (0.258)	-1.734* (0.425)	1.566* (0.145)	2.578* (0.734)	1.204* (0.198)	1.947 (0.326)	1.554* (0.206)	2.519* (0.342)	1.292* (0.184)	2.207* (0.321)
β	0.074* (0.011)	0.075* (0.011)	0.039* (0.002)	0.039* (0.007)	0.894* (0.064)	0.894* (0.064)	0.646* (0.069)	0.648* (0.068)	1.281* (0.072)	1.272* (0.069)
log-likelihood	-659.03	-659.60	-680.87	-685.85	-742.12	-742.09	-733.15	-733.11	-738.96	-700.62
N	1155	1155	1100	1100	1100	1100	1100	1100	1155	1155

*Estimates significantly different from zero at the 5% test level.

**Estimates significantly different from zero at the 10% test level.

TABLE 25 PARAMETER ESTIMATES OF INDUCED PREFERENCES (PROBIT MODEL)--SECOND EXPERIMENT

A. Subjects Knew How to Calculate Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-\beta n_i})/(1-e^{-\beta 50})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{\beta n_i})/(-1+e^{\beta 50})$		C. Risk Neutral Induced Preferences $f(n_i) = (n_i/50)^{\beta}$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^{\beta}$		E. Constant Relative Risk Preferring Preferences $f(n_i)=(n_i/50)^{\beta}$	
	(1)	(2)[a]	(3)	(4)[a]	(5)	(6)[a]	(7)	(8)[a]	(9)	(10)[a]
α	-2.060* (0.476)	5.417* (0.867)	1.692* (0.614)	0.973* (0.295)	-	1.314* (0.408)	-	2.970* (0.365)	-	1.758* (0.336)
β	0.063* (0.008)	0.302* (0.087)	0.047* (0.010)	1.900* (0.286)	-	1.051* (0.122)	-	0.708* (0.053)	-	1.345* (0.099)
log-likelihood	-260.71	-295.79	-210.53	-219.62	-	-182.52	-	-234.83	-	-226.09
N	440	440	385	385	-	275	-	385	-	440

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.
a) Estimated with a constant relative function $f(n_i) = (n_i/50)^{\beta}$.

TABLE 25 PARAMETER ESTIMATES OF INDUCED PREFERENCES (PROBIT MODEL)--SECOND EXPERIMENT

B. Subjects Did Not Know How to Calculate Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-\beta n_i})/(1-e^{-\beta 50})$		B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{\beta n_i})/(-1+e^{\beta 50})$		C. Risk Neutral Induced Preferences $f(n_i) = (n_i/50)^\beta$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^\beta$		E. Constant Relative Risk Preferring Preferences $f(n_i)=(n_i/50)^\beta$	
	(1)	(2)[a]	(3)	(4)[a]	(5)	(6)[a]	(7)	(8)[a]	(9)	(10)[a]
α	-0.619* (0.303)	3.600 (4.030)	1.142* (0.517)	0.820* (0.208)	-	1.187* (0.227)	-	0.961* (0.255)	-	1.155* (0.233)
β	0.085* (0.027)	0.186* (0.023)	0.041* (0.012)	1.534* (0.171)	-	0.829* (0.078)	-	0.549* (0.171)	-	1.223* (0.095)
log-likelihood	-380.07	-377.23	-460.67	-454.30	-	-557.92	-	-488.17	-	-469.90
N	660	660	715	715	-	825	-	715	-	660

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.
a) Estimated with a constant relative function $f(n_i) = (n_i/50)^\beta$.

TABLE 26 TEST OF SENSITIVITY OF THE FUNCTIONAL FORM WITH THE SET OF 21 LOTTERIES WITH ABSOLUTE AND RELATIVE INCREASE IN POINTS--SECOND EXPERIMENT

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i) = (1-e^{-\beta n_i})/(1-e^{-\beta 50})$				B. Constant Absolute Risk Preferring Induced Preferences $f(n_i) = (-1+e^{\beta n_i})/(-1+e^{\beta 50})$				C. Risk Neutral Induced Preferences $f(n_i)=(n_i/50)^\beta$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^\beta$		E. Constant Relative Risk Preferring Preferences $f(n_i)=(n_i/50)^\beta$	
	1[a]	1[b]	1[c]	1[d]	2[a]	2[b]	2[c]	2[d]	3[a]	3[b]	4[a]	4[b]	5[a]	5[b]
α	-0.473 (0.482)	-0.567 (0.561)	3.472 (2.777)	3.941 (5.756)	1.159 (0.909)	1.159 (1.107)	0.712 (0.500)	1.204** (0.615)	1.002 (0.557)	2.015* (0.631)	1.851* (0.559)	1.481* (0.592)	0.722 (0.474)	0.778 (0.544)
β	0.109 (0.072)	0.088 (0.056)	0.238 (0.286)	0.174 (0.343)	-0.057* (0.027)	-0.049 (0.029)	2.046* (0.764)	1.476* (0.311)	1.025* (0.187)	0.931 (0.074)	0.665* (0.127)	0.686* (0.126)	1.699* (0.529)	1.551* (0.482)
log likelihood	189.89	-187.91	-193.10	-190.86	-169.04	-170.03	-171.85	-171.12	-191.18	-187.11	-188.64	-190.78	-191.17	-190.38
N	294	294	294	294	294	294	294	294	294	294	294	294	294	294

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.

a) Sample of lotteries with an absolute increase in points Δ as compared to the base lottery, i.e. $\{(n_1+\Delta)[f(n_1+\Delta)]\ P_1\ ;\ (n_2+\Delta)[f(n_2+\Delta)]\ (1-P_1)\}$.

b) Sample of lotteries with a relative increase in points Δ as compared to the base lottery, i.e. $\{(n_1 * \Delta)[f(n_1 * \Delta)]\ P_1\ ;\ (n_2 * \Delta)[f(n_2 * \Delta)]\ (1-P_1)\}$.

c) Sample of lotteries with an absolute increase in points Δ estimated with constant relative risk function.

d) Sample of lotteries with a relative increase in points Δ estimated with constant relative risk function.

TABLE 27 TEST OF SENSITIVITY OF THE FUNCTIONAL FORM WITH 21 LOTTERIES WITH ABSOLUTE AND RELATIVE INCREASE IN POINTS--SECOND EXPERIMENT

A. *Subjects Knew How to Calculate the Expected Probability*

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i) = (1-e^{\beta n_i})/(1-e^{\beta 50})$				B. Constant Absolute Risk Preferring Induced Preferences $f(n_i) = (-1+e^{\beta n_i})/(-1+e^{\beta 50})$				C. Risk Neutral Induced Preferences $f(n_i)=(n_i/50)^\beta$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^\beta$		E. Constant Relative Risk Preferring Preferences $f(n_i)=(n_i/50)^\beta$	
	1^a	1^b	1^c	1^d	2^a	2^b	2^c	2^d	3^a	3^b	4^a	4^b	5^a	5^b
α	-1.160 (0.944)	- 2.503* (1.279)	2.956* (0.837)	3.395* (0.821)	1.160 (1.157)	1.159 (1.446)	0.844 (0.845)	0.193 (0.770)	0.889 (1.077)	1.801 (1.198)	3.514* (0.958)	3.084* (0.948)	0.686 (0.893)	1.769 (1.447)
β	0.078* (0.038)	0.049* (0.015)	0.450* (0.221)	0.565* (0.119)	0.072* (0.024)	0.062 (0.047)	2.314 (1.305)	5.939 (20.130)	1.264* (0.549)	1.192* (0.257)	0.698* (0.098)	0.725* (0.092)	2.581 (2.006)	1.307* (0.366)
log likelihood	-83.46	-77.54	-90.54	-87.37	-51.09	-52.17	-53.05	-53.99	-47.16	-43.97	-61.81	-63.51	-54.45	-58.74
N	189	189	189	189	147	147	147	147	84	84	126	126	168	168

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.

a) Sample of lotteries with an absolute increase in points Δ as compared to the base lottery, i.e. $\{(n_1 + \Delta)[f(n_1 + \Delta)]\ P_1\ ;\ (n_2 + \Delta)[f(n_2 + \Delta)]\ (1-P_1)\}$.

b) Sample of lotteries with a relative increase in points Δ as compared to the base lottery, i.e. $\{(n_1 * \Delta)[f(n_1 * \Delta)]\ P_1\ ;\ (n_2 * \Delta)[f(n_2 * \Delta)]\ (1-P_1)\}$.

c) Sample of lotteries with an absolute increase in points Δ estimated with constant relative risk function.

d) Sample of lotteries with a relative increase in points Δ estimated with constant relative risk function.

TABLE 27 TEST OF SENSITIVITY OF FUNCTIONAL FORM WITH THE SET OF 21 LOTTERIES WITH ABSOLUTE AND RELATIVE INCREASE IN POINTS--SECOND EXPERIMENT

B. Subjects Did Not Know How to Calculate the Expected Probability

(Values in parenthesis are standard errors)

Coefficient	A. Constant Absolute Risk Averse Induced Preferences $f(n_i)=(1-e^{-\beta n_i})/(1-e^{-\beta 50})$				B. Constant Absolute Risk Preferring Induced Preferences $f(n_i)=(-1+e^{\beta n_i})/(-1+e^{\beta 50})$				C. Risk Neutral Induced Preferences $f(n_i)=(n_i/50)^\beta$		D. Constant Relative Risk Averse Induced Preferences $f(n_i)=(n_i/50)^\beta$		E. Constant Relative Risk Preferring Preferences $f(n_i)=(n_i/50)^\beta$	
	1[a]	1[b]	1[c]	1[d]	2[a]	2[b]	2[c]	2[d]	3[a]	3[b]	4[a]	4[b]	5[a]	5[b]
α	-0.061 (0.447)	-0.086 (0.503)	9.724 (89.210)	3.276 (1.629)	1.159 (1.352)	0.062 (0.414)	0.713 (0.632)	1.461** (0.774)	1.067 (0.652)	2.157* (0.738)	1.085 (0.687)	0.709 (0.711)	0.800 (0.584)	0.478 (0.615)
β	0.382 (2.548)	0.223 (1.091)	0.061 (0.609)	0.014 (0.072)	-0.049 (0.035)	0.303 (1.796)	1.800* (0.779)	1.278* (0.243)	0.944* (0.195)	0.847* (0.078)	0.620* (0.304)	0.602 (0.425)	1.321* (0.384)	1.748 (1.119)
log likelihood	103.72	-106.74	-103.27	-101.71	-115.69	-123.12	-114.76	-114.84	-143.66	-140.87	-124.90	-125.58	-132.08	-130.15
N	231	231	231	231	273	273	273	273	336	336	294	294	252	252

*Estimates significantly different from zero at the 5% test level.
**Estimates significantly different from zero at the 10% test level.

a) Sample of lotteries with an absolute increase in points Δ as compared to the base lottery, i.e. $\{(n_1+\Delta)[f(n_1+\Delta)]\ P_1\ ;\ (n_2+\Delta)[f(n_2+\Delta)]\ (1-P_1)\}$.

b) Sample of lotteries with a relative increase in points Δ as compared to the base lottery, i.e. $\{(n_1{*}\Delta)[f(n_1{*}\Delta)]\ P_1\ ;\ (n_2{*}\Delta)[f(n_2{*}\Delta)]\ (1-P_1)\}$.

c) Sample of lotteries with an absolute increase in points Δ estimated with constant relative risk function.

d) Sample of lotteries with a relative increase in points Δ estimated with constant relative risk function.

APPENDIX C

LIST OF FIGURES

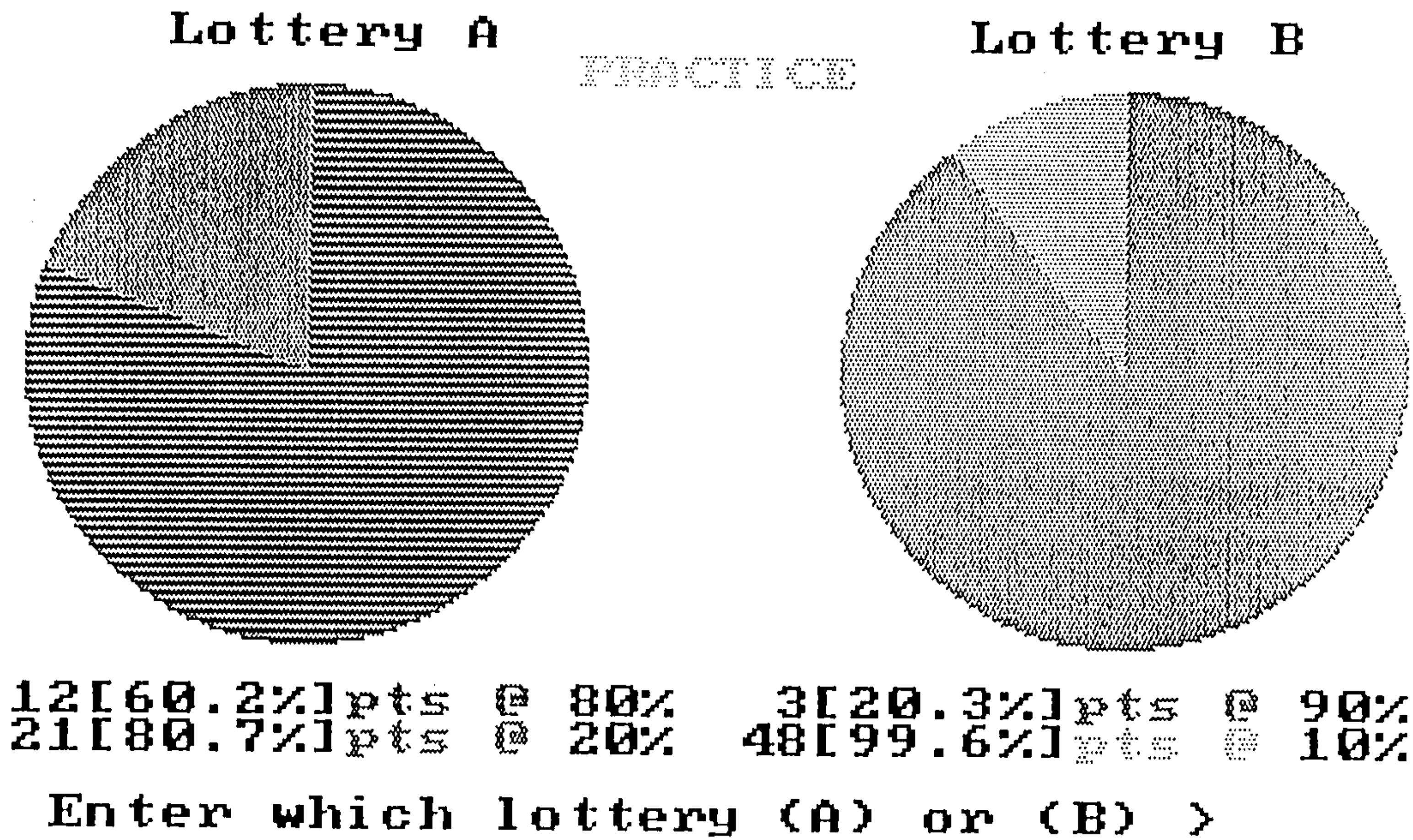

FIGURE 1 A COMPUTER DISPLAY OF A PAIR OF BINARY LOTTERIES AS PRESENTED TO SUBJECTS IN THE ABSOLUTE RISK AVERSE CONDITION

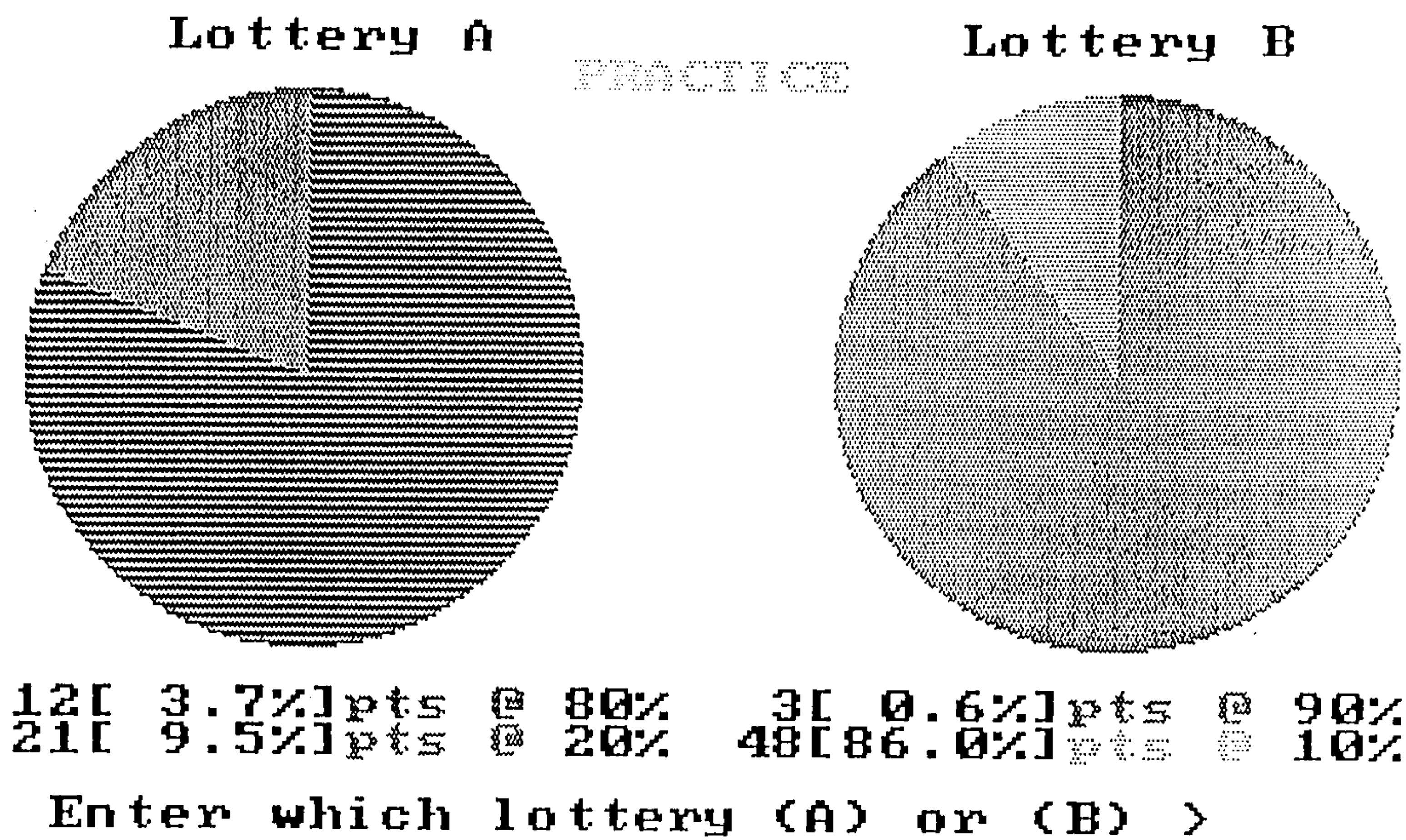

FIGURE 1 B COMPUTER DISPLAY OF A PAIR OF BINARY LOTTERIES AS PRESENTED TO SUBJECTS IN THE ABSOLUTE RISK PREFERRING CONDITION

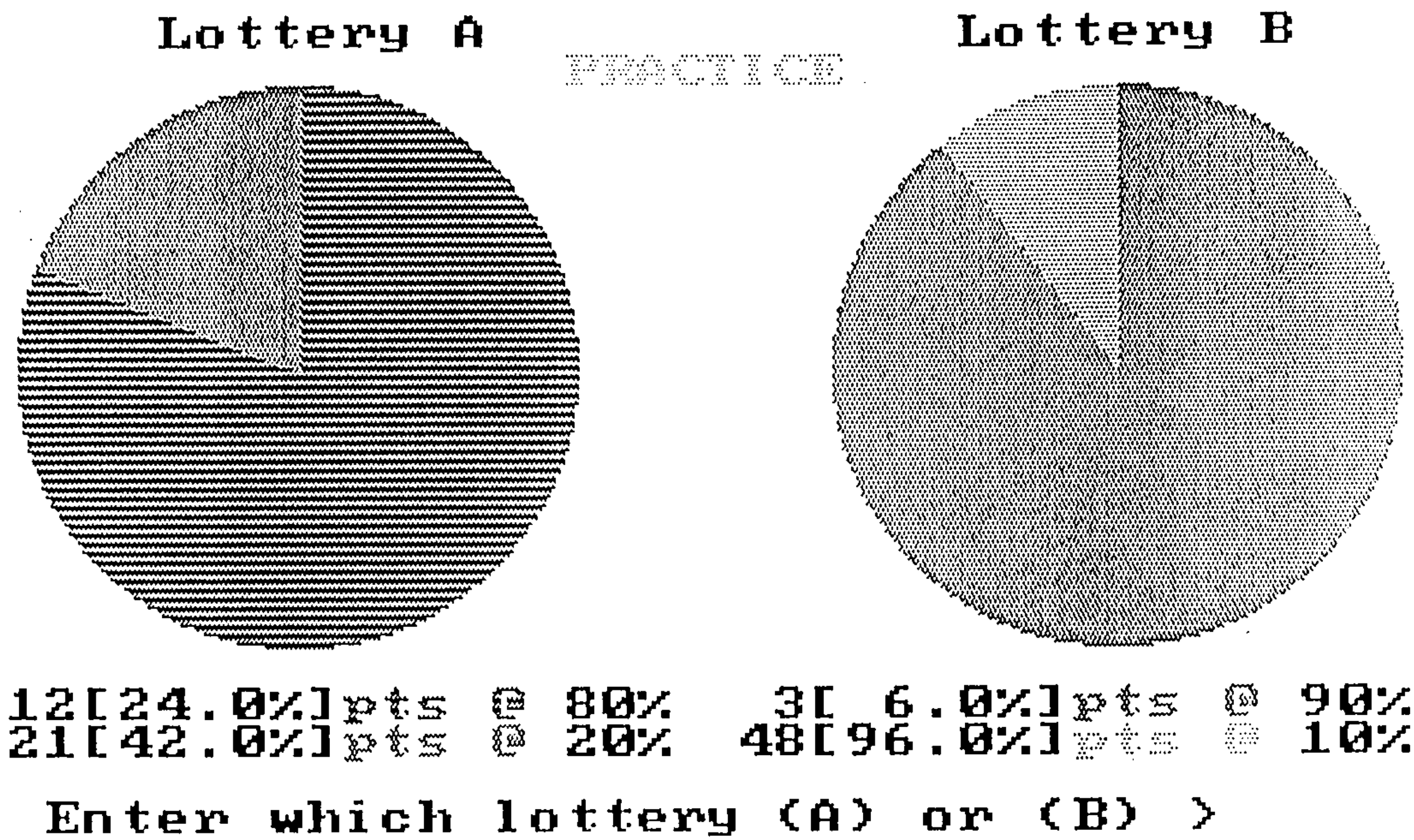

FIGURE 1 C COMPUTER DISPLAY OF A PAIR OF BINARY LOTTERIES AS PRESENTED TO SUBJECTS IN THE RISK NEUTRAL CONDITION

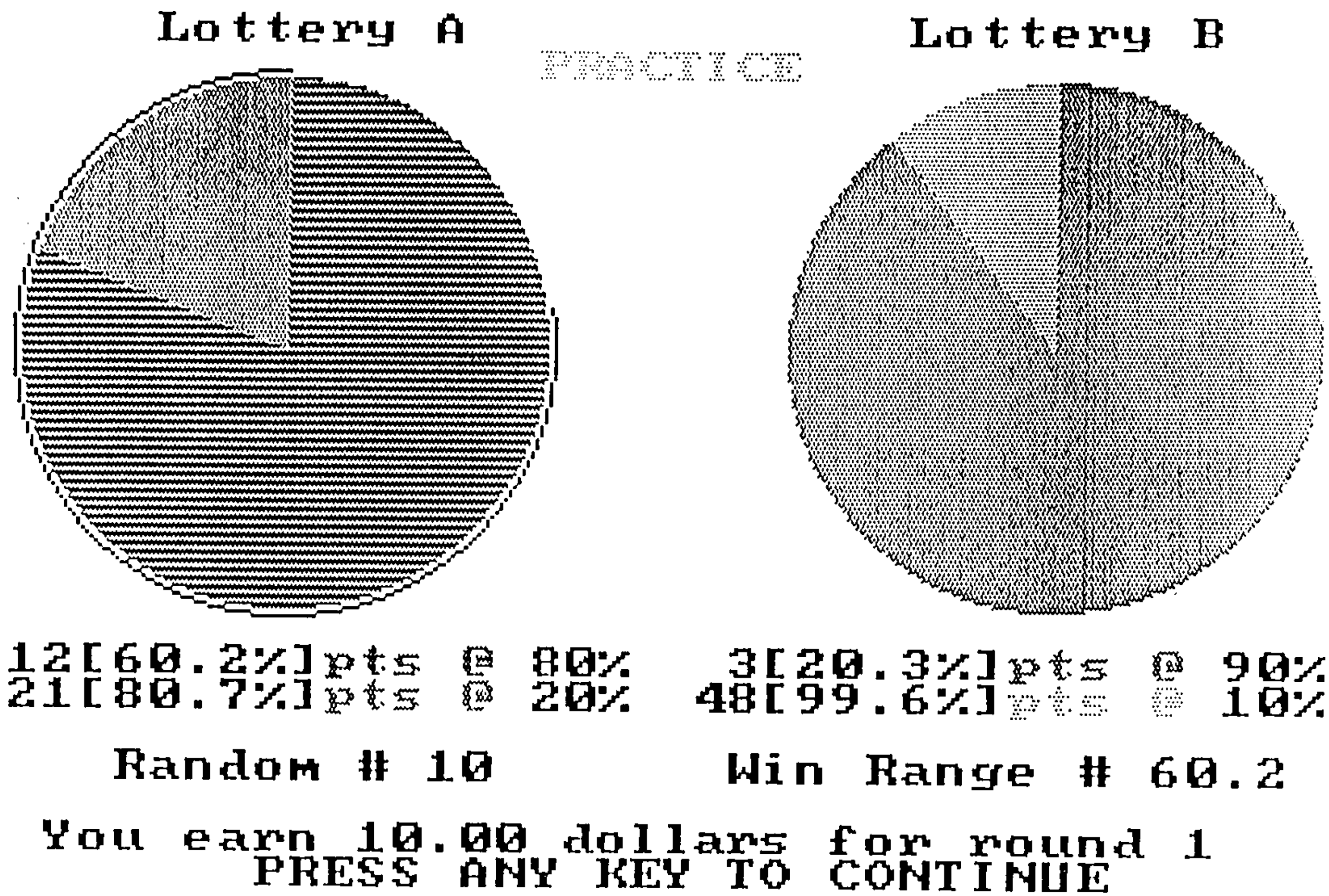

FIGURE 2 A COMPUTER DISPLAY OF A PAIR OF BINARY LOTTERIES AS PRESENTED TO SUBJECTS IN THE ABSOLUTE RISK AVERSE CONDITION AFTER THE CHOICE SELECTION

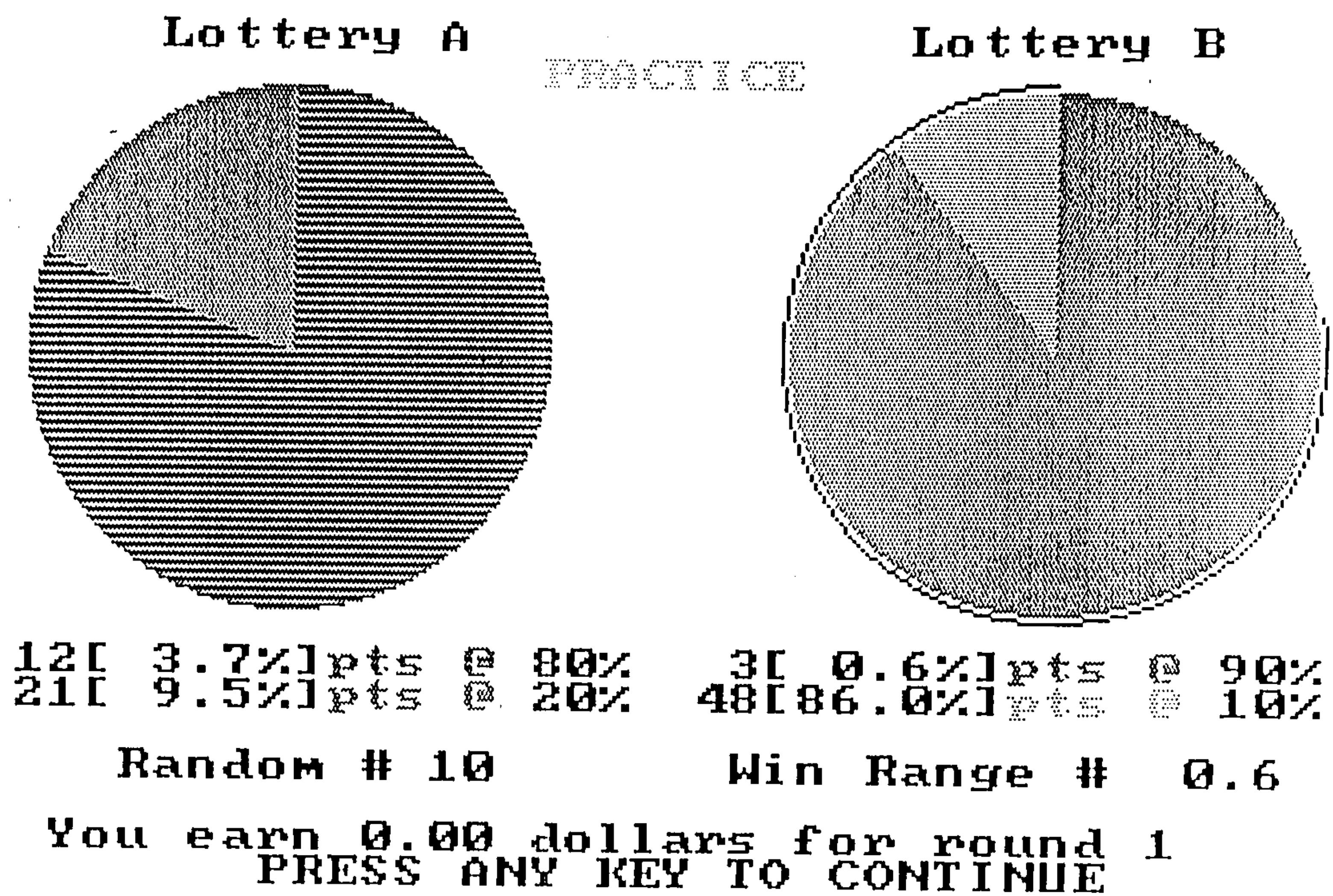

FIGURE 2 B COMPUTER DISPLAY OF A PAIR OF BINARY LOTTERIES AS PRESENTED TO SUBJECTS IN THE ABSOLUTE RISK PREFERRING CONDITION AFTER THE CHOICE SELECTION

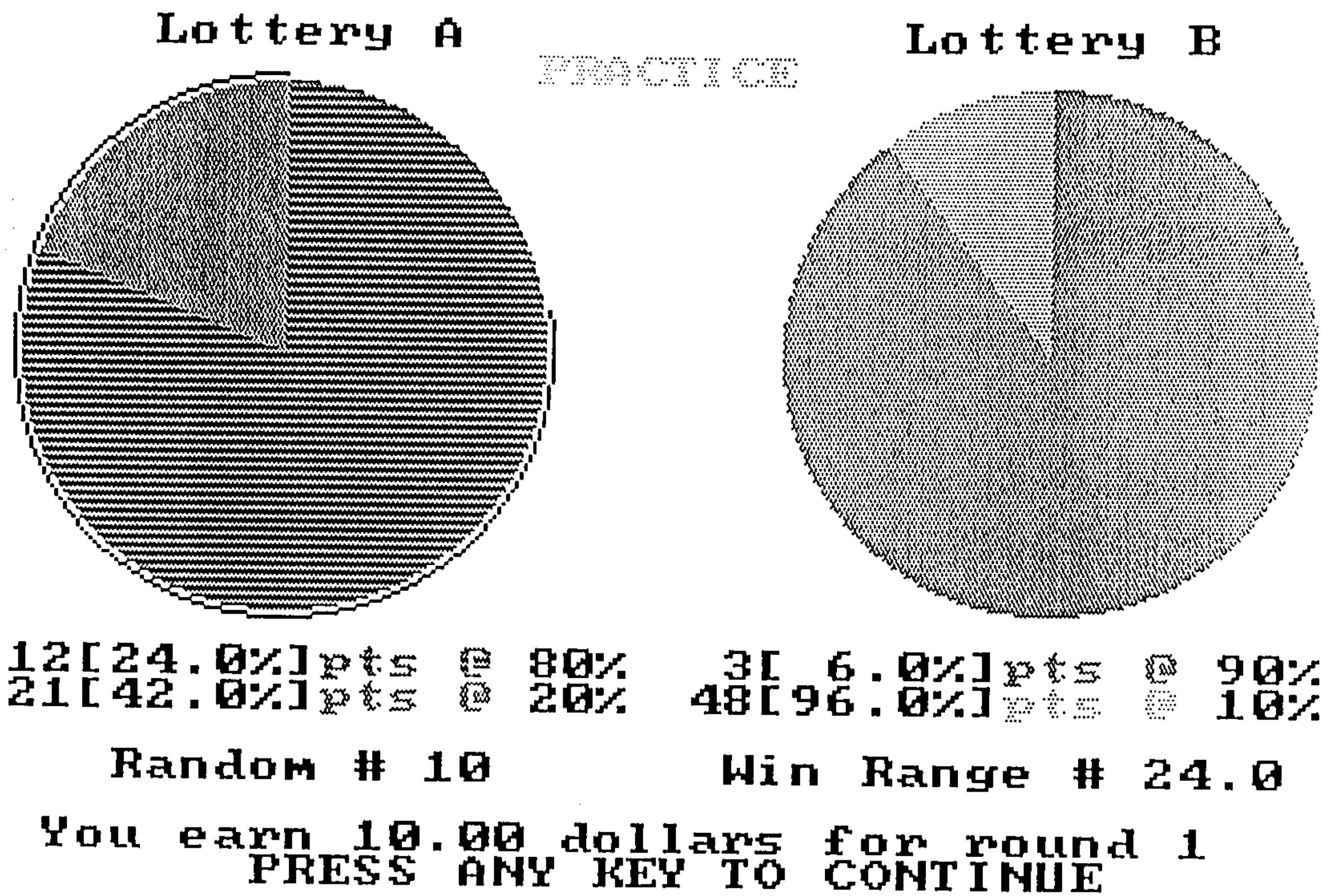

FIGURE 2 C COMPUTER DISPLAY OF A PAIR OF BINARY LOTTERIES AS PRESENTED TO SUBJECTS IN THE RISK NEUTRAL CONDITION AFTER THE CHOICE SELECTION

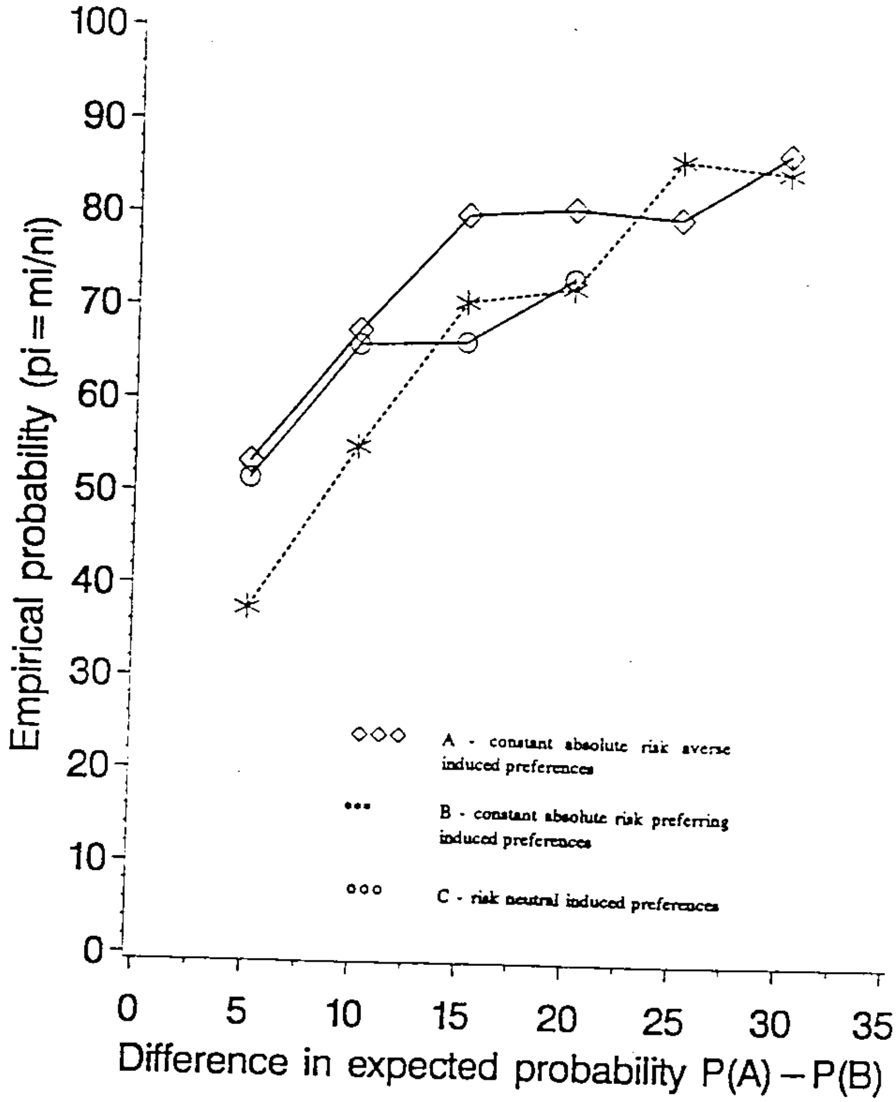

FIGURE 3 EMPIRICAL PROBABILITIES ($P_i=m_i/n_i$) FOR EACH CORRESPONDING DIFFERENCE IN EXPECTED PROBABILITY – FIRST EXPERIMENT

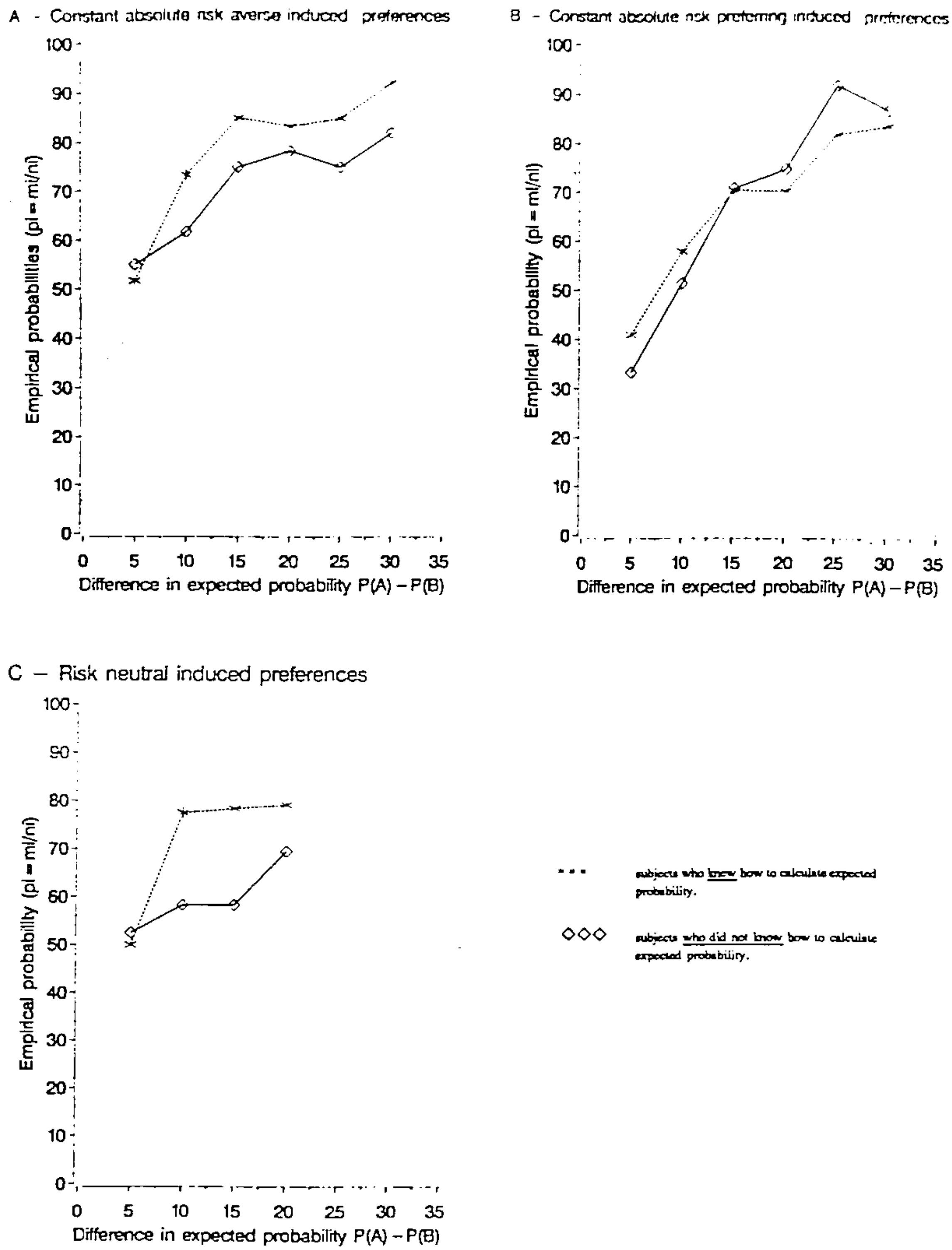

FIGURE 4 EMPIRICAL PROBABILITIES ($P_i=m_i/n_i$) FOR EACH CORRESPONDING DIFFERENCE IN EXPECTED PROBABILITY FOR SUBJECTS WHO KNEW AND SUBJECTS WHO DID NOT KNOW HOW TO CALCULATE THE EXPECTED PROBABILITY-- FIRST EXPERIMENT

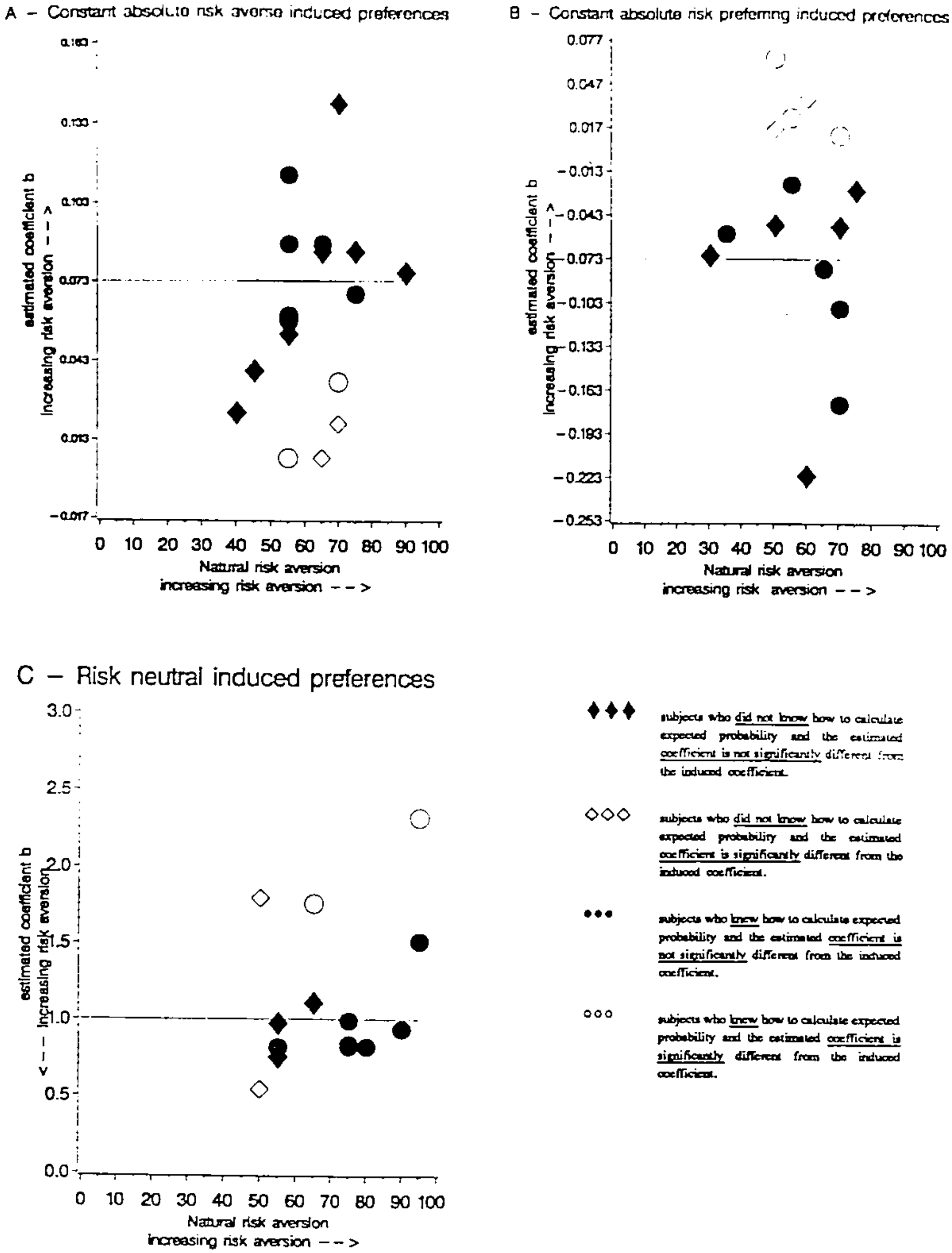

FIGURE 5 THE RELATIONSHIP BETWEEN THE ESTIMATED COEFFICIENT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION FOR MONEY (p_i)--FIRST EXPERIMENT

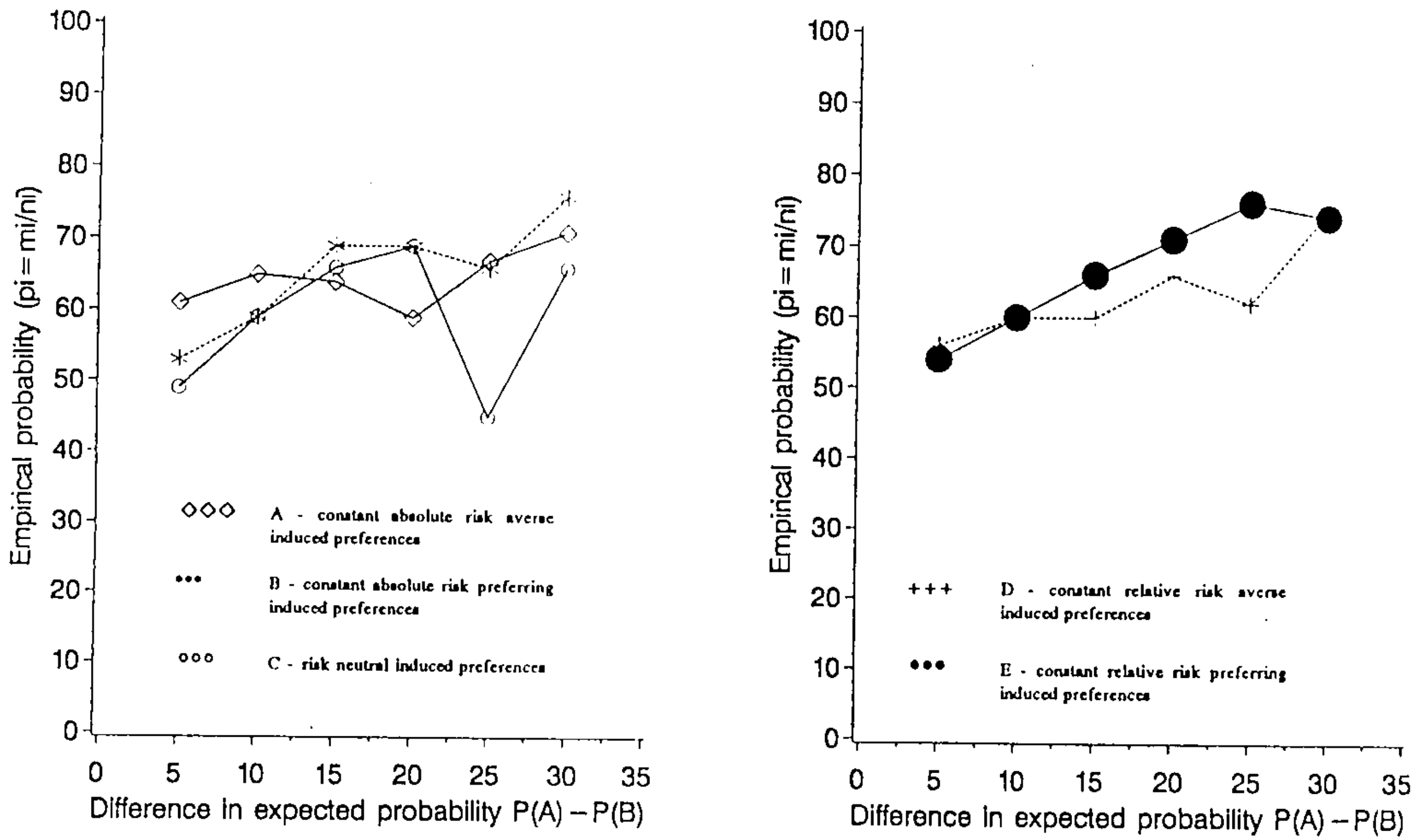

FIGURE 6 EMPIRICAL PROBABILITIES ($P_i=m_i/n_i$) FOR EACH CORRESPONDING DIFFERENCE IN EXPECTED PROBABILITY -- SECOND EXPERIMENT

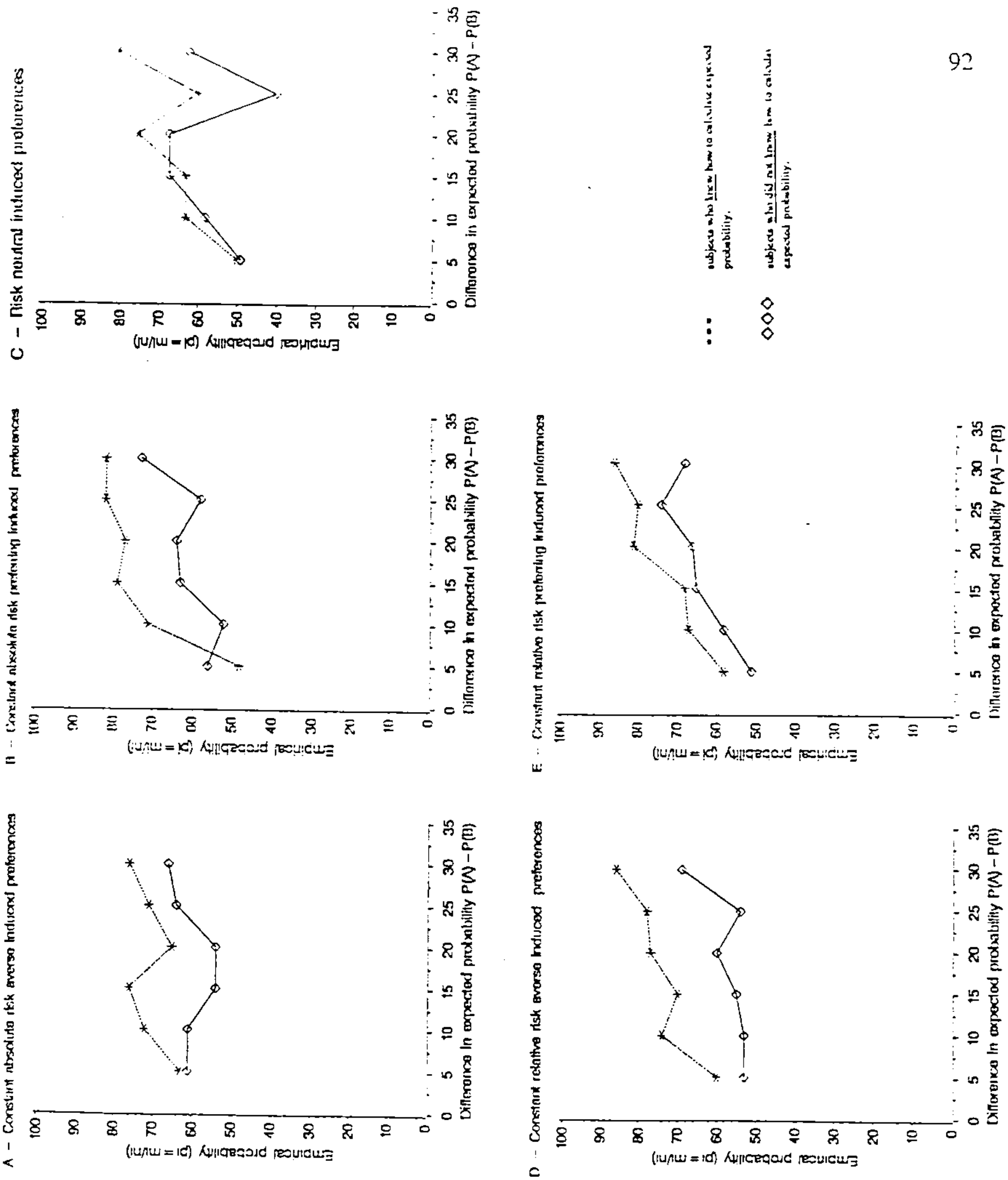

FIGURE 7 EMPIRICAL PROBABILITIES ($P_i = m_i/n_i$) FOR EACH CORRESPONDING DIFFERENCE IN EXPECTED PROBABILITY FOR SUBJECTS WHO KNEW AND SUBJECTS WHO DID NOT KNOW HOW TO CALCULATE THE EXPECTED PROBABILITY-- SECOND EXPERIMENT

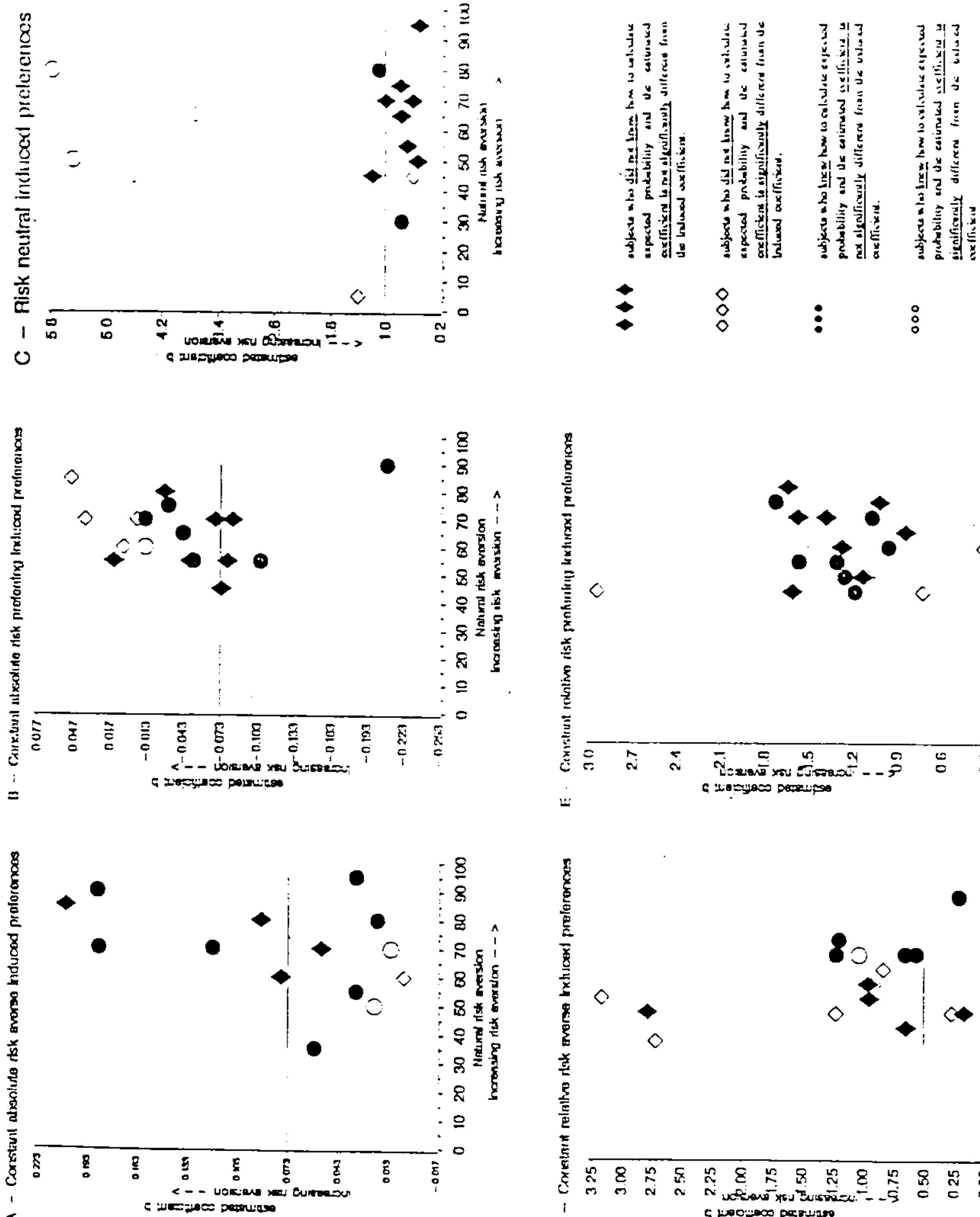

FIGURE 8 THE RELATIONSHIP BETWEEN THE ESTIMATED COEFFICIENT OF INDUCED PREFERENCES AND NATURAL RISK AVERSION FOR MONEY (p_i)--SECOND EXPERIMENT

APPENDIX D

THE SET OF INSTRUCTIONS AND QUESTIONNAIRES FOR ALL FIVE INDUCED PREFERENCES[1]

[1] The instructions are available upon request from the author

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