Appendix A: Supplementary Experimental Results

We classified the participants into two groups: "L" and "Not L", according to a variation of Definition 1[1] based on 17 out of the 18 problems in Part A. Figure S1 presents the likelihood of choosing a left-biased rule in the omitted problem for each of these two groups (for each omitted problem). Figure S2 replicates this exercise for Part B.

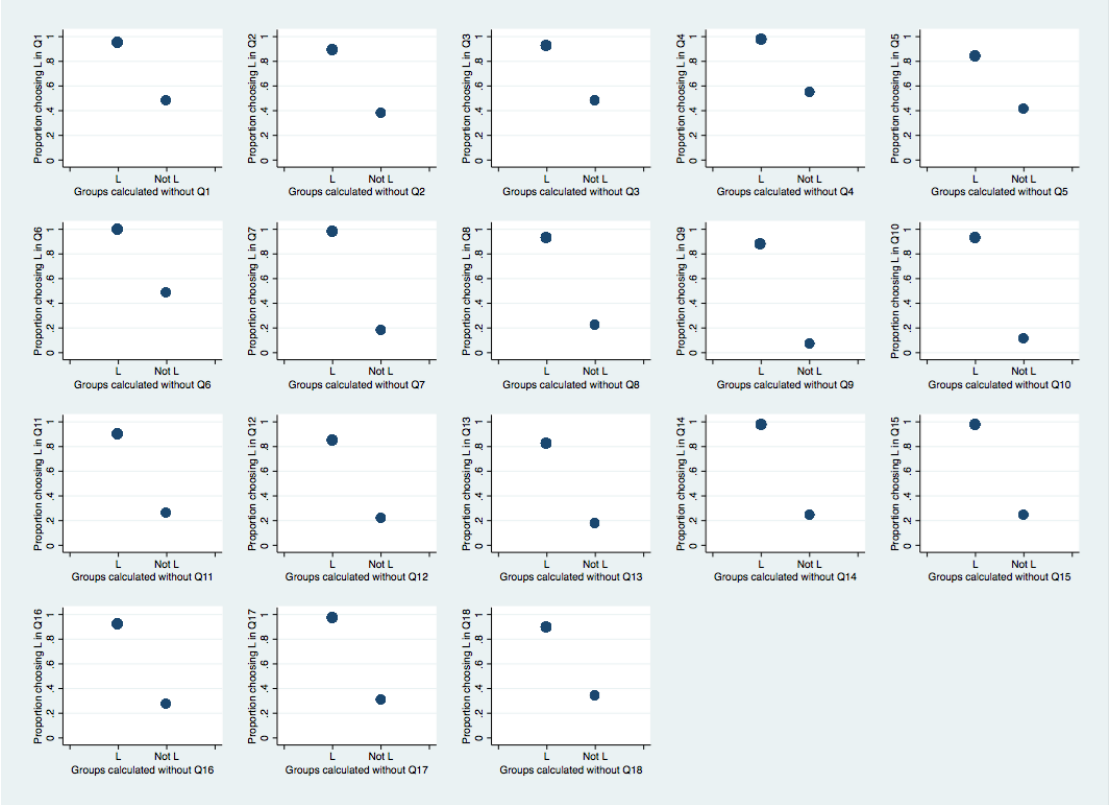

Figure S1. Definition 1 – number of left-biased choices, Part A.

[1]We omitted one of the 18 problems and partitioned the participants according to their choices in the remaining 17: participants who chose at least 12 left-biased rules were categorized as "L" and those who chose at most 11 were classified as "Not L".

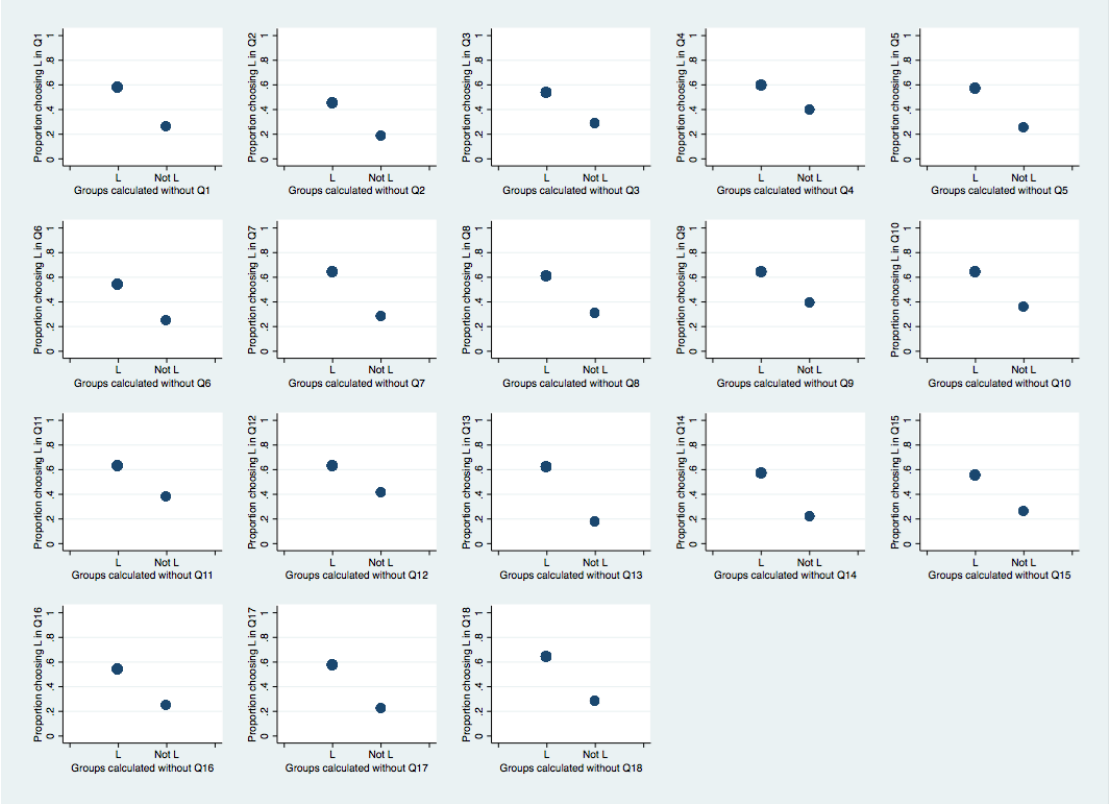

Figure S2. Definition 1 - number of left-biased choices, Part B.

Figure S3 is based on a variation of Definition 2. We omitted one of the problems in Part A and partitioned the participants into three groups according to the sum of their answers in the remaining 17 problems: participants who accumulated 17-37 points were classified as L, participants who accumulated 18-64 were classified as Other, and participants who accumulated 65-85 points were classified as R. Figure S3 illustrates the average answer in the omitted problem for each of these groups. Figure S4 repeats the exercise for Part B.

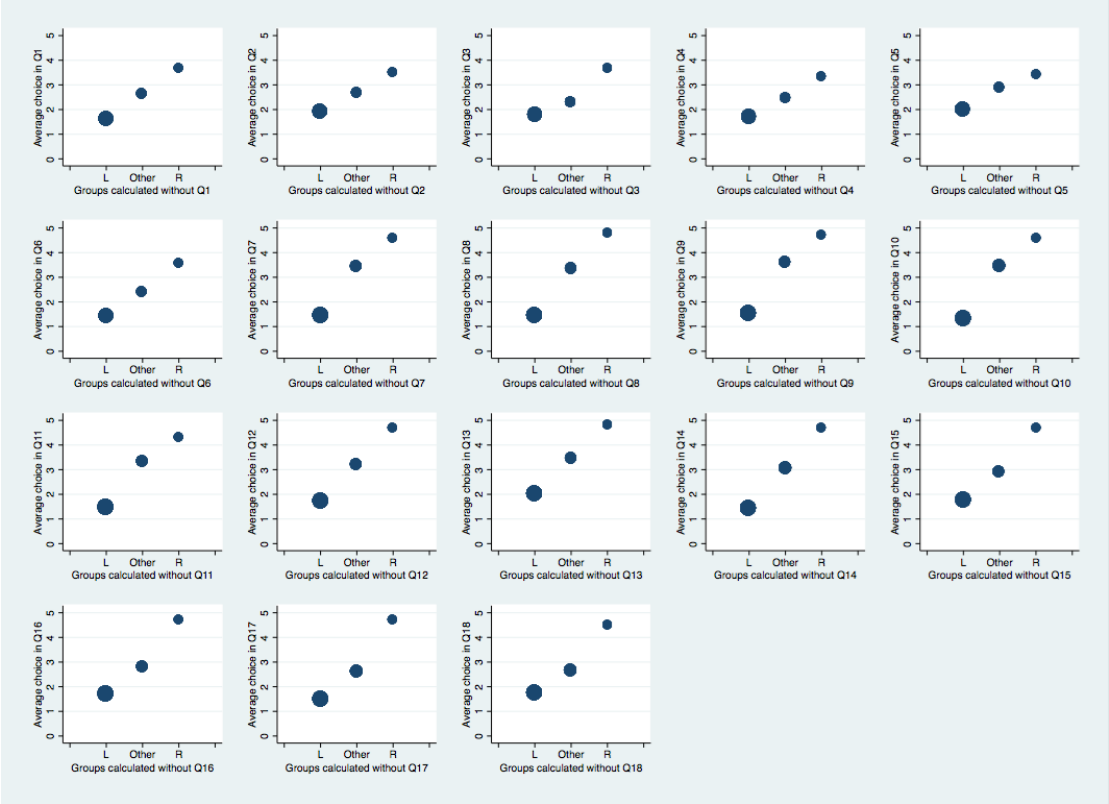

Figure S3. Definition 2 – total score, Part A.

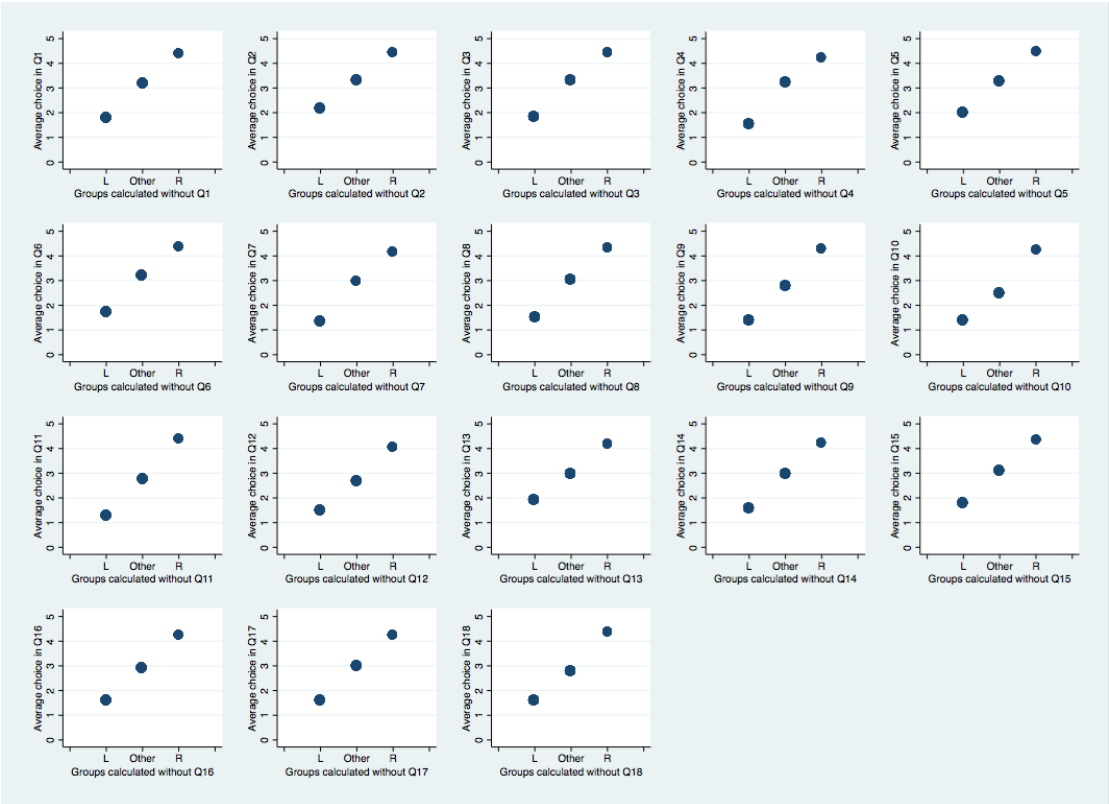

Figure S4. Definition 2 – total score, Part B

An alternative definition of types: L* and R*

A different definition of types L* and R* can be based on the alternative assumption that the probability of randomly choosing a stopping-rule (left-biased, right-biased or neutral) corresponds to the population's empirical frequency of choosing it. Thus, using the frequencies described in Table 1 for Treatment 1, a random choice in Part A would result in 17-18 left-biased choices with $p<0.01$ and to 10-18 right-biased choices with a similar probability. Therefore, in Part A, L* (R*) is a participant who chose left-biased (right-biased) rules 17-18 (10-18) times. In part B, a random choice is defined according to the observed frequencies and hence a participant who chose left-biased (right-biased) rules 14-18 (12-18) times is defined as L* (R*). We find that in Part A of Treatment 1, 39% of participants are L* and 19% are R*, whereas in Part B, 34% of participants are L* and 27% are R*. Note that this definition entails a very different interpretation from those we used in that it identifies participants whose tendency to choose left- or right-biased rules is extreme relative to the experiment population.

A detailed comparison between T_0 and T_p

Table S1 indicates that at the aggregate level the sum of answers (where answer i corresponds to a score of i in each problem) in Problems 1-6 (fixed loss) of Part A and Problems 7-12 (fixed gain) of Part B is smaller in T_p than in T_0, whereas the sum of answers in Problems 1-6 (fixed loss) of Part B is larger in T_p. There are no significant differences between the treatments in the number of left-biased or right-biased choices, suggesting that the main difference between the treatments is the tendency to choose more extreme stopping rules in T_p (i.e., Answers 1 and 5 are more common than Answers 2 and 4) which was documented in Section 5.

	Part A			**Part B**		
	Mean Difference	*t(112)*	*p*	*Mean Difference*	*t(112)*	*p*
sum 1-6	3.03	2.62	0.01	-3.43	-2.26	0.03
sum 7-12	-1.79	-1.08	0.28	3.19	2.02	0.05
sum 13-18	-0.71	-0.46	0.64	0.60	0.45	0.66
Total score	0.53	0.14	0.89	0.36	0.09	0.93
# of L choices	0.81	0.67	0.50	-0.45	-0.33	0.74

Table S1: The mean difference according to various measures between the two treatments (T_0-T_p).

Classification into types in T_p

Table S2 describes the proportions of types in parts A and B in T_p relative to T_0. Since in T_0 the proportion of L-types is much higher than that of R-types, there is a positive correlation between being a particular type in Part A and being the same type in B (Spearman's rho=0.47, p=0.001), and L (R) types are more (less) common in Part A than in Part B (p=0.039 in both parts, McNemar test).[2]

		Types in Part A		**Types in Part B**	
		L	*R*	*L*	*R*
T_0 N=67	*Number of choices*	57% (38)	13% (9)	39% (26)	24% (16)
	Total score	57% (38)	15% (10)	37%(25)	25% (17)
	Corrected	55% (37)	10% (7)	36% (24)	24% (16)
T_p N=47	*Number of choices*	45% (21)	2% (1)	28% (13)	17% (8)
	Total score	47% (22)	9% (4)	28% (13)	19% (9)
	Corrected	49% (20)	0% (0)	23% (11)	11% (5)

Table S2: The proportions of types in Parts A and B in T_p and T_0.

The table suggests that the proportions of both L types and R types are lower in T_p, though most of the differences are not statistically significant. When we consider the two parts together, there are 22 (47%) L types and 11 (23%) R types in T_p, which is slightly higher than the respective figures in T_0 .

[2] The tests reported here are for the "number of choices" definition. Similar results are obtained for the others.

Explaining the behavior in T_p using a single theory

In the body of the text, we classified the participants in T_0 into types according to several theories of decision-making under risk. We now classify the 47 participants in T_p into types according to the same procedures. Recall that, according to Definition 1, we classified 22/21/33 of the participants in Part A/Part B/both, respectively as R or L types. Among the other theories, the best match was obtained by loss aversion (with diminishing returns). We were able to classify 12/23/30 participants as loss averse in Part A/Part B/both, respectively. The second-best match was obtained by expected utility theory (with log-utility and an endowment of w=55 which reflects a mental accounting procedure): in Part A/Part B/both, we were able to classify 12/18/20 respectively of the participants as types.

To further examine the fit of our participants' behavior to loss aversion, we removed participants from this classification whose behavior is better explained by our procedure. Similarly, we removed participants from the classification performed using our procedure whose behavior is better explained by loss aversion. After the correction, we are able to characterize 21/21/28 of the participants in Part A/Part B/both respectively as L or R types and 11/11/10 of the participants in Part A/Part B/both respectively as loss aversion types. Thus, while at first glance it may seem that loss aversion can explain the behavior of many of the participants, a more thorough investigation leads to the conclusion that the behavior in T_p matches our decision procedure significantly better than does loss aversion.

Appendix B: The experiment's instructions and questionnaire

Direct translation from Hebrew

The Experiment's Introductory Instructions [which were read out loud]

In this experiment, you will play 57 games one after the other.

For example, in some of the games you will be asked to choose one lottery from among several lotteries in which you would prefer to participate.

At the end of the experiment, the computer will randomly select **one out of the 57 games**. For this game only, you will receive a payment according to the choice you made in that game.

For example, if in the selected game you chose to participate in a particular lottery, at the end of the experiment you will actually participate in that lottery and win a monetary prize according to the lottery's outcome.

Thus, you should seriously consider any decision you make since any of the 57 games could be the one that determines the amount of money you will receive at the end of the experiment.

Recall that each participant received 55 shekels for participating in the experiment. In the following games, you could win additional amounts or lose part of that amount. Nevertheless, it is guaranteed that at the end of the experiment, each participant will have at least 25 shekels (out of the original 55 shekels).

The experiment consists of 4 parts and you will receive instructions at the beginning of each.

Instructions for Part A

In Part A, you will be presented with a "red or black" lottery (like roulette) of the following type:

A participant has a probability of 18/37 (0.486) to win 1 shekel and a probability of 19/37 (0.514) to lose 1 shekel.

Each time you participate in a lottery, the computer will implement it (that is, will pick a color for you and will spin a virtual roulette wheel) that determines the outcome – whether you win or lose 1 shekel.

You can participate in this lottery over and over again, but you will be asked to decide in advance when you would like to stop betting.

A "stopping rule" defines the accumulated gain or loss at which you wish to stop betting.

For illustration, if you choose the following stopping rule:

loss	gain
-3	+2

the computer will implement the lottery for you over and over again until you accumulate a gain of 2 shekels or a loss of 3 shekels.

Following are a number of possible scenarios:

- If you win the lottery twice in a row, the game will end with a gain of 2 shekels.
- If you lose the lottery 3 times in a row, the game will end at a loss of 3 shekels.
- If you win the lottery once, then lose twice, and then win 3 times, the game will end with a gain of 2 shekels. [This scenario was demonstrated using a graph on the blackboard.]
- If you lose twice, then win once, and then lose twice, the game will end with a loss of 3 shekels.
- There are of course other possible scenarios

Any questions?

Now enter your ID number on the screen to start the experiment.

Computerized Questionnaire

Part A

Instructions:

In this part, you will be given the opportunity to participate over and over again in the following roulette lottery:

- You win 1 shekel with a probability of 18/37 (0.486)
- You lose 1 shekel with a probability of 19/37 (0.514)

In each of the following 18 games, you are required to choose a "stopping rule", i.e. to define when you wish to stop gambling (in the case that the game is selected to determine your payment in the experiment). You will not be able to change your decision during the course of play.

[Only in T_P: "To make your choice easier, the chances of finishing the game with a gain or a loss will be presented next to each stopping rule."]

Note that there are no right or wrong answers here; each participant may have different preferences regarding the bets.

continue

[The instructions for Part B are identical, except that the probabilities of gain and loss in the baseline lottery are reversed.]

[At the end of Part A, B and D, the participants were asked: "How would you instruct someone who is playing for you in the games you have just played? Try to explain the principles that guided you in your choices."]

The following is the structure of questions in Part A and B in T_0:

[In T_P, there was an additional sentence next to each lottery: "The probability of finishing the game with a gain is *q*% and the probability of finishing with a loss is (1-*q*)%"]

Part A [B] – Game x

Choose your preferred stopping rule from the following five:

a.

loss	gain
-24	+8

b.

loss	gain
-24	+16

c.

loss	gain
-24	+8

d.

loss	gain
-24	+16

e.

loss	gain
-24	+16

Reminder: the probability of winning any single lottery is 18/37 (0.486) [19/37 (0.514) in Part B]

continue

Questions 1-18 in Part A

[In Part A and B, the 5 stopping rules to choose from in each question appeared in one of two orders (consistently throughout the two parts): from a to e or from e to a. The probabilities appearing in the right column are for the reader's convenience. They were not presented to the participants.]

Part A – Question 1

lottery	loss	gain	probability of gain
a	-21	+9	52%
b	-21	+15	35%
c	-21	+21	24%
d	-21	+27	17%
e	-21	+33	12%

Part A – Question 2

lottery	loss	gain	probability of gain
a	-15	+5	64%
b	-15	+10	44%
c	-15	+15	31%
d	-15	+20	22%
e	-15	+25	16%

Part A – Question 3

lottery	loss	gain	probability of gain
a	-24	+8	57%
b	-24	+16	35%
c	-24	+24	21%
d	-24	+32	14%
e	-24	+40	9%

Part A – Question 4

lottery	loss	gain	probability of gain
a	-27	+9	55%
b	-27	+18	32%
c	-27	+27	19%
d	-27	+36	11%
e	-27	+45	7%

Part A – Question 5

lottery	loss	gain	probability of gain
a	-14	+4	69%
b	-14	+9	46%
c	-14	+14	32%
d	-14	+19	23%
e	-14	+24	17%

Part A – Question 6

lottery	loss	gain	probability of gain
a	-20	+12	42%
b	-20	+16	32%
c	-20	+20	25%
d	-20	+24	20%
e	-20	+28	16%

Part A – Question 7

lottery	loss	gain	probability of gain
a	-25	+17	33%
b	-21	+17	31%
c	-17	+17	29%
d	-13	+17	25%
e	-9	+17	20%

Part A – Question 8

lottery	loss	gain	probability of gain
a	-20	+12	42%
b	-16	+12	39%
c	-12	+12	34%
d	-8	+12	28%
e	-4	+12	18%

Part A – Question 9

lottery	loss	gain	probability of gain
a	-25	+15	37%
b	-20	+15	35%
c	-15	+15	31%
d	-10	+15	25%
e	-5	+15	16%

Part A – Question 10

lottery	loss	gain	probability of gain
a	-28	+20	29%
b	-24	+20	27%
c	-20	+20	25%
d	-16	+20	23%
e	-12	+20	20%

Part A – Question 11

lottery	loss	gain	probability of gain
a	-26	+18	31%
b	-22	+18	30%
c	-18	+18	27%
d	-14	+18	24%
e	-10	+18	20%

Part A – Question 12

lottery	loss	gain	probability of gain
a	-22	+14	38%
b	-18	+14	35%
c	-14	+14	32%
d	-10	+14	27%
e	-6	+14	20%

Part A – Question 13

lottery	loss	gain	probability of gain
a	-25	+5	70%
b	-20	+10	48%
c	-15	+15	31%
d	-10	+20	18%
e	-5	+25	8%

Part A – Question 14

lottery	loss	gain	probability of gain
a	-27	+15	38%
b	-24	+18	31%
c	-21	+21	24%
d	-18	+24	19%
e	-15	+27	14%

Part A – Question 15

lottery	loss	gain	probability of gain
a	-24	+8	57%
b	-20	+12	42%
c	-16	+16	30%
d	-12	+20	20%
e	-8	+24	12%

Part A – Question 16

lottery	loss	gain	probability of gain
a	-26	+10	51%
b	-22	+14	38%
c	-18	+18	27%
d	-14	+22	19%
e	-10	+26	12%

Part A – Question 17

lottery	loss	gain	probability of gain
a	-21	+9	52%
b	-18	+12	41%
c	-15	+15	31%
d	-12	+18	22%
e	-9	+21	15%

Part A – Question 18

lottery	loss	gain	probability of gain
a	-25	+9	54%
b	-21	+13	40%
c	-17	+17	29%
d	-13	+21	19%
e	-9	+25	12%

Questions 1-18 in Part B

Part B – Question 1

lottery	loss	gain	probability of gain
a	-19	+9	82%
b	-19	+14	77%
c	-19	+19	74%
d	-19	+24	71%
e	-19	+29	69%

Part B – Question 2

lottery	loss	gain	probability of gain
a	-14	+6	80%
b	-14	+10	73%
c	-14	+14	68%
d	-14	+18	65%
e	-14	+22	62%

Part B – Question 3

lottery	loss	gain	probability of gain
a	-24	+10	86%
b	-24	+17	82%
c	-24	+24	79%
d	-24	+31	77%
e	-24	+38	75%

Part B – Question 4

lottery	loss	gain	probability of gain
a	-27	+15	86%
b	-27	+21	83%
c	-27	+27	81%
d	-27	+33	80%
e	-27	+39	79%

Part B – Question 5

lottery	loss	gain	probability of gain
a	-20	+8	85%
b	-20	+14	79%
c	-20	+20	75%
d	-20	+26	72%
e	-20	+32	70%

Part B – Question 6

lottery	loss	gain	probability of gain
a	-16	+8	80%
b	-16	+12	74%
c	-16	+16	70%
d	-16	+20	68%
e	-16	+24	65%

Part B – Question 7

lottery	loss	gain	probability of gain
a	-23	+15	82%
b	-19	+15	76%
c	-15	+15	69%
d	-11	+15	59%
e	-7	+15	45%

Part B – Question 8

lottery	loss	gain	probability of gain
a	-27	+21	83%
b	-24	+21	80%
c	-21	+21	76%
d	-18	+21	71%
e	-15	+21	65%

Part B – Question 9

lottery	loss	gain	probability of gain
a	-18	+12	78%
b	-15	+12	72%
c	-12	+12	66%
d	-9	+12	57%
e	-6	+12	45%

Part B – Question 10

lottery	loss	gain	probability of gain
a	-27	+17	85%
b	-22	+17	79%
c	-17	+17	71%
d	-12	+17	60%
e	-7	+17	43%

Part B – Question 11

lottery	loss	gain	probability of gain
a	-28	+22	84%
b	-25	+22	80%
c	-22	+22	77%
d	-19	+22	72%
e	-16	+22	66%

Part B – Question 12

lottery	loss	gain	probability of gain
a	-24	+16	82%
b	-20	+16	77%
c	-16	+16	70%
d	-12	+16	61%
e	-8	+16	48%

Part B – Question 13

lottery	loss	gain	probability of gain
a	-23	+7	89%
b	-19	+11	80%
c	-15	+15	69%
d	-11	+19	56%
e	-7	+23	39%

Part B – Question 14

lottery	loss	gain	probability of gain
a	-27	+11	88%
b	-23	+15	82%
c	-19	+19	74%
d	-15	+23	64%
e	-11	+27	51%

Part B – Question 15

lottery	loss	gain	probability of gain
a	-18	+6	86%
b	-15	+9	76%
c	-12	+12	66%
d	-9	+15	53%
e	-6	+18	38%

Part B – Question 16

lottery	loss	gain	probability of gain
a	-28	+12	88%
b	-24	+16	82%
c	-20	+20	75%
d	-16	+24	65%
e	-12	+28	54%

Part B – Question 17

lottery	loss	gain	probability of gain
a	-20	+8	85%
b	-17	+11	77%
c	-14	+14	68%
d	-11	+17	57%
e	-8	+20	45%

Part B – Question 18

lottery	loss	gain	probability of gain
a	-23	+11	85%
b	-20	+14	79%
c	-17	+17	71%
d	-14	+20	63%
e	-11	+23	53%

Part C (T_0 & T_P)

Instructions:

In this part, you will answer 3 questions that relate to the roulette lottery from Part A.

In each question, a different "stopping rule" will be presented. For each stopping rule, you will be asked to estimate the chances of finishing the game with a gain.

In contrast to Part A, in this part there is only one correct answer to each question.

For example, if the lottery you can play again and again is:

- With a probability of 49%, you win 1 shekel
- With a probability of 51%, you lose 1 shekel

and the stopping rule is:

loss	gain
-1	+1

then the probability that the game will end with a gain (of 1 shekel) is exactly 49%.

The closer your answer is to the correct one, the higher the payment you will receive for this question (if it is selected for payment in your case). The payment you will receive will be 40 shekels minus the size of the error in your answer (in absolute terms).

If, for instance, you estimate that the chance of finishing the game with a gain in the example above is 65%, then the amount of money you could get for this question is 40-|49-65|=24.

continue

Questions 1-3 in Part C

Part C – Question 1

Assume that as in Part A, a participant in the lottery has a chance of 18/37 (0.486) to win 1 shekel and a chance of 19/37 (0.514) to lose 1 shekel.

If the stopping rule chosen by the participant and that the computer implements is:

loss	gain
-25	+25

what are the chances that the participant will end the game with a gain (of 25)? _____

[the correct answer is about 20.5%]

Part C – Question 2

Assume that as in Part A, a participant in the lottery has a chance of 18/37 (0.486) to win 1 shekel and a chance of 19/37 (0.514) to lose 1 shekel.

If the stopping rule chosen by the participant and that the computer implements is:

loss	gain
-25	+50

what are the chances that the participant will end the game with a gain (of 50)? _____

[the correct answer is about 5%]

Part C – Question 3

Assume that as in Part A, a participant in the lottery has a chance of 18/37 (0.486) to win 1 shekel and a chance of 19/37 (0.514) to lose 1 shekel.

If the stopping rule chosen by the participant and that the computer implements is:

loss	gain
-25	+100

what are the chances that the participant will end the game with a gain (of 100)? _____

[the correct answer is about 0%]

Part D (T_0 & T_P)

Instructions:

In this part, you will play 18 games.

In each game, you will be asked to choose between two lotteries.

For simplicity, a lottery with a probability of 63% to win 13 shekels and a probability of 37% to lose 26 shekels will be presented in the following manner:

chance	37%	63%
amount	-26	+13

As explained previously, if a particular game is selected for your payment, then the computer will implement your chosen lottery.

continue

Questions 1-18 in Part D

[In each of the following questions, the two available lotteries appeared in random order, one above the other.]

Part D – Question 1

chance	35%	65%
amount	-22	+12

chance	65%	35%
amount	-12	+22

Part D – Question 2

chance	24%	76%
amount	-25	+8

chance	76%	24%
amount	-8	+25

Part D – Question 3

chance	32%	68%
amount	-15	+7

chance	68%	32%
amount	-7	+15

Part D – Question 4

chance	19%	81%
amount	-22	+5

chance	81%	19%
amount	-5	+22

Part D – Question 5

chance	40%	60%
amount	-24	+16

chance	60%	40%
amount	-16	+24

Part D – Question 6

chance	37%	63%
amount	-19	+11

chance	63%	37%
amount	-11	+19

Part D – Question 7

chance	25%	75%
amount	-24	+8

chance	75%	25%
amount	-8	+24

Part D – Question 8

chance	35%	65%
amount	-17	+9

chance	65%	35%
amount	-9	+17

Part D – Question 9

chance	17%	83%
amount	-19	+4

chance	83%	17%
amount	-4	+19

Part D – Question 10

chance	29%	71%
amount	-20	+8

chance	71%	29%
amount	-8	+20

Part D – Question 11

chance	38%	62%
amount	-16	+10

chance	62%	38%
amount	-10	+16

Part D – Question 12

chance	22%	78%
amount	-21	+6

chance	78%	22%
amount	-6	+21

Part D – Question 13

chance	37%	63%
amount	-25	+15

chance	63%	37%
amount	-15	+25

Part D – Question 14

chance	25%	75%
amount	-18	+6

chance	75%	25%
amount	-6	+18

Part D – Question 15

chance	20%	80%
amount	-16	+4

chance	80%	20%
amount	-4	+!6

Part D – Question 16

chance	29%	71%
amount	-24	+10

chance	71%	29%
amount	-10	+24

Part D – Question 17

chance	37%	63%
amount	-20	+12

chance	63%	37%
amount	-12	+20

Part D – Question 18

chance	33%	67%
amount	-16	+8

chance	67%	33%
amount	-8	+16