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The Binary Lottery Procedure does not induce risk neutrality in the Holt-Laury and Eckel-Grossman tasks*

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Abstract

We test whether the binary lottery procedure makes subjects behave as if they are risk neutral in the Holt-Laury and Eckel-Grossman tasks. Depending on the task we find that at most a third of subjects behave as if risk neutral. In fact, when we compare the distribution of choices we find no significant difference to earlier experiments in the same lab that did not use the binary lottery procedure.

Keywords: risk elicitation, binary lottery procedure; experimental economics.
JEL-Classification:C91; C81

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1 Introduction

The *Binary Lottery Procedure* (BLP henceforth) is, in theory, an ingenious method of inducing risk neutrality of subjects in experiments. If an experiment requires that subjects behave as if they are risk neutral,[1] one can pay them by lottery tickets rather than directly with money. Each lottery ticket then gives subjects an objective probability of winning a high prize in a binary lottery. If subjects satisfy two axioms (monotonicity and the reduction of objective compound lotteries, axioms which are satisfied, in particular, for expected utility maximizers),[2] they should simply maximize the probability of winning the high prize, in other words, they should maximize the expected number of lottery tickets.

Since Smith (1961) proposed and Roth and Malouf (1979) implemented (and independently proposed) the BLP, many experimenters have employed it in order to induce risk neutrality.[3] However, after Selten et al. (1999) found in an experiment that the BLP did not work at all as intended, the use of the BLP by experimenters came to an effective halt. Recently, there seems to be some kind of resurrection of the method. Harrison et al. (2013) have re-examined the procedure and found evidence that, at least, it moves risk preferences towards risk neutrality. This has in turn inspired the use of its premise for incentive compatible belief elicitation (see Hossain and Okui, 2013; Schlag and van der Weele, 2013), also discussed in Schotter and Trevino (2014). Given the conflicting evidence, it seems appropriate to give the method another test.

We test the BLP in combination with two of the most popular experimental methods to measure risk attitudes, the Holt and Laury (2002) method and the Eckel and Grossman (2002) method.[4] These are both standard risk preference elicitation tasks that are used in numerous experimental papers.[5] If the BLP actually succeeds in making subjects behave as if they are risk neutral, we should observe only one type of choice: the choice that maximizes the expected number of lottery tickets. The short answer is: this is not what we observe. In fact, not even half the subjects (depending on the method between 17% and 34%) behave as if they are risk neutral. The share of subjects who behave as if they are risk neutral across *both* tasks is only 10%.

[1] Often, theories are to be tested under the auxiliary assumption that subjects are risk neutral.

[2] See Selten et al. (1999) for formal statements.

[3] It was also discussed in various experimental textbooks (e.g. Kagel and Roth, 1995), while Berg et al. (2008) specifically argue strongly for its merits.

[4] The latter method was originally developed by Binswanger (1980).

[5] For recent surveys of risk preference elicitation see Charness et al. (2013) and Holt and Laury (2014)

We also compare the proportion of risk neutral choices to other studies that have been implemented in recent years utilizing the same subject pool in our laboratory. In these comparison studies, the two risk elicitation tasks were using prize money rather than lottery tickets – as is standard in the literature – so we can contrast the proportion of risk neutral choices while implementing BLP (in our current data) and while not (comparison studies). The results clearly show that implementing the BLP does not result in a significant difference in the proportion of risk neutral choices.

Thus, we find neither support for Selten et al. (1999), who concluded that the BLP makes things worse, nor for Harrison et al. (2013), who stated that the BLP moved decisions at least in the right direction. Instead, it does not seem to make any noticeable difference in our experiment.

2 Experimental Design

In total 119 subjects participated in our experiment. Subjects were recruited via hroot (Bock et al., 2014) from the subject pool of the experimental lab at the economics department of the University of Heidelberg. We ran a total of 6 sessions with pen and paper.[6] Instructions are included in the appendix.

The two risk elicitation tasks administered were one Eckel and Grossman (2002) type task and one multiple price list type task (Holt and Laury, 2002). All participants were asked to respond to both risk elicitation tasks. Participants were informed that only one of the two elicitation tasks would be the payoff relevant one and this would be determined at the end of the experiment by a coin toss conducted by one of the participants.[7] The participants received a show-up fee of 5 Euro and could earn an additional 5 Euro depending on their decisions and the lottery realizations.

The binary lottery procedure was implemented as follows. Instead of listing lotteries for monetary prizes, we let subjects choose among lotteries that paid out "tokens". Each token then corresponded to a probability of 0.01 for winning the monetary prize of 5 Euro. The instructions explicitly mentioned that the greater number of tokens they earn, the higher the chance for winning a prize of 5 Euro. For example, if a subject won 72 tokens,

[6] For the first two sessions of the data reported, participants had just completed an unrelated experiment and were asked if they were willing to spend few more minutes in the lab and participate in a new short experiment. These subjects did not receive an additional show-up fee.

[7] This procedure is incentive-compatible under fairly mild conditions. In particular, subjects are assumed to respect first-order stochastic dominance, see Azrieli et al. (2019) and the literature cited there.

he had a probability of 0.72 of winning 5 Euro. This was implemented by letting each subject throw two 10-sided dice, one determining the tens and one determining the ones. If the subjects rolled any number below or equal to 72, he would win 5 Euro.

For the Eckel and Grossman (2002) task, Table 1 lists the 4 lotteries the participants had to choose from. Participants were asked to choose their preferred one out of the four lotteries listed. Each lottery had a 50% chance to reward the participants with either the low or high prize and this was determined by a coin flip at the end. If tokens were monetary prizes, choosing lotteries 1 or 2 would be indicative of risk averse preferences as they entail lower (or even zero) variance, choosing lottery 3 implies risk neutrality as it is the lottery that maximizes expected value and finally, choosing lottery 4 is indicative of risk seeking behavior as it is the lottery with the highest variance and a lower expected value than lottery 3.

Table 1: Eckel and Grossman Lottery Task: Participants choose one of the lotteries 1-4

Lottery	Tokens if coin shows Heads	Tokens if coin shows Tails	Exp. value
1	38	38	38
2	52	28	40
3	72	16	44
4	84	0	42

Note: Each lottery has equal chance of either outcome, determined by a coin flip.

For the Holt and Laury (2002) task, Table 2 displays the choice list participants were faced with. Participants had to choose option A or B for each of the 10 situations listed. The last column lists the difference in expected values of lotteries A and B. This was not shown to subjects. Any participant who wants to maximize expected value would choose Lottery A for rows 1 through 4 and then switch to Lottery B for rows 5-10. We call the last row for which a participant chose Lottery A the switch point.[8] If tokens were monetary prizes, participants with switch point of less than 4 would be classified as risk seekers, those with a switch point of 4 would be classified as risk neutral, and those with a switch point higher than 4 as risk averse.[9]

The payment of subjects was conducted as follows. First, one subject in each session

[8] Participants who switched more than once were coded as having made a mistake. We excluded 9 of the 119 subject due to this reason when reporting results for Holt-Laury. If we instead code multiple switchers by their first switching point, results become even stronger (see Table 4).

[9] Participants who always choose Lottery B have a switch point of 0. A switch point of 10 (always choose A) would imply a dominated choice for the last row.

Table 2: Holt and Laury Lottery Task: Participants choose one of the lotteries A or B for each of the 10 possible situations

	Lottery A	Your choice	Lottery B	$EV(A)-EV(B)$
1	40 tokens if the die shows 1 32 tokens if the die shows 2-10	A or B	77 tokens if the die shows 1 2 tokens if the die shows 2-10	23.3
2	40 tokens if the die shows 1-2 32 tokens if the die shows 3-10	A or B	77 tokens if the die shows 1-2 2 tokens if the die shows 3-10	16.6
3	40 tokens if the die shows 1-3 32 tokens if the die shows 4-10	A or B	77 tokens if the die shows 1-3 2 tokens if the die shows 4-10	9.9
4	40 tokens if the die shows 1-4 32 tokens if the die shows 5-10	A or B	77 tokens if the die shows 1-4 2 tokens if the die shows 5-10	3.2
5	40 tokens if the die shows 1-5 32 tokens if the die shows 6-10	A or B	77 tokens if the die shows 1-5 2 tokens if the die shows 6-10	−3.5
6	40 tokens if the die shows 1-6 32 tokens if the die shows 7-10	A or B	77 tokens if the die shows 1-6 2 tokens if the die shows 7-10	−10.2
7	40 tokens if the die shows 1-7 32 tokens if the die shows 8-10	A or B	77 tokens if the die shows 1-7 2 tokens if the die shows 8-10	−16.9
8	40 tokens if the die shows 1-8 32 tokens if the die shows 9-10	A or B	77 tokens if the die shows 1-8 2 tokens if the die shows 9-10	−23.6
9	40 tokens if the die shows 1-9 32 tokens if the die shows 10	A or B	77 tokens if the die shows 1-9 2 tokens if the die shows 10	−30.3
10	40 tokens if the die shows 1-10	A or B	77 tokens if the die shows 1-10	−37

Note: One row was chosen for payment by use of a 10-sided die. Suppose choice 3 was chosen and the subject chose A. Then another 10-sided die determined whether he would get 40 tokens or 32 tokens.

flipped a coin to determine which task was the payoff relevant for everyone. Then each individual subject came to the front of the lab and flipped coins and/or rolled 10-sided dice to determine their payment. In addition to the show-up fee, average pay from the lottery choice was about 2.50 Euro for about 20 minutes. At the end there was a questionnaire where we asked for subjects' gender.

To compare our results to risk elicitation tasks without the BLP, we collected results and (partly) the whole data from other recent studies that took place in the same lab. These studies implemented similar risk elicitation tasks but with prizes rather than tokens as is usual in the literature. Table 3 lists the studies surveyed, with information on which risk elicitation task each implemented and the number of observations. The Holt-Laury tasks used in all studies were exactly the same as the one in the current study up to a scaling factor. The Eckel-Grossman tasks are less comparable since each study used a different number and kind of lotteries.

Table 3: Survey of recent studies implementing risk elicitation tasks in the same lab

Study	Risk Task	Number of participants
Dürsch et al. (2012) (DOV)	H&L	210
Brunner et al. (2014) (BHO)	H&L	359
Roth et al. (2016) (RTV)	H&L	104
Dürsch et al. (2017) (DRR)	H&L	134
Apesteguia et al. (2018) (AOW)	E&G	176
Kersting-Koenig et al. (2019) (LMK)	E&G	199
Proto et al. (2019) (PRS)	H&L	191
Schmidt (2019) (S)	E&G	158

Note: E&G stands for Eckel & Grossman task and H&L stands for Holt & Laury task.

3 Results

Since we were employing the BLP, all subjects in our experiment should have switched from A to B after the fourth choice in the Holt-Laury task and should have chosen lottery 3 in the Eckel Grossman task.[10] In Table 4 we report the proportions of choices that are compatible with this payoff maximizing prediction as "Risk neutral". In the Eckel-Grossman task, only 34.45% of choices can be classified as risk neutral, in the Holt-Laury task this percentage is even lower at 17.27, certainly far away from the predicted 100%. Binomial tests (risk neutral vs. not risk neutral) show that these percentages are significantly below 50% ($p < 0.001$). Furthermore, strictly speaking the BLP should make subjects risk neutral in both risk elicitation tasks simultaneously. However, this works only for 11 out of 110 subjects.[11] Thus, it seems that the BLP clearly fails in letting all - or even a majority of - subjects behave as if they are risk neutral.

Given the different findings in the literature whether the BLP at least shifts the distribution of preferences towards risk neutrality, it is of course interesting to compare the share of risk-neutral choices in studies with and without the BLP. For this purpose, we report in

[10] Under the assumptions of monotonicity and the reduction of objective compound lotteries.

[11] The switch point in Holt-Laury and the chosen lottery in Eckel-Grosman are however significantly correlated with a coefficient of -0.20 ($p = 0.039$).

Table 4: Elicited Risk Preference Classifications.

Risk Preference	Eckel & Grossman		Holt & Laury	
Classification	Frequency	Percentage	Frequency	Percentage
"Risk Averse"	69	57.98	81 (81)	73.64 (68.06)
"Risk Neutral"	41	34.45	19 (19)	17.27 (15.97)
"Risk Seeking"	9	7.56	10 (19)	9.09 (15.97)
Total	119		110 (119)	

Note: Numbers in parentheses indicate the frequencies when we code multiple switchers in Holt-Laury by their first switching point.

Figures 1 and 2 the proportion of risk neutral participants for our study contrasted with the studies outlined in Table 3. For the Eckel-Grossman task our results are slightly higher than the comparison studies but very similar to two of the three studies.[12] For Holt-Laury, our data are in fact at the lower end of the spectrum in terms of the proportion of risk neutral participants.[13]

As mentioned above, the Holt-Laury studies in Table 3 are directly comparable to the current study since they all use the same lotteries (up to a scaling factor). The left panel of Figure 3 shows the full frequency distribution of switch points in the Holt-Laury task of our data ($n = 110$). The right panel shows the same for the pooled distribution of all comparison studies ($n = 947$). Comparing the two panels it seems pretty obvious that there is no noticeable shift towards the risk-neutral choice (indicated in red). A Kolmogorov-Smirnov test shows that we cannot reject the hypothesis that the two distributions are the same ($p = 0.33$) despite the high number of observations.

4 Conclusion

This paper set out to re-examine the efficacy of the Binary Lottery Procedure by using standard risk preference elicitation tasks. Namely, we ask participants to respond to an Eckel & Grossman type task as well as a Holt & Laury type task. The only tweak to these

[12] The LMK study has a much lower proportion of risk neutral participants than our data as well as the other two comparison studies (AOW and S). This can be because in LMK they implement a longer list of lotteries to choose from, namely participants were choosing one out of 11 lottery options. Any noise in choices would then explain the lower percentage of risk neutral choices.

[13] As an aside, we find the usual effect that females in our study ($n = 68$) are significantly more risk averse in the Eckel-Grossman task (MWU-test, $p = 0.002$) than males ($n = 51$). The same holds with weak significance for the Holt-Laury task ($p = 0.059$).

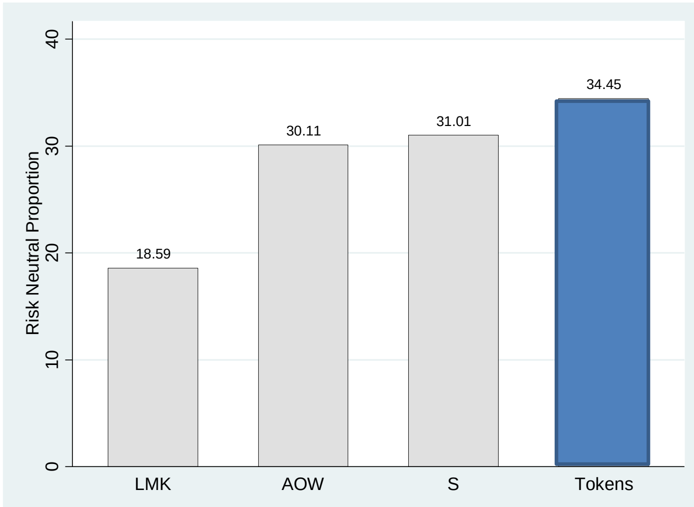

Figure 1: Proportion of Risk Neutral Participants in the Eckel-Grossman task: Comparing across studies

Note: For the acronyms of studies see Table 3.

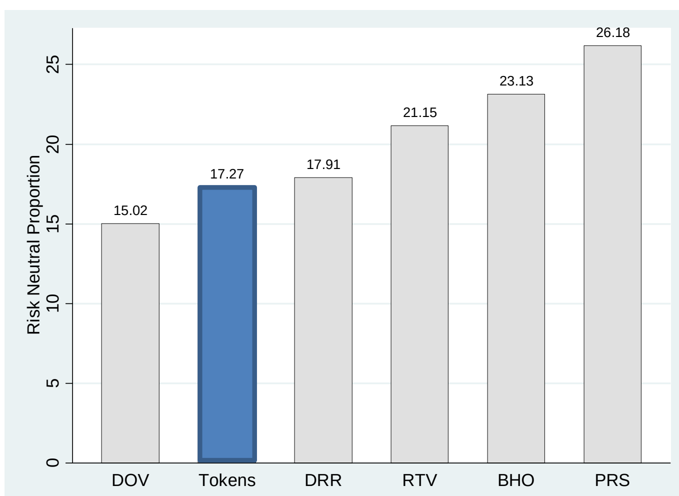

Figure 2: Proportion of Risk Neutral Participants in the Holt-Laury task: Comparing across studies

Note: For the acronyms of studies see Table 3.

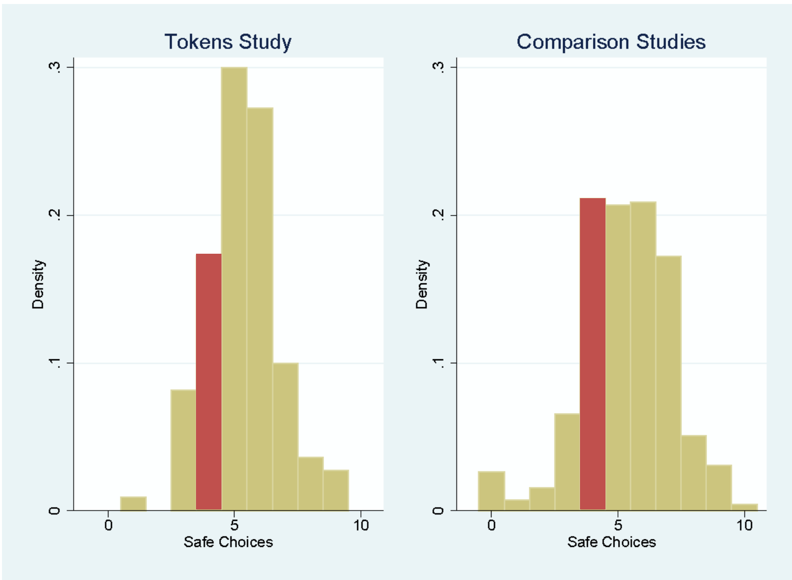

Figure 3: Frequency distributions of switching points in the Holt-Laury task.

Note: Left panel: our data using the BLP procedure. Right panel: pooled data from H&L comparison studies (listed in Table 3) in the same lab with monetary payoffs. Marked in red is the switch point that would correspond to a risk-neutral choice.

procedures that we make is to have subjects choose across lotteries of tokens rather than prize money, exactly as the Binary Lottery Procedure proposes. If the procedure worked as proposed, we should observe all (or at least most) participants choosing lotteries that maximize expected earnings and thus all appear to be risk neutral agents.

Putting together the results of the proportion of risk neutral agents, both in terms of the modal response within our data and the comparison with other studies should put one in serious doubt on whether BLP does indeed work in practice. Far from the majority of participants are found to be risk neutral and in fact we find no substantive differences in the occurrence of risk neutral preferences between our own data and other comparison studies where similar risk elicitation procedures were implemented but with - as is standard - prize money. Given how the Binary Lottery Procedure can complicate tasks for participants and can be tedious in implementation and as it importantly appears to not work as hoped, it seems redundant for experimenters to be utilizing it.

There may be, however, alternative methods for making subjects behave as if risk neutral and there is some evidence that they work as intended. Kirchkamp et al. (2006) tell subjects that their earnings in an auction are determined by the average of their payoffs from playing the auction multiple times (e.g. 50 times) with the same bidding function. They then find that bidding functions are much closer to the risk neutral equilibrium bids. Similarly, Niemeyer et al. (2019) let subjects choose lotteries in a Holt-Laury task where the payoff is determined by the average result of many drawings from the chosen lottery. They find that most subjects behave as if they are risk neutral.

References

Apesteguia, J., Oechssler, J. and Weidenholzer, S. (2018). Copy trading, University of Heidelberg: AWI Discussion Paper Series No. 649.

Azrieli, Y., Chambers, C. P. and Healy, P. J. (2019). Incentives in experiments with objective lotteries, *Experimental Economics* .

Berg, J. E., Rietz, T. A. and Dickhaut, J. W. (2008). On the performance of the lottery procedure for controlling risk preferences, *in* C. R. Plott and V. L. Smith (eds), *Handbook of experimental economics results*, Vol. 1, Elsevier, chapter 115, pp. 1087–1097.

Binswanger, H. P. (1980). Attitudes toward risk: Experimental measurement in rural india, *American Journal of Agricultural Economics* **62**(3): 395–407.

Bock, O., Baetge, I. and Nicklisch, A. (2014). hroot: Hamburg registration and organization online tool, *European Economic Review* **71**: 117–120.

Brunner, C., Hu, A. and Oechssler, J. (2014). Premium auctions and risk preferences: an experimental study, *Games and Economic Behavior* **87**: 467–484.

Charness, G., Gneezy, U. and Imas, A. (2013). Experimental methods: Eliciting risk preferences, *Journal of Economic Behavior & Organization* **87**: 43–51.

Dürsch, P., Oechssler, J. and Vadovic, R. (2012). Sick pay provision in experimental labor markets, *European Economic Review* **56**(1): 1–19.

Dürsch, P., Römer, D. and Roth, B. (2017). Intertemporal stability of uncertainty preferences, *Journal of Economic Psychology* **60**: 7–20.

Eckel, C. C. and Grossman, P. J. (2002). Sex differences and statistical stereotyping in attitudes toward financial risk, *Evolution and human behavior* **23**(4): 281–295.

Harrison, G. W., Martínez-Correa, J. and Swarthout, J. T. (2013). Inducing risk neutral preferences with binary lotteries: A reconsideration, *Journal of Economic Behavior & Organization* **94**: 145–159.

Holt, C. A. and Laury, S. K. (2002). Risk aversion and incentive effects, *American Economic Review* **92**(5): 1644–1655.

Holt, C. A. and Laury, S. K. (2014). Assessment and estimation of risk preferences, *Handbook of the economics of risk and uncertainty*, Vol. 1, Elsevier, pp. 135–201.

Hossain, T. and Okui, R. (2013). The binarized scoring rule, *Review of Economic Studies* **80**(3): 984–1001.

Kagel, J. H. and Roth, A. E. (eds) (1995). *The Handbook of Experimental Economics*, Princeton University Press.

Kersting-Koenig, C., Merkel, A. L. and Lohse, J. (2019). Active and passive risk taking. mimeo.

Kirchkamp, O., Reiss, J. P. and Sadrieh, A. (2006). A pure variation of risk in first-price auctions, *Technical report*, Jena economic research papers.

Niemeyer, C., Reiss, P. and Sadrieh, K. (2019). Reducing risk in experimental games and individual choice, *Technical report*, KIT.

Proto, E., Rustichini, A. and Sofianos, A. (2019). How intelligent players teach cooperation. mimeo.

Roth, A. E. and Malouf, M. W. (1979). Game-theoretic models and the role of information in bargaining., *Psychological review* **86**(6): 574.

Roth, B., Trautmann, S. T. and Voskort, A. (2016). The role of personal interaction in the assessment of risk attitudes, *Journal of Behavioral and Experimental Economics* **63**: 106–113.

Schlag, K. H. and van der Weele, J. (2013). Eliciting probabilities, means, medians, variances and covariances without assuming risk neutrality, *Theoretical Economics Letters* **3**: 38–42.

Schmidt, R. J. (2019). Identifying the ranking of focal points in coordination games on the individual level, University of Heidelberg: AWI Discussion Paper Series No. 660.

Schotter, A. and Trevino, I. (2014). Belief elicitation in the laboratory, *Annu. Rev. Econ.* **6**(1): 103–128.

Selten, R., Sadrieh, A. and Abbink, K. (1999). Money does not induce risk neutral behavior, but binary lotteries do even worse, *Theory and Decision* **46**(3): 213–252.

Smith, C. A. (1961). Consistency in statistical inference and decision, *Journal of the Royal Statistical Society: Series B (Methodological)* **23**(1): 1–25.

Appendix: Instructions

[These are translations of the original German instructions]

Please read these instructions carefully. Please do not talk to other participants. Please turn off your mobile phone and leave it turned off until the end of the experiment. If you have any questions, please raise your hand, and someone will come over. All participants have received the same instructions.

This experiment consists of two decision problems. One of the decision problems will be chosen for payment in the end by flipping a coin. Hence, you should work through both parts carefully because both parts can be relevant for your payoff.

Additionally to the payoff from the decision problem, each participant receives 5€ for participation.

All random decisions of coin flips and dice rolls will be made at the end of the experiment by either yourself or some other volunteer with fair and genuine coins and dice.

Decision problem 1

Decision problem 1 will be chosen for payoff if the flipped coin shows "Tails".

In this experiment you have to make a choice among 4 lotteries. Each lottery has two possible outcomes. The outcome will be decided by flipping a coin at the end of the experiment (of course, this is independent of the coin above). Depending on whether the coin comes up "heads" or "tails" you can win a number of "tokens".

For example, in lottery 2 you win 52 tokens if heads comes up and 28 tokens if tails comes up.

Tokens will later give you the opportunity to win 5 euro by the draw of a random number between 1 and 100. Each random number between, and including, 1 and 100 is equally likely to occur. In fact, you will be able to draw the two random numbers yourself by rolling two 10-sided dice. The tokens give you the chance of winning the 5 euro. The more points you earn, the greater your chance of winning 5 euro. In particular, if the random number generated by the dice is equal or less than the number of tokens you own, then you win 5 euro.

For example, if you chose lottery 2 and tails comes up, you win 28 tokens. If then the dice produce a random number of 28 or less, you win 5 euro. If the random number is higher than 28, you win nothing.

Now please choose one of the lotteries 1-4.

Lottery	Tokens if coin shows Heads	Tokens if coin shows Tails	Please choose exactly one lottery
1	38	38	☐
2	52	28	☐
3	72	16	☐
4	84	0	☐

Decision problem 2

Decision problem 2 will be chosen for payoff if the flipped coin shows "Heads".

In this experiment you have to make a choice across 2 lotteries, A or B, in 10 different cases. Each lottery has the same structure: with some probability, you receive a large amount of tokens and with the residual probability, you will receive a smaller amount of tokens. Which of the 10 choices will be the payoff relevant one will be decided by throwing a 10-sided die at the end of the experiment. Further, the outcome of the chosen decision will be decided by throwing a 10-sided die.

For example, say the 10-sided die rolls a 3 and in the third row you chose lottery A. If now the 10-sided die rolls a number between 1 and 3, you receive 40 tokens and if it rolls a number between 4 and 10, you receive 32 tokens.

Tokens will later give you the opportunity to win 5 euro by the draw of a random number between 1 and 100. Each random number between, and including, 1 and 100 is equally likely to occur. In fact, you will be able to draw the two random numbers yourself by rolling two 10-sided dice. The tokens give you the chance of winning the 5 euro. The more points you earn, the greater your chance of winning 5 euro. In particular, if the random number generated by the dice is equal or less than the number of tokens you own, then you win 5 euro.

Now please choose one of the lotteries A or B across the different cases below by underlining your preferred lottery in the middle, in all 10 cases.

Lottery A	Your choice	Lottery B
	(please underline one lottery in each row)	
40 tokens if the die shows 1 32 tokens if the die shows 2-10	A or B	77 tokens if the die shows 1 2 tokens if the die shows 2-10
40 tokens if the die shows 1-2 32 tokens if the die shows 3-10	A or B	77 tokens if the die shows 1-2 2 tokens if the die shows 3-10
40 tokens if the die shows 1-3 32 tokens if the die shows 4-10	A or B	77 tokens if the die shows 1-3 2 tokens if the die shows 4-10
40 tokens if the die shows 1-4 32 tokens if the die shows 5-10	A or B	77 tokens if the die shows 1-4 2 tokens if the die shows 5-10
40 tokens if the die shows 1-5 32 tokens if the die shows 6-10	A or B	77 tokens if the die shows 1-5 2 tokens if the die shows 6-10
40 tokens if the die shows 1-6 32 tokens if the die shows 7-10	A or B	77 tokens if the die shows 1-6 2 tokens if the die shows 7-10
40 tokens if the die shows 1-7 32 tokens if the die shows 8-10	A or B	77 tokens if the die shows 1-7 2 tokens if the die shows 8-10
40 tokens if the die shows 1-8 32 tokens if the die shows 9-10	A or B	77 tokens if the die shows 1-8 2 tokens if the die shows 9-10
40 tokens if the die shows 1-9 32 tokens if the die shows 10	A or B	77 tokens if the die shows 1-9 2 tokens if the die shows 10
40 tokens if the die shows 1-10	A or B	77 tokens if the die shows 1-10