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Pre-Play Learning and the Preference Reversal Phenomenon

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Elicited preference rankings for two lotteries are typically inconsistent across choice and pricing tasks. We test whether pre-play learning makes preference rankings consistent. Pre-play learning denotes ex-ante lottery learning, where subjects observe playing lotteries before making decisions. We find that pre-play learning makes the average selling prices for the p-bet, of subjects who choose the p-bet, higher than their average selling prices for the $-bet. However, pre-play learning is not strong enough to equalize the rates of standard and non-standard reversals, although pre-play learning reduces the rate of standard reversals.

JEL Classification: C91, D81, D12

1. Introduction

The preference reversal phenomenon is an iconic empirical puzzle in decision theory. Preference reversals have challenged standard economic theory, as well as policy evaluation techniques that rely on preference elicitation.[1] Preference reversals are defined as inconsistent preference rankings for two lotteries across choice and pricing tasks; subjects choose a low-payoff, high-probability lottery (p-bet), but place a higher minimum willing-to-sell price on a high-payoff, low-probability lottery ($-bet). Some researchers have proposed explanations of why preference reversals occur, and others have developed new preference theories to accommodate preference reversals.[2]

We test whether pre-play learning significantly increases the proportion of subjects who consistently indicate a preference between two lotteries when they are asked to make a choice or indicate a minimum willingness-to-sell price (or willingness to accept). Pre-play learning is ex-ante lottery learning, where subjects observe a series of lotteries actually played out before making decisions. In the absence of pre-play learning, subjects may overweight the small probability of a negative lottery payoff in the p-bet (Fehr-Duba and Epper 2012). However, pre-play learning may help subjects more appropriately weight possible outcomes by demonstrating the frequencies of realized lottery outcomes. This change may make selling prices for the p-bet, for subjects who choose the p-bet, higher than their selling prices for the $-bet and thus make subjects' preference rankings consistent across choice and pricing tasks.

The preference reversal phenomenon has been conjectured to be a product of "limited awareness about the immediate environment or the possible longer-run consequences of any acts that

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[1] For comprehensive reviews on the preference reversals, see Seidl (2002) and Lichtenstein and Slovic (2006).

[2] For example, Cubitt, Munro, and Starmer (2004) tested several explanations of preference reversals, such as the scale compatibility hypothesis of Tversky, Slovic, and Kahneman (1990). Schmidt, Starmer, and Sugden (2008) and Bordalo, Gennaioli, and Shleifer (2012) have developed new preference theories to accommodate the preference reversals.

might be taken" (p. 226) in Plott's (1996) preference discovery hypothesis. Plott hypothesized that learning about one's own preferences and decision environments through "repeated choices, practice, incentives (feedback)" and "sobering and refocusing experiences" (p. 227) allows one to reach rational choices and avoid preference reversals. Braga and Starmer (2005) reviewed empirical works on the preference reversal phenomenon and speculated that learning one's own preferences and decision environments could remove preference reversals. In our experiment, pre-play learning may help subjects learn their own preferences and learn more about objective probabilities. Subjects may learn their own preferences by experiencing realized lottery outcomes. Subjects may also improve their understanding of objective probabilities and behave as if they update their subjective probabilities.

To explain our experimental design, we add pre-play learning to a typical preference-reversal experimental design in the economics literature. We adopt Grether and Plott's (1979) experimental design. Their experiment carefully controlled for potential concerns in other researchers' previous preference-reversal experiments, such as the absence of monetary incentives and subjects' confusion and misunderstanding of experimental procedures. Moreover, their experiment became the prototype for subsequent studies.

In our experiment, we find that pre-play learning makes the average selling price for the p-bet, among subjects who choose the p-bet, higher than their average selling price for the $-bet, suggesting that pre-play learning makes subjects' preference rankings consistent across choice and pricing tasks at the group level. This result can be explained by the convergence of probability weighting functions toward linearity (Hau et al. 2008; Erev et al. 2010). In the absence of pre-play learning, subjects may overweight a small probability of receiving a negative lottery payoff in the p-bet, which may lead them to price the p-bet lower than the $-bet. However, pre-play learning may reduce the overweighting of the small probability of losing in the p-bet, which may lead subjects to increase their selling prices for the p-bet. Thus, pre-play learning may increase the frequency of subjects whose elicited preference rankings are consistent across choice and pricing tasks.

Researchers have tested lottery feedback in the preference reversal literature (Cox and Grether 1996). Lottery feedback is different from pre-play learning. Lottery feedback denotes ex-post lottery learning, where lotteries are played each round after subjects have made decisions in that round. Braga, Humphrey, and Starmer (2009) find that lottery feedback is problematic because it makes subjects' selling prices for the $-bet, for subjects who choose the $ bet, lower than their prices for the p-bet. They may be more sensitive to the realization of a negative lottery payoff of the $-bet when they own the bet. Thus, lottery feedback may not make subjects' preference rankings consistent across choice and pricing tasks. However, we do not find such evidence for pre-play learning in our experiment.

2. Experiment

We recruited 77 subjects via email invitation on a university campus in 2015. All sessions were conducted in a lab with paper and pencil and lasted 30 minutes. Each subject was randomly assigned to either a pre-play learning group (n = 42) or a control group (n = 35). Decision tasks were identical in these two groups, except for the availability of pre-play learning. Subjects were asked to make decisions in one choice task and two pricing tasks. In the choice task, subjects chose between two lotteries. The two lotteries were a low-payoff, high-probability lottery with a 35/36 chance of winning $4 and a 1/36 chance of losing $1 (Expected value = $3.86), and a high-payoff, low-probability lottery with an 11/36 chance of winning $16 and a 25/36 chance of losing $1.50 (Expected value = $3.85).[3] We call these lotteries a p-bet and a $-bet, respectively. In the pricing tasks, subjects decided whether they would sell a lottery at given prices. Twenty-one prices were displayed in decreasing order in $.50 decrements between $9.99 and $0. This kind of pricing task has been used in other studies (e.g., Butler and Loomes 2007; Loomes, Starmer, and Sugden 2010). Subjects joined three practice rounds for pricing tasks. In these practice rounds, subjects were asked to make decisions at given prices. Then we assumed arbitrary numbers were drawn and explained which lottery payoffs they would receive.[4] We controlled for possible order effects by switching the order of tasks: (pricing tasks) then (choice task) and (choice task) then (pricing tasks).

At the end of each experiment, subjects earned a show-up fee of $10 and the additional earnings (or losses) from their decisions in a randomly selected task. The task was selected by drawing a ball from a bingo cage containing three balls: one for the lottery choice task, one for pricing the p-bet, and one for pricing the $-bet. If a lottery choice task was selected, the lottery that subjects had chosen was played, and its outcome was paid. If a pricing task was selected, one price was randomly drawn by drawing a ball from a bingo cage containing 21 balls, and subjects were paid according to their decisions at that price. If a subject had decided to sell the lottery at that price, the subject received that price. Otherwise, the lottery was played and payment was determined by the lottery outcome. A bingo cage containing 36 balls was used to determine lottery outcomes. We followed Grether and Plott's (1979) experimental instructions to the extent possible. Our experimental instructions are available in the Appendix.

Pre-play learning was conducted only for the pre-play learning group. We played lotteries 10 times each by drawing a ball from a bingo cage that contained 36 balls (with replacement each time) before subjects made any decisions in choice and pricing tasks.[5] Half of the subjects saw the p-bet first and half of the subjects saw the $-bet first. During this demonstration, subjects kept a record of the drawn numbers and circled the corresponding lottery outcomes on decision sheets.

In analyzing our experimental data, if a subject indicated a willingness to sell a lottery for $X but not for $X-$0.50, we used the midpoint ($X-$0.25) as the subject's lowest named selling price. In lottery-pricing tasks, there were nine subjects who indicated more than one switching point or who indicated unusual choices consisting of keeping a lottery at high prices and selling it at low prices. We included responses of those subjects in our analysis by using a first switching point in the case of multiple switching points, and using a maximum price of $9.99 in the case of the unusual choice pattern.[6,7]

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[3] The size of lottery payoffs did not seem trivial for subjects because our control-group results are comparable with Grether and Plott (1979), who used lotteries with similar expected values to ours. The rate of standard reversals is the same (56%) in our and their experiments. The rate of non-standard reversals is 14% and 11% in our and their experiments, respectively. Note that their experiments were conducted in the 1970s. These comparisons seem to suggest that the size of lottery payoffs in our experiment was not trivial.

[4] Practice rounds were used in other studies (e.g., Grether and Plott 1979; Braga, Humphrey, and Starmer 2009) as well.

[5] The realization of a higher lottery payoff in the $-bet was not "bumpy" from 10 draws. A higher lottery payoff was realized 2–4 times out of 10 draws across sessions. We find that more draws of a higher lottery payoff in the $-bet increase subjects' probability of choosing the $-bet over the p-bet but does not affect their selling prices for the $-bet. Our main results reported in the results section do not seem to be driven by a small number of draws of a higher lottery payoff in the $-bet. Only 17% (=7/42) of subjects observed two draws of a higher lottery payoff in the $-bet. Forty-five percent and 38% of subjects observed three and four draws of a higher lottery payoff in the $-bet, respectively.

[6] Excluding the responses of the nine subjects does not change the general findings in our subsequent analyses.

[7] In the pre-play learning group and the control group, 12% (=5/42) and 14% (=5/35) of subjects priced the $-bet at the ceiling of $9.99, respectively. When we exclude nine subjects who indicated more than one switching point or who indicated unusual choices consisting of keeping a lottery at high prices and selling it at low prices, these rates fall to 5% (=2/37) and 10% (=3/31), respectively.

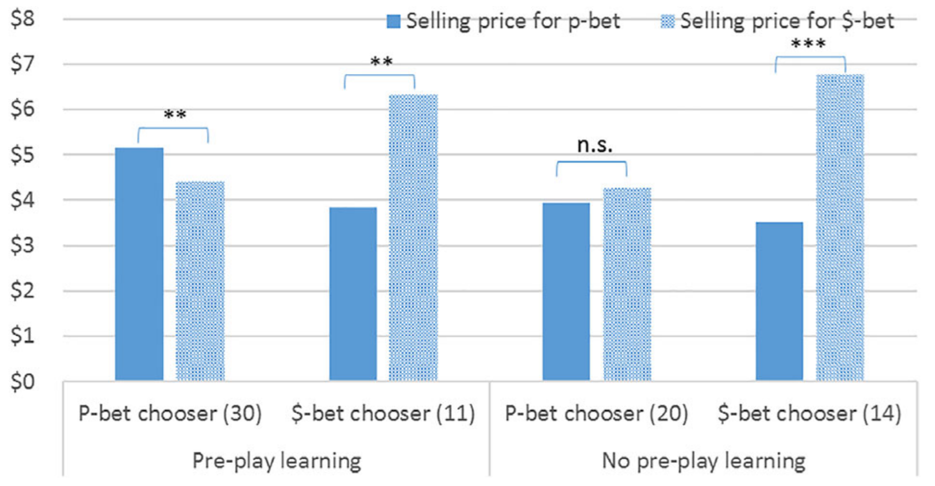

Figure 1. Subjects' Average Selling Prices for Bets by Choice.
Notes: *p*-values are reported from two-sided wilcoxon signed-rank tests for the equality of selling prices for the p-bet and the $-bet. The numbers of subjects are in the parentheses. Subjects who chose an indifferent option between the p-bet and the $-bet are omitted. *** *p* value <0.01, ** <0.05, n.s.: Not significant at the 10% level.

3. Results

Figure 1 reports the average minimum willingness-to-sell prices for lotteries by subjects' lottery choices. In the fifth and the sixth bars (without pre-play learning), subjects choosing the p-bet assign similar minimum willingness-to-sell prices to the p-bet ($3.94) and the $-bet ($4.26). These two values are not significantly different in a two-sided Wilcoxon signed-rank test (*p* value: 0.47). In contrast, in the first two bars (with pre-play learning), subjects choosing the p-bet assign higher selling prices to the p-bet ($5.16) than to the $-bet ($4.41). These two values are significantly different in the same test (*p* value: 0.03). With and without pre-play learning, subjects choosing the $-bet consistently assign higher selling prices to the $-bet (*p* value <0.05 in both cases using the same test). These results show that pre-play learning makes the preference rankings of subjects choosing the p-bet consistent across choice and pricing tasks at the group level.

We compare subjects' preference rankings for two lotteries across choice and pricing tasks at the individual level. Two types of preference reversals are possible. One is the standard reversal: a subject who chooses the p-bet values the $-bet higher than the p-bet. The other is the non-standard reversal: a subject who chooses the $-bet values the p-bet higher than the $-bet. The rate of standard reversals among subjects who choose the p-bet is typically greater than the rate of non-standard reversals among subjects who choose the $-bet. Previous studies focused on whether this asymmetric pattern is removed by a particular method. Preference reversals can be viewed as subjects' decision errors and no longer challenge standard economic theory if the rates of standard and non-standard reversals are the same.

In the right half of Table 1 (without pre-play learning), the rate of standard reversals is 56%: 7 out of 16 subjects who chose the p-bet valued the $-bet higher than the p-bet. The rate of non-standard reversals is 14%: 2 of 14 subjects who chose the $-bet valued the p-bet higher than the $-bet. These two rates are different in a two-sided sign test (*p* value: 0.07), which suggests that subjects' preference rankings for lotteries are different across choice and pricing tasks at the individual level, in the absence of pre-play learning. In the left half of the table (with pre-play learning), the

Table 1. Subjects' Preference Rankings for Bets in Choice and Pricing Tasks

	With Pre-Play Learning (n = 42)				Without Pre-Play Learning (n = 35)			
	$p_p > p_\$$	$p_p < p_\$$	$p_p = p_\$$	Rate of Inconsistent Preference Rankings	$p_p > p_\$$	$p_p < p_\$$	$p_p = p_\$$	Rate of Inconsistent Preference Rankings
Chose p-bet	19	7	4	0.27	7	9	4	0.56
Chose $-bet	1	9	1	0.10	2	12	-	0.14
Indifferent	-	1	-	-	-	1	-	-
p value				0.07				0.07

Notes: p-values are reported from a two-sided sign test of the null hypothesis that standard and non-standard reversals are equally likely. p_p and $p_\$$ denote subjects' elicited selling price for the p-bet and the $-bet, respectively.

rates of standard and non-standard reversals are 27% and 10%, respectively. These two rates are still significantly different (p value: 0.07), which suggests that pre-play learning is not strong enough to equalize the rates of standard and non-standard reversals. Note, however, that pre-play learning decreased the rate of standard reversals by half, from 56% to 27%, which suggests that pre-play learning makes subjects' preference rankings more consistent at the individual level than choices without pre-play learning. Also, note that pre-play learning does not seem to increase the rate of non-standard reversals. The rate of non-standard reversals is 14% without pre-play learning and 10% with pre-play learning. In contrast, Braga, Humphrey, and Starmer (2009) found that lottery feedback increased the rate of non-standard reversals. In this sense, pre-play learning has a more pronounced effect on preference reversals than lottery feedback.

We test whether pre-play learning affects subjects' choice-pricing preference rankings. We pool data from the pre-play learning group and the control group and conduct an ordered logit estimation in the first two columns of Table 2. In the first column, the dependent variable is subjects' lottery choices (i.e., 1 = p-bet, 0.5 = indifferent, 0 = $-bet). We control for subjects' gender and age (22+). The estimated coefficient for pre-play learning (0.89) is positive and weakly significant,

Table 2. Effects of Pre-Play Learning on Subjects' Lottery Choice and Pricing

	Ordered Logit		OLS	
Dependent variable	Subject's lottery choice (1 = p-bet, 0.5 = indifferent, 0 = $-bet)	Subject's pricing preference ranking (1 = p-bet, 0.5 = indifferent, 0 = $-bet)	Subject's minimum selling price for the p-bet	Subject's minimum selling price for the $-bet
Pre-play learning	0.89 (0.52)*	0.83 (0.48)*	0.77 (0.50)	−0.97 (0.68)
Male	0.86 (0.53)	−0.31 (0.47)	−0.99 (0.50)*	−1.49 (0.68)**
Age (22+)	−0.26 (0.50)	−0.09 (0.47)	0.20 (0.50)	0.94 (0.68)
Log likelihood	−54.72	−71.73	-	-
Adj. R^2	-	-	0.07	0.05
Obs.	77		77	

Notes: Standard errors are reported in parentheses. The OLS estimations include a constant term.
*p value <0.10, ** <0.05.

which suggests that pre-play learning increases subjects' probability of choosing the p-bet. In the second column, the dependent variable is subjects' pricing preference rankings (i.e., 1 = p-bet, 0.5 = indifferent, 0 = $-bet). The estimated coefficient for pre-play learning is positive and weakly significant, which suggests that pre-play learning promotes subjects to value the p-bet higher than the $-bet. We turn to test whether pre-play learning affects subjects' selling prices for the p-bet and the $-bet. We conduct ordinary least squares (OLS) regressions in the last two columns. In the third column, the dependent variable is subjects' selling prices for the p-bet. The estimated coefficient for pre-play learning is not significant, which suggests that pre-play learning does not affect subjects' selling prices for the p-bet. This is true for subjects' selling prices for the $-bet in the last column; pre-play learning does not affect subjects' selling prices for the $-bet. Pre-play learning seems to make subjects at the margin (i.e., who value the p-bet slightly lower than the $-bet) value the p-bet higher than the $-bet.

4. Discussion

Our results can be explained by the psychology of "tail events"—rare, high-impact events—discussed in Barberis (2013). In the absence of pre-play learning, subjects tend to overweight the probability of tail events (Fehr-Duba and Epper 2012). That is, subjects may overweight the probability (i.e., 0.03) of receiving the negative lottery payoff of the p-bet when they value the bet. However, pre-play learning may help subjects balance their attention across lottery outcomes in the p-bet and reduce their overweight of the tail event in the p-bet. This line of explanation is empirically supported by Hau et al. (2008) and Erev et al. (2010). These authors found that probability weighting functions converged toward linearity when subjects observed playing lotteries multiple times before making decisions. Moreover, this line of explanation seems likely because the majority of people have non-linear probability weighting functions in the absence of pre-play learning. Bruhin, Fehr-Duda, and Epper (2010) found that, without pre-play learning, about 80% of subjects exhibited non-linear probability weighting functions, while the remainder exhibited linear probability weighting functions.

Pre-play learning does not change subjects' selling prices for the $-bet, probably because subjects do not overweight the probability (i.e., 0.31) of winning a positive lottery payoff in the $-bet, even in the absence of pre-play learning. This conjecture is supported by typical probability weighting functions reviewed in Fehr-Duba and Epper (2012); the probability weighting functions are close to the objective probability in the range between 0.3 and 0.4. Hau et al. (2008) and Erev et al. (2010) found that the observation of playing lotteries had little impact on subjects' probability weighting functions in the range between 0.3 and 0.4. We expect that pre-play learning would equalize the rates of standard and non-standard reversals if we used another $-bet with a smaller probability of winning a positive lottery payoff than the current one. Subjects are likely to overweight a probability of winning a positive lottery payoff that is smaller than 0.3 in the absence of pre-play learning. We expect that pre-play learning would decrease subjects' selling prices for the new $-bet and thus decrease the ratio of standard reversals further than in the current result. We leave this hypothesis for the future research.

Our results bring researchers' attention to a cause of preference reversals that has been relatively little considered in the literature. The overpricing of the $-bet has been considered the main cause for preference reversals (Lichtenstein and Slovic 2006). That is, when subjects value a bet, their valuation is anchored at the higher lottery payoff of the bet. Subjects adjust their valuation downward from the higher lottery payoff based on the probability of winning. If the downward adjustment is insufficient for the $-bet, the $-bet would be overpriced. This anchoring-and-insufficient-adjustment explanation is not consistent with our result that the over-weighting of a small probability of receiving a negative lottery payoff in the p-bet may result in the preference reversals. Thus, our results provide a new insight into the preference reversal literature.

The role of pre-play learning can be understood in the broader context of "choices from description" versus "choices from experience." Harman and Gonzalez (2015) and Gonzalez and Mehlhorn (2016) found that experience with the distribution of payoffs decreased two anomalies in choices under risk, the Allais paradox and gain-loss framing, respectively.[8] Our results indicate that experience with the distribution of payoffs reduces the prevalence of pricing-choice preference reversals. These observations suggest that behavior converges toward normative predictions with experience.[9]

Our results reinvigorate prospect theory in explaining the preference reversal phenomenon. Preference reversals have been thought to be unexplained by prospect theory. However, our results suggest that the preference reversal phenomenon is related to a probability weighting function, one of the main components of prospect theory. A possible prospect-theory explanation for the preference reversal phenomenon is as follows. In the absence of pre-play learning, in the lottery choice task, subjects overweight the probability of receiving the negative lottery payoff in the p-bet. When subjects value the p-bet, subjects overweight that probability further because that probability is perceived more salient in the lottery pricing task (i.e., p-bet vs. money) than in the lottery choice task (i.e., p-bet vs. $-bet). This additional overweighting in the pricing task leads to the standard preference reversal. However, pre-play learning decreases the standard preference reversal by removing the probability overweighting in the choice task and the pricing task. This line of explanation requires future research.

Our study adds pre-play learning to the literature which attempts to remove the preference reversals. Pommerehne, Schneider, and Zweifel (1982) found that larger lottery payoffs reduced the rate of standard preference reversals but not enough to equalize the rates of standard and non-standard reversals. Chu and Chu (1990) found that repeated arbitrage transactions removed preference reversals. Bostic, Herrnstein, and Luce (1990) found that choice-based valuation equalized the rates of standard and non-standard reversals. Bateman et al. (2007) found that a ranking method equalized the rates of standard and non-standard reversals. In one treatment of Pommerehne, Schneider and Zweifel (1982), and Chu and Chu (1990), lotteries were played each round after subjects made decisions, which is the same as lottery feedback. None of these studies used pre-play learning.

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[8] Their methods were quite different from pre-play learning. Lottery description for lottery payoffs and probabilities was not provided to subjects in their methods. In Harman and Gonzalez (2015), lotteries were played each round after subjects made decisions in that round.

[9] We appreciate these insightful comments from a referee.

Appendix: Experimental Instruction

Study Title: Economic Valuation

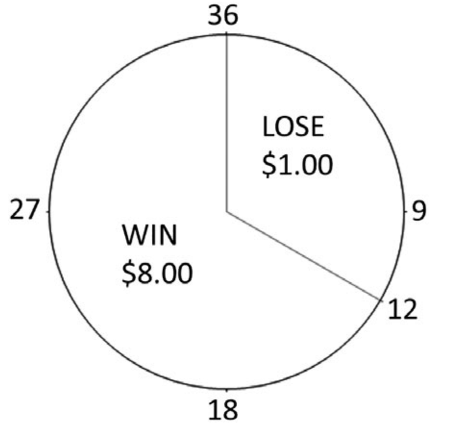
This is a research study about economic valuation. You MUST be at least 18 years old to participate. This lab session is completely anonymous and will take approximately *25 minutes* to complete. You will be compensated $10 for your participation. Your final compensation may vary depending on your decisions made on study tasks. If you have questions during the session, please raise your hand and the facilitator will assist you. Please do not talk with other participants or use your smartphone during the session. *Please do not go to subsequent pages of the packet until the facilitator asks you to do so.*

Please find the Informed Consent document in front of you and sign at the bottom of the second page.

Please do NOT go to subsequent pages of the packet until the facilitator asks you to do so.

Instructions

We are trying to determine how people make decisions. We have designed a simple choice experiment and will ask you to make decision(s) in each of three items. Each decision you make will involve one or two *bets.* If a bet is played, then one ball will be drawn from a bingo cage that contains 36 balls numbered 1 to 36. Depending upon the nature of the bet, the number drawn will determine whether you lose an amount of money or win an amount of money. The figure below is an example of the type of bets used in the experiment. In the example, if you play the following bet, then you will lose $1 if the number drawn is less than *or equal to* 12, and you will win $8 if the number drawn is greater than 12.



You will be paid in the following fashion. We will first give you $10. After you have made a decision on each item, one item will be chosen at random by drawing a ball from a bingo cage. The bet(s) in the chosen item will then be played. You will be paid an amount depending upon your decisions and upon the outcomes of the bets in the chosen item—any amount you win will be added to the $10, and any amount you lose will be subtracted from the $10. However, the most you can lose on a bet is $1.50, so you will receive at least $8.50. All actual payments will occur after the experiment.

If you have questions, please raise your hand.

Please do NOT go to the next page until the facilitator asks you to do so.

PART 1

For each of the items below, you have been presented a ticket that allows you to play a bet. You will then be asked for the *smallest* price at which you would sell the ticket to the bet. To help you find your minimum selling price for the ticket, we will ask you 21 questions of whether or not you would like to sell the ticket at given prices.

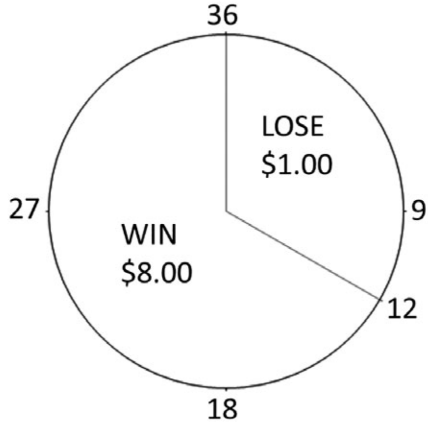
If an item from this part is chosen at the end of the experiment, we will do the following. First, a bingo cage will be filled with 21 balls numbered 1 to 21. Then one ball will be drawn from this cage, and the number on the ball will determine which question number would be considered for your compensation.

It is in your best interest to be accurate; that is, the best thing you can do is to be honest. If your selling price is too high or too low, then you are passing up opportunities that you prefer. For example, suppose you would be willing to sell the bet for $4 but instead you say that the lowest price you will sell it is $6. If the price in the chosen question is between the two (for example $5), you would be forced to play the bet even though you would rather have sold it for $5. Suppose that you would sell it for $4 but not for less, and that you state that you would sell it for $2. If the price in the chosen question is between the two (for example $3) you would be forced to sell the bet even though at that price you would prefer to play it.

If you have questions, please raise your hand. You will have three practice tasks soon.

Please do NOT go to the next page until the facilitator asks you to do so.

Practice Task 1: What is the *smallest* price for which you would sell a ticket to the following bet? To help you find your minimum selling price for the ticket, we will ask you questions of whether or not you would like to sell the ticket at given prices.



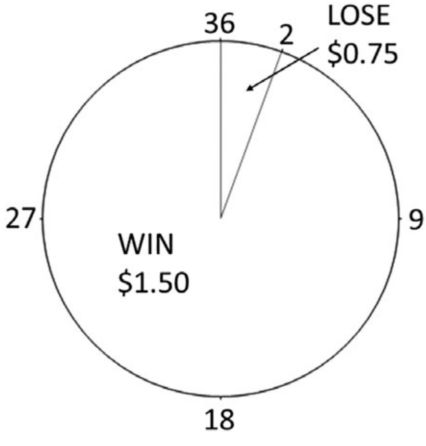
Please check one box for each of the following questions.

Question	I will sell the ticket.	I will NOT sell the ticket.	Question	I will sell the ticket.	I will NOT sell the ticket.
1. If the price is $9.99,	☐	☐	12. If the price is $4.50,	☐	☐
2. If the price is $9.50,	☐	☐	13. If the price is $4.00,	☐	☐
3. If the price is $9.00,	☐	☐	14. If the price is $3.50,	☐	☐
4. If the price is $8.50,	☐	☐	15. If the price is $3.00,	☐	☐
5. If the price is $8.00,	☐	☐	16. If the price is $2.50,	☐	☐
6. If the price is $7.50,	☐	☐	17. If the price is $2.00,	☐	☐
7. If the price is $7.00,	☐	☐	18. If the price is $1.50,	☐	☐
8. If the price is $6.50,	☐	☐	19. If the price is $1.00,	☐	☐
9. If the price is $6.00,	☐	☐	20. If the price is $0.50,	☐	☐
10. If the price is $5.50,	☐	☐	21. If the price is $0.00,	☐	☐
11. If the price is $5.00,	☐	☐	-		

Please wait for other participants to finish their decisions.

Suppose that the question number randomly drawn is ____. Please fill in either (1) or (2) below.
(1) If you have decided to sell the ticket in that question: I get the price of $_____.
(2) If you have decided NOT to sell the ticket, you play the bet.
Suppose that the number drawn for the bet is ___. I get/lose $____.
(Circle one)
Please do NOT go to the next page until the facilitator asks you to do so.

Practice Task 2: What is the *smallest* price for which you would sell a ticket to the following bet? To help you find your minimum selling price for the ticket, we will ask you questions of whether or not you would like to sell the ticket at given prices.



Please check one box for each of the following questions.

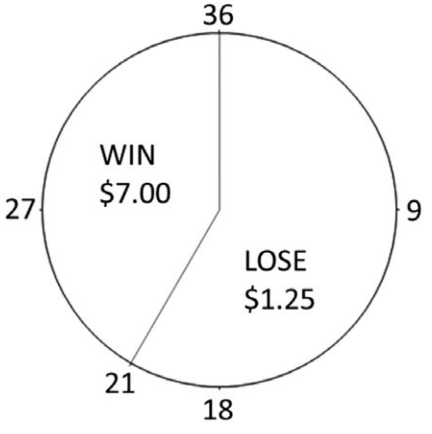
Question	I will sell the ticket.	I will NOT sell the ticket.	Question	I will sell the ticket.	I will NOT sell the ticket.
1. If the price is $9.99,	☐	☐	12. If the price is $4.50,	☐	☐
2. If the price is $9.50,	☐	☐	13. If the price is $4.00,	☐	☐
3. If the price is $9.00,	☐	☐	14. If the price is $3.50,	☐	☐
4. If the price is $8.50,	☐	☐	15. If the price is $3.00,	☐	☐
5. If the price is $8.00,	☐	☐	16. If the price is $2.50,	☐	☐
6. If the price is $7.50,	☐	☐	17. If the price is $2.00,	☐	☐
7. If the price is $7.00,	☐	☐	18. If the price is $1.50,	☐	☐
8. If the price is $6.50,	☐	☐	19. If the price is $1.00,	☐	☐
9. If the price is $6.00,	☐	☐	20. If the price is $0.50,	☐	☐
10. If the price is $5.50,	☐	☐	21. If the price is $0.00,	☐	☐
11. If the price is $5.00,	☐	☐	-		

Please wait for other participants to finish their decisions.

Suppose that the question number randomly drawn is ____. Please fill in either (1) or (2) below.
(1) If you have decided to sell the ticket in that question: I get the price of $______.
(2) If you have decided NOT to sell the ticket, you play the bet.
Suppose that the number drawn for the bet is ___. I get/lose $____.
(Circle one)

Please do NOT go to the next page until the facilitator asks you to do so.

Practice Task 3: What is the *smallest* price for which you would sell a ticket to the following bet? To help you find your minimum selling price for the ticket, we will ask you questions of whether or not you would like to sell the ticket at given prices.



Please check one box for each of the following questions.

Question	I will sell the ticket.	I will NOT sell the ticket.	Question	I will sell the ticket.	I will NOT sell the ticket.
1. If the price is $9.99,	☐	☐	12. If the price is $4.50,	☐	☐
2. If the price is $9.50,	☐	☐	13. If the price is $4.00,	☐	☐
3. If the price is $9.00,	☐	☐	14. If the price is $3.50,	☐	☐
4. If the price is $8.50,	☐	☐	15. If the price is $3.00,	☐	☐
5. If the price is $8.00,	☐	☐	16. If the price is $2.50,	☐	☐
6. If the price is $7.50,	☐	☐	17. If the price is $2.00,	☐	☐
7. If the price is $7.00,	☐	☐	18. If the price is $1.50,	☐	☐
8. If the price is $6.50,	☐	☐	19. If the price is $1.00,	☐	☐
9. If the price is $6.00,	☐	☐	20. If the price is $0.50,	☐	☐
10. If the price is $5.50,	☐	☐	21. If the price is $0.00,	☐	☐
11. If the price is $5.00,	☐	☐	-		

Please wait for other participants to finish their decisions.

Suppose that the question number randomly drawn is ____. Please fill in either (1) or (2) below.
(1) If you have decided to sell the ticket in that question: I get the price of $______.
(2) If you have decided NOT to sell the ticket, you play the bet.

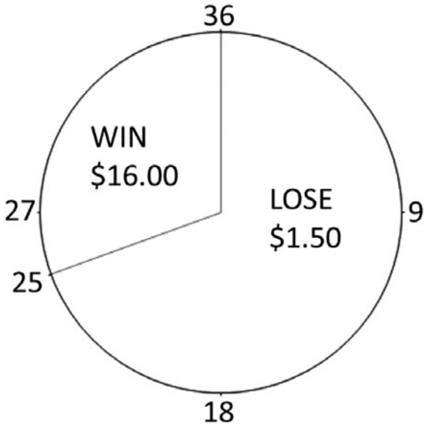
Suppose that the number drawn for the bet is ___. I get/lose $____.
(Circle one)

Please do NOT go to the next page until the facilitator asks you to do so.

All practice tasks are over. We will give you two items that may influence your compensation.

Item 1

Consider carefully the following bet shown below:



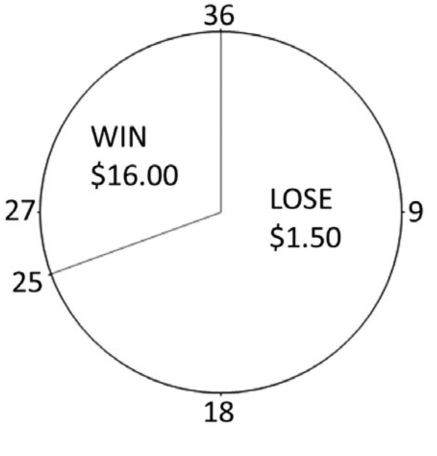
To give you a sense of outcomes from the bet, we will draw a ball from a bingo cage ten times. Please keep records of the numbers drawn and circle the corresponding money outcome in the table below.

Trial	Write the number drawn	Circle the corresponding money outcome
1		Win $16/Lose $1.50
2		Win $16/Lose $1.50
3		Win $16/Lose $1.50
4		Win $16/Lose $1.50
5		Win $16/Lose $1.50
6		Win $16/Lose $1.50
7		Win $16/Lose $1.50
8		Win $16/Lose $1.50
9		Win $16/Lose $1.50
10		Win $16/Lose $1.50

Please go to the next page.

(Continued from the previous page)

What is the *smallest* price for which you would sell a ticket to the bet you saw on the previous page? The same bet is shown below. To help you find your minimum selling price for the ticket, we will ask you questions of whether or not you would like to sell the ticket at given prices.



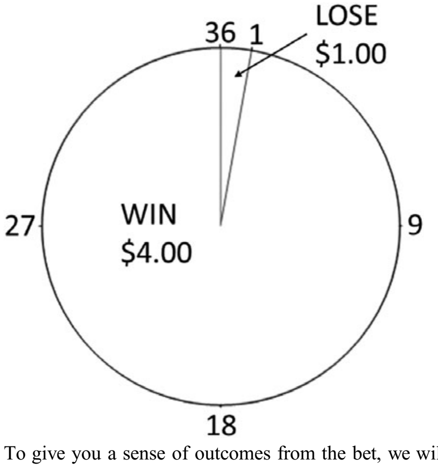
Please check one box for each of the following questions.

Question	I will sell the ticket.	I will NOT sell the ticket.	Question	I will sell the ticket.	I will NOT sell the ticket.
1. If the price is $9.99,	☐	☐	12. If the price is $4.50,	☐	☐
2. If the price is $9.50,	☐	☐	13. If the price is $4.00,	☐	☐
3. If the price is $9.00,	☐	☐	14. If the price is $3.50,	☐	☐
4. If the price is $8.50,	☐	☐	15. If the price is $3.00,	☐	☐
5. If the price is $8.00,	☐	☐	16. If the price is $2.50,	☐	☐
6. If the price is $7.50,	☐	☐	17. If the price is $2.00,	☐	☐
7. If the price is $7.00,	☐	☐	18. If the price is $1.50,	☐	☐
8. If the price is $6.50,	☐	☐	19. If the price is $1.00,	☐	☐
9. If the price is $6.00,	☐	☐	20. If the price is $0.50,	☐	☐
10. If the price is $5.50,	☐	☐	21. If the price is $0.00,	☐	☐
11. If the price is $5.00,	☐	☐	-		

Please do NOT go to the next page until the facilitator asks you to do so.

Item 2

Consider carefully the following bet shown below:



To give you a sense of outcomes from the bet, we will draw a ball from a bingo cage ten times. Please keep records of the numbers drawn and circle the corresponding money outcome in the table below.

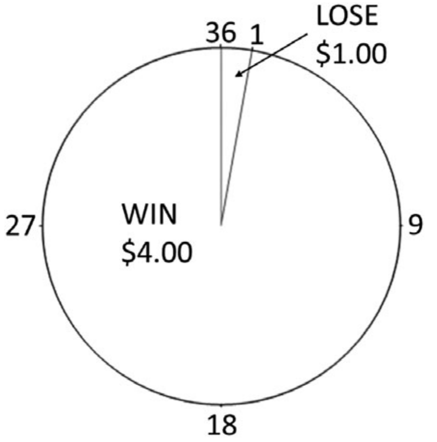
Trial	Write the number drawn	Circle the corresponding money outcome
1		Win $4/Lose $1
2		Win $4/Lose $1
3		Win $4/Lose $1
4		Win $4/Lose $1

5	Win $4/Lose $1
6	Win $4/Lose $1
7	Win $4/Lose $1
8	Win $4/Lose $1
9	Win $4/Lose $1
10	Win $4/Lose $1

Please go to the next page.

(Continued from the previous page)

What is the *smallest* price for which you would sell a ticket to the bet you saw on the previous page? The same bet is shown below. To help you find your minimum selling price for the ticket, we will ask you questions of whether or not you would like to sell the ticket at given prices.



Please check one box for each of the following questions.

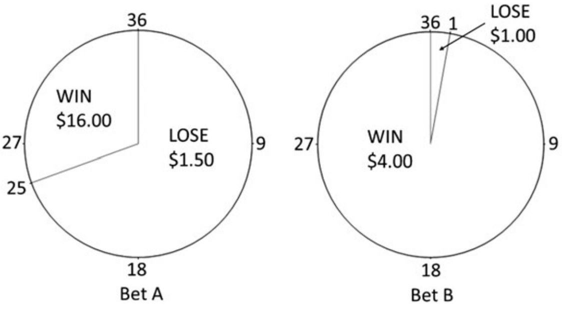
Question	I will sell the ticket.	I will NOT sell the ticket.	Question	I will sell the ticket.	I will NOT sell the ticket.
1. If the price is $9.99,	☐	☐	12. If the price is $4.50,	☐	☐
2. If the price is $9.50,	☐	☐	13. If the price is $4.00,	☐	☐
3. If the price is $9.00,	☐	☐	14. If the price is $3.50,	☐	☐
4. If the price is $8.50,	☐	☐	15. If the price is $3.00,	☐	☐
5. If the price is $8.00,	☐	☐	16. If the price is $2.50,	☐	☐
6. If the price is $7.50,	☐	☐	17. If the price is $2.00,	☐	☐
7. If the price is $7.00,	☐	☐	18. If the price is $1.50,	☐	☐
8. If the price is $6.50,	☐	☐	19. If the price is $1.00,	☐	☐
9. If the price is $6.00,	☐	☐	20. If the price is $0.50,	☐	☐
10. If the price is $5.50,	☐	☐	21. If the price is $0.00,	☐	☐
11. If the price is $5.00,	☐	☐	-		

Please do NOT go to the next page until the facilitator asks you to do so.

PART 2

If an item from this part is chosen at the end of the experiment, you will play the bet you select. If you check "Do not care," the bet you play will be determined by a coin toss.

Item 3
Consider carefully the following two bets shown below.



Suppose you have the opportunity to play one of these bets. Make one check below to indicate which bet you would prefer to play:

Bet A	Bet B	Do not care
☐	☐	☐

Please do NOT go to the next page until the facilitator asks you to do so.

Your Earnings

You will calculate your earnings. The facilitator will randomly draw one ball. The number on the ball will decide which item would be considered for your compensation.

The item number drawn:

1) If the item number is 1 or 2, the facilitator will randomly draw one ball. The number on the ball will decide which question number would be considered for your compensation.

The question number drawn:

Please fill in either i) or ii) below.
i) If you have decided to sell the ticket in that question: I get the price of $_____.
ii) If you have decided NOT to sell the ticket, you play the bet.
Suppose that the number drawn for the bet is ___. I get/lose $____.
(Circle one)
2) If the item number is 3, please fill in ONLY ONE SIDE in the table below.

i) If you have chosen bet A in item 3,	ii) If you have chosen bet B in item 3,	iii) If you have chosen "Do not care" in item 3,
The number drawn:_______ **I get/lose $ _______** **(Circle one)**	**The number drawn:_______** **I get/lose $_______** **(Circle one)**	**The coin flip:** Head/Tail **(Circle one)** Heads mean bet A, and tails mean bet B. **The number drawn: _______** **I get/lose $_______** **(Circle one)**

My total earnings: $10 plus or minus $_______ = $________
(Circle one)

Please go to the next page.

Please answer the following questions:

A. What is your gender? [Male ☐/Female ☐]

B. What is your age? []

C. What year are you in school?

[Freshman ☐/Sophomore ☐/Junior ☐/Senior ☐/Graduate ☐/Other ☐]

Please find a receipt on the next page and fill it out using the total earnings you calculated on the previous page. Then *detach it from this packet* to keep your responses anonymous. Please submit the receipt and all decision sheets when you receive your compensation. You will receive a debriefing form for this study when you leave the lab.

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