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Market Experience and Willingness to Trade: Evidence from Repeated Markets with Symmetric and Asymmetric Information

Luke Lindsay

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Abstract

Many studies have found a gap between willingness-to-pay and willingness-to-accept that is inconsistent with standard theory. There is also evidence that the gap is eroded by experience gained in the laboratory and naturally occurring markets. This paper argues that the gap and the effects of experience are explained by a caution heuristic. This conjecture is tested in a repeated market experiment with symmetric and asymmetric information. The results support the conjecture: people do seem to use heuristics rather than reacting optimally and their behavior adjusts slowly when the environment changes.

JEL classification: D4, D81, D82.

Keywords: WTA/WTP disparity, endowment effect, market experience, bounded rationality, asymmetric information.

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†Chair for Organizational Design, Department of Economics, University of Zurich, Blümlisalpstrasse 10, CH-8006 Zurich, Switzerland. Phone: +41 44 634 55 93 Email: luke.lindsay@econ.uzh.ch

Over the last thirty years, a large body of evidence has accumulated that suggests willingness to accept (WTA) valuations exceed willingness to pay (WTP) valuations.[1] This gap between WTA and WTP is an anomaly for standard theory.[2] A consequence of the gap is that people are less willing to trade than standard theory predicts, so gains from trade may not be fully realized. A natural question that has been the focus of some recent research is whether the incentives and experience provided by markets eliminate the gap. A number of studies (see Table 1) have found that when items are bought or sold repeatedly in laboratory markets, the WTA/WTP gap decays. Additionally, recent studies using subjects recruited at sportscard and memorabilia markets (List, 2003, 2004) have found that those with relatively less intense trading experience exhibit the gap while those with relatively more intense trading experience do not. Together, these studies show (a) that market experience acquired in the lab and (b) that certain market experience acquired in naturally occurring markets can be sufficient to eliminate the gap. What is puzzling, however, is why we observe a gap at all: if experience outside the lab has the potential to eliminate the gap, why does the gap survive until a subject enters the lab, then decay within a few minutes? Given that subjects with intense trading experience tend not to exhibit the gap but are no more familiar with the experimental procedures than typical subjects, misconceptions about the nature of the experimental tasks (as argued by Plott and Zeiler (2005)) cannot easily explain the results.

This paper proposes a solution to the puzzle and presents an experiment to test it. The conjecture is that observed WTA/WTP gaps are the result of people using a *caution heuristic* that causes them to make costly errors in the lab but protects them from costly errors in naturally occurring settings.[3] The explanation is based on the following principles.

1. People solve some decision problems using heuristics rather than deliberate analysis.[4]

2. People use heuristics that tend to produce good outcomes in the environment they inhabit.

3. Most people face asymmetric information as the uninformed party in naturally occurring markets, so a heuristic that tends to produce good outcomes is setting WTA above WTP.

On this view, a typical subject in a laboratory experiment has experience of trading under asymmetric information as the uninformed party. In valuation tasks, she initially sets WTA above WTP. This causes her to make costly errors, so when tasks are repeated, she adjusts her behavior. In

[1] Reviews of WTA/WTP studies can be found in Horowitz and McConnell (2002), Brown and Gregory (1999), Sayman and Onculer (2005), and Plott and Zeiler (2005).

[2] The WTA/WTP gap has been found in studies that use incentive compatible elicitation mechanisms and control for income and substitution effects (e.g. Bateman et al., 1997).

[3] A related argument has been proposed by Ert and Erev (2008) to explain why gambles with positive expected value but a chance of a loss are rejected more often in some settings than others

[4] A heuristic is a rule-of-thumb or simplifying procedure that typically gives accurate judgments and optimal behavior but can also give rise to systematic errors. See Kahneman et al. (1981) or Gilovich et al. (2002) for a summary of the literature on heuristics.

Table 1: The WTA/WTP Gap and the Effects of Laboratory Market Experience

Study	Good(s)	Trials	Main Finding
Coursey et al. 1987	tasting a bitter liquid	5-10	Gap reduces
Kahneman et al. 1990	induced value tokens	1-3	No gap
	pens, mugs, binoculars	4-5	Gap persists
Shogren et al. 1994	chocolate and coffee mugs	5	Gap closes
	food safety	20	Gap persists
List and Shogren 1999	chocolate bars	4	Gap closes
	food safety	9-10	Gap reduces
Shogren et al. 2001	chocolate and mugs (2nd Price Auction)	10	Gap closes
	chocolate and mugs (Random Price Auction)	10	Gap closes
Knetsch et al. 2001	coffee mugs (2nd Price Auction)	6	Gap closes
	coffee mugs (9th Price Auction)	6	Gap widens
Loomes et al. 2003	2 unresolved risky lotteries	6	Gap closes

contrast, a subject who is one of the most intense traders in a naturally occurring market not only has more experience of trading but also a different type of experience: trading under asymmetric information as the informed party. Consequently, he has not adopted the heuristic of setting WTA above WTP, so does not do so in valuation tasks. There are several mechanism that could account for how heuristics are chosen. A plausible candidate is some variant of Thorndike's (1898) *law of effect* (actions that have led to satisfying consequences are repeated more frequently; those that have led to unsatisfying consequences, less frequently).[5] Although there is relatively little research on simple learning models in the economics literature, there is evidence that in some settings such models predict behavior better than standard game theory (Erev and Roth, 1998).

The caution heuristic conjecture was tested in a repeated market experiment with over 200 subjects. The experiment had two parts each of which consisted of 10 rounds where subjects bought or sold lotteries in a Vickrey auction under either symmetric or asymmetric information. The results provide some support for the caution heuristic conjecture. Under symmetric information, the WTA/WTP gap decayed; under asymmetric information it persisted. Individual bidding patterns suggested previous trading success increases willingness to trade. When subjects switch between facing symmetric information and asymmetric information as the uninformed party, they do not

[5] Another possible explanation is evolution. Heifetz and Segev (2004) argue the WTA/WTP gap is an example of *toughness* and that a *toughness* bias may be evolutionary viable. They show how in an evolutionary model toughness can emerge in bargaining with asymmetric information. Further more, Chen et al. (2006) ran experiments using capuchin monkeys and find evidence of loss aversion, which suggests it may have an evolutionary origin. It is not clear, however, how an evolutionary account could explain why the gap is eliminated by certain experiences.

immediately adjust their behavior. Finally, when the market regime switches from asymmetric information to symmetric information, the previously informed traders trade more frequently than the previously uninformed.

The rest of this paper is organized as follows. Section 1 describes how setting WTA above WTP can be optimal when bidding in a Vickrey Auction and faced with asymmetric information. Section 2 presents the experimental design, the hypotheses tested, and the details of how the experiment was implemented. Section 3 analyzes the experimental results. Finally, Section 4 discusses the results and their implications.

1 Optimal Behavior in a Vickrey Auction with Asymmetric Information

This section presents a concrete example of how asymmetric information could explain a gap between WTA and WTP under standard theory. It is intended to capture the key features of trading under asymmetric information in a way that can be implemented in an experiment. Suppose that there is an item that is worth 30 in one state of the world (the low state) and 70 in another (the high state). Three people are bidding to buy the item in a second price sealed-bid buying auction (the highest bidder receives the item and pays the second highest bid). All three are risk neutral expected utility maximizers. The two states of the world are known to obtain with equal probability. For all three bidders, it is a weakly dominant strategy to bid 50, the expected value of the item [6].

Now suppose that one of the bidders (call him *the informed*) observes which state of the world obtains before placing his bid. It is a weakly dominant strategy for the informed to bid 30 in the low state and 70 in the high state. The other two bidders (call them the uninformed) know the informed will observe the state of the world before bidding but cannot observe it themselves. There are no weakly dominant strategies for the uninformed.[7] However, how they bid can be predicted using iterative deletion of weakly dominated strategies.[8] For the informed, bidding 30 in the low state and 70 in the high state weakly dominates all other strategies, so all other strategies can be

[6]Consider an auction for a lottery with expected value 50 from the point of view of bidder 1, who submits bid b. Suppose the highest competing bid is p. Since bidder 1 is risk neutral, the value of the lottery to them is 50. Bidder 1's payoff is $50 - p$ if $b > p$ and zero otherwise. By bidding 50, bidder 1 will win if $p < 50$ and not if $p > 50$. Suppose bidder 1 bids $b < 50$. When $b > p$, then they still win and their profit is $50 - p$. If $p > 50 > b$, they still lose. However, if $50 > p > b$, they lose but would have made a positive profit had they bid 50. Thus, bidding $b < 50$ never increases profits and in some cases decreases it. A corresponding argument applies to bidding $b > 50$. A more detailed discussion of bidding behavior in second price auctions can be found in Krishna (2002, p15)

[7]If the informed player bids 40 in both states and the other uninformed player bids 41, the best response for the remaining uninformed player is to bid > 41 whereas if the informed bids 30 in the low state and 70 in the high state and the first uninformed player bids 41, the second uninformed player's best response is to bid < 41.

[8]See Marx (1999) for a discussion of iterative deletion of weakly dominated strategies.

removed. In the resulting game, it is a weakly dominant strategy for the uninformed to bid 30.

Conversely, in a second price sealed-bid selling auction, after the informed's weakly dominated strategies are deleted, it is a weakly dominant strategy for the uninformed to bid 70. So the uninformed have a reason to bid lower in buying auctions than they do in selling auctions.

2 The Experiment

2.1 Design and Predictions

Subjects faced a variant of the decision problem described above in Section 1. Each subject was assigned to a *trading group.* Members of a trading group bid against each other in a series of 20 auction *rounds*. Each round consisted of an auction to buy or sell lotteries after which the lotteries were played out and subjects told how much they had made or lost in the round. The markets were one sided in the sense that all the subjects were buying (selling) lotteries from (to) the experimenter. This is an important feature of the design since it prevents the market unravelling under asymmetric information in the way Akerlof (1970) described. Market prices were generated using a median price Vickrey auction as used by Loomes et al. (2003). An advantage of this auction is that for a given set of bids, the price produced by a median price buying auction will be the same as the one produced by a median price selling auction. This allows meaningful comparisons between buying and selling prices.

The auctions occurred under two market regimes: symmetric information and asymmetric information. Under symmetric information, everyone had the same information when they were placing their bids. Under asymmetric information, a minority of the members of each trading group were given extra information about which lottery outcome would occur before they placed their bids. Suppose all the informed bid b_I and all uninformed bid b_U and $b_I \neq b_U$. Since the median bid is the price and the majority of bids are placed by the uninformed, the price will be b_U. If the price were determined by the informed, then the price under asymmetric information would be no different to what it would be if everyone were informed.

Each trading group and hence each subject was assigned to one of eight treatments. The organization of the treatments is shown in Table 2. The experiment was divided into two parts each consisting of ten rounds. Some treatments switched between symmetric and asymmetric information after ten rounds while others did not. In the rest of this paper, the abbreviations SS, SA, AS, and AA shown in the first column of the table are used to refer to the treatments.

The caution heuristic conjecture predicts that subjects who are used to trading under asymmetric information as the uninformed party will initially set WTA above WTP. When the market is repeated, they will adjust their behavior if the heuristic they are using produces bad outcomes. This

Table 2: The Treatments

Treatment	Regime		Type	Subjects	Trading Groups
	Rounds 1-10	Rounds 11-20			
SS	Symmetric	Symmetric	Buying	22	4
			Selling	29	5
SA	Symmetric	Asymmetric	Buying	22	4
			Selling	31	5
AS	Asymmetric	Symmetric	Buying	27	5
			Selling	31	5
AA	Asymmetric	Asymmetric	Buying	24	4
			Selling	22	4

Each row on the table represents a treatment. Each trading group consisted of 5 or 7 subjects.

means that under symmetric information the WTA/WTP gap would decay whereas under asymmetric information it would persist or widen. This can be tested by comparing the size of the gap in round 1 and round 10. The conjecture also suggests that good and bad outcomes will influence subsequent behavior. This can be investigated by testing whether previous trading success increases willingness to trade. Another aspect of the conjecture is that people do not deliberately solve decision problems. This can be investigated by comparing behavior before and after the regime switches between symmetric and asymmetric information. Finally, under asymmetric information, the informed and uninformed will have different experiences. The effect of these experiences can be investigated using the results of rounds 11 to 20 of the AS treatments and comparing the willingness to trade of the previously informed and uninformed.

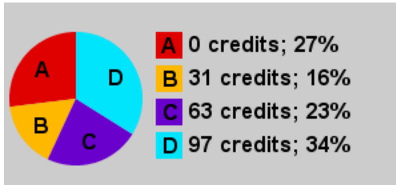
2.2 Procedure

Subjects were divided into trading groups of 5 or 7 and traded in buying or selling auctions for lotteries. In the buying treatments, subjects were endowed with *credits*[9] and took part in auctions to buy lotteries from the experimenter. Subjects completed the sentence ‘I am willing to buy the lottery from the experimenter if the price is less than __ credits’ by typing a value. When all subjects had entered bids, the computer selected the median bid as the market price, p. Everyone who bid above p paid p and received the lottery; everyone who bid p or less did not trade. In the selling treatments they were endowed with lotteries and took part in auctions to sell lotteries to the experimenter. Subjects completed, ‘I am willing to sell the lottery to the experimenter if the price is more than __ credits’. The median ask was selected as the price p. Everyone who asked less than p received p credits and gave up the lottery; everyone who asked p or more did not trade.

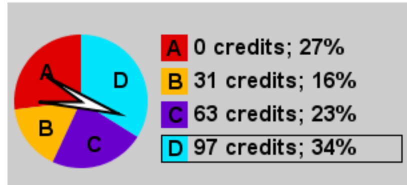
[9]The credits were exchanged for cash at the end of the experiment.

Figure 1: The Spinning Arrow

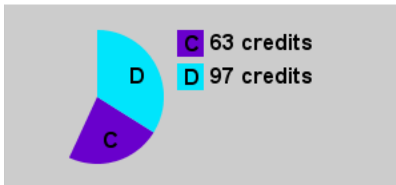
(a) Unresolved Lottery



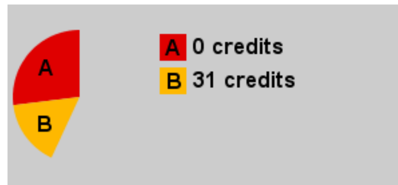
(b) Resolved Lottery



(c) High State



(d) Low State



The lotteries used are shown in Table 3. The lotteries labeled *high state* and *low state* have two possible outcomes. For instance, the low state lottery pays out zero with probability 0.63 and 31 with probability 0.37. The *composite* lottery (shown on the last row of the table) is constructed by combining the low state and high state lotteries. [10]

In rounds with symmetric information, the composite lottery was traded. In rounds with asymmetric information, the minority were informed i.e. 2 in trading groups of 5, 3 in trading groups of 7. The informed traders were told whether it was a high or low state before bidding; the uninformed traders were not. So effectively, the informed were trading either the high or low state lotteries while the uninformed were trading the composite lottery. The uninformed were told that there were informed subjects in the trading group and told what the informed would have been told.

Figure 1 shows how the lotteries were presented to the subjects when they were prompted to place bids. Figure 1a, was shown to everyone in symmetric information auctions and to the uninformed in asymmetric information auctions. Figure 1c, was shown to the informed in asymmetric information auctions when the high state occurred; Figure 1d, was shown to them, when the low state occurred. The lottery outcomes were determined by computer generated random numbers. There was one lottery outcome per trading group per round. The outcomes were revealed to subjects after the outcome of each auction. An animated spinning arrow, Figure 1b, was used to present the lottery outcomes. Examples of the complete screens subjects saw are shown in appendices B.1 to B.5.

[10] We can think of the composite lottery as a lottery with two outcomes which are themselves lotteries. With probability 0.43 the outcome of the composite lottery is the low state lottery; with probability $1-0.43 = 0.57$ it is the high state lottery. The low state lottery pays out 31 with probability 0.37, so the composite lottery will pay out 31 with probability $0.37 \times 0.43 \approx 0.16$. The probability values for the other payouts are calculated in the same way.

Table 3: The Lotteries Used

Name		Lottery[a]	Expected Value
Low state	l	$(0, 0.63; 31, 0.37)$	11.5
High state	h	$(63, 0.40; 97, 0.69)$	83.3
Composite	$(l, 0.43; h, 0.57)$	$(0, 0.27; 31, 0.16; 63, 0.23; 97, 0.34)$	47.8

[a] Each lottery is a list of consequences $(x_1, \ldots, x_n)$ and the associated probability of the consequence occurring $(p_1, \ldots, p_n)$ written in the form $(x_1, p_1; \ldots; x_n, p_n)$ where n is the number of possible outcomes of the lottery. For instance, the *lottery low* state pays out zero with probability 0.63 and pays out 31 with probability 0.37. Probability figures are rounded to two decimal places.

A paper copy of the instructions was given to the subjects (see appendix A). Before the experiment started the experimenter read the instructions aloud, then gave subjects the opportunity to ask questions. All subjects were told about symmetric and asymmetric information even if they did not participate in auctions under both regimes. The motivation for this was to isolate the effect of knowing about asymmetric information from actually experiencing it.[11]

3 Results

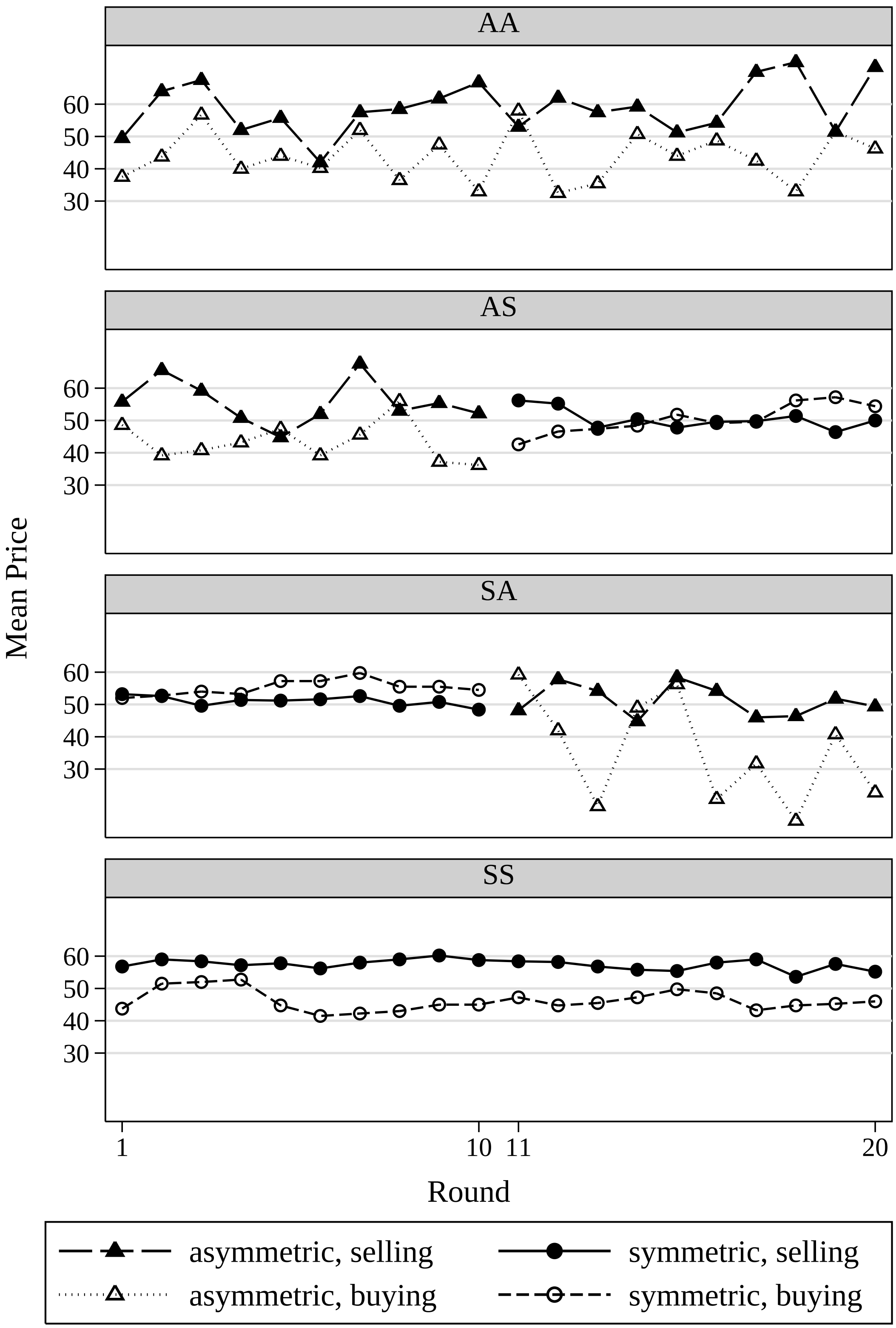
A total of 208 people participated in the experiment. They were divided into 36 trading groups. Table 2 shows how the subjects and trading groups were divided among the 8 treatments. Two types of data were collected: prices and valuations.

In each auction the median bid or ask determined the price at which lotteries were bought or sold. There was one auction per trading group per round giving a total of $36 \times 20 = 720$ observations across all treatments. Prices have an obvious economic meaning. If the price changes, then so do the payoffs of the subjects who traded. In contrast, if one of the bids changes without influencing the price, then the payoffs of the subjects who traded are unchanged. The subject who submits the bid that determines the price is at the margin between trading and not trading, hence there is a greater incentive for them than for non marginal bidders to bid carefully. The evolution of prices in each of the treatments is shown in Figure 2. The graphs show the mean price across trading groups in each treatment.

In each auction, every subject submitted a bid or ask. Every subject completed 20 auctions giving a total of $208 \times 20 = 4160$ observations. The advantage of studying bids and asks is that all the data is used and questions about individual behavior can be addressed. The evolution of

[11] This approach is similar to the one used by Andreoni and Miller (1993) in their experiment where in some treatments there was a 50% chance of meeting a computer opponent and in others a 0.1% chance. In both treatments subjects knew about the chance of meeting a computer, but only in one was there a realistic chance of this happening.

Figure 2: The Evolution of Prices by Treatment



bids and asks in each of the treatments made by uninformed subjects is shown in Figure 3 and the evolution of those made by informed subjects is shown in Figure 4.[12]

3.1 Round 1 and Round 10 Behavior

Result 1 *The size of the WTA/WTP gap decreases in a repeated market with symmetric information.*

Support. The mean buying and selling price in round one and round ten under symmetric information are shown in the upper section of Table 4. The columns labeled *gap* report the difference between mean selling and buying prices. Observations from the SS and SA treatments are pooled. Rounds 1-10 of these treatments had symmetric information. In a given treatment, subjects were either buying for the whole experiment or selling for the whole experiment. Each subject only took part in one treatment. As a consequence, the buying and selling figures are produced by different sets of subjects but corresponding first and last round figures are produced by the same set of subjects. In the first round there is a statistically significant gap. In the final rounds the gap is smaller and not statistically significant, but still present. The round 1 ratio of selling to buying price is $\frac{55.0}{47.9} = 1.15$. The expected value of the lottery is 47.8. Buying prices are close to expected value whereas selling prices are a few points above it. There is little if any evidence of risk aversion.

The lower section of Table 4 shows similar data for individual bids rather than market prices. The same pattern emerges: a statistically significant gap partially closes.

Result 2 *The WTA/WTP gap persists in a repeated market with asymmetric information.*

Support. The mean round 1 and round 10 prices under asymmetric information are shown in the upper section of Table 4. Data from the AA and AS treatments are pooled. The figures in the *gap* columns are the difference between the mean selling and buying prices. First round behavior is similar to that under symmetric information: there is a statistically significant gap in the predicted direction. However the gap persists and marginally increases in size. Note, that iterated deletion of weakly dominated strategies suggests that the buying price should fall to 11.5 (the expected value of the lottery in the low state) and the selling price should rise to 83.3 (the expected value of the lottery in the high state). Instead, although the gap persists, buying and selling prices remained relatively close to the expected value of the lottery across both states which is 47.8.

Mean bids under asymmetric information are shown in the lower section of Table 4. Under asymmetric information, the uninformed did not know whether it was a high or low payout state

[12] A subject is classed as 'informed' if for at least one part of the experiment they were an informed trader. A subject is classed as 'uninformed' if they were never an informed trader.

Figure 3: The Evolution of Bids by Treatment: Uninformed Subjects

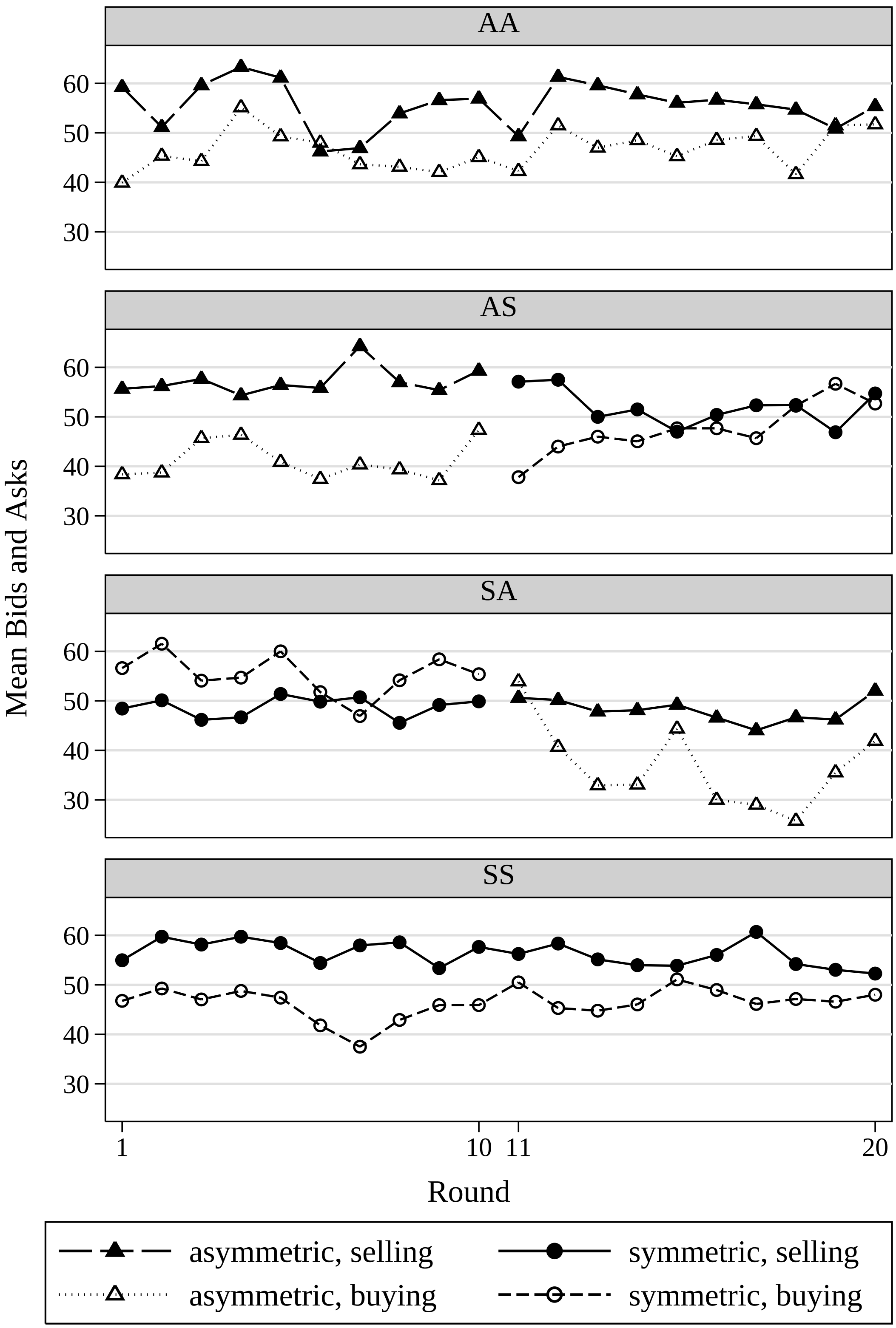


Figure 4: The Evolution of Bids by Treatment: Informed Subjects

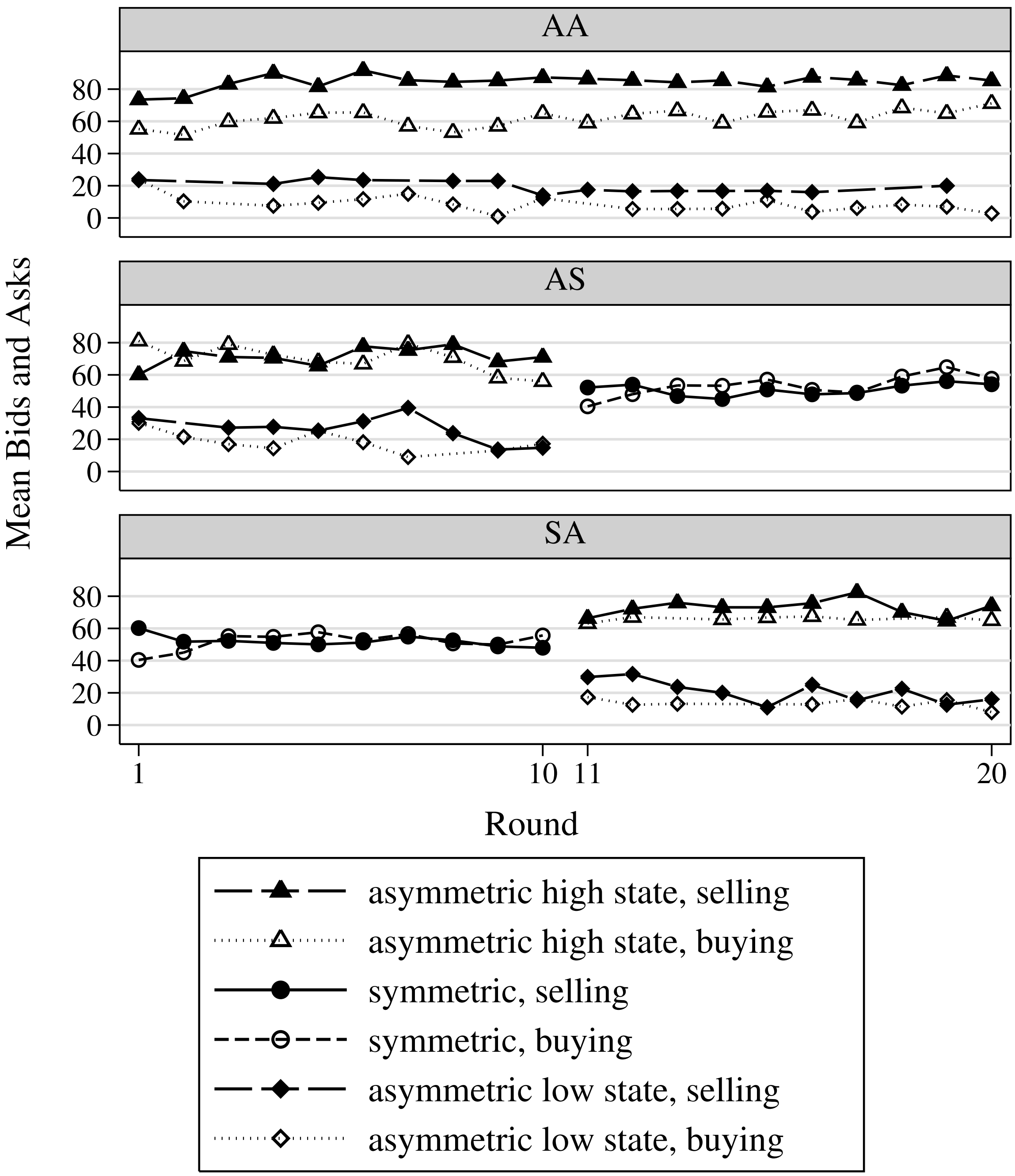


Table 4: Mean Prices and Bids

	Round 1 buying	Round 1 selling	Round 1 gap	Round 10 buying	Round 10 selling	Round 10 gap
Prices Symmetric Information						
	47.9	55.0	7.1***	49.8	53.6	3.9
	(5.8)	(5.8)		(4.0)	(2.3)	
Prices Asymmetric Information						
	43.7	53.0	9.3*	34.8	58.7	23.9***
	(14.0)	(8.3)		(13.9)	(16.8)	
Bids Symmetric Information						
	48.4	54.2	5.8**	50.7	53.2	2.5
	(16.6)	(13.3)		(14.8)	(13.0)	
Bids Asymmetric Information						
Uninformed	39.1	57.2	18.1***	46.3	58.3	12.0**
	(16.5)	(15.5)		(24.0)	(18.7)	
Informed high state	71.7	64.0	−7.7	60.5	78.2	17.7***
	(20.4)	(20.8)		(7.2)	(12.1)	
Informed high state	26.5	28.7	2.2	14.9	14.5	−0.4
	(20.0)	(15.0)		(13.7)	(14.6)	

Data from (a) the SS and SA treatments and (b) the AS and AA treatments are pooled. Samples standard deviations are in parentheses. The null hypothesis $gap \leq 0$ is tested against the alternative $gap > 0$ using a t-test.
The low state is when the lottery paid out 0 or 31; the high state when it paid out 63 or 97. The informed traders were told whether it was a high or low state before they bid; the uninformed were not.
Significance levels: * denotes 10 percent; ** denotes 5 percent; *** denotes 1 percent.

when placing their bids but the informed did know. The bids are disaggregated accordingly into those made by the uninformed, the informed when they knew it was a high state, and the informed when they knew it was a low state. For the uninformed, there is a gap between buying and selling bids in round 1 and round 10. The informed take advantage of the extra information they possess and bid considerably higher when they know it is a high state.

3.2 Trading Success

The last section found that the WTA/WTP gap closes under symmetric information but persists under asymmetric information. What causes the changes over successive rounds, and why does behavior differ between symmetric and asymmetric information? This section assesses whether previous successful trades influence behavior in later rounds.

Result 3 *Willingness to trade increases with previous trading success.*

Support. I estimate the following model[13]:

$$bid_{it} = \alpha_i + \beta success_{i,t-1} + \gamma D_{it} + \psi_t + \varepsilon_{it} \tag{1}$$

The variables are defined as follows: bid_{it} is the bid or ask submitted by subject i in round t of the experiment. Fixed effects are captured by α_i and ψ_t: α_i represents characteristics of subject i that influence bids but whose effects are constant across rounds; ψ_t represents factors that vary across successive auction rounds but are constant across subjects. The variable $success_{i,t-1}$ is a measure of the relative number of profitable and loss-making trades subject i made before round t; β is the corresponding coefficient. D_{it} is a vector of dummy variables specifying the decision problem subject i faced in round t; γ is a vector of corresponding coefficients. The final term, ε_{it} captures errors, the variation in bid_{it} not accounted for by the preceding variables.

Trading success is measured as follows. When *buying* the lottery trading is profitable if and only if the lottery payout *exceeds* the price. When *selling* the lottery trading is profitable if and only if the lottery payout *falls short of* the price. Let π_{it} indicate the outcome of subject i's trading in round t as follows:

$$\pi_{it} = \begin{cases} +1 & if\, traded\, and\, profited \\ 0 & if\, did\, not\, trade\, or\, traded\, and\, exactly\, broke\, even \\ -1 & if\, traded\, and\, made\, a\, loss \end{cases} \tag{2}$$

[13] The equation is a two-way fixed effects model. It has a similar form to the one used by List and Shogren (1999) to determine whether previous observed market prices influence bidding in repeated second price auctions.

Table 5: Two-Way Fixed Effects Estimates of the Relation between Amount Bid and Previous Trading Success

	Pooled		SS		SA		AS		AA	
	buying	selling	buying	selling	buying	selling	buying	selling	buying	selling
success	4.7***	−7.1***	4.3*	−3.9*	5.1	−5.1*	0.8	−6.8**	7.4**	−14.7***
	(1.9)	(1.7)	(3.0)	(2.7)	(4.8)	(3.3)	(3.7)	(4.0)	(3.7)	(4.0)
$p(\beta\|H_0)$	0.006	0.000	0.079	0.070	0.145	0.059	0.415	0.046	0.022	0.000
N	1805	2147	418	551	418	589	513	589	456	418

The table shows the results of estimating equation 1. Standard errors are shown in parentheses. β is the coefficient on the measure of trading success. $p(\beta|H_0)$ is the p value for the obtained results under the null hypothesis that (i) $\beta \leq 0$ for buying and (ii) $\beta \geq 0$ for selling. N is the number of observations where each bid counts as one observation. Significance levels: * denotes 10 percent; ** denotes 5 percent; *** denotes 1 percent.

Subject i's relative success trading in all rounds up to and including t is measured as follows.

$$success_{i,t} = \frac{\sum_{k=1}^{t} \pi_{ik}}{t} \tag{3}$$

The measure has the following properties. If the majority of trades have been profitable, then $success > 0$. If the majority of trades have been loss making, then $success < 0$. If subject i does not trade in round t, then $|success_{i,t}| < |success_{i,t-1}|$, that is the magnitude of $success$ decreases. The motivation for this measure is that people might use a variant of the availability heuristic to judge how likely it is they will make a profit from trading. The more often they have traded and made a profit in previous auctions, the easier it will be for them to imagine that trading in the next auction will be profitable, hence they will judge that trading is more likely to be profitable and accordingly they will be more willing to trade.[14]

Table 5 shows the results of estimating equation 1 for (a) a pool of the 4 buying treatments, (b) a pool of the 4 selling treatments, and (c) each of the 8 treatments. Whichever set of bids the estimation is estimated on, increased trading success (i) increases bids in buying treatments but (ii) decreases bids in selling treatments. Bidding higher in a buying auction increases the likelihood of trading; bidding lower in a selling auction does the same. Hence the results suggest willingness to trade increases with previous trading success.

[14]Kahneman and Tversky (1973) give the following example of the availability heuristic: "one may assess the divorce rate in a given community by recalling divorces among ones acquaintances. If subjects in the experiment use a similar heuristic, they may assess the probability that the next trade will be profitable by recalling what happened in previous trades.

3.3 Spillovers between Markets with Symmetric and Asymmetric Information

Does the presence of informed subjects and the resulting asymmetric information cause the uninformed to behave differently? If so, when the market regime changes between symmetric and asymmetric information, do those without the informational advantage adapt their behavior immediately or is the change gradual?

Result 4 *The uninformed do not immediately change their behavior when they switch between facing symmetric and asymmetric information.*

Support. I estimate the following two models:

$$bid_{it} = \alpha_i + \beta_0 AI_{i,t} + \psi_t + \varepsilon_{it} \tag{4}$$

$$bid_{it} = \alpha_i + \beta_0 AI_{i,t} + \beta_1 AI_{i,t-1} + \ldots + \beta_4 AI_{i,t-4} + \psi_t + \varepsilon_{it} \tag{5}$$

where bid_{it} is the bid or ask submitted by subject i in round t. As in equation 1, α_i and ψ_t capture fixed effects of individuals and experiment round number. $AI_{i,t}$ is a dummy variable: $AI_{i,t} = 1$ if subject i faced asymmetric information in round t of the experiment; $AI_{i,t} = 0$ if they faced symmetric information. The equations were estimated for buying and selling auctions separately. Equation 4 is estimated using all bids from the SS treatments plus all the bids made by the uninformed from the AS, SA and AA treatments (i.e. bids made by the informed are excluded). Equation 5 is estimated using a subset of the bids used to estimate equation 4: the bids that are not used are those where $t < 5$ since the dummy variable $AI_{i,t-4}$ does not exist for these bids.

Table 6 reports the results of estimating equations 4 and 5. The estimates of the coefficients for the dummy variables show how bids are adjusted relative to bids placed under symmetric information. For instance, the estimates of equation 4 suggest when the uninformed face asymmetric information, they bid 12 points lower in buying auctions and 2.3 points higher in selling auctions. If the uninformed adjusted their behavior immediately when they faced asymmetric information, we would expect (a) the AI_t coefficients to be equal in the simple model and the model with lags and (b) the coefficients on the lagged dummy variables to be zero. Instead, the coefficients on the lagged dummy variables are not zero. This indicates that the value of a bid is influenced by whether there was asymmetric information in previous rounds. Hence, it appears the uninformed do not adjust their bidding strategy immediately when the regime switches between symmetric and asymmetric information.

Table 6: Two-Way Fixed Effects Estimates of the Relationship between Value Bid and Asymmetric Information

	Buying		Selling	
	Simple	Spillovers	Simple	Spillovers
Equation Estimated	4	5	4	5
AI_t	-12.0***	1.3	2.3**	1.1
	(1.3)	(3.1)	(1.0)	(2.4)
AI_{t-1}		-9.5**		-0.4
		(4.1)		(3.2)
AI_{t-2}		-4.8		2.6
		(4.1)		(3.2)
AI_{t-3}		0.6		-0.6
		(4.1)		(3.2)
AI_{t-4}		-2.2		0.1
		(3.1)		(2.4)
Subjects N	65	65	78	78
Rounds T	20	16	20	16
Observations $T \times N$	1300	1040	1560	1248

The table shows the results of estimating equations 4 and 5. The dependent variable is bid_{it}, the bid made by subject i in round t. The equations were estimated using all bids from the SS treatments and the bids of the uninformed in the other treatments. The reported figures are coefficients for dummy variables indicating whether round $t-x$ had asymmetric information. Standard errors are shown in parentheses.
Significance levels: ** denotes 5 percent; *** denotes 1 percent.

Table 7: The Effects of Experience of Asymmetric Information on Behavior under Symmetric Information

Experience	Bid	Trading Rate	Plays Lottery Rate
Uninformed			
buying	47.6	0.33	0.33
selling	52.0	0.39	0.61
all	49.9	0.36	0.47
Informed			
buying	53.3	0.46	0.46
selling	50.9	0.38	0.62
all	52.0	0.42	0.55

The table reports data from rounds 11 to 20 of the AS treatment (the rounds with symmetric information).

We can also analyze how the informed and uninformed behave after the regime switches from asymmetric to symmetric information.

Result 5 *After the market regime switches from asymmetric to symmetric information, the previously informed traders have a higher propensity to trade than the previously uninformed.*

Support. Table 7 reports behavior at the level of the individual for rounds 11 to 20 of the AS treatment (i.e. the behavior under symmetric information of those with experience of asymmetric information). The behavior of the subjects who were previously uninformed traders is compared to the behavior of those who were previously informed (rounds 1-10 of treatment AS had asymmetric information). The *Bid* column shows the mean bids. The *Trading Rate* is the proportion who either buy or sell the lottery. The *Plays Lottery Rate* is the proportion of subjects who hold a lottery at the end of the round (i.e. those who buy the lottery or do not sell it). The uninformed trade at lower rates than the informed and are less likely to finish the round holding a lottery. This can be interpreted as experience of being the uninformed party under asymmetric information having two effects: first, it increases aversion to trading (the endowment effect); second, it increases risk aversion. In buying auctions, these two factors act in the same direction; in selling auctions, they act in opposite directions. So there is a large difference between the behavior of the informed and uninformed in buying auctions.

To test hypotheses about the relative trading rates of the informed and uninformed it does not make sense to look at individual level data since whether a given subject trades in an auction is not independent of whether the others trade. For example, in a trading group of 5 (and assuming no ties) exactly two members trade; in a group of 7, three trade. To get around this difficulty, each auction is taken as one observation and the following is asked: is the number of trades by informed

Table 8: The Trading Rate of Previously Informed Traders under Symmetric Information

	Selling	Buying	Total
Number of auctions previously informed traders:			
trade not more than expected	24	14	37
trade more than expected	26	36	62
Total	40	50	100

The table reports the trading rates during rounds 11-20 of the AS treatment of those who were informed traders during rounds 1-10. There were 10 trading groups in the AS treatment and each trading group completed 10 rounds under symmetric information giving 100 auctions. In each of the remaining auctions, the expected number of trades by previously informed traders is calculated as $expected\ trades = total\ trades \times \frac{informed\ traders}{all\ traders}$.

traders more or less than expected? The expected number of trades by previously informed traders is calculated as $expected\ trades = total\ trades \times \frac{informed\ traders}{all\ traders}$. Table 8 reports the number of auctions in which the informed traders traded more and less than expected. If there were no difference in the behavior of the previously informed and uninformed, then the informed should trade more than expected and less than expected with equal probability. In fact the informed traders traded more than expected in $\frac{62}{100}$ of the auctions.

Consider (i) the null hypothesis that in each auction informed traders are equally likely to trade more than expected as they are less than expected and (ii) the alternative hypothesis that informed traders trade more than expected. To test the hypotheses, I estimate the following fixed effects logit model:

$$Pr(informed\, trades_{it} > total\ trades_{it} \times \frac{informed\ traders_i}{all\ traders_i}) = \Lambda(\beta + \gamma_i + u_{it}) \tag{6}$$

where $informed\, trades_{it}$ is the number of trades by previously informed traders in trading group i and round t, $informed\ traders_i$ is the number of informed traders in trading group i etc. The coefficient β is positive if informed traders on average trade more than expected. The coefficient γ_i captures trading group fixed effects. It is positive if informed traders in trading group i trade more than expected more often than informed traders in the other trading groups. Finally, u_{it} is the residual. Since the model controls for trading group fixed effects, it allows meaningful hypothesis testing even though there is more than one observation per trading group. The null hypothesis $\beta = 0$ was tested against the alternative $\beta > 0$. The test produced a p-value of 0.02 for obtaining the observed results under the null hypothesis.

4 Discussion

The experiment was motivated by the conjecture that willingness to trade is determined by a heuristic rather than deliberate analysis of decision problems. The results are consistent with previous studies in that I find that under symmetric information (a) there is an initial gap between WTA and WTP for lotteries and (b) that this gap decays in a repeated market. The novel findings are as follows. First, under asymmetric information the WTA/WTP gap persists in a repeated market. Second, willingness to trade increases with previous trading success. Third, when the market regime switches between symmetric and asymmetric information, subjects do not immediately adjust their behavior. Fourth, when the regime switches from asymmetric information to symmetric information, the previously informed traders trade more than the previously uninformed. These results support the caution heuristic conjecture.

One might wonder why, if using a heuristic causes suboptimal behavior as described above, people would solve decision problems using a heuristic rather than deliberately solving each one. A possible explanation is that determining the optimal behavior under asymmetric information is hard. People do not fully take into account how other people's actions depend on these other people's information (Eyster and Rabin, 2005). For instance consider the asymmetric information problem subjects faced in the experiment. Iterative deletion of weakly dominated strategies suggests an equilibrium where the selling price is 83.3 and the buying price 11.5. Even when the same problem is repeated 10 times, the market prices were no where near these values. If people can not solve a relatively simple asymmetric information problem in the lab, even when it is repeated, can we expect them to do better in naturally occurring markets where the problems are likely less well specified and successive problems are unlikely to be identical?

One might also wonder if the observed behavior, such as willingness to trade increasing with previous trading success, would occur if the stakes were higher or the time period were longer. While it is hard to answer these questions decisively, there is evidence that even over longer periods and when the stakes are high, personal experience influences behavior. For instance, Malmendier and Nagel (forthcoming) find that people who have experienced low stock-market returns throughout their lives so far are less willing to take financial risk, are less likely to participate in the stock market and invest a lower fraction of their liquid assets in stocks if they participate.

This paper builds on earlier studies on how market experience affects willingness to trade. In a recent study, Engelmann and Hollard (2010) found that the reluctance to trade typically found in simple exchange experiments (e.g. Knetsch (1989)) could be eliminated if subjects had first taken part in a "forced trade" round. In this "forced trade" round, subjects were endowed with one of two items and could trade with other subjects in a group. At the end of the round, if a subject possessed an item of the type with which they had been endowed, they had to return it to the experimenter; otherwise (if they had traded), they kept the item they possessed. Engelmann and Hollard conjecture that "forcing" subjects to make trades they would not otherwise have made teaches them that trading is not as risky as they had feared, so they are more willing to trade in subsequent tasks. In terms of the caution heuristic conjecture presented in this paper, the results can be interpreted as follows. The "forced trade" treatment has the opposite effect to asymmetric information. Under forced trade, not trading results in losses, so subjects adopt the heuristic of being willing to trade; under asymmetric information, trading results in losses, so subjects adopt the heuristic of being reluctant to trade.

What are the wider consequences of people using a caution heuristic? The direct consequence is that the decision of whether or not to trade is not fully determined by preferences. There will be some potential trades that will make both parties better off but will not be executed. This means that welfare gains from trade will not be fully realized. Furthermore, there are consequences to spillover effects. Suppose making a loss on a trade causes a person to be more cautious and generally more reluctant to trade. Institutions that protect buyers from making losses on purchases will reduce the number of buyers suffering losses and so cautiousness among buyers. Examples of such institutions include legal rights for buyers of goods, additional guarantees offered by some sellers, financial redress for people who were miss-sold financial products. Notice, however, if both buyers and sellers are equally prone to use a caution heuristic, institutions that transfer risk between them will not increase the gains from trade if transferring the risk makes one party less cautious but the other more cautious.

References

Akerlof, G. A.: 1970, 'The Market for 'Lemons': Quality Uncertainty and the Market Mechanism'. *The Quarterly Journal of Economics* **84**(3), 488–500.

Andreoni, J. A. and J. H. Miller: 1993, 'Rational Cooperation in the Finitely Repeated Prisoner's Dilemma: Experimental Evidence'. *Economic Journal* **103**(418), 570–85.

Bateman, I., A. Munro, B. Rhodes, C. Starmer, and R. Sugden: 1997, 'A Test of the Theory of Reference-Dependent Preferences'. *Quarterly Journal of Economics* **112**(2), 479–505.

Brown, T. C. and R. Gregory: 1999, 'Why the WTA-WTP Disparity Matters'. *Ecological Economics* **28**(3), 323–335.

Chen, M. K., V. Lakshminarayanan, and L. R. Santos: 2006, 'How Basic Are Behavioral Biases? Evidence from Capuchin Monkey Trading Behavior'. *Journal of Political Economy* **114**(3), 517–537.

Coursey, D. L., J. L. Hovis, and W. D. Schulze: 1987, 'The Disparity Between Willingness to Accept and Willingness to Pay Measures of Value'. *The Quarterly Journal of Economics* **102**(3), 679–690.

Engelmann, D. and G. Hollard: 2010, 'Reconsidering the Effect of Market Experience on the "Endowment Effect"'. *Econometrica* **78**(6), 2005–2019.

Erev, I. and A. E. Roth: 1998, 'Predicting How People Play Games: Reinforcement Learning in Experimental Games with Unique, Mixed Strategy Equilibria'. *American Economic Review* **88**(4), 848–81.

Ert, E. and I. Erev: 2008, 'The rejection of attractive gambles, loss aversion, and the lemon avoidance heuristic'. *Journal of Economic Psychology* **29**(5), 715 – 723.

Eyster, E. and M. Rabin: 2005, 'Cursed Equilibrium'. *Econometrica* **73**(5), 1623–1672.

Gilovich, T., D. Griffin, and D. Kahneman: 2002, *Heuristics and Biases: The Psychology of Intuitive Judgment*. Cambridge University Press.

Heifetz, A. and E. Segev: 2004, 'The Evolutionary Role of Toughness in Bargaining'. *Games and Economic Behavior* **49**(1), 117–134.

Horowitz, J. K. and K. E. McConnell: 2002, 'A Review of WTA/WTP Studies'. *Journal of Environmental Economics and Management* **44**(3), 426–447.

Kahneman, D., J. L. Knetsch, and R. H. Thaler: 1990, 'Experimental Tests of the Endowment Effect and the Coase Theorem'. *The Journal of Political Economy* **98**(6), 1325–1348.

Kahneman, D., P. Slovic, and A. Tversky: 1981, *Judgement under uncertainty: Heuristics and biases*. Cambridge University Press, Cambridge.

Kahneman, D. and A. Tversky: 1973, 'Availability: A Heuristic for Judging Frequency and Probability'. *Cognitive Psychology* **5**, 207–232.

Knetsch, J., F.-F. Tang, and R. Thaler: 2001, 'The Endowment Effect and Repeated Market Trials: Is the Vickrey Auction Demand Revealing?'. *Experimental Economics* **4**(3), 257–269.

Knetsch, J. L.: 1989, 'The Endowment Effect and Evidence of Nonreversible Indifference Curves'. *American Economic Review* **79**(5), 1277–84.

Krishna, V.: 2002, *Auction Theory*. Academic Press.

List, J. A.: 2003, 'Does Market Experience Eliminate Market Anomalies?'. *The Quarterly Journal of Economics* **118**(1), 41–71.

List, J. A.: 2004, 'Neoclassical Theory Versus Prospect Theory: Evidence from the Marketplace'. *Econometrica* **72**(2), 615–625.

List, J. A. and J. F. Shogren: 1999, 'Price Information and Bidding Behavior in Repeated Second-Price Auctions'. *American Journal of Agricultural Economics* **81**(4), 942–949.

Loomes, G., C. Starmer, and R. Sugden: 2003, 'Do Anomalies Disappear in Repeated Markets?'. *Economic Journal* **113**(486), C153–C153.

Malmendier, U. and S. Nagel: 2010, 'Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?'. *The Quarterly Journal of Economics*. Forthcoming.

Marx, L. M.: 1999, 'Adaptive Learning and Iterated Weak Dominance'. *Games and Economic Behavior* **26**(2), 253–278.

Plott, C. R. and K. Zeiler: 2005, 'The Willingness to Pay-Willingness to Accept Gap, the "Endowment Effect," Subject Misconceptions, and Experimental Procedures for Eliciting Valuations'. *American Economic Review* **95**(3), 530–545.

Sayman, S. and A. Onculer: 2005, 'Effects of Study Design Characteristics on the WTA-WTP Disparity: A Meta Analytical Framework'. *Journal of Economic Psychology* **26**(2), 289–312.

Shogren, J. F., S. Cho, C. Koo, J. List, C. Park, P. Polo, and R. Wilhelmi: 2001, 'Auction Mechanisms and the Measurement of WTP and WTA'. *Resource and Energy Economics* **23**(2), 97–109.

Shogren, J. F., S. Y. Shin, D. J. Hayes, and J. B. Kliebenstein: 1994, 'Resolving Differences in Willingness to Pay and Willingness to Accept'. *The American Economic Review* **84**(1), 255–270.

Thorndike, E.: 1898, 'Animal intelligence'. *Psychological Review, Monograph Supplements* (8).

A Instructions

Introduction

You are about to participate in an experiment investigating how people make decisions in markets. During the session, please do not talk or communicate with any of the other participants. If you have a question, please raise your hand and I will come to your desk to answer it.

Payment

You will be paid in cash at the end of the experiment. The amount you receive will depend on the decisions you and other participants make and the outcome of random events. During the course of the experiment you will gain or lose credits. At the end of the experiment, the credits you have accumulated will be exchanged for real money. You will receive £1 for every 250 credits.

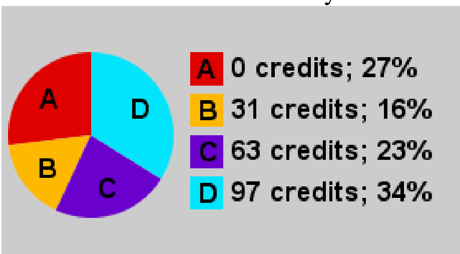
Outline

The experiment involves buying lotteries. The experiment is divided into two parts: A and B. There are 10 rounds in each part, so there are 20 rounds in total. In each round you will be allocated 100 credits and have the chance to buy a lottery from the experimenter. The price of the lottery will be determined by a special type of auction (how the auction works is described in detail later). At the end of each round you will be told the result of the auction and how much the lottery paid out. How much you earn from each round is affected by some or all of the following factors: whether you buy the lottery, the price of the lottery, and how much the lottery pays out. If you do not buy the lottery, the amount you earn from the round is simply the 100 credits you were allocated at the start of the round. If you buy the lottery, your earnings are 100 credits plus whatever the lottery pays out minus the amount you paid for the lottery.

After each round your earnings from the round are banked. At the end of the experiment you will be paid based on the number of credits you have banked over the 20 rounds.

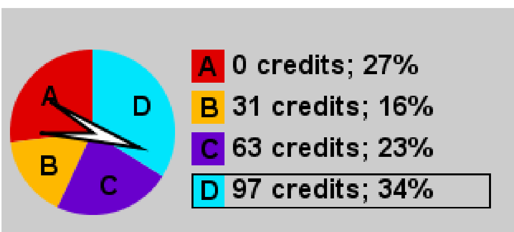
Lotteries

The lotteries will be shown to you in the following format.



The lottery shown above pays out 0 credits with probability 27%, 31 credits with probability 16%, 63 credits with probability 23%, and 97 credits with probability 34%.

The lottery result is determined by a computer simulated spinning device as illustrated below. The amount that the lottery pays out depends on what colour the arrow is pointing to after it has been spun. In the screenshot below, the arrow is pointing to region D, so the lottery would payout 97 credits. There are no tricks. The probability figures for each of the regions are accurate. We have determined all of the lottery outcomes in advance, so we do not have to do this during the experiment. However, we can assure you that the outcomes of the lotteries were resolved in a genuinely random way. If you wish, after the experiment is over you can request a printout showing all the lottery outcomes for the session you took part in to verify this. The outcomes are then revealed to the participants in the experiment at the appropriate stage in the experiment



Auctions

As stated above, during the experiment you will participate in a series of auctions to buy lotteries. You will be told how many other participants are bidding in the auctions. It will be the same people bidding against you in every auction.

During the auction, you and the other participants are bidding to buy a lottery from the experimenter. Each participant can only buy one lottery per auction. However, in most auctions more than one participant will buy a lottery. The price and who buys will be determined as follows.

(1) How are bids entered? Each participant will be prompted to type a bid into the box shown on the screenshot below.

[Screen shot appeared here]

(2) How is the price determined? The computer will record the bids made by each of the participants and arrange them in order from lowest to highest. Suppose, for example, the bids were:
35, 36, **56**, 68, 72

The middle value (median) determines the price. So in this case the price would be 56.

(3) Who buys the lotteries and how much do they pay?
Each of the participants who bid above the price buys a lottery. They pay the price, not the amount they bid. So, if (as in the above example) the bids were 35, 36, 56, 68 and 72, the price would be 56 and the participants who bid 68 and 72 would each pay 56 and play the lottery.

(4) Who gets told what? After the auction, you won't be told the value of other participants' bids and they won't be told the value of your bid. However, you and the other participants will be told the price and who bought lotteries.

Informed Traders

As noted above, the experiment will be divided into two parts: A and B. Each part will consist of 10 rounds. Before the experiment starts you will be assigned to a group of 5 or 7 participants who you will play against in the auctions.

In some groups 2 or 3 participants will be selected to be *Informed Traders* in one or both parts of the experiment. Whether you are assigned to a group with *Informed Traders* and if so, whether you are selected to be an informed trader is determined at random. Everyone in the group will be told whether the group contains *Informed Traders.* If the group does contain *Informed Traders*, everyone in the group will be told how many *Informed Traders* there are in the group and whether or not they are an informed trader.

The *Informed Traders* will be given extra information about where the spinner that determines the lottery outcome stopped before they enter their bid. The screenshot below shows an example of what the informed traders might see.

[Screen shot appeared here]

The other members of the group (*The Uninformed*) will be told that there are *Informed Traders* in the group, but *The Uninformed* will not be given any extra information about where the spinner stopped before they make their bids. The screenshot below shows an example of what they might see.

[Screen shot appeared here]

How you will be told the results of the auction and the outcome of the lottery

Once you and the other participants in your group have submitted their bids, you will be told the result of the auction and the outcome of the lottery. The screenshot below shows and example of what you might be shown. (The numbers are just examples and contain no significance beyond this.)

[Screen shot appeared here]

When you click continue on the ‘Round Results’ screen, you will be shown a summary of the results of the experiment so far. The screenshot below shows an example of what you will see.

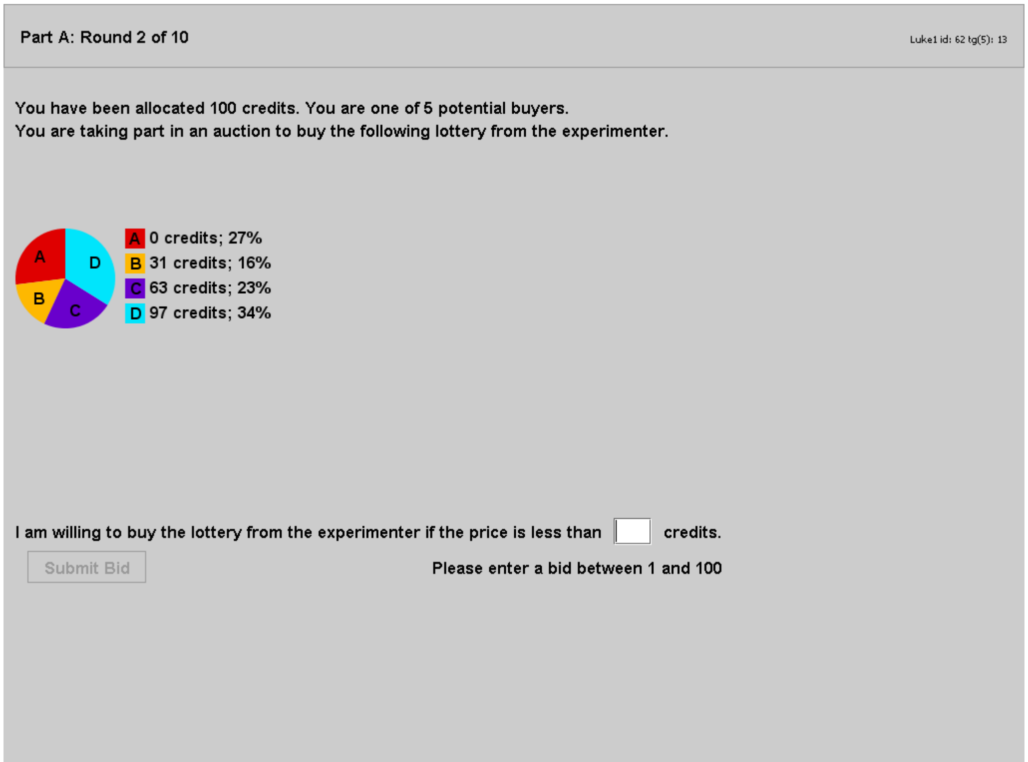
[Screen shot appeared here]

It shows that in round 1, you and Player #2 bought a lottery for 48 credits and it paid out 63 credits, so you both made a profit of 15 from buying the lottery. Likewise in round 2 you made a profit of 35 credits from buying the lottery. In round 3 you did not buy the lottery. Finally, in round 4 you bought the lottery for 40 credits but it paid out zero, so you made a loss of 40 credits. (These numbers are just examples and contain no significance beyond this.)

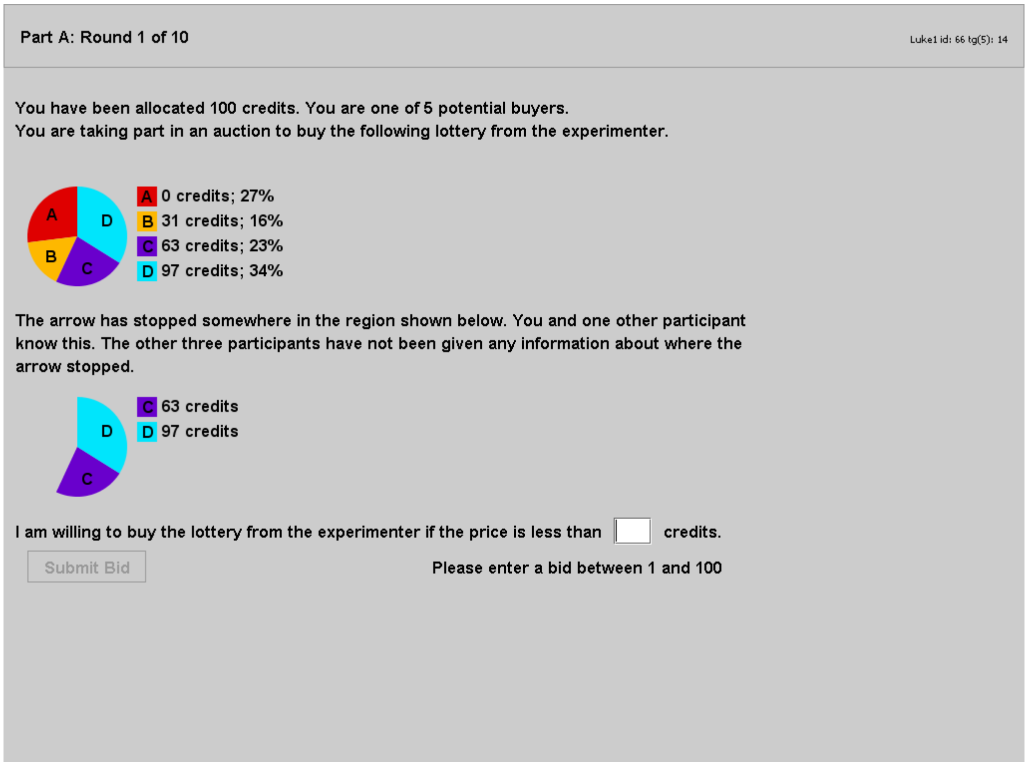
When you click continue on the ‘Results so far’ screen you will begin the next round.

B Screenshots

B.1 Enter Bid: Symmetric Information



B.2 Enter Bid: Asymmetric Information Informed


Part A: Round 1 of 10

Luke1 id: 66 tg(5): 14

You have been allocated 100 credits. You are one of 5 potential buyers.
You are taking part in an auction to buy the following lottery from the experimenter.

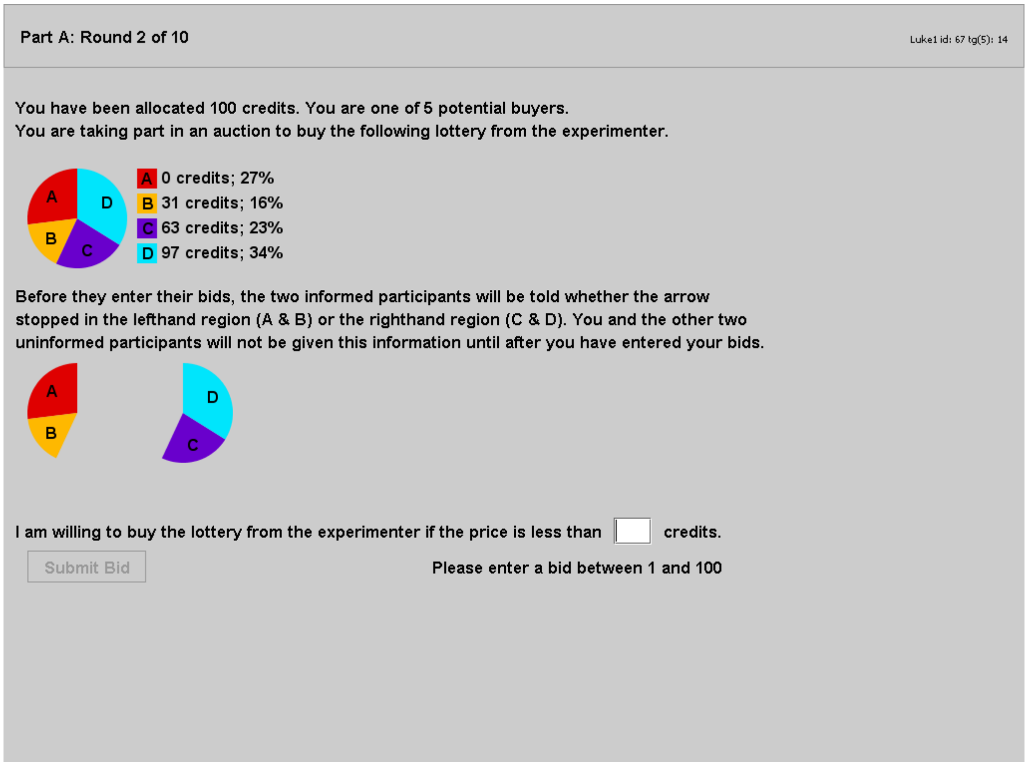
The arrow has stopped somewhere in the region shown below. You and one other participant know this. The other three participants have not been given any information about where the arrow stopped.

I am willing to buy the lottery from the experimenter if the price is less than [ ] credits.

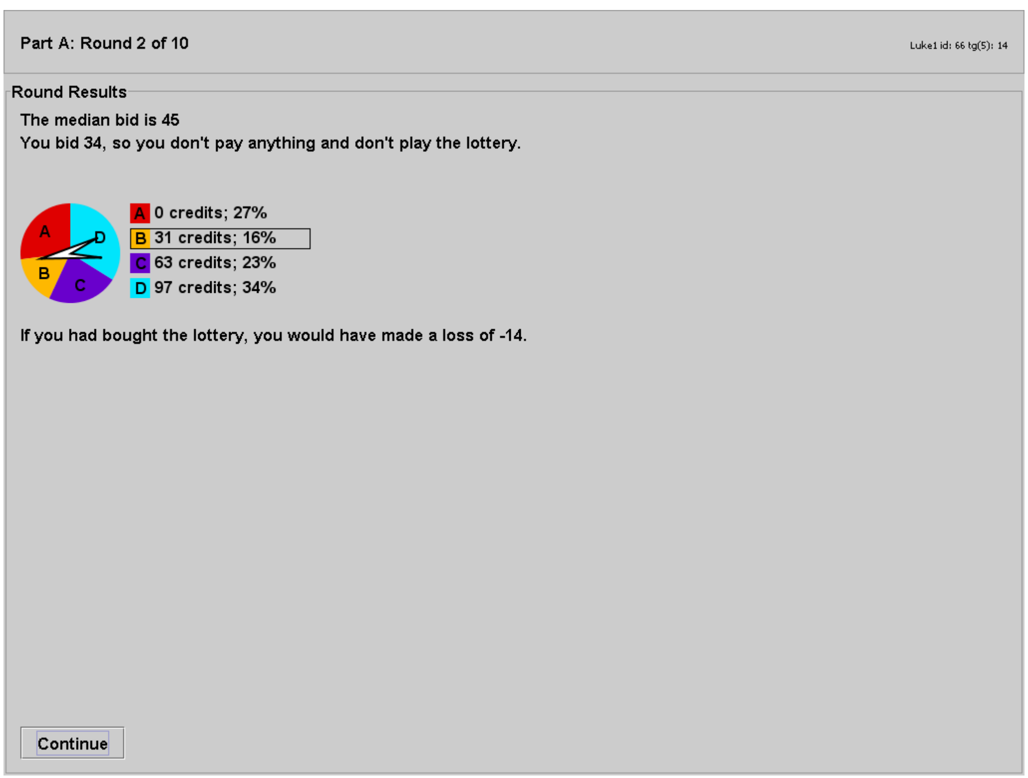
Submit Bid

Please enter a bid between 1 and 100

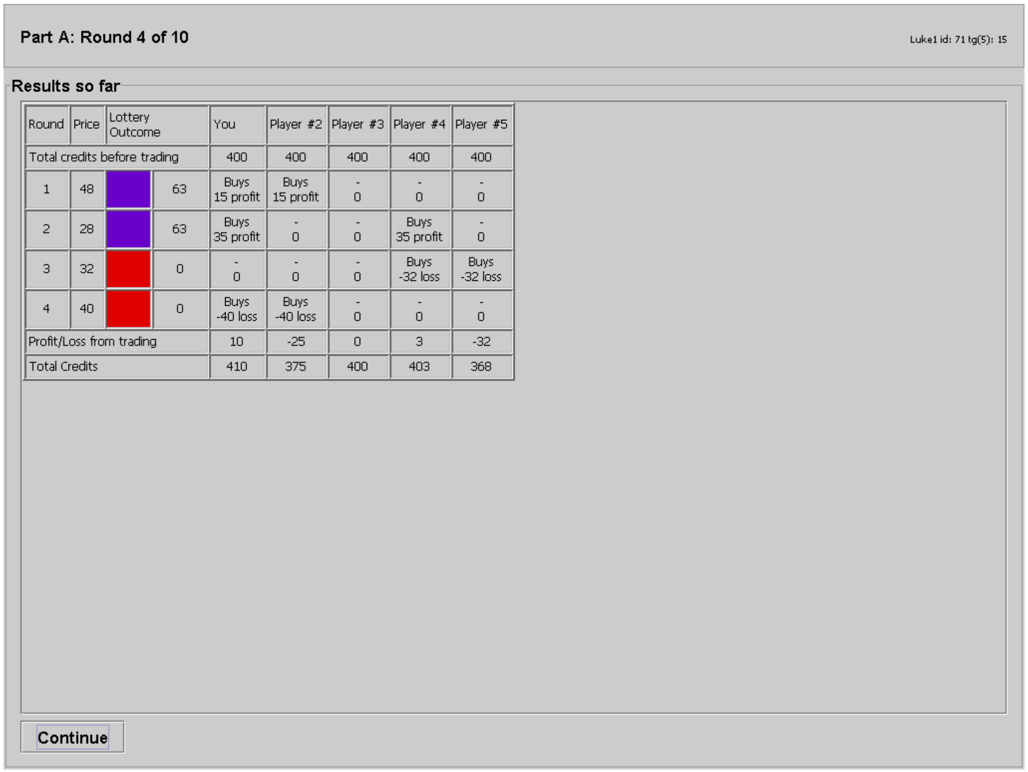
B.3 Enter Bid: Asymmetric Information Uninformed



B.4 Results: Current Round



B.5 Results: All Rounds Completed



Part A: Round 4 of 10

Luke1 id: 71 tg(5): 15

Results so far

Round	Price	Lottery Outcome		You	Player #2	Player #3	Player #4	Player #5
Total credits before trading				400	400	400	400	400
1	48		63	Buys 15 profit	Buys 15 profit	- 0	- 0	- 0
2	28		63	Buys 35 profit	- 0	- 0	Buys 35 profit	- 0
3	32		0	- 0	- 0	- 0	Buys -32 loss	Buys -32 loss
4	40		0	Buys -40 loss	Buys -40 loss	- 0	- 0	- 0
Profit/Loss from trading				10	-25	0	3	-32
Total Credits				410	375	400	403	368

Continue