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BARGAINING WITH COSTLY VOLUNTARY DISCLOSURE*

Paul Pecorino
Department of Economics, Finance and Legal Studies
University of Alabama
Box 870224
Tuscaloosa, Alabama 35487
(205) 348-0379
Fax: (205) 348-0590
ppecorin@cba.ua.edu

Mark Van Boening
Department of Economics
University of Mississippi
Holman Hall 373
University, MS 38677
(662) 915-5841
Fax: (662) 915-6943
bmvan@olemiss.edu

Abstract

We conduct an experimental analysis of pretrial bargaining, while allowing for the costly disclosure of private information. We do this for both a signaling game in which voluntary disclosures are predicted to occur and a screening game in which voluntary disclosures are predicted not to occur. Our results are weakly in the direction of theory, as we find voluntary disclosures to be much more common in the signaling game than in the screening game, but in both cases, the point predictions of the theory are missed by a wide margin. In both sets of experiments, players with favorable private information were more likely to make a voluntary disclosure, than players with unfavorable information. In line with theory, players who revealed favorable private information experienced a large drop in the dispute rate.

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1. Introduction

It is well known that asymmetric information can lead to costly disputes such as trials, strikes and wars. Institutions which facilitate the transfer of information between disputants have the potential to reduce the incidence of these disputes. One such institution, which is quite simple, is the voluntary disclosure of private information. While it might appear that individuals with favorable information would have an incentive to reveal it, the theoretical literature on pretrial bargaining predicts that the information structure of the game determines whether costly disclosures will be made. In particular, costly voluntary disclosures may be made when the informed party makes the final offer prior to trial (i.e., in the signaling model), but are predicted never to occur when the uninformed party makes this offer (i.e., in the screening model).

In this paper, we conduct an experimental analysis of pretrial bargaining, while allowing for the costly disclosure of private information. We do this for both a signaling game in which voluntary disclosures are predicted to occur and a screening game in which voluntary disclosures are predicted not to occur. Our results are weakly in the direction of theory, as we find voluntary disclosures to be much more common in the signaling game than in the screening game, but in both cases, the point predictions of the theory are missed by a wide margin. In both sets of experiments, players with favorable private information were more likely to make a voluntary disclosure, than players with unfavorable information. In line with theory, players who revealed favorable private information experienced a large drop in the dispute rate.

The data provide some support for the theory, but also contain some important anomalies which we discuss in more detail below. We view this paper first pass at gaining a better understanding of the role of costly voluntary disclosures in the litigation process. It is important to gain this understanding, because it may help to shed light on how to better structure

bargaining prior to a dispute and on whether costly institutions, such as mandatory discovery, are necessary elements of the litigation process.

2. Theory

In this section, we will present a simple screening game based on Bebchuk (1984) and a simple signaling game based on Reinganum and Wilde (1986). We will describe the games without voluntary disclosure in some detail, so as to make the baseline of the experiment clear. We will then draw on the results of the literature for our predictions about when costly voluntary disclosures are possible. Shavell (1989) analyzes costless and credible voluntary disclosure in the screening model and finds that it leads to a 100% rate of settlement. Sobel (1989) shows that these results are not robust in the sense that even small costs of disclosure will prevent its occurrence in this model. However, if the costs of revealing private information are sufficiently small, voluntary disclosures will be made in the signaling game (Farmer and Pecorino 2005).

Both the plaintiff and defendant are risk neutral. The level of damages to be awarded at trial is known by the plaintiff but not the defendant. The defendant only knows that with probability q he faces a high damage plaintiff J^H and with probability 1-q he faces a low damages plaintiff J^L. Using this simple environment, we first present the screening model and then the signaling model.

In all of our analyses, the probability p that the plaintiff prevails at trial is common knowledge, and we furthermore assume that $p = 1$. The plaintiff is one of two types, type H with a strong case or type L with a weak case. If the case proceeds to trial, the plaintiff receives judgment J^i, $i = H,L$ with $J^H > J^L$. The amounts of the state-contingent judgments are common knowledge. The court costs for the plaintiff and defendant are, respectively, C_P and C_D. (These

costs are incurred only if the case proceeds to trial.) We assume that $J^L - C_P > 0$ so that the plaintiff always has a credible threat to proceed to trial.[1]

2.1 The Screening Game

The stages of the game are as follows:

0. Nature determines the plaintiff's type to be either *H* with judgment J^H or *L* with judgment J^L. The plaintiff is type *H* with probability *q* and type *L* with probability 1-*q*. The plaintiff knows her type, but the defendant knows only the probability *q* that the plaintiff is type *H* (and hence the probability 1-*q* that the plaintiff is type *L*).

1. The plaintiff decides whether to reveal her type to the defendant. If she does reveal her type, she incurs the cost *v*.

2. The defendant makes an offer O_D to the plaintiff.

3. The plaintiff accepts or rejects the offer. If the offer is accepted, the game ends with the plaintiff receiving a payoff of O_D and the defendant receiving a payoff of $-O_D$ (i.e., the defendant incurs a cost equal to O_D).

4. If the offer is rejected, trial occurs. The plaintiff receives the payoff $J^i - C_P$, and the defendant receives the payoff $-J^i - C_D$ (or incurs cost $J^i + C_D$), where *i* = *H, L*.

We include the step for voluntary disclosure, but first discuss the outcome of the game when this is not possible. The plaintiff will accept any offer that leaves her at least as well off as the expected outcome at trial. In other words, a type i plaintiff will accept any offer such that $O_D \geq J^i - C_P$. The defendant is free to make any offer he chooses, but the optimal offer will be one of the following:

[1] Nalebuff (1987) analyzes a model in which this is not always true.

$$O_D^L = J^L - C_P \tag{1a}$$

$$O_D^H = J^H - C_P \tag{1b}$$

In making his offer O_D, the defendant will choose either a high pooling offer O_D^H that both plaintiff types will accept or the low screening offer O_D^L that only a type *L* plaintiff will accept. The defendant offers O_D^L iff $(1-q)(J^L - C_P) + q(J^H + C_D) < J^H - C_P$. This may be written as

$$q < \frac{(J^H - J^L)}{(J^H - J^L) + C_P + C_D}. \tag{2}$$

The defendant makes a low screening offer if the probability *q* of encountering a high damage plaintiff is sufficiently small. When the screening offer is made, trials will occur with probability *q*. If the condition in (2) fails to hold, the defendant will make the pooling offer under which all cases settle. In our experiment, we choose parameter values such that (2) holds. In the absence of voluntary disclosure, our theoretical predictions are that the player in the role of the defendant will offer O_D^L, and that players in the role of a type *L* plaintiff will accept this offer with 100% probability and players in the role of a type *H* plaintiff will reject it will 100% probability.

Costly voluntary disclosures are never made in this game. A type *L* plaintiff receives O_D^L in equilibrium if she remains silent and would receive $O_D^L - v$ if she reveals her type. Similarly, a type *H* plaintiff receives $J^H - C_P$ if she remains silent and would receive $J^H - C_P - v$ if she reveals her type. The key factor driving this result is that the defendant makes the take-it-or-leave-it offer and extracts all of the joint surplus from settlement via this offer. If in practice the defendant is unable to extra all of the settlement surplus via his offer, then we might see, contra

the theory, voluntary disclosures in this setting. The results of the ultimatum game literature call into question the idea that the player making the final offer can extract all of the surplus from settlement. Thus, it is an interesting empirical question as to whether this prediction of the model will be borne out.

2.2 The Signaling Game

The stages of the game are similar to those above with 2' and 3' replacing stages 2 and 3.

2'. The plaintiff makes an offer O_P to the defendant.

3'. The defendant accepts or rejects the offer. If the offer is accepted, the game ends with the plaintiff receiving payoff O_P and the defendant receiving payoff $-O_P$ (or incurring cost O_P).

As before, we will first analyze the game without voluntary disclosure (step 1). Multiple equilibria are a problem in signaling games. In this particular game, the refinement concept D1 has been used to eliminate all but a pure strategy separating equilibrium.[2] We will present this equilibrium only. Pecorino and Van Boening (2004a) contains a more in depth discussion of other equilibria which can arise in this model.[3] In the separating equilibrium, each plaintiff makes a unique offer associated with her type. These offers are as follows:

$$O_P^L = J^L + C_D \tag{3a}$$

$$O_P^H = J^H + C_D \tag{3b}$$

In the separating equilibrium, H plaintiffs make the offer O_P^H and L plaintiffs offer O_P^L. Since the plaintiff follows a pure strategy, these offers are revealing of the plaintiff's type. In

[2] See Cho and Kreps (1987).

[3] We choose parameter values so as to rule out a pooling equilibrium. Semi-pooling equilibria are possible, but the prediction that voluntary disclosure will occur is robust to these equilibria.

other words, a defendant receiving an offer O_P^H believes with probability 1 that this offer has been made by a type *H* plaintiff.

The low offer O_P^L will be accepted by the defendant with probability 1.[4] Type *L* plaintiffs will reveal their type via the offer O_P^L only if O_P^H is rejected with a sufficiently high probability. Note that the revealing offer O_P^H leaves the defendant indifferent between acceptance and rejection. Thus, the defendant is free to respond to this offer with a mixed strategy. The offer O_P^H will be rejected by the defendant with probability ϕ such that $(1-\phi)(J^H + C_D) + \phi(J^L - C_P) \le J^L + C_D$. Rearranging yields the condition

$$\phi \ge \frac{(J^H - J^L)}{(J^H - J^L) + C_P + C_D}. \qquad (4)$$

Under the refinement D1, (4) will hold as an equality. (See Daughety (1999).) The probability of a trial is $q\phi$, the probability that the plaintiff is type *H* times the probability that the high offer is rejected. More specifically, the dispute rate for type *L* plaintiffs is 0% and the dispute rate for type *H* plaintiffs is ϕ%.

This model is consistent with costly voluntary disclosure made by type *H* players, but not type *L*. If a type *H* player reveals her private information, she can make the offer O_P^H and have it accepted with probability 1. If she does not reveal her private information, this offer will be rejected with probability ϕ. Each time the offer is rejected, the plaintiff loses the entire joint surplus from settlement, $C_P + C_D$. Thus, if $v < \phi(C_P + C_D)$, type *H* plaintiffs will voluntarily disclose their information. Under the parameter values in our experiment, v = \$.25, $C_P + C_D$ =

[4] See Reinganum and Wilde (1986, p. 565).

\$1.50 and the predicted value of $\phi = 2/3$. Thus, the expected net benefit to type *H* players from revealing is \$.75 per round. Since a type *L* plaintiff receives $O_P^L - v$ when she discloses and O_P^L when she does not disclose, this plaintiff should never make a costly voluntary disclosure.

3. Experimental Design

Table 1 summarizes the twelve sessions in our experimental design. In sessions Scr 1-3, subjects played the baseline screening game and in sessions Sig 1-3, they played the baseline signaling game. The corresponding treatment sessions are Scr V 1-3 and Sig V 1-3. In the treatment sessions, the player in the role of the plaintiff was given the opportunity to make a costly voluntary disclosure. Subjects were recruited from business classes at The University of Alabama. The number of bargaining pairs ranges from 5 – 8, and each session lasted 12 or 13 rounds.

Type *L* plaintiffs are denoted by A_L and type *H* plaintiffs by A_H. The player in the role of the defendant is referred to as the *B* player. In each round of the experiment, the *A* and *B* players were randomly and anonymously paired. Subjects were not informed ahead of time how many rounds there would be. A typical session, inclusive of an instructional period at the beginning and private payment at the end, lasted between one-and-a-half and two hours. The mean and median earnings for our subjects were about \$30 with a minimum of \$7.05 and a maximum of \$46.75.

As they arrived to a session, subjects were randomly assigned to one of two rooms, with subjects in one room being player *A* and subjects in the other room player *B*. An experimenter was assigned to each room. Subjects were not informed of their role until the end of the experimental instructions; all subjects received common instructions that explained how both

Table 1. Experimental Design

Session	Number of pairs	Number of rounds	Date
I. Screening Game – Baseline			
Scr 1	7	12	06/23/04
Scr 2	5	13	07/21/04
Scr 3	8	13	07/22/04
II. Signaling Game – Baseline			
Sig 1	6	12	06/15/04
Sig 2	8	12	06/24/04
Sig 3	8	12	07/20/04
I. Screening Game – Voluntary Disclosure Treatment			
ScrV1	5	12	06/22/05
Scr V2	7	12	06/28/05
Scr V3	7	12	06/29/05
II. Signaling Game - Voluntary Disclosure Treatment			
Sig V1	8	12	06/16/04
Sig V2	8	12	06/17/04
Sig V3	5	12	06/21/05

Note: All sessions conducted at the University of Alabama

player *A* and player *B* made decisions and earned money. Subjects maintained the same role throughout the session, and other than the written messages transmitted by experimenters between the two rooms, there was no interaction between the *A* and *B* players. Each subject had a private Record Sheet, and each experimenter had forms on which to record information. Players wrote their decisions on their respective Record Sheet, and an experimenter recorded this information on his form. After all subjects in a room had made their decisions, the

experimenters met in the hallway between the two rooms, silently copied information from one another's forms, and then returned to the rooms and wrote the results on the respective subject's Record Sheet.

The parameters for the signaling and screening games are the same. The "judgments" at trial J^L = \$1.50 for A_L players and J^H = \$4.50 for A_H players. Trial costs are $C_P = C_D$ = \$.75, so that total dispute costs are \$1.50. The probability that a plaintiff is A_H is q = 1/3. When voluntary disclosure is an option, the cost v = \$.25. Of course, in the experiment, we did not use verbiage like plaintiff, defendant, judgment at trial, court costs, etc.

3.1. The Screening Game

The sequence in a round of the screening game is as follows (this is very similar to language and appearance used in the subjects' instruction):

1. Player *A* and Player *B* are randomly and anonymously paired.
2. A 6-sided die is rolled for each Player *A*. A roll of 1, 2, 3, or 4 is called outcome *L*. A roll of 5 or 6 is called outcome *H*. Only Player *A* knows the outcome of the die roll.
3. In the voluntary disclosure treatment, Player *A* decides whether or not to inform Player B of the outcome of the die roll. This costs Player *A* \$.25 regardless of how the round proceeds from this point. (All payoffs for *A* below are reduced by \$.25 if a voluntary disclosure occurred.)
4. Player *B* decides on an offer to submit to Player *A*. This offer may be any number between (and including) \$0.00 and \$6.99.
5. Player *B*'s offer is then communicated to Player *A*. Player *A* is given a few moments to decide whether or not to accept the offer. Player *A*'s decision is then communicated to Player *B*.
6. If Player *A* accepts Player *B*'s offer, then the round is over for that pair.

   Players *A*'s Payoff for the round = Player *B*'s offer

   Player *B*'s Cost for the round = Player *B*'s offer.

7. If Player *A* does not accept *B*'s offer, both *A* and *B* incur a fee of 75. *A*'s payoff and *B*'s cost for the round depend on the die roll and the fees:

Under outcome L:	Player *A*'s Payoff for the round =	150 – 75 = 75
	Player *B*'s Cost for the round =	150 + 75 = 225
Under outcome H	Player *A*'s Payoff for the round =	450 – 75 = 375
	Player *B*'s Cost for the round =	450 + 75 = 525.

Step 3 applies only in the voluntary disclosure treatment. Player *A*'s payoff from the experiment is the sum of her payoffs from all rounds. Player *B*'s payoff from the experiment is lump sum minus the sum of his costs from all rounds; the lump sum is known in advance by player *B* but is never revealed to player *A*.

3.2. The Signaling Game

The parameters and procedures for the signaling game are identical to the screening game, except that player *A* makes the take-it-or-leave-it offer to player *B*. The steps of a round are identical to the screening game except for the following modifications.

4'. Player *A* decides on an offer to submit to Player *B*. This offer may be any number between (and including) $0.00 and $6.99.

5'. Player *A*'s offer is then communicated to Player *B*. Player *B* is given a few moments to decide whether or not to accept the offer. Player *B*'s decision is then communicated to Player *A*.

6'. If Player *B* accepts Player *A*'s offer, then the round is over for that pair.

Players *A*'s Payoff for the round	=	Player *A*'s offer
Player *B*'s Cost for the round	=	Player *A*'s offer.

The payoffs in the event of a dispute (i.e., *B* does not *A*'s offer) are the same in the two games. Once again, if *A* makes a voluntary disclosure, her payoff for the round is reduced by $.25.

3.3. Predictions

In the absence of voluntary disclosure in the screening game, the predictions are:

1. Player *B* will make a separating offer 75 to player *A*.[5]

2. A_L players accept all offers greater than or equal to 75 and reject all offers below 75. If prediction 1 is correct, this implies a 0% dispute rate for A_L players.

3. A_H players accept all offers greater than or equal to 375 and reject all offers less than 375. If prediction 1 is correct, this implies a 100% dispute rate for A_H players.

Voluntary disclosure is predicted not to occur in this game. Thus, 0% of both A_L and A_H players are predicted to reveal their type. The other predictions are identical to the game without voluntary disclosure.

For the signaling game without voluntary disclosure, matters are a bit more complicated, but here we will list the predictions of the unique equilibrium outcome that applies under the refinement D1.

Under D1, we have the following prediction for the signaling game without voluntary disclosure:

1. A_L players offer 225 to player *B*.

2. A_H players offer 525 to player *B*.

3. Player *B* accepts all offers of 225 or less. All offers between (and including) 226 and 524 are rejected with 100% probability. An offer of 525 is rejected with a probability of $\phi = 2/3$.

When voluntary disclosure is added to the model, 100% of A_H players and 0% of A_L players are predicted to disclose. The predictions for offers are the same, but the dispute rate for A_H players is predicted to fall from 67% to 0%.

[5] An offer of 75 leaves an A_L player with none of the joint surplus of settlement. For the purposes of exposition, we will ignore (here and elsewhere) the extra penny of surplus we might expect players to offer to ensure settlement under the predictions of the fully rational model. If fairness plays a role, then players may need to offer substantially more than one penny of surplus in order to ensure settlement.

4. Results

We will discuss the screening game first, followed by the signaling game. A fuller analysis of the baseline experiments may be found in Pecorino and Van Boening (2004a).

4.1. Screening Game

For our purposes, the most important aspect of the data from the baseline is the dispute rates. In the screening game, A_L players have a dispute rate of 20%, while the predicted rate is 0%. The predicted dispute rate for A_H players is 100%, the actual dispute rate is 89%. While these figures do not hit the point predictions, the results are very much in the direction of theory. Contray the theory, about 7% of the offers by player *B* are pooling (375 or more) and many of these were accepted by A_H players. This explains some of the settlement behavior by A_H. The excess disputes among the A_L players is fairly typical, and this seems to reflect uncertainty over how much surplus from settlement should be contained in a "fair" offer. The A_L dispute rate is 27% for offers between 75 and 125 and 0% for offers greater than 125. Note that an offer of 150 would be an equal split of the surplus from settlement.[6]

The prediction under costly disclosure is that no costly disclosures will be made and that the outcome of the game will be exactly the same as in the baseline. The A_L players made costly disclosures 16.5% of the time, while A_H players made such disclosures 31.6% of the time. While these values are clearly above the point predictions of 0%, they are roughly in the direction predicted by the theory. In Pecorino and Van Boening (2004b), we found that 80% of A_H players make a voluntary disclosure when doing so is costless.

For the players who did not reveal their type (i.e., those who sent the message "N"), the outcome of the game is quite similar to the baseline. The median offer by Player *B* to the silent

[6] The total surplus from settlement is \$1.50. An A_L player receives \$.75 when a dispute occurs. An offer of \$1.50 gives her \$.75 or half the surplus from settlement.

players is 115, which compared to a median offer of 112 in the baseline. The dispute rates for silent A_H players is 90%, while silent A_L players have a dispute rate of 12.6% (vs. 20% in the baseline).

For A_H players sending the message "H", the dispute rate falls to 37.5%, while theory suggests these players should have a dispute rate of 0%. This is very close to the dispute rate of 35% we found for A_H players revealing their type in an experiment with costless communication. (See Pecorino and Van Boening (2004b).) The median offer to players sending the message "H" is 375, which is right at the theoretical prediction. These offers are not very generous, in the sense that they offer no surplus from settlement to player A_H. We found a similar lack of generosity in our previous work. (See Pecorino and Van Boening (2004b: 149). This lack of generosity in the offers explains the excess dispute rates in both sets of experiments. The stinginess of the observed offers also implies that A_H is (as predicted by theory) better off when she does not reveal her type.[7]

Only 25 out of 152 A_L players send the message "L", and 7 (28%) of these negotiations result in a dispute. This is higher than the dispute rate (12.6%) for A_L players sending the message "N". The mean (111 vs. 159) and median (100 vs. 115) offer were both lower to players sending the message "L". This reduced offer may explain some of the increased dispute rate. The pattern on the offers probably reflects a lack of clarity on *B*'s part about what constitutes a separating offer when he is uncertain about the recipient's type. Receiving the message "L" clarifies the situation for player *B*, and results in stingier offer. Thus we have the perverse increase in dispute rates when the message "L" is sent. Clearly, it is unprofitable for A_L players to send the message "L", and this is in line with the predictions of theory.

[7] If an A_H player remains silent and has a dispute she receives \$3.75. If she reveals her type and receives the median offer of \$3.75, she nets only \$350.

In summary, the actions of most (83.5%) A_L players is in line with theory in the sense that they send the message "N". The results for A_H players are weaker, as only 68.4% send this message. For both player types, sending a costly message is unprofitable as predicted by the theory.

4.2. Signaling Game

Under the refinement D1, a separating equilibrium is predicted for the baseline. However, only 63% of A_L offers are 225 or less which means that upwards of 37% of A_L players may be considered to be bluffing. While this is inconsistent with the predictions implied under D1, this type of semi-pooling equilibrium may be consistent with a perfect Bayesian equilibrium. The dispute rate for A_L players making offers of 225 or less is 13.3%. (It is 9.8% for offers of 224 or less.) The dispute rate for A_L players making offers in excess of 225 is 73%, and this identical to the dispute rate for A_H players.

Type A_L players send the message "L" 23.4% of the time, while they are predicted to do so 0% of the time. They are somewhat more likely to send the message "L" than A_L players in the screening game. The mean and median offers for A_L players were similar regardless of whether they sent the message "N" or the message "L". The dispute rate for A_L players is higher for those who send the message "L". For offers below 225, the dispute rate is 20.7% for those sending the message "Y" and 9.8% for those sending the message "N". Once again, we have a perverse effect from A_L players revealing their type to player *B*.

The A_H players send the message "H" 55.6% of the time, while they are predicted to do so 100% of the time. This is very weakly in the direction of the theory. The mean offer made by players sending the message "Y" is 485.5, while those sending the message "N" have a mean offer of 456.9. Thus players revealing their type at cost are more aggressive in their demands.

Despite the more aggressive offers, the dispute rate for players sending the message "Y" is only 26.7%, compared with 72.2% for players sending the message "N". The latter figure is very close to the 73% dispute rate for A_H players in the baseline. Thus, consistent with the theory, when A_H players reveal their type, we obtain a large reduction in the dispute rate.

If we apply the rejection rates to the mean offer under each strategy, we find that A_H players revealing their type earn about $.58 more than players who do not. If we subtract the cost, we find that revealing private information nets an A_H player (on average) $.33 per round. Thus, it is profitable for A_H players to reveal their type in equilibrium.

Under the theory the net benefit from A_H players revealing their type is $.75 per round. Thus, the incentives are considerably weaker in practice than in theory. The reason is that A_H players cannot, as implied by theory, extract all of the joint surplus from settlement, and at the same time enjoy a 0% dispute rate. This weaker incentive relative to the theory may help to explain why only 55% of A_H players reveal their private information.

To summarize, the theory predicts that revealing private information is unprofitable for A_L players, and this is borne out in the data. However, almost ¼ of A_L players reveal their information anyway, and this group experiences a perverse rise in their dispute rate. Consistent with the theory, it is profitable for A_H players to reveal their type and those who do achieve a rather large reduction in their dispute rate. However, many fewer A_H players reveal their type than is predicted by theory (55% vs. 100%).

5. Conclusion

The performance of the theory is decidedly mixed. For the most part, A_L players do not reveal their type, and this is consistent with the theory. However, a significant minority of A_L players do

reveal their type in both games, counter to the predictions of the theory. For A_H players in the screening game the deviation is larger with 31.6% of these players revealing their type against a prediction of 0%. The only group who are predicted to reveal their type are the A_H players in the signaling game, but only about 56% of these players do so. When A_H players reveal their type, we obtain a large reduction in the dispute rate, and this is consistent with theory, but when A_L players reveal their type, there is a perverse increase in the dispute rate. This increased dispute rate occurs in both the signaling and screening game.

Based on the empirically observed behavior, the only group which receives a positive net benefit from revealing their type are the A_H players in the signaling game. This is consistent with the theory. The feedback provided to the players in this bargaining game is fairly weak. Reasonable offers are sometimes rejected, and A_H players are present in only 1/3 of the rounds. Thus, experience may accumulate slowly. However, the fact that only A_H players receive a net benefit from revealing their type suggests that as players obtained greater experience, we might expect outcomes to evolve more closely to the theoretical predictions. Similarly, the fact that A_L players in both games and A_H players in the screening game receive a negative payoff from revealing their type suggests that these player types might exhibit a greater conformity to the theory as they gained experience.

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