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ABSTRACT

(In)Transparency of Information Acquisition: A Bargaining Experiment*

We analyze how transparency affects information acquisition in a bargaining context, where proposers may chose to purchase information about the unknown outside option of their bargaining partner. Although information acquisition is excessive in all our scenarios we find that the bargaining outcome depends crucially on the transparency of the bargaining environment. In transparent games, when responders can observe whether proposers have acquired information, acceptance rates are higher. Accordingly, in transparent bargaining environments information is more valuable, both individually and socially.

JEL Classification: C91 and D82
Keywords: information acquisition, transparency and ultimatum experiment

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1 Introduction

There is growing evidence that in situations of social learning individuals tend to overinvest in information because they are overconfident about their own information (e.g. Anderson and Holt, 1997, Nöth and Weber, 2003, Kübler and Weizsäcker, 2004, Kraemer et al., 2006). Does overconfidence also occur in a strategic context, when individuals interact with individuals rather than with an anonymous market? Do they also overinvest in information, and if so, how do they use this information in a strategic context?

We attempt to address these issues by analyzing a series of experiments in one of the simplest possible strategic environments, the well-known ultimatum bargaining game. Consider a situation, when the proposer does not initially know the value of the respondent's outside option. She may purchase this information. If her investment can be observed by the respondent we call the environment transparent.[1] Otherwise we call it intransparent. In both cases the incomplete information about the responder's outside option should tend to reduce the first mover advantage of the proposer.

In our experiment proposer participants decide about information acquisition before playing the resulting ultimatum game with (non-)informed proposers. Contrasting the predictions of rational choice models with experimental behavior reveals that the value of information is grossly overstated by a vast majority of respondents. We observe extremely high, and, thus, excessive investment in information, both in terms of the equilibrium-benchmark as well as relative to the actually observed characteristics.

Surprisingly, we also find that the inefficiencies are enhanced, when agents cannot observe whether their counterpart has acquired information. Transparency about the informational endowment of the counterpart seems to affect individual payoffs more than information privately acquired by the respondents.[2] People seem to care a lot about whether it is commonly known which (ultimatum) game they are playing.

[1]Game theoretically, (in)transparency determines whether (or not) ultimatum bargaining qualifies as a proper subgame of the overall interaction.

[2]Ambiguity aversion (see Ellsberg (1988) or Salo and Weber (1995)) for instance, suggests that transparency improves the willingness to invest.

This finding is independent of the actual value of the responder's conflict payoff. In particular, even, when the outside opportunity is less than an equal split of the surplus and when individuals could split the surplus without any informational investments only 20 percent of our subjects would select the fair and cost efficient solution. Overall, we find very little evidence for fairness concerns in our population of participants.[3] Given the dominance of the rational choice solution among our participants the excessive investment result is all the more surprising.

Our analysis proceeds as follows. Section 2 provides the details of the experimental design. Section 3 discusses the results on bidding behavior and section 4 on information acquisition. Section 5 concludes.

2 The Experimental Framework

To distil most visibly the crucial behavioral determinants of (in)transparent information acquisition we employ an ultimatum game as our basic workhorse model.

Proposer X and responder Y , may share a common surplus of 10 units. Proposer X offers y units, which the responder Y can accept or reject (y is an integer with $1 \leq y \leq 9$). In either case the game ends. If the responder accepts, the agents will earn the respective payoffs $(x, y) = (10 - y, y)$ corresponding to X's proposal. If the responder rejects the proposal the agents will earn their conflict payoffs (c_x, c_y) .

We assume that c_x is commonly known. However, c_y is known only to Y . For simplicity $c_y \in \{\underline{c}, \bar{c}\}$ can assume only two values. In the experiment we distinguish different values of $\bar{c}$. Some treatments have $\bar{c} = 3$, while others have $\bar{c} = 6$, while $c_x = 2$ and $\underline{c} = 0$ are constant over treatments. We implement the case, in which the higher conflict payoff for Y is *a priori* twice as likely as the low conflict payoff of 0.

Since proposer X does not know responder Y's conflict payoff she may choose to purchase precise information about this conflict payoff. So proposer X can decide whether she wants

[3]Our more general conjecture which is partly based on experimental findings (e.g., from the fair-division game-experiments of Güth at al. (2002)) is that privately known payoffs render equity theory (see originally Homans (1961)) less appealing since its information prerequisites are no longer satisfied.

to be perfectly informed about responder Y's outside option at some price or whether she prefers to bear uncertainty. More specifically, proposers are asked to choose their willingness to pay for information. Since the actual price in case of trade is randomly determined, the only undominated strategy is to bid one's true value for information (Becker, de Groot and Marshak (1964)). We do not allow for intermediate cases such as different qualities of information for example.

Another treatment aspect is whether X's decision on information acquisition is revealed to Y (strategic information acquisition) or not (secret information acquisition). (Not)Knowing c_y proposer X determines her offer, which responder Y can accept or reject.

The game theoretic solution is based on commonly known opportunism (maximization of own payoff expectation) of both players. Assuming that the responder accepts in case of indifference[4] the optimal responder strategy of Y is to accept all offers y of at least c_y. Thus if the proposer is aware of c_y she should offer $y^*(c_y) = c_y$. Therefore there are two candidates for the optimal offer y^* : the minimal offer 1 (which will be accepted with probability $\frac{1}{3}$) or $\bar{c}$ (which will always be accepted). Therefore, the optimal offer is $y^* = \bar{c}$ if $10 - \bar{c} \geq \frac{1}{3}(10-1) + \frac{2}{3}c_x$ if X is risk neutral. Thus one has $y^* = 3$ for $\bar{c} = 3$ and $y^* = 1$ for $\bar{c} = 6$ (if $c_x = 2$). Finally in the case of $\bar{c} = 3$ information acquisition allows the proposer to adjust the offers and it increases proposer's expected payoff from bargaining to $\frac{2}{3}$, i.e., the whole pie (10) minus the expected minimal acceptable offer in case of exploring information ($\frac{2}{3}\bar{c} + \frac{1}{3} = \frac{7}{3}$) minus the payoff of $10 - y^* = 7$ in case of no information. Similarly, the incentive to inform about c_y in case of $\bar{c} = 6$ which equals to $\frac{4}{3}$ is determined by expected minimal acceptable offer $\frac{2}{3}\bar{c} + \frac{1}{3} = \frac{13}{3}$ utilizing information and by expected payoff in the case of no information $\frac{2}{3}c_x + \frac{1}{3}9 + \frac{13}{3}$ due to proposer's risk neutrality.[5]

The participants were recruited at the University of Freiburg. The experiment uses a series of population cohorts. In 4 cohorts we consider $\bar{c}_y = 3$ (84 participants), in 5 cohorts $\bar{c}_y = 6$ (122 participants). Players are randomly assigned to either the proposer's role X or or the responder's role Y .

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[4]The benchmark solution when Y rejects in case of indifference can be derived analogously (see the next footnote).

[5]If the responder rejects in case of indifference X's information incentive is 1 for $\bar{c} = 3$ and $\frac{2}{3}$ for $\bar{c} = 6$.

In order to fully characterize the individual participants we apply Selten's (1967) strategy method,[6] i.e.

- proposer X must choose an offer for all possible states in addition to deciding whether to buy information, and
- responder Y has to select between acceptance and rejection for all possible offers and all cases of what she knows about what X knows and both levels of c_y.

This method allows us to simultaneously sort the agents with respect to several criteria and to perform the cluster analysis that helps to reveal the correlations between different behavioral phenomena. So for each responder, we can elicit the minimal acceptable offers. We shall see that responder behavior is quite central for understanding proposer behavior.[7]

At the end of the experiment we randomly choose a treatment (i.e. informational setup, outside option, price of information) for any cohort and partner for each participant and we paid the corresponding profits. The average earning was 3,80.

3 Description of Strategies

3.1 Response Behavior

Figure 1 presents the cumulative distributions of responders' acceptance thresholds for $\bar{c} = 6$ and the six scenarios considered. (Figure 4 depicts the behavioral pattern for the case of $\bar{c} = 3$. Since the result is analogous it is deferred to the Appendix.) The vertical axis measures the share of responders with acceptance threshold not exceeding the corresponding offer level of the horizontal axis (cumulative distribution). The black points (●, ⧫, ■) represent responders with low outside option ($\bar{c} = 0$) the white points (○ , ◇ , □ ,) represent the high outside option ($\bar{c} = 6$).

[6]The English translation of the instructions are available from authors upon request.

[7]In fact, while the literature concentrates on proposer behavior, relatively little is known about responder behavior. One notable exception is Huck (1999).

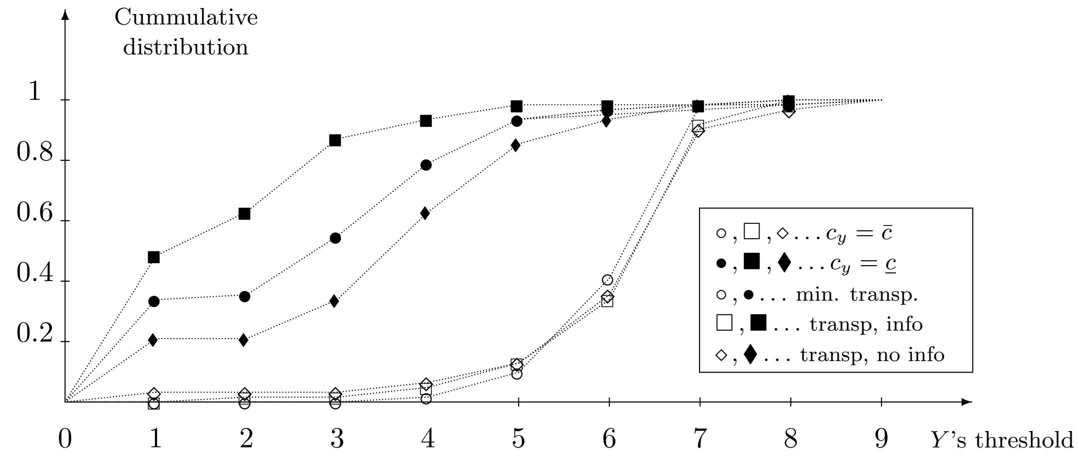

Figure 1: Cummulative distributions of Y's acceptance thresholds, $\bar{c} = 6$

An opportunistic responder would accept any offer that is not lower than her outside option. Formally, the set of acceptance threshold is $\{c_y, c_y + 1\}$. The cumulative distribution of rational responders with low outside options would reach the level 1 directly for offer 1, the cumulative distribution of rational responders with high outside option would follow 0 until offer 6 (no rational responder with outside option accepts offer bellow 6) and jumping to 1 for offer 7. How does the observed behavior correspond to that?

There are two systematic trends in the response data. First, the "willingness" to play optimally increases with the outside option in case of minimal transparency (○, ●). More than 85% of players play "accept" 6 or "accept" 7 in the case of outside option 6. This share is significantly[8] higher than the corresponding 53% in case of outside option 3. The rates are approx. 43% and 36% for the two cases of zero outside options.

A similar behavioral pattern can be observed in case of full transparency with uninformed proposers – ◇, ♦, (resp. full transparency with informed proposers – □, ■). With uninformed (informed) proposers X we observed 21 (28) optimal responses out of 41 in the case

[8]The following methodology is used. In the sample of z_3-choices (z_3 equals to one for the acceptance threshold 3 or 4 and to zero otherwise in case of $\bar{c} = 0$) we observe 22 successes in 41 trials, so z_3 has binomial distribution $b(41, \frac{22}{41})$. Correspondingly, z_6 is $b(61, \frac{54}{61})$. Considering the fact that z_i has approximate normal distribution the standard test concerning the equality of means can be employed. The zero hypothesis $\mu_3 = \mu_6$ can be rejected ($p < 0.0001$) .

of outside option 3 compared to 48 (49) out of 62 in the case of outside option 6. Employing an analogous test, as in the minimal transparency case, we can reject the hypothesis of identical success rates ($p = 0.01$) in the case of uninformed proposers X only.[9]

Secondly, we find the following new feature in behavioral patterns:

Result 1 *Transparency significantly impacts on acceptance thresholds of responders with low outside options.*

The share of opportunistic and fair play strongly depends on the information status of the proposer X (informed vs. non-informed). This phenomenon is particularly clear in the case of low outside options where the two strategies (fair vs. rational) differ. While on average five of eight responders Y with the low option accept the smallest offer 1 from the informed proposer X, just one of three responders Y accepts it when the proposer X is uninformed when $\bar{c} = 3$. A similar behavioral pattern[10] shows up for $\bar{c} = 6$: almost half of responders Y with low outside option accept the offer 1 from informed proposers X and only approx. one fifth of responders Y accept this offer from uninformed proposers X. The strategies of responders Y with low outside options are presented in the Appendix in Table 5.

Figure 1 presents another way of visualizing of the impact of transparency on responder's behavior. For the low outside option we observe the highest share of aggressive responders in case of full transparency and non-informed X (line $\blacksquare$). The other extreme is reached in case of full transparency and informed proposers X (line $\blacklozenge$). Here responders Y are aware that proposer X is informed about c_y when making the offer. The case of minimal transparency (line $\bullet$) rests between the two.

The fact that in the case of high outside option $c_y = 6$ responders Y neither care about proposer X's information nor transparency is demonstrated by the confluence of the "white" lines $\circ, \square, \diamond$ in Figure 1.

[9]With informed proposers X the difference between the two populations is insignificant even for $p = 0.1$.

[10]Such a pattern is, of course, at odds with sequential rationality of self-centered Y-players who are only interested in their own payoff. It seems as if Y-participants want to punish X-gambling: "Okay, I'am willing to accept an insultingly low offer in case of $c_y = 0$, but only if I know that you know that $c_y = 0$!"

Strategy of X	Outside Option 3				Outside Option 6			
	Bad	Good	Eπ_x	# X	Bad	Good	Eπ_x	# X
1	**4,87**	2,17	3,07	2	**4,37**	2,00	**2,79**	**5**
2	5,23	2,15	3,17	5	4,13	2,00	2,71	3
3	5,97	**2,49**	**3,65**	**8**	4,74	2,00	2,91	13
4	5,49	**4,24**	**4,66**	**17**	5,16	2,07	3,10	19
5	4,92	4,49	4,63	9	4,81	2,30	3,13	9
6	4,00	3,90	3,93	2	3,94	**2,82**	3,19	5
7	3,00	3,00	3,00	0	2,98	**2,98**	2,98	6
8	2,00	2,00	2,00	0	2,00	2,00	2,00	0
9	1,00	1,00	1,00	0	1,00	1,00	1,00	0

Table 1: Strategies of non-informed X, Inf. Barrier

3.2 Proposals

The behavioral heterogeneity of responder's population described above generates a non-trivial decision problem even for a rational proposer, who correctly anticipates the true population characteristics. Table 1 presents the expected payoffs of particular strategies of proposers X against the given population of responders y and the number of uninformed proposers that actually played this strategy.[11]

We can deduce from Table 1 that even the heterogeneity of the responder population of Y does not provide a strong incentives for proposer X to deviate from opportunism (see similar or closely related finding of Harrison and McCabe (1996), and Güth et al. (2003)). In case of outside option 3 the best offer is 4. In case of outside option 6 basically all offers by proposer X (smaller than 8) yield a similar expected payoff.

According to our data there is a relatively small range for exploiting the information. In case of outside option 3 the largest expected profit of 4.66 is generated by an offer of 4. When informed about Y's outside option X should slightly change her strategy and play 3 (yielding the maximal payoff 5.97 in that column) when the outside option of Y is low, resp. 5 (yielding maximum of 4.49 in that column) if she receives the information that Y's outside option is 3 . So, her value of the game is $\frac{1}{3}5.97 + \frac{2}{3}4.49 = 4.98$. Comparing the

[11]We denote in bold type the optimal behavior in all the tables throughout the paper.

	Outside Option 3						Outside Option 6					
	Unknown		Bad		Good		Unknown		Bad		Good	
X	$E\pi_x$	#X	$E\pi_x$	#X	$E\pi_x$	#X	$E\pi_x$	#X	$E\pi_x$	#X	$E\pi_x$	#X
1	3,12	1	**6,20**	**19**	2,34	0	**2,64**	**2**	**5,39**	**26**	2,00	1
2	2,96	2	6,05	8	2,29	1	2,55	3	5,77	17	2,10	0
3	**3,43**	**7**	6,00	3	**2,49**	**6**	2,67	5	6,35	6	2,08	2
4	**4,62**	**14**	5,50	4	**4,93**	**21**	3,01	10	5,74	4	2,19	4
5	4,53	14	4,85	5	4,63	7	3,11	16	4,95	5	2,39	5
6	3,79	3	4,00	3	3,85	2	3,10	18	3,97	1	**2,68**	**14**
7	2,98	0	3,00	0	2,98	4	2,93	6	2,98	0	**2,92**	**33**
8	2,00	2	2,00	0	2,00	2	2,00	0	2,00	0	2,00	1
9	1,00	0	1,00	1	1,00	0	1,00	0	1,00	1	1,00	0

Table 2: X strategies in the case of Full transparency

rational expectation-approach[12] with the empirical value of the information for the given population, we find that those two measures differ by 0.32 .

Using the same analysis for the case of outside option 6 we can see that in this case the best strategy 6 yields 3.19 . When informed about Y's outside option the optimal strategy for X is either 4 or 7 yielding the expected profit $3.71 = \frac{1}{3}5.16 + \frac{2}{3}2.98$. Consequently, in this case the value of information is about 0.52.

Table 2 presents the strategies of informed proposers. In case of outside option 3, the best strategies are 4-5 without information, 1 when knowing that Y's outside option is low, and 4 when it is high. X-participants surprisingly often behave in this way. Basically two thirds of them played either best or second-best replies to Y-behavior in all the three cases. An analogous conclusion holds for the outside option 6 as revealed by Table 2. On average participants quite closely anticipate the empirical population characteristics. In this sense proposers seem smart on average.

Setup		Outside Option 3					Outside Option 6				
Tr.	Info	Acc.	π_x	$\sum \pi$	Eq.	Fair	Acc.	π_x	$\sum \pi$	Eq.	Fair
Min	No	0,58	4,19	7,74	3,65-4,66	4,63	0,35	3,01	8,16	2,79	3,13
Min	Yes	0,54	4,10	7,27	3,28-4,45	4,63	0,50	3,20	7,89	3,34-3,44	3,13
Full	No	0,65	4,11	8,31	3,43-4,62	4,53	0,42	2,99	8,35	2,64	3,11
Full	Yes	0,71	4,63	8,27	3,72-5,35	4,70	0,63	3,64	8,56	3,58-3,74	3,24

Table 3: Average payments and Acceptance Ratios for Different Strategies

4 Value of Information

In the previous section we already discussed how, in principle, proposers with rational expectations about the responders' population could use this information. Let us now compute the empirical value of information.

4.1 Social Value of Information

First, we pool all X- and Y-decision data and compare the *per capita* payoff in different scenarios (see Table 3)[13]. In fact, we only compare the average payoffs with and without information, i.e., the information incentives according to the actual strategy profiles of (non)informed proposers and responders.

The left part of the first row of Table 3 refers to an outside option of 3 with the information barrier. Although the value of information for the "perfect-belief" strategy of X is 0.32 in this case (see the computation in Subsection 3.2), the empirical value of the information is negative for the average proposer. (The payoff to the average informed X is 4.1 in

[12]The actual earning difference of (non)informed X-participants is influenced by the random matching of X and Y participants which we ruled out when comparing the payoff expectations based on rational anticipation.

[13]In Table 3 "Tr." stands for transparency with "Min" representing the information barrier and "Full" full transparency, "Info" whether or not information has been acquired, "Acc." is the acceptance ratio, "π_x ," resp. "$\sum \pi$" the average of all X-, resp. $X+Y$-payoffs, "Eq." compares the payoff in the theoretical equilibrium case (lower bound for offer $\bar{c}$, upper bound for offer $\bar{c}+1$) and "Fair" in the case of fifty-fifty offer 5.

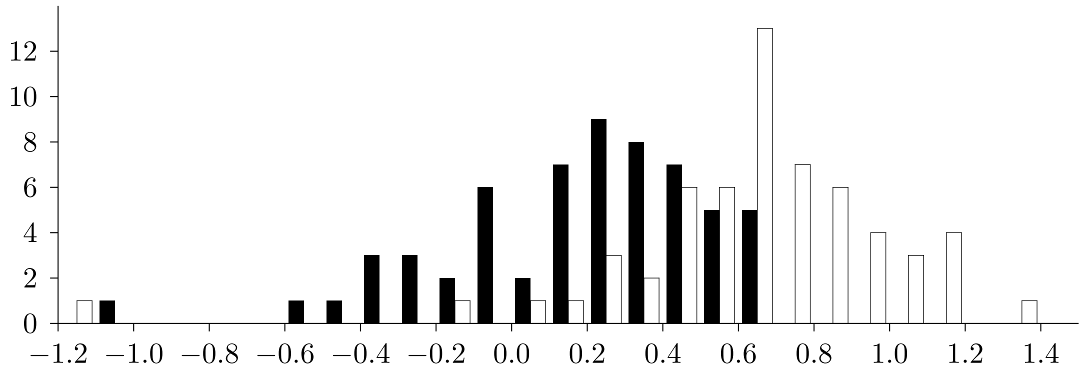

Figure 2: Distribution of empirically realized value of the information, $\bar{c} = 6$

comparison to 4.19 of the non-informed X.) If the outside option of responder Y is 6 information becomes valuable, since the proposer's average payoff with(out) information is 3.2(3.01). However, also here the gain of 0.19 is below the "true" beliefs effect (0.52).

Result 2 *The (social) value of information is significant*[14] *in case of transparency.*

The average payoff of informed proposer increases from 4.11 to 4.63 for $\bar{c} = 3$ with from 2.99 to 3.64 for $\bar{c} = 6$. However, also here one suffers from "non-true" expectations (in the case of $\bar{c} = 3$ the information surplus is 0.51 vs. 0.73, in case of $\bar{c} = 6$ it is on average 0.65 vs. 0.95).

Although the value of the information is positive for proposers, in three of four cases, the average pair (of X and Y) is worse off since responders must bear the costs.[15] The information loss of efficiency is $7.74 - 7.27 = 0.47$ ($\bar{c} = 3$ and no transparency), $8.16 - 7.83 = 0.27$ ($\bar{c} = 6$ and no transparency) and $8.31 - 8.27 = 0.04$ ($\bar{c} = 3$ and transparency). Only in the case "$\bar{c} = 6$ and transparency" the average pair profit increases by 0.21.

The positive efficiency effect of transparency applies to all the scenarios. The social gain caused by transparency runs from 0.19 ($\bar{c} = 6$ without information acquisition) and 0.57, resp. 0.67 ($\bar{c} = 3$ without acquisition, resp. $\bar{c} = 6$ with acquisition) even to remarkable

[14] When comparing the distribution of π_x in case of "Full" one obtains that "Yes" yields significantly ($p = 0.01$) larger profits than "No."

[15] See "$\sum \pi$"="$\pi_x + \pi_y$" in Table 3. Since $\sum \pi$ is 10 whenever y is accepted by Y, the variation of $\sum \pi$ is due to the different acceptance rates in Table 3 and the randomness of $\pi_y = \underline{c}$ or $\pi_y = \bar{c}$ in case of conflict.

1.0 in the case "$\bar{c} = 3$ with acquisition." The same behavioral pattern is captured by the acceptance ratio, which increases after removing the informational barrier by 7–17% depending on the particular case.

Result 3 *The impact of transparency on both proposer's and social payoffs is significantly positive in the case of informed proposer.*

4.2 Individual Value of Information

Until now we have only discussed the aggregate data. What does our experiment reveal about individual behavior? Let us examine the individual value of information ν_i resulting from the strategy profile of X_i facing the empirical population of Y's. Figure 2 presents the empirical distribution of ν_i the case of $\bar{c} = 6$. The horizontal axis stand for ν_i. Black columns present the number of participants in the given interval for the case of intransparency, the white columns correspond to the transparency treatment. Figure 5 applying to the case of $\bar{c} = 3$, is presented in the Appendix.

Considering these results and the reservation price p_i of information indicated by player X_i we can define the individual overvaluation of the information as $e_i = p_i - \nu_i$ (see Figure 3). We can see that the distribution of e_i resembles a skewed normal distribution with the largest number of players close to the average. Further, we observe an extreme overestimation of the value of the information (e.g. in case of outside option 3 and minimal transparency more than 50% of proposers are willing to pay at least 3 more than the information yields given their strategy profile and the empirical population of responders).

Result 4 *Individual overvaluation of information e_i is significantly positive.*

Based on this huge overvaluation of information the following question seems to be natural: can we characterize a cluster performing significantly better (worse) than the average? The following hypothesis is tested: we suppose that agents that perform poorly (i.e., have small ν_i) fail also in their price-setting behavior (big e_i).

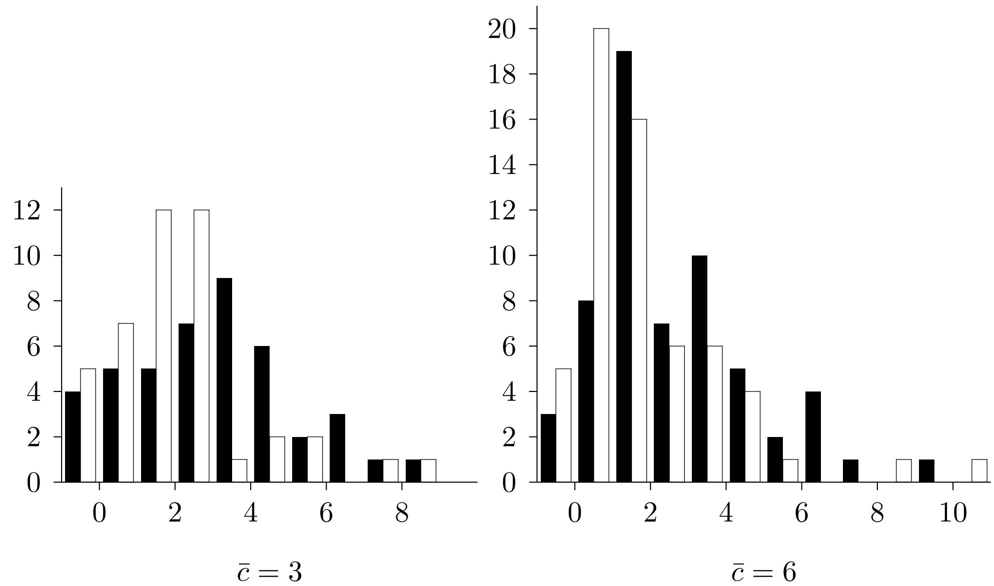

Figure 3: Distribution of information overvaluation

This intuition is supported particularly well in the case of transparency and outside option 6. Analysing the median-split of the proposers' population with respect to e_i and ν_i we get the following table:

	adequate ($e_i \leq m_e$)	excessive ($e_i > m_e$)
adequate ($\nu_i \geq m_\nu$)	22	8
excessive ($\nu_i < m_\nu$)	6	24

More than 75% of the population rest on the diagonal. This difference is statistically significant for all four scenarios (see the last two columns in Table 4). So we conclude that the population of responders is composed of individuals with different abilities when stating bargaining offers and valuing information.

It could be that one cluster (extensive e_i , to low ν_i ,) is largely motivated to buy information because of ambiguity aversion, while the other cluster values information qualitatively in line with standard rational choice theory. To test this hypothesis we run a linear regression with reservation prices p as dependent variable and the empirical value of information as explanatory one. A positive intercept might be interpreted as a measure of intrinsic curiosity or ambiguity aversion while a positive slope would account for reacting to information value. By means of standard OLS we obtain, e.g. for $\bar{c} = 6$ and full transparency,

$$p = \underset{(0.45)}{3.73} - \underset{(0.60)}{2.04}\ \nu\,,$$

Scenario		Stat. description						OLS-estimation			Clustering	
Tr.	$\bar{c}$	μ_ν	σ_ν	μ_p	σ_p	μ_e	σ_e	trend	st.err.	Acc.	Diag.	Off
Min	3	-.081	.570	2.87	3.52	2.96	4.72	-.549	.378	.155	30	13
Min	6	.187	.118	2.88	4.18	2.69	4.36	-.265	.782	.736	38	22
Full	3	.521	.738	2.50	2.82	1.98	3.99	-.295	.302	.334	27	16
Full	6	.644	.138	2.42	3.52	1.78	4.19	-2.04	.601	.001	46	14

Table 4: Information: analysing value vs. price

where both coefficients are significant ($p < 0.005$). The negative covariance $Cov(p, \nu)$ applies to all scenarios, but is statistically insignificant. All the relevant statistics regarding ν , p and e and the results of the OLS and clustering analysis are summarized by Table 4, with "trend" denoting the coefficient of ν and "Acc." its significance.

Result 5 *Information overvaluation e_i react significant antagonistically to overall performance ν_i .*

Overall we conclude that there is strong intrinsic curiosity or ambiguity aversion. This is particularly true for individuals with a low absolute value, or even negative ν_i for being informed.

5 Conclusions

In our experiment the empirical value of proposers being informed about responders' conflict payoffs is positive in case of the high outside option 6, but turns negative in case of the low outside option 3 when responders do not know whether proposers are informed (intransparency). In such cases proposers seem to play too aggressively and are often punished by similarly aggressive responders. In the case of low outside options, knowledge of responders about the information type of proposers (transparency) is more valuable for proposers (in terms of average payoffs) than the actual information about responders outside option. We emphasize that the empirical value of information does depend both on proposers and on responders behavior. Work that concentrates only on one type of player (i.e. proposers) may miss relevant aspects.

Proposers systematically overweight the individual value of information by large margins. Ambiguity aversion resp. intrinsic curiosity could explain the high degree of individual overbidding (e.g. Salo, Weber, 1995) . This systematic overestimation is moderated by transparency in a strategic context.

Our main finding is similar to Kraemer et al. (2006) and Kübler et al. (2001) who also find excessive information acquisition, albeit in non-strategic sequential purchasing scenarios,[16] where prices are unaffected by individual information. The emphasis of this literature is on social learning, i.e. to test whether individuals take into account social information. These papers find an excessive evaluation of individual signals leading to excessive investment in information acquisition. In contrast to this literature we report excessive information acquisition in a strategic bilateral bargaining situation where social learning is not possible, and where (in)transparency of information acquisition seems more relevant than in large markets.

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6 Appendix

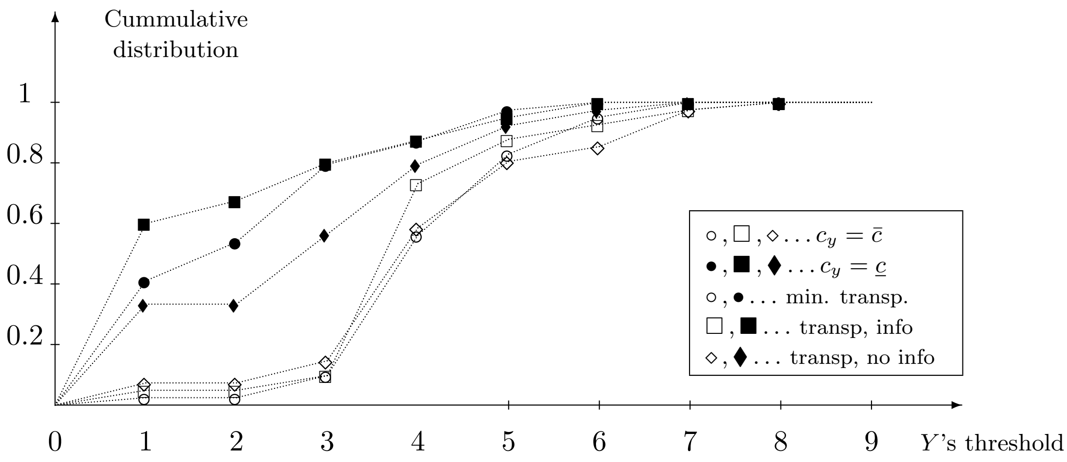

Figure 4: Cummulative distributions of Y's acceptance thresholds, $\bar{c} = 3$

	Info vs. No Info X (case 3)									Info vs. No Info X (case 6)								
Y	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
1	**11**		6	5	2					**11**		5	6	6		1	1	
2			1	2						1		1	4		2			
3	2		1	1	1					1		2	4	6	1	1		
4			1		2								2	1	1			
5				1		1							1	1	1			
6						1	1											
7																		
8																1		
9																		

Table 5: Responders' behaviour vs. Informed and Non-informed proposers

(The lines correspond to responders behavior against informed proposers X, while columns correspond to behavior facing non-informed X . The behavioural asymmetry is captured by the triangular shape of the table. The majority of participants is located in the upper-right triangular what reflects the fact that the acceptance treshold facing informed proposer is smaller than in the case of non-informed proposers. Less than one fourth of players (11) play the equilibrium strategy (1,1). We only observe four outliers below the diagonal.)

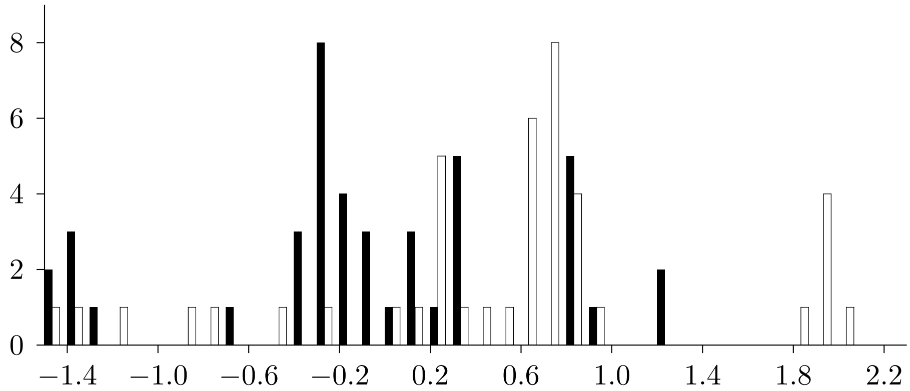

Figure 5: Distribution of empirically realized value of the information, $\bar{c} = 3$