Rejection Pattern of Generous Offers in a Three Player Ultimatum Game: A Tale of Two Tails.

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Abstract: We present a three-player ultimatum game, with a proposer, a decision-maker who accepts or rejects the offer and a dummy player who gets paid the outcome of the game. Using the strategy method we observe high levels of rejection not only of selfish offers but also of generous ones. Moreover, acceptance rates follow a negative monotonic correlation with distance to the fair split creating a single peaked pattern centered in the equal split. This result is robust across different treatments, even when decision-makers are monetarily penalized for rejecting offers. In this latter treatment, and by introducing the concept of "absolute inequality", we are able to show that selfish attitudes by decision makers are of second order of importance to decision makers and do not justify rejections. Our results cannot be explained by any of the most known social-preferences models, and present us with an interesting puzzle for future research.

Preliminary Version

"The cry of equality pulls everyone down"
Iris Murdoch

1. Introduction

In this paper we present the results of a three-player ultimatum game where we split the responder's role between two different players: while one subject accepts or rejects the offer (in exchange for a flat fee payoff independent of his decision), the other gets paid the outcome of the game. The results show a single peaked distribution of acceptances with its highest point at the equal split, and monotonically decreasing rates of acceptance as we get further away from it. This result is robust across treatments and shows a monotonic decrease in acceptance rates as offers get more selfish, but also, and more strikingly, as offers get more generous. That is; the more unfair is the final splitting of the pie, the more rejections we see. While this is hardly surprising with selfish offers, the negative correlation between generosity and acceptance rates for offers over 50% of the pie was totally unexpected. Furthermore, rejections of generous offers still exist even after we impose a cost to rejections.

The rejection of generous offers that we report is thanks to the use of the strategy method, which allows us to observe results for the whole support (from \$0 to \$10) of potential offers. To make the analysis simpler we will partition our results into two different groups, those to the left of the equal split of \$5, the left hand tail (LHT), and those to the right of it, the right hand tail (RHT). The equal split will not be included in any of the two groups and will be used as the boundary between LHT and RHT[1].

The experiment has two families of treatments and, within each, there are different treatments. The first family is formed by the "free rejection" treatments, the second by the "costly rejection" ones. Within the free rejection family of treatments, the decision maker is paid a flat fee whatever the outcome of the game. In the costly rejection family, the decision-maker will pay a penalty of \$1 if she decides to reject the offer or will get paid the full fee otherwise. Under free rejection we will consider three different treatments: a normal payoff (N) of \$5, a low (L) of \$3 and a High (H) of \$12. Under costly rejection we will have a low treatment (L-1) which pays \$3 if the outcome is an acceptance and \$2 if it's a rejection and a high treatment (H-1) which pays \$12 if the offer is accepted and \$11 if rejected.

Our results show a pattern of rejections that deviates from previous theoretical literature such as Bolton and Ockenfelds (2000) and Fehr and Schmidt (1999) inequality aversion, or Charness and Rabin (2002) quasi-maximin model. Not even intention-based models such as Falk and Fischbacher (2006), which can explain LHT rejections, can help clarify why there are rejections of generous offers and why there seems to be an aversion to "absolute inequality", as defined later in the paper.

While building a model that explains our results is beyond the scope of this paper, we hope that these results will help develop a model that embraces the preference for symmetry that subjects show in these experiments.

[1] Equal splits are always the peak of the acceptance rates and are not interesting to analyze.

2. Literature review

Three-player ultimatum games have been studied as far back as Knez and Camerer (1995). In this experiment a proposer would split two independent pies each with a separate responder who gave acceptance thresholds, through a strategy method, conditional on the offer made to the other subject. Their results showed that the higher the offer to other subjects, the higher the acceptance threshold (i.e. subjects use other players payoffs as reference). In Güth and Van Damme (1998) a proposer had to split the whole pie with a decision maker and a dummy player; if the offer was accepted, then the split went as suggested, if rejected all subjects got zero. The result was that both proposer and responder ended up giving a minimal share to the dummy player; he was ignored. Kagel & Wolfe (2001) also present a three player UG in which a subject made an offer on how to split a pie amongst all three subjects, then a responder accepted or rejected it. If the offer was rejected, then the non-responder got a consolation prize and the other two subjects got nothing. As in Güth and Van Damme (1998), the authors observed a complete ignorance for the dummy player payoffs, with no reduction of the rejections compared to a regular ultimatum game.

All of these experiments, except the first one, show results contrary to inequality aversion models, which predict no rejections. But what all of them have in common is that subjects seem to give priority to intentions of the proposer over equality (even if this is disadvantageous to them). The priority of "justice" over payoffs is consistent with the third-party costly punishment literature as in Fehr and Fischbacher (2004), where they show that violation of social norms transcends even to unaffected third parties. Following this literature Fehr, Falk and Fischbacher (2005) report two types of punishment incentives: spite and fairness, and that most fairness-induced sanctions are due to selfish actions by the punished subject. Leibbrandt and Lopez-Perez (2008) use a within-subject structure and conclude that both 2nd and 3rd party punishments are envy-driven and, as a result, socially-efficient outcomes and passive bystanders can be harmed if they are better off than the punisher. Interestingly, in Leibbrandt and Lopez-Perez (2008), and against in Fehr and Fischbacher (2004), 2nd party punishment is not significantly higher than 3rd party. Finally, with the same viewpoint, Falk and Fischbacher (2006) show that intentions are what drives punishments and not outcomes.

In our experiment we will show that *any* deviation from equal (fair) shares is rejected; as subjects reject selfish offers, but also generous ones. These results show that subjects are in some way averse to “absolute inequality” and that when a cost to rejecting is introduced, subjects ignore the proposers intentions and look only at the inequality of the offer made.

While the use of the strategy method has been discussed as a potential source of distortion, a recent survey by Brandts and Charness (2010) comes to the conclusion that overall there does not seem to be an effect on decisions due to the use of the strategy method. In fact, in those cases were there seems to be differences, using a direct method would most probably accentuate or results (see Brandts and Charness (2003) or Güth, Huck and Müller (2001)). Moreover, as reported in this same survey “in no case do we find that a treatment effect found with the strategy method is not observed in the direct-response method”.

3. Experimental Design

The experiment was run with a total of 233 undergraduates from both Universitat Pompeu Fabra (UPF) in Barcelona and the University of California at Santa Cruz (UCSC). Each session lasted around 25 minutes, with average earnings at UCSC of $3.5 plus a $5 show-up fee, and average earnings of €3.35 plus a €5 show-up fee at UPF.

Subjects were recruited through the internal electronic systems of each university with the only requirement of no previous experience with bargaining games in the lab. In total 15 sessions were run, UCSC sessions had 12 subjects[2] and those at UPF had 18[3]. As subjects arrived to the lab, they were seated randomly in front of a terminal and the initial instructions were read aloud.

In these instructions we told them five key items about the experiment:

1) The experiment had three rounds and they would be informed about what to do in each round immediately before it started.
2) Each subject would be allocated a player type (A, B or C) which would stick to them across all three rounds.
3) Each round, they would be reallocated to a random group of three subjects, composed by a type A, a type B and a type C (i.e. one of each type).
4) The final payoffs were a $5 show-up fee plus the outcome of one of the three rounds. The chosen round would be randomly picked by the computer. All rounds had the same chance of being picked.

[2] Except 3 sessions that had 9 subjects.
[3] Except 2 sessions that had 12 subjects.

5) No information on the outcome of each round would be disclosed until the last round was over, and then subjects would be informed about the decisions and outcome of each round along with the randomly chosen final payoff.

Two types of game that could be played in each of these rounds, a three-player ultimatum game (3UG) or a regular ultimatum game (2UG).

3.1 3UG:

This is the treatment of interest: type A subjects (proposers) are endowed with $10 (€10 in Barcelona) and have to decide how to split them in integer values with a type C subject (dummy). Without knowing the offer from A to C, type B subjects (decision makers) fill out a strategy profile where they decide whether to accept or reject each potential offer.

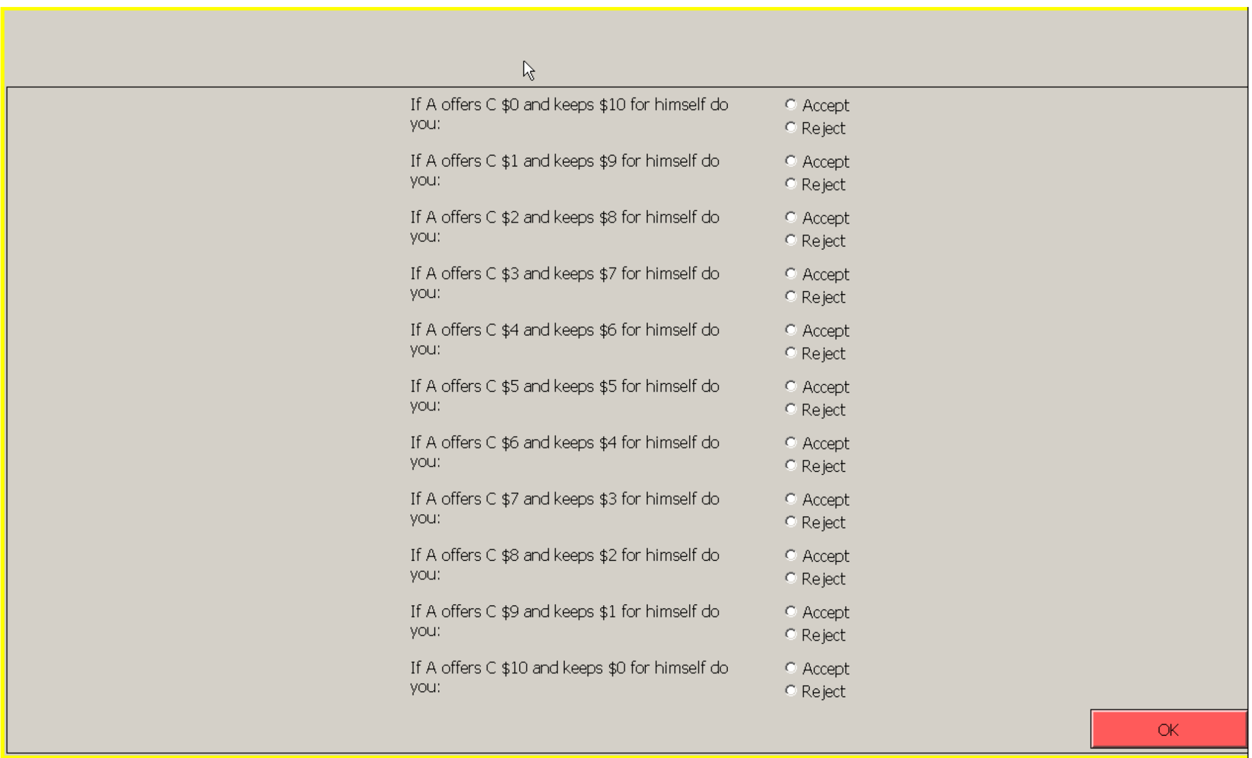

Figure 1: Decision Maker Screenshot

If the offer is accepted, then the split goes as suggested by A, if the offer is rejected, then both A and C get nothing. B's payoff, on the other hand, depends on the treatment. As mentioned above, there are two different families of treatments; free and costly rejection families.

Under free rejections, decision-makers will always get paid a fixed amount for that round, independent of her decisions. There are three different treatments in this family:

Normal (N): B gets paid a flat fee of $5 (€5) whether he accepts or rejects A's offer to C.

Low (L): B gets paid a flat fee of $3 (€3) whether he accepts or rejects A's offer to C.

High (H): B gets paid a flat fee of $12 (€12) whether he accepts or rejects A's offer to C.

Costly rejections have two different treatments[4]:

Low-1 (L-1): B gets paid $3 if he accepts A's offer to C and $2 if he rejects (i.e. B gets penalized $1 for rejecting the offer from A to C).

High-1 (H-1): B gets paid $12 if he accepts A's offer to C and $11 if he rejects.

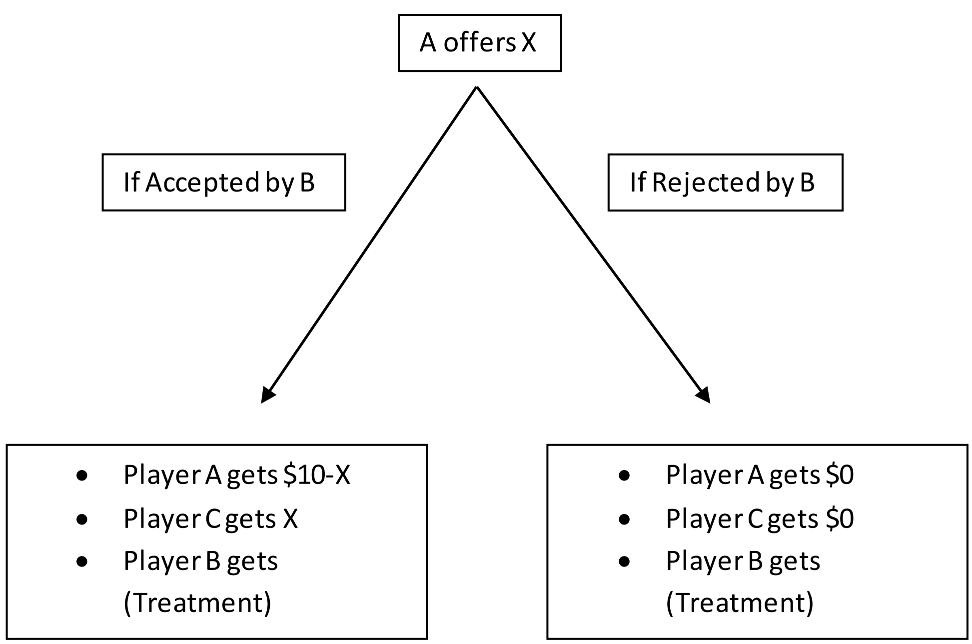

Figure 2: General Structure of the Experiment

3.2 2UG:

Under this treatment, while still having three players per group, where A made two independent offers on how to split $10, one to B and the other to C. As in the 3UG case, before knowing the offer made to

[4] Note that these types of session were only run at UCSC so payments were made only in dollars.

them, both B and C filled in a strategy profile accepting or rejecting every potential offer made *to them*. So, unlike 3UG, now B and C subjects were each playing a regular ultimatum game with A, where B's actions had no effect on C's payoffs and vice versa. That is, if B (C) rejected the offer that A made to him, then B (C) would get $0 for the round; if he accepted, then the splitting would go as suggested by A. On the other hand A subjects only got paid for one, randomly selected, of the two outcomes (either the offer to B or the offer to C) in order to prevent portfolio effects, and to make payoffs fairer across subject types. So, if the subject of the randomly selected offer accepted the offer, then A would get the suggested split, if rejected both got $0.

This treatment was introduced for two reasons: the first one was to create a "break" between the two 3UG treatments, as each session had 3 rounds and we wanted to avoid any learning or repeated games effects (notice that by mixing groups and not giving feedback until the end of the experiment we were already tackling these two problems). The second reason was that we wanted to have a control for our population of subjects and for our software: if the results of 2UG treatments were similar to those of a normal ultimatum game, then we would be validating both our pool of subjects and our software interface.

3.3 Structure of the sessions:

Each session had three rounds and, in each round, subjects underwent a different treatment. Sessions were run in different orders (see Table 1) to test for potential order effects[5].

Treatment Order	**Number of subjects**[6]	
	Barcelona	**Santa Cruz**
N2H	18	21
N2L	18	21
(H-1)2(L-1)	-	33
(L-1)2(H-1)	-	48
L2H	-	12
2NL	18	-
2NH	18	-
H2N	15	-
L2N	15	-

Table 1: Order of Treatments and Number of Subjects Participating

In total, for each type of treatment (independent of order):

[5] Unfortunately, due to some problems not all orderings were tried. See the results in Appendix A.

[6] Note that this is the total number of subjects per session, only one third of them are B players, thus the number of observations must be divided by 3.

	Observations[7] by Treatment		
	Barcelona	Santa Cruz	Total
N	33	14	47
2[8]	33	45	78
H	17	11	28
L	17	11	28
H-1	-	27	27
L-1	-	27	27

Table 2: Total Observations per Treatment and Localization

4. Results:

4.1 2UG:

This treatment presents us with a regular ultimatum game and is used as control for our software and subject pool.

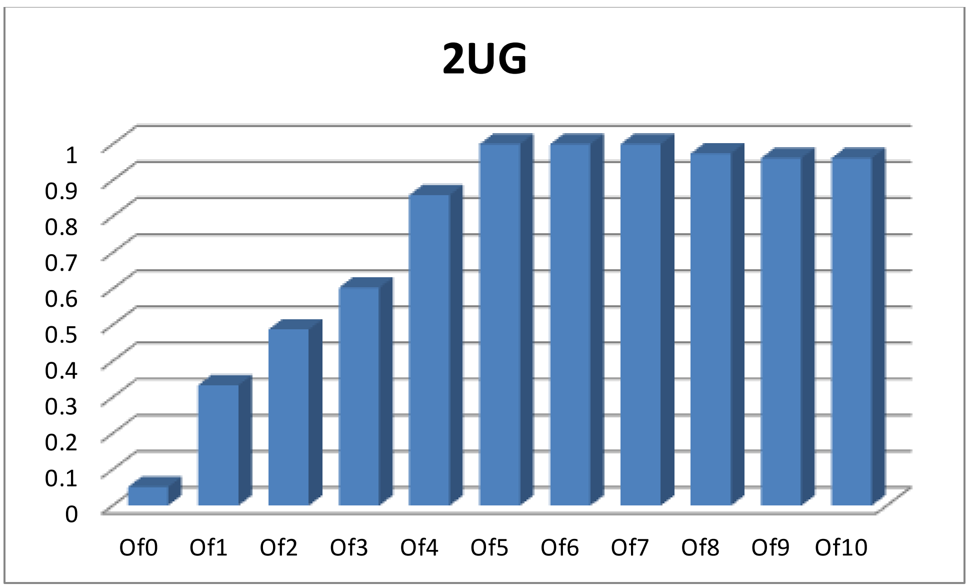

Figure 3: Acceptance rates 2UG treatment

In Figure 3 we see the histogram of acceptances for each potential offer, for example: almost 60% of subjects accept an offer of \$3[9] and 30% accept an offer of \$1. The acceptance results are perhaps slightly higher than those reported on average in the literature (Camerer and Thaler (1995)), but still in the range of what we would expect. The average offer was of \$3.59, which is also what would be expected of an experiment like this.

[7] No need to divide in this case.
[8] We will only look at observations of decision-makers and discard C subjects answers.
[9] From now on we will use the dollar sign as a generalization for euros and dollars.

The only “out of norm” results are four subjects[10] who accept all offers (including $0), two participants that reject offers of $8 and $9 and another subject rejecting a $10 offer. For the former four, three are social optimizers as they also accept all offers under 3UG treatments. The remaining subject accepting all offers under 2UG only accepts equal splits in both his 3UG treatments (N and H). For the subjects rejecting high offers, we can only conjecture that they made mistakes filling the strategy profile.

In order to see how the level of acceptances changes with the offer made we ran a Spearman Rank Correlation test. This test is used not only to see if there is an association between the offers and the level of acceptances, but most importantly to see if there is a correlation between them. The test gives a value for the linear relation and the significance of the relation between the value of the offers and acceptance levels. To run the test I will collapse all acceptances for each offer (Table 3) and divide them into two groups, offers from $0 to $5 will be the LHT (Left Hand Tail) and offers from $5 to $10 will be the RHT (Right Hand Tail). This is due to the linear nature of the correlations that we are looking for. Unfortunately this system has the drawback of little observations (6) per group, making the test sensible to even small deviations.

Offer	$0	$1	$2	$3	$4	$5	$6	$7	$8	$9	$10
Total Acceptances	4	26	38	47	67	78	78	78	76	75	75

Table 3: Aggregate Number of Acceptances per Offer in 2UG

The results (Table 4) show a perfect and significant correlation between the total number of acceptances and LHT offers. On the other hand, and due to the few subjects that presumably made mistakes while filling out the RHT, we also see a highly significant negative correlation between acceptances and the second group of offers, recall from Figure 3 that indeed that is the case.

	LHT [$0, $5]	RHT [$5, $10]
Spearman Rho	1.000	-0.9258
Prob > |t|	0.000	0.0080

Table 4: Spearman Rank Correlation Results for Group 1 and Group 2 in 2UG

The results from this treatment show that our subjects understand our program interface, while also showing us that the Spearman test can be susceptible to even the smallest mistakes in our subject pool. Fortunately, this will not happen in our following treatments. Finally, the 2UG treatment also validates our subject pool and most importantly; it shows that subjects believe that offers over $5 are possible and don’t randomize their answers.

4.2 3UG:

4.2.1 Free Rejection :

The main finding of this paper is the single peaked shape of acceptances across all 3UG treatments. The distribution always has its highest point at the fair split ($5) and then a monotonic decrease in acceptances as offers move away from the fair split in *both directions*. In other words, as offers get

[10] These represent 5% of the total observations.

closer to the tails, acceptance rates decrease, even when the deviation is towards overly generous offers by the proposer.

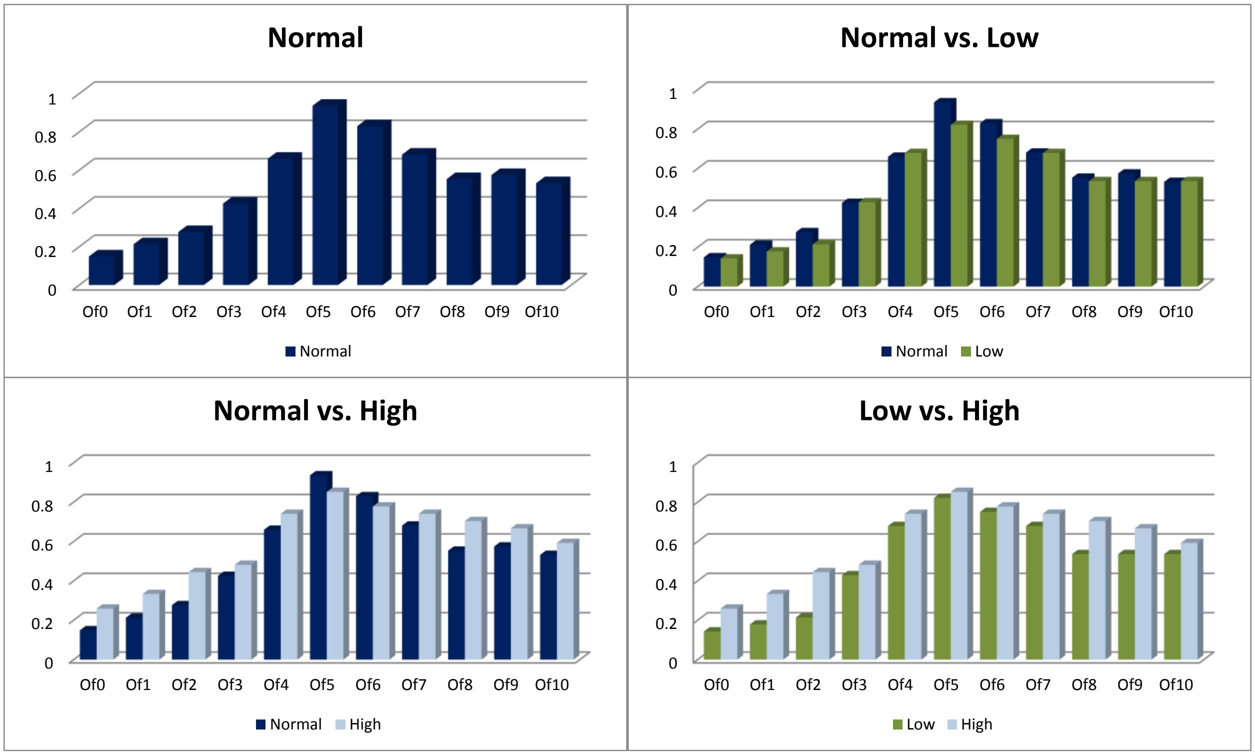

Figure 4: Acceptance Rate Histograms for all Three Free Rejection Treatments, with Pairwise Comparisons

In Figure 4 we can see how under all treatments of the free rejection family, as offers move towards the extremes of the support, acceptance rates. This drop is more significant in the LHT, while this is no surprise, rejections on the RHT and especially their *monotonic pattern* were totally unexpected results. Especially surprising was the robustness of this pattern across treatments (Tables 5 and 6).

	LHT (L)	LHT (N)	LHT (H)
Spearman Rho	1.000	1.000	1.000
Prob > |t|	0.000	0.000	0.000

Table 5: Spearman Rank Correlation Results for LHT of L, N and H treatments.

	RHT (L)	RHT (N)	RHT (H)
Spearman Rho	-0.9411	-0.9429	-1.000
Prob > |t|	0.0051	0.0048	0.000

Table 6: Spearman Rank Correlation Results for RHT of L, N and H treatments.

As we can see in Table 5, LHT offers present a prefect positive correlation between increase in offers and acceptance rates. That is, the higher the offer, the more decision-makers accept it. It is in Table 6 were we found the most interesting results. For RHT, in all free rejection treatments there is an almost perfect negative correlation between generosity of offers and number of acceptances; the more generous the offer the lower the number of acceptances in the RHT.

To explain the low level of acceptances on the LHT one could argue that these rejections are driven by intentions (Falk and Fischbacher (2006)), with the decision-maker punishing subject A for her selfish choices (at the cost of leaving subject C with a $0 payoff). On the other hand, for RHT rejections we cannot argue that disadvantageous inequality is driving the results (Leibbrandt and Lopez-Perez (2008)) since even under H treatment we see rejections. Further, we cannot reject the null that H and L (or N) treatments have the same rate of rejections when comparing acceptance rates (see Table 7). This suggests that the pattern of rejections is not driven by the decision-makers flat fee, but rather by something other than their final payoff, discarding disadvantageous inequality as the main reason not to accept generous offers.

P-values	$0	$1	$2	$3	$4	$5	$6	$7	$8	$9	$10
L vs. N	1	.775	.596	1	1	.141	.55	1	1	.81	1
H vs. N	.355	.280	.202	.808	.604	.250	.759	.792	.226	.469	.636
L vs. H	.329	.227	.089	.789	.768	1	1	.768	.269	.412	.787

Table 7: Two-sided Fisher P-Values Comparing Offers Across Treatments (Grey Background for Significant Results).

Since the decision maker's payoff does not drive his decision, an alternative explanation may hinge on the "absolute inequality" between subject A and C. Absolute inequality measures the level of inequality that the decision-maker perceives in the offer from the proposer to the dummy (i.e., an offer of ($8, $2) is equivalent to an offer of ($2, $8) in absolute inequality terms) and does not take into account the decision-maker's own payoff. Our results (see table 8) show that under the "free rejection" family of treatments, there appears to be differences for the same levels of "absolute inequality". Further, differences increase the lower is the flat fee payoff. Therefore, we can conclude that in this family of treatments, and given the significant difference in absolutely unequal offers, intentions do matter.

Treatment	$0 vs. $10	$1 vs. $9	$2 vs. $8	$3 vs. $7	$4 vs. $6
L	0.004	0.011	0.026	0.106	0.768
H	0.027	0.029	0.098	0.093	1.00
N	0.000	0.001	0.006	0.011	0.048

Table 8: Two-sided Fisher P-values Comparing Same "Absolute Inequality" Offers.

Interestingly, even under the L treatment there is a significantly higher proportion of acceptances for $0 offers than under 2UG (0.14 in the former and 0.05 in the latter). This could reflect a preference for maximizing social outcomes, perhaps combined with the fact that the decision-maker cannot be "personally insulted" by any offer and thus, as in Xiao and Houser (2005), the threshold for acceptances is lowered.

Yet, not all $5 offers are accepted as some subjects reject all possible offers. In fact, with only two exceptions, when a subject rejects a $5 then she will also reject all other offers. This $5 rejection phenomenon is present across all treatments[11]. Further, all subjects that reject all offers in the first 3UG round will do the same in the second round (i.e. reject -all subjects are consistent and it does not

[11] 5/28 in L treatment, 3/28 in H and 4/47 in N.

depend on the flat fee). When subjects were asked in a post-experiment questionnaire about their decision to reject all, no subject provided an answer[12].

Finally, one could argue that rejections on the RHT are due to an "experimenter effect", or because some decision makers do not believe that such high offers are to be expected. But if any of these were true, we would not see the persistent pattern of monotonically decreasing acceptances, nor would we see in our 2UG treatments the flat plateau at 100% acceptance rate for all offers over $5.

Hence, we can conclude that under the "free rejection" family of treatments:

1) Subjects reject unequal offers in *both tails*, across all treatments.
2) Differences of rejections across treatments are not significant.
3) Rejection of generous offers follow a monotonic pattern, relative to distance from equal split, in both tails.
4) Same treatment comparison of "absolute inequality" offers show that decision-makers are concerned with the intentions of the proposer. For the same level of absolute inequality, RHT acceptances are higher than those in the LHT.
5) The level of acceptances of $0 offers is much higher under the flat-fee treatments than under 2UG.
6) Subjects that reject all offers under one free rejection 3UG treatment do so under any other 3UG treatment.

In summary, under free rejection we find a negative and monotonic relationship between acceptances and distance to equal split *in both directions*. Both generous and selfish offers are rejected. The surprising low levels of acceptances in the generous RHT are not driven by disadvantageous inequality since there is no statistical difference in acceptance rates in this tail when comparing treatments. Subjects seem to be affected by proposer intentions since "absolutely equivalent offers" are statistically different.

<u>4.2.2 Costly Rejection:</u>

In view of our results for the free rejection family of treatments, we wanted to verify if rejections on the RHT were robust under a costly rejection setup. Adding an extra cost, we should expect no rejections under the classical rational model. But, according to Fehr and Fischbacher (2004) and Fehr and Gächter (2002), we should expect rejections on the LHT but not necessarily on the RHT. Basically, one would have expected the results of this family of treatments to be very similar to those of the 2UG treatment given the literature. On the other hand, if we find that rejections on the RHT disappear, then this would suggest that, in some way, selfish intentions are of second order of importance to our subjects, contrary to Falk and Fischbacher (2006).

In the high treatment (H-1), B subjects were paid $12 if the outcome of the round was an acceptance and $11 dollars if the outcome was a rejection. In the low treatment (L-1), B subjects were paid $3 if the

[12] Except one, who claimed that he did it: "for the LOLZ [sic], screw the other players".

outcome of the round was an acceptance and $2 if it was a rejection. This makes the relative difference in payoffs large enough for significant differences between treatment results if what is driving decision-makers acceptances are their payoffs.

Note also that unlike the previous literature on third-party punishment, our experiment has a unique punishment fee and intensity (i.e. $1 to leave the proposer and dummy player at $0, no other option). In our setup rejecting an offer is a much stronger statement than previous literature "classic-punishment" as it not only leaves the proposer with $0 but also because it leaves the dummy player with $0.

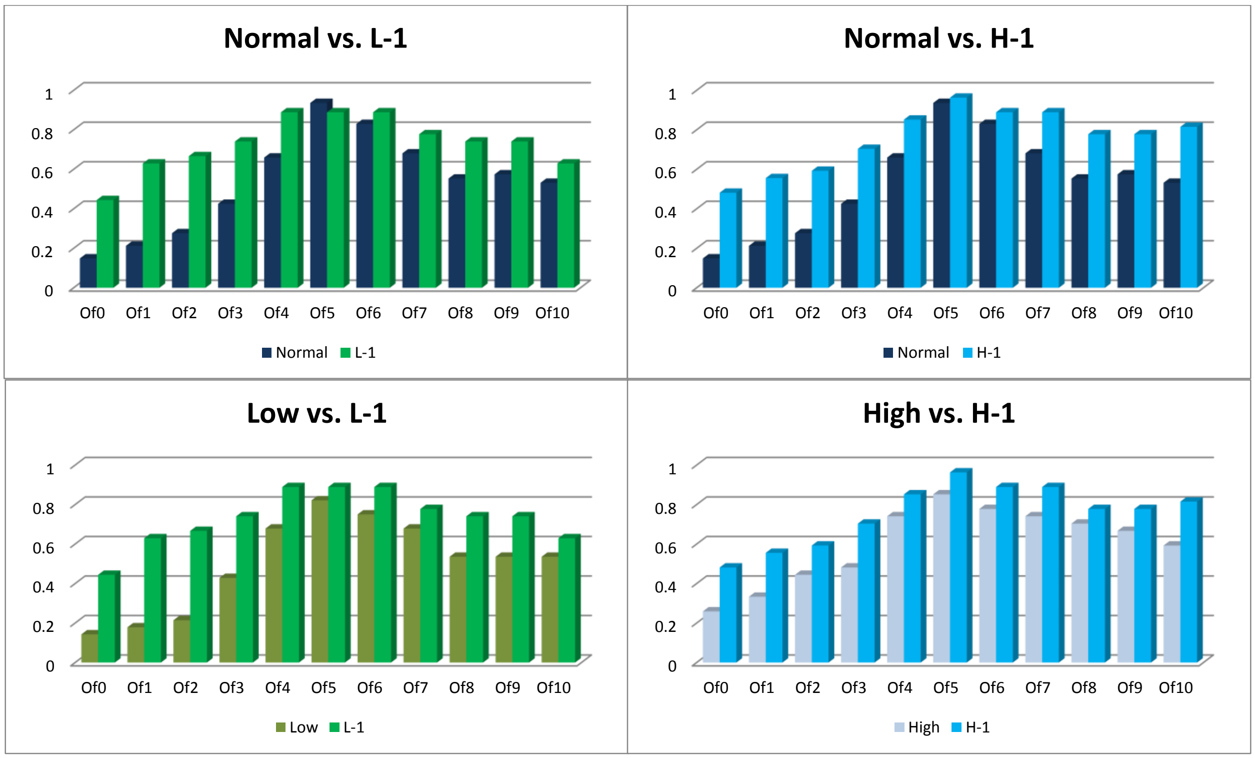

Figure 5: Acceptance rates of L-1 and H-1 vs. Normal, Low and High Treatments

As Figure 5 shows, both in H-1 and L-1 treatments the single peaked form of acceptances is still there, though in a much flatter form. This is due to an increase of acceptances in both tails, but especially in the LHT. When doing a Spearman Rank Test we see how RHT acceptances in the costly treatment are linearly increasing with the generosity of the offer (Table 9) as would be consistent with the costly punishment literature. On the other hand, and as we have been seeing in the RHT, generosity and acceptance rates have a negative correlation (Table 10). In this case though, and given the sudden jump in acceptances for the $10 offers, we cannot reject at a 5% that there is no association between generosity and aggregate acceptance levels in the H-1 treatment[13]. The better behaved L-1 RHT though still presents us with a significant result as we could guess from the graph. So, even when subjects are penalized for rejecting an offer we see that, generosity is punished in a monotonic way whenever we look at the RHT, something that adds up to the results found in the free rejection family.

[13] This is yet again proof of how sensible this test is. We believe that if more observations were gathered we would find a significant relation for the H-1 treatment.

	LHT (L-1)	LHT (H-1)
Spearman Rho	0.9856	1.000
Prob > |t|	0.0003	0.000

Table 9: Spearman Rank Correlation Results for LHT of L, N and H treatments.

	RHT (L-1)	RHT (H-1)
Spearman Rho	-0.9710	-0.7495
Prob > |t|	0.0012	0.059

Table 10: Spearman Rank Correlation Results for RHT of L, N and H treatments.

When comparing across treatments it is apparent that the LHT relative increase is much bigger in the L-1 treatment than in the H-1 with respect to their equivalent free treatments (Table 11). So, when a penalization to reject is introduced, subjects seem to relax relatively more their concern with selfish intentions than whatever other reason made them reject RHT offers. In fact, the more expensive it gets to punish, the bigger is the relative increase in acceptances in both tails.

P-Values	\$0	\$1	\$2	\$3	\$4	\$5	\$6	\$7	\$8	\$9	\$10
H-1 vs. N	0.003	0.005	0.013	0.030	0.103	1.000	0.736	0.053	0.079	0.128	0.023
L-1 vs. N	0.011	0.000	0.001	0.015	0.051	0.662	0.736	0.432	0.139	0.211	0.471
L-1 vs. L	0.019	0.001	0.001	0.029	0.101	0.705	0.295	0.547	0.162	0.162	0.587
H-1 vs. H	0.158	0.170	0.414	0.166	0.501	0.351	0.467	0.293	0.757	0.544	0.135

Table 11: Two-Sided Fisher P-values Comparing Costly Treatments Amongst them and to N Treatment (gray background for significant results).

As we see in Figure 5, the more relatively expensive it gets to reject an offer, the more similar are LHT and RHT. In fact, by comparing absolute inequality equivalent offers we can see how there is not difference in the L-1 treatment and almost no difference in the H-1 one (Table 12). Seeing how under free treatments there was a significant difference between both RHT and LHT equivalent offers reinforces our belief that by introducing a cost we have effectively shown how selfishness concerns are of second order when compared to absolute inequality.

	\$0 vs. \$10	\$1 vs. \$9	\$2 vs. \$8	\$3 vs. \$7	\$4 vs. \$6
L-1	0.275	0.559	0.766	1.000	1.000
H-1	0.021	0.148	0.241	0.175	1.000

Table 12: 2 Sided Fisher P-values Comparing Same "Absolute Inequality" Offers.

In fact, and favoring our idea of absolute inequality, in the free treatment family there was no difference when comparing across treatments (Table 7), which is exactly what happens in the costly family (Table 13 and Figure 6). This is especially striking given the difference in the relative costs to punish.

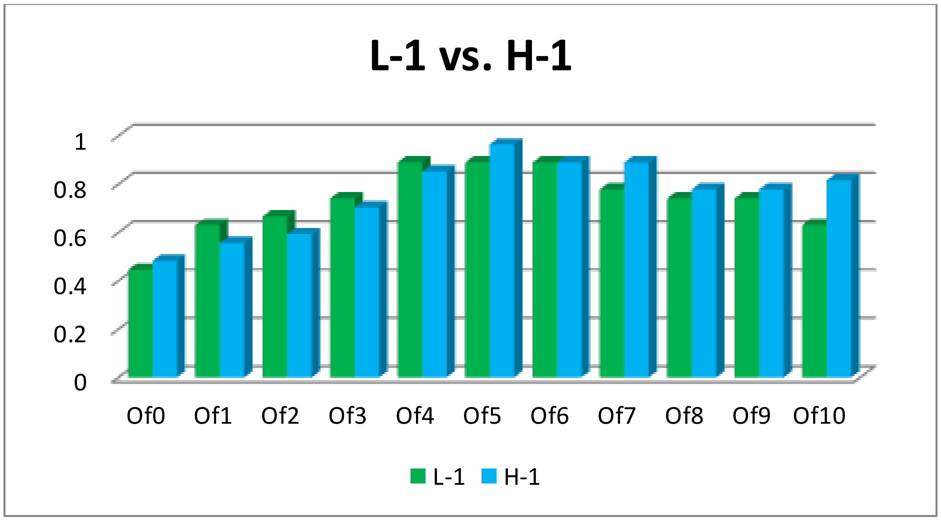

Figure 6: Acceptance Rates of L-1 and H-1

P-Values	\$0	\$1	\$2	\$3	\$4	\$5	\$6	\$7	\$8	\$9	\$10
L-1 vs. H-1	1.000	0.782	0.779	1.000	1.000	0.610	1.000	0.467	1.000	1.000	0.224

Table 13: Two-Sided Fisher P-values Comparing L-1 and H-1 Treatments.

So, under costly rejection treatments our findings can be summarized in 5 points:

1) Single peaked form of acceptances is persistent even when rejections are costly.
2) Correlation between acceptance rates and distance to equal split (in both directions) is still present.
3) Introduction of a cost to reject makes acceptances go up in both tails, but relatively more in the LHT.
4) The relatively more expensive rejections are, the relatively higher are LHT acceptance rates.
5) Both LHT and RHT are not significantly different.

After introducing a cost to rejecting an offer we observe how acceptances increase overall, especially in the LHT. It seems like subjects are more indulgent with selfish behavior when a cost is introduced, but not so willing to condone absolute inequality. This is reinforced by the fact that both tails are almost indistinguishable, so we could claim that subjects are rejecting following absolute inequality aversion. This theory is further reinforced when we cannot distinguish between costly treatments even when relative costs of rejection are so different.

5. Discussion:

We have presented here a three player ultimatum game with some results that cannot be explained by any of the most known literature on social preferences. Our results show a single peaked pattern showing rejections in both the generous and the selfish distribution of offers. This pattern is robust across all our treatments, even when rejecting an offer has an economic cost. This is shown through a spearman rank correlation test proving that a correlation between distance to the fair split and number of acceptances exists and is significant.

In fact, we cannot statistically distinguish acceptance levels across treatments in any of the two families, of treatments that we present. Further, while in the free rejection family we see an asymmetric pattern of acceptances, in the costly family treatment both RHT and LHT are not different due to a relatively higher increase in acceptance rates of the latter. We interpret this as selfish concerns being of second order to decision-makers while still maintaining absolute inequality aversion.

While presenting a model to explain our results is not our intention, we introduce the concept of absolute inequality aversion in hope that these results might help refine future models of social preferences. Our structure of three player ultimatum game can still be used to implement new treatments such as implementing s treatment in the nature of Blount (1995) or Falk, Fehr and Fischbacher (2008) where computers instead of a human being make the offer. This experiment would help clarify if the intentions concerns are really that weak in this 3UG structure.

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Appendix A: Ordering Effects

In order to compare to see if there are any ordering effects we run a 2 tailed Fisher test comparing first round treatments against other rounds in the experiment.

P-Values	\$0	\$1	\$2	\$3	\$4	\$5	\$6	\$7	\$8	\$9	\$10
N	0.752	0.890	0.344	0.671	0.174	1.000	0.767	0.492	0.357	0.923	0.628
H-1	0.704	1.000	1.000	0.090	0.621	1.000	1.000	1.000	1.000	1.000	1.000
H	0.091	0.030	0.010	0.165	0.283	1.000	1.000	1.000	1.000	0.136	0.060
L	0.574	1.000	0.352	0.687	0.407	1.000	1.000	1.000	0.435	1.000	0.435
L-1	1.000	0.448	0.692	1.000	0.056	0.549	0.549	1.000	0.662	0.662	0.448

Table A: Two-Sided Fisher P-values Comparing L-1 and H-1 Treatments.

While most treatments present us with results that show no ordering effects, the H treatment seems to be clearly affected by order. This can be explained on the other hand by the lack of observations that we have for first round H treatments (5) compared with third round H treatments (22). As mentioned above, this was due to communication problems while running the experiments. If we look at Graph A, it seems like third round subjects behave "normally" while those in the first round H treatment clearly deviate from what we observe in all other rounds.

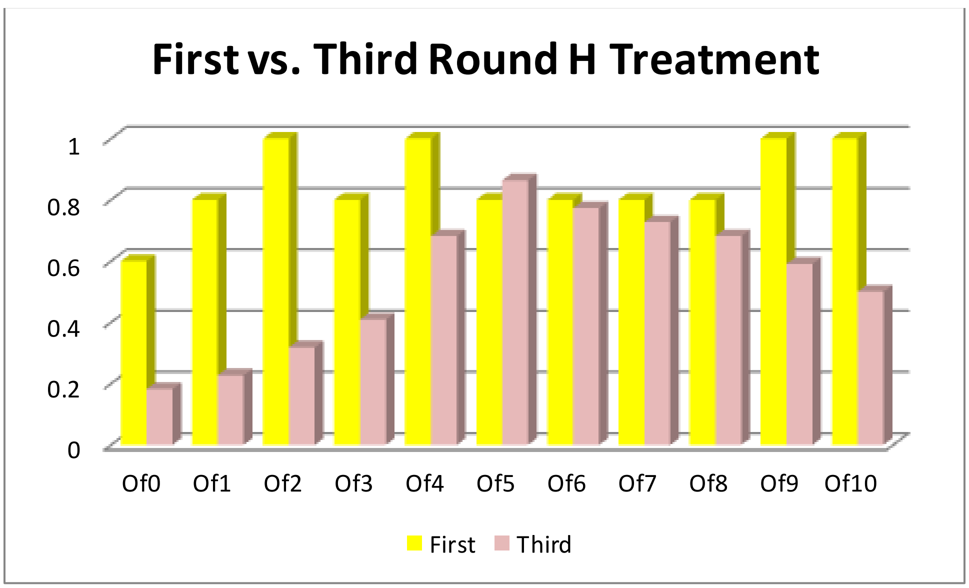


Figure A: Acceptance Rates for H for First (n=5) and Third (n=22) Round

Appendix B: Instructions for an L2H session

3UG:

Welcome! This is an economics experiment. You will be a player in many periods of an interactive decision-making game. If you pay close attention to these instructions, you can earn a significant sum of money. It will be paid to you in cash at the end of the last period.

It is important that you remain silent and do not look at other people's work. If you have any questions, or need assistance of any kind, please raise your hand and we will come to you. If you talk, laugh, exclaim out loud, etc., you will be asked to leave and you will not be paid. We expect and appreciate your cooperation today.

What's this all about:

This experiment has three different rounds. Before each round the specific rules and how you will earn money will be explained to you.

In each round there will always be three types of players: A, B and C. You will be assigned to a type in Round 1 and will remain this type across all three rounds.

Only one of the three rounds will be used for the final payoffs. This round is chosen randomly by the computer.

The outcomes of each round are not made public until the end of the session (i.e. after round 3).

Each round the groups are scrambled so you will never make offers or decide for the same player in two different rounds.

Round 1:

The first thing that you will see on your screen is your player type.

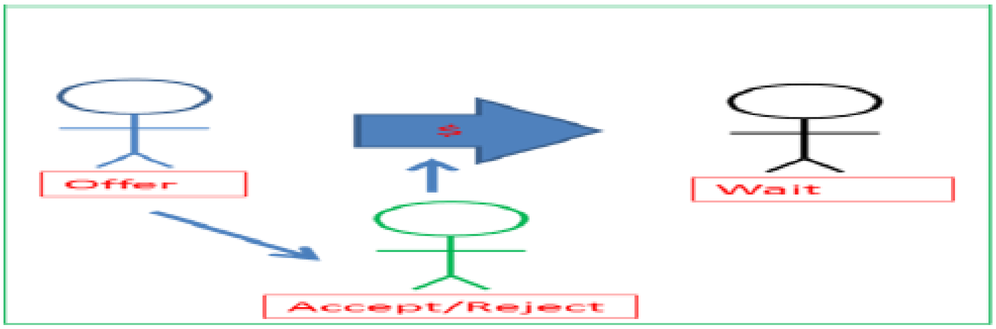
You will then be assigned to a group consisting of three players: an A type, B type and C type.

Player A will be endowed with $10 with which he will split with player C. In order to do so Player A will have to input the amount he is willing to *offer* Player C. Player A will only be able to make integer offers (full dollars), so A will not be able to break its offer into cents.

While player A is deciding how much to offer player C, player B will be filling out a "strategy profile". The strategy profile has an "accept or reject" button for each potential offer from A to C (from $0 to $10). Player B will have to decide whether he accepts or rejects A's offer to C *before* he knows the actual offer by filling the "strategy profile".

A's decision: How to split an endowment of $10 with Player C by making him an offer between $0 and $10. If the offer is of $X, A will be keeping for himself 10-X.

B's decision: Before knowing the offer from A to C, B will fill a "strategy profile" deciding whether he accepts or rejects *every potential offer from A to C.*



It is very important for A to realize that he is going to write the *amount he wants to offer* C and not how much he wants to keep.

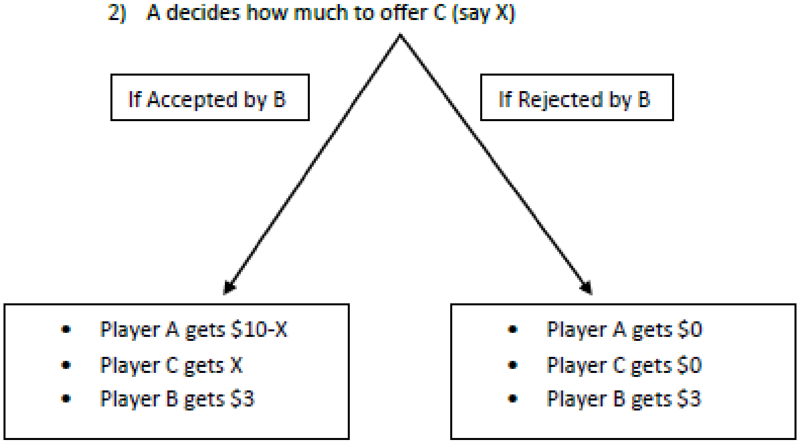
Payoff for Round 1:

If B accepts the offer from A to C, then they split the $10 as suggested by A.

B will get paid $3 *no matter what is the outcome*.

Timing and Payoffs:

1) B fills a strategy profile with all potential offers from A to B.
2) A decides how much to offer C (say X)



3UG:

<u>Round 2:</u>

As mentioned at the beginning of the experiment you will keep your player type across the whole session. So A players are still A, B are B and C are C.

In this round type A players will be endowed with $20 and will have to make TWO offers:

1. How to split $10 with player B.
2. How to split $10 with player C.

As in Round 1 a binding "strategy profiles" will be filled by B and C players before they know the offer made *to them*.

It is very important to notice that B and C players are making decisions concerning *their* payoffs.

<u>A's decision:</u>

How to split $10 with B and how to split $10 with A.

Each offer is independent. So the outcome of the offer to B has no effect on the outcome of the offer to C.

Payoffs for A will be as in Round 1 (if he offer X and the offer is accepted he gets $10-X, if the offer is rejected both him and the rejecting player get 0).

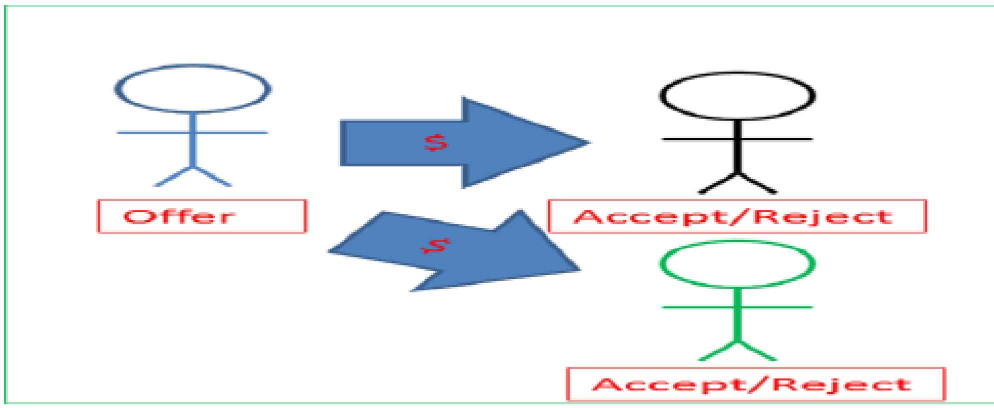
B and C players will get paid X or 0 depending if the accepted or rejected the offer made *directly to them*.

In order to make payoffs equitable for this round, A's payoff for this round will be chosen at random between the two outcomes (offer to B and offer to C).

<u>B and C's decision:</u>

Before knowing the offer made to them by Player A, receivers will fill a "strategy profile" deciding if they accept or reject *every potential offer made directly to them.*

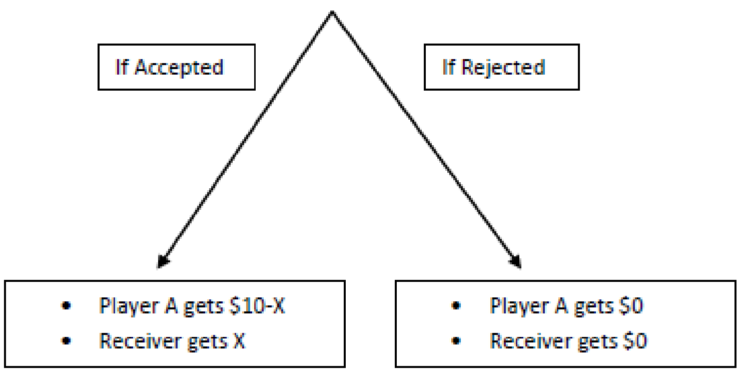
If the offer from A is accepted, then the split is done as proposed by A. If the offer is rejected both the receiver and A get $0 as the outcome for this round.



Timing and Payoff for Round 2:

3) Each receiver fills a strategy profile with all potential offers that A could make them.
4) A decides how much to offer C (say X)
5) Payoffs for B and C will be the outcome of their particular game with A.
6) To make outcomes equitable, the computer will choose randomly one of the two outcomes to be A's payoff for the round.

For each offer made from A to the other members of his group:



<u>Round 3:</u>

As mentioned at the beginning of the experiment you will remain your player type across the whole session.

This round is very similar to round 1. You will now be re-scrambled into groups of three subjects (one A, one B and one C subject).

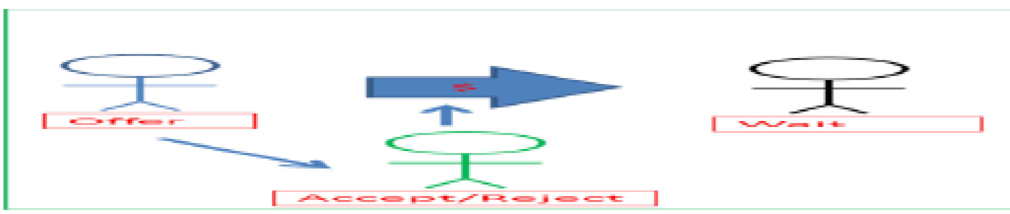
A will be endowed with $10 and must decide how to split them with C.

B's role is exactly the same as that in round 1: Before knowing the offer from A to C, B will fill a "strategy profile" deciding whether he accepts or rejects *every potential offer from A to C.*

If the offer from A to C is accepted by B, then the split is done as proposed by A. If B rejects the offer, then both A and C receive $0 for this round.

B's payoff in this round is a *flat $12 fee, whatever his decision and outcome of the round*.

So, the only change between Round 1 and Round 3 is that player B, the decision maker, is getting paid a different flat fee.



<u>Timing and Payoffs:</u>

1) B fills a strategy profile with all potential offers from A to B.
2) A decides how much to offer C (say X)

If Accepted by B

- Player A gets $10-X
- Player C gets X
- Player B gets $12

If Rejected by B

- Player A gets $0
- Player C gets $0
- Player B gets $12