Multiple Proposers in Ultimatum Game: Simultaneous Offers versus Sequential Offers

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Abstract

This paper compares variants of the ultimatum game where two proposers make offers to a single recipient either simultaneously or sequentially but the recipient can accept at most one offer. There were significant deviations from Nash equilibrium, especially in the first stage of sequential offers.

Keywords: Ultimatum game; Multiple proposers; Competition; Simultaneous offers; Sequential offers;

JEL classification codes: C70; C90; C92

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Introduction

In a standard ultimatum game, a "proposer" proposes to divide some amount of money between himself and a "recipient" by making a take-it-or-leave-it offer to the recipient (Guth et al., 1982; reviewed in Camerer, 2003). If the recipient accepts the offer, then they divide the money as proposed. If the recipient rejects the offer, then they both receive nothing. Some researchers have extended the game to the case of multiple proposers to investigate the effect of competition on sharing behavior (for example, Roth et al., 1991; Fischbacher et al., 2009). They found that when multiple proposers had to compete by making simultaneous offers to a recipient, the recipient's share of the pie rose drastically.

This paper adopts their framework and extends it to compare sharing behavior when two proposers make offers to a single recipient either simultaneously or sequentially. Nash equilibrium predicts polar opposite sharing behaviors for proposers in simultaneous and sequential offers but similar acceptance rules for recipients. We found that the proposers' offers were quite similar across different scenarios. Although in most cases the proposers making simultaneous offers or the first offer seemed at least as likely to offer at least as much as the second proposer, the differences are never statistically significant. Ceteris paribus, however, the recipients were much more likely to reject the first offer than the second offer or simultaneous offers and the differences are always highly statistically significant.

Experimental Design and Procedures

Three experimental sessions were carried out at the National University of Singapore with 57 students recruited from an advertisement posted on the university's Integrated Virtual Learning Environment (IVLE), an online courseware management system that all students use to access course materials. Every student could view and respond to the advertisement. All sessions lasted for about forty-five minutes. In addition to any payout based on the

decisions they made in the experiment, all subjects were paid a participation fee of $8. All payments were in Singapore dollars.[2]

The subjects were seated far apart in a large room and randomly assigned a role as a proposer or a recipient. They kept the same role throughout the experiment. There were 29 proposers and 28 recipients in total. Their assigned role was private information, i.e., known only to themselves but not to the other participants in the room. The experimental instructions were read aloud to the subjects, who also received the experimental instructions in hardcopy. The subjects indicated their decisions on the record sheets in hardcopy.

A within-subject design was used. The same subjects had to make allocation decisions for simultaneous offers as well as sequential offers. They were told that at the end of the exercise, the experimenter would randomly select one scenario and randomly match two proposers with one recipient for real money payouts based on the decisions they had made.[3] In all scenarios, the proposer had to allocate $10 between himself and a recipient. He had to state his offer, i.e., the amount to pass to the recipient. The recipient had to state the minimum amount that is deemed acceptable before any offers from the proposers were revealed.

In simultaneous offers, both proposers made their offers simultaneously. The subjects were told that the higher offer would then be compared to the minimum amount stated by the recipient. If this offer were accepted (i.e., the higher offer $\geq$ the recipient's minimum amount), the recipient would receive the amount offered and the proposer with the higher offer would keep the remaining amount, whereas the other proposer with the lower offer would get nothing and the exercise would end. Conversely, if the higher offer were rejected (i.e., the higher offer $<$ the recipient's minimum amount), then the lower offer would also be rejected.

[2] One Singapore dollar was worth about USD 0.70 at the time.
[3] Every subject was matched for real money payout exactly once. Although a subject might be randomly drawn and matched more than once to generate outcomes for the other subjects, real money payout was based only on the outcome the first time that a subject was drawn and matched.

So neither the proposers nor the recipient would receive any payouts and the exercise would end.

In sequential offers, two proposers made their offers sequentially. The subjects were told that who got to propose first would be randomly determined. The exercise would end as soon as the recipient accepted an offer or when the recipient rejected both offers. Each proposer had to state two offers in advance before any acceptance or rejection decision was known: an offer assuming that he were the first to propose and another offer assuming that he were the second to propose and the first offer by the other proposer had been rejected by the recipient. Each recipient also had to state two minimum amounts in advance before any offers were known: a minimum amount for the first offer and a minimum amount for the second offer assuming that the first offer had been rejected. If the first proposer's offer were accepted (i.e., this proposer's offer assuming that he were the first to propose ≥ recipient's minimum amount for the first offer), then the recipient would receive the amount offered and the first proposer would keep the remaining amount. The exercise would end and the second proposer would get nothing.

On the other hand, if the first proposer's offer were rejected (i.e., this proposer's offer assuming that he were the first to propose < recipient's minimum amount for the first offer), then the first proposer would get zero and the second proposer would then get his turn to propose to the recipient. If the second proposer's offer were accepted (i.e., this proposer's offer assuming that he was the second to propose ≥ the recipient's minimum amount for the second offer), then the recipient would receive the amount offered and the second proposer would keep the remaining amount. If the second proposer's offer were also rejected (i.e., this proposer's offer assuming that he were the second to propose < recipient's minimum amount for the second offer), then neither the proposers nor the recipient would receive any payouts and the exercise would end.

The experiment was conducted double-blind; the participants' decisions and earnings would only be known to themselves but not to the experimenters or the other participants. To ensure anonymity, subjects were not personally identified but were randomly assigned an identification number, which they would use to collect their participation fees and earnings at the end of the exercise in closed envelopes from the cashier located outside the room. We explained these procedures to the subjects before they stated their decisions. Post-experiment surveys revealed that the participants found the instructions to be clear.

Nash Equilibrium

Nash equilibrium predicts polar opposite sharing behaviors for proposers making simultaneous offers and sequential offers but similar acceptance rules for recipients. In simultaneous offers with competition, the proposers should offer almost the entire pie to the recipient, who will in turn accept any positive offer. In a market game with competition, prices generally converge to the competitive equilibrium (Davis and Holt, 1992). This competitive outcome must be the unique equilibrium outcome even if the proposers are inequity averse (Fehr and Schmidt, 1999). Competition between proposers makes it impossible for individual players to enforce equitable outcomes.

In sequential offers, because the order of proposal was randomly determined irrespective of their offers, there was no competition between the proposers. By backward induction, the second proposer would offer the minimal amount and the recipient would accept it because it is just a standard ultimatum game. Anticipating this, the first proposer would also offer the minimal amount, the recipient would accept it, and the game would end.

Results

Figure 1 shows the empirical density functions of the proposers' offers in different scenarios. In Nash equilibrium, the offers should be close to $10 in simultaneous offers but

near zero in sequential offers. But it turns out that there were large deviations from Nash equilibrium. Moreover, the offers appear to be relatively insensitive to the scenarios. The average offer is \$4.9 for simultaneous offers, \$4.9 for the first offer in sequential offers, and \$4.7 for the second offer, respectively. The standard deviation of the offers is 1.65, 1.48 and 1.43 in the three scenarios, respectively. The median offer is \$5 in all three scenarios. Using t-test, the null hypothesis that average offer is \$0 or \$10 can be rejected at the 1% level in all scenarios. In contrast, the null hypothesis that average offer is \$5 cannot be rejected at the 10% level in all scenarios.

Many proposers offered to share exactly half of the stake: 37.9% in simultaneous offers, 31.0% in the first offer, and 34.5% in the second offer. Many offered roughly even split: 65.5%, 79.3% and 72.4% of the proposers offered \$4 to \$6 to the single recipient in the three scenarios, respectively. Among the three scenarios, the proposers were most likely to propose more than half of the stake size to the recipient when they were the first to propose in sequential offers and they were least likely to do so when they were the last to propose in sequential offers. Proposers who offered more than half of the stake size to the recipient account for 37.9% of first offers, 27.6% of simultaneous offers, and 24.1% of second offers, respectively. The large number of proposers who offered to share more than half of the stake size with the recipient in sequential offers is surprising, especially in the last stage of sequential offers because the game simply reduces to a standard ultimatum game.

Figures 2-4 compare the cumulative distribution functions of the proposers' offers in different scenarios. Figure 2 shows that comparing the first and second offers in sequential offers, $P(\text{First offer} \leq x) \leq P(\text{Second offer} \leq x)$ for $x \geq 1.5$, where $P(.)$ denotes probability. Thus, for any $x \geq 1.5$, the first proposer has at least as high a probability of offering at least \$$x$ as does the second proposer. Figure 3 shows that comparing simultaneous offers and the first offer in sequential offers, $P(\text{First offer} \leq x) \leq P(\text{Simultaneous offers} \leq x)$ for $x < 6$, whereas $P(\text{First offer} \leq x) \geq P(\text{Simultaneous offers} \leq x)$ for $x \geq 6$. Figure 4 shows that comparing

simultaneous offers and the second offer in sequential offers, $P(\text{Simultaneous offers} \leq x) \leq P(\text{Second offer} \leq x)$ for $x \geq 1.5$. In other words, for any $x \geq 1.5$, the proposers making simultaneous competitive offers have at least as high a probability of offering at least \$$x$ as does the second proposer in sequential offers.

Panel A of Table 1 reports statistical test results for the null hypotheses that the proposers' offers in different scenarios have identical distributions or identical means. We report the results for both the Wilcoxon signed-rank test and the paired t-test. It turns out that the test statistics are never statistically significant at the 10% level in all pairwise comparisons. In other words, we cannot reject the null hypotheses of identical distributions or identical means for the proposers' offers in different scenarios.

Figure 5 shows the empirical density functions of the minimum acceptable amount in different scenarios. In Nash equilibrium, the recipients would never reject any positive amount, which implies a minimum amount that is near zero in all scenarios. In contrast to the Nash prediction, the average minimum acceptable amount is \$3.8 for simultaneous offers, \$5.4 for the first offer, and \$3.8 for the second offer, respectively. The standard deviation of the minimum amount is 1.92, 1.44 and 1.68 in the three scenarios, respectively. The median is \$4.85, \$5, and \$4 in the three scenarios, respectively. Many stated a minimum acceptable amount of \$5; they account for 39.3%, 46.4%, and 28.6% of the recipients in the three scenarios, respectively.

Using t-test, we can reject the null hypothesis that the mean is \$0 or \$10 at the 1% level in all scenarios. But it turns out that we cannot reject the null hypothesis that the mean is \$5 for the first sequential offers at the 10% level. The *p*-value for a two-tailed test is 0.197. Specifically, there is some evidence that the mean amount demanded is higher than \$5 for the first sequential offers. The p-value for an upper-tailed test is 0.098. In other words, we can reject the null hypothesis that the mean is \$5 in favor of the alternative hypothesis that the mean is higher than \$5 at the 10% level. In contrast, for the second sequential offers and

simultaneous offers, we can reject the null hypothesis that the mean amount demanded is \$5 in favor of the alternative hypothesis that the mean is lower than \$5 at the 1% level. The *p*-values for a lower-tailed test are 0.0003 and 0.0014, respectively.

Thus, the farthest deviation from Nash equilibrium occurred in the first stage of sequential offers. Given the prospect of a second offer, the recipient demanded a larger share from the first proposer: 35.7% of the recipients would reject a first offer that was less than \$6 and an overwhelming 82.1% of the recipients would reject a first offer that was less than half of the stake size.[4] Such behaviors cannot be explained by Nash equilibrium, fairness considerations, or inequity-averse considerations.

Figures 6-8 compare the cumulative distribution functions of the minimum acceptable amount in different scenarios. Figure 6 shows that comparing the first and second offers in sequential offers, $P(\text{Acceptable amount for the first offer} \leq x) \leq P(\text{Acceptable amount for the second offer} \leq x)$ for all x. In other words, the recipient has at least as high a probability of demanding at least \$$x$ from the first proposer as he does from the second proposer. Figure 7 shows that comparing simultaneous offers and the first sequential offers, $P(\text{Acceptable amount for the first offer} \leq x) \leq P(\text{Acceptable amount for simultaneous offers} \leq x)$ for all x. Again, the recipient has at least as high a probability of demanding at least \$$x$ from the first proposer as he does from proposers making simultaneous competitive offers. Finally, Figure 8 shows that comparing simultaneous offers and the second sequential offers, the evidence is mixed. Specifically, $P(\text{Acceptable amount for the second offer} \leq x) \leq P(\text{Acceptable amount for simultaneous offers} \leq x)$ for $x < 4$, whereas $P(\text{Acceptable amount for second offer} \leq x) \geq P(\text{Acceptable amount for simultaneous offers} \leq x)$ for $x \geq 4$.

[4] In contrast, the recipient demanded less from the second proposer and from proposers making simultaneous competitive offers. Specifically, 7.1% of the recipients would reject a second offer that was less than \$6 and 35.7% of them would reject a second offer that was less than half of the stake size. Similarly, in simultaneous offers, 10.7% of the recipients would reject an offer that was less than \$6 and 50% of them would reject an offer that was less than half of the stake size.

Panel B of Table 1 reports statistical test results for the null hypotheses that the recipients' minimum acceptable amounts in different scenarios have identical distributions or identical means. We report the results for both the Wilcoxon signed-rank test and the paired t-test. It turns out that we can reject the null hypotheses of identical distributions or identical means at the 1% level when we compare the minimum amount for the first sequential offers and the second sequential offers, as well as for the first sequential offers and simultaneous offers, in favor of the alternative hypothesis that the minimum amount demanded is higher for the first sequential offers. On the other hand, when we compare the minimum amount for simultaneous offers and the second sequential offers, we cannot reject the null hypotheses of identical distributions or identical means at the 10% level.

Discussions and Conclusions

This paper investigates how people behave in variants of the ultimatum game where multiple proposers make offers to a single recipient either simultaneously or sequentially. Nash equilibrium predicts polar opposite sharing behaviors for proposers in these two conditions: the proposers should offer almost the entire pie to the recipient when they make offers simultaneously and competitively, but very little to the recipient when they make offers sequentially and non-competitively. On the other hand, Nash equilibrium predicts very similar acceptance decisions by the recipients regardless of whether they face the offers simultaneously or sequentially: the recipients should never reject any positive offers.

We found large deviations from the Nash predictions in all scenarios. The proposers' offers were quite insensitive to the conditions in different scenarios. The recipients, however, demanded significantly more from the proposers in the first stage of two sequential offers, to the extent that the recipients rejected less than even split with the first proposers about 80% of the times. Surprisingly, this could lead to first mover disadvantage and inequity to the first proposer in a sequential setting.

Our games may be a good approximation to wage offers in different labor market conditions, where job seekers expect multiple job offers from prospective employers that arrive either sequentially or simultaneously and they can accept at most one offer. To the extent that this is true, our findings may have implications for the labor market.

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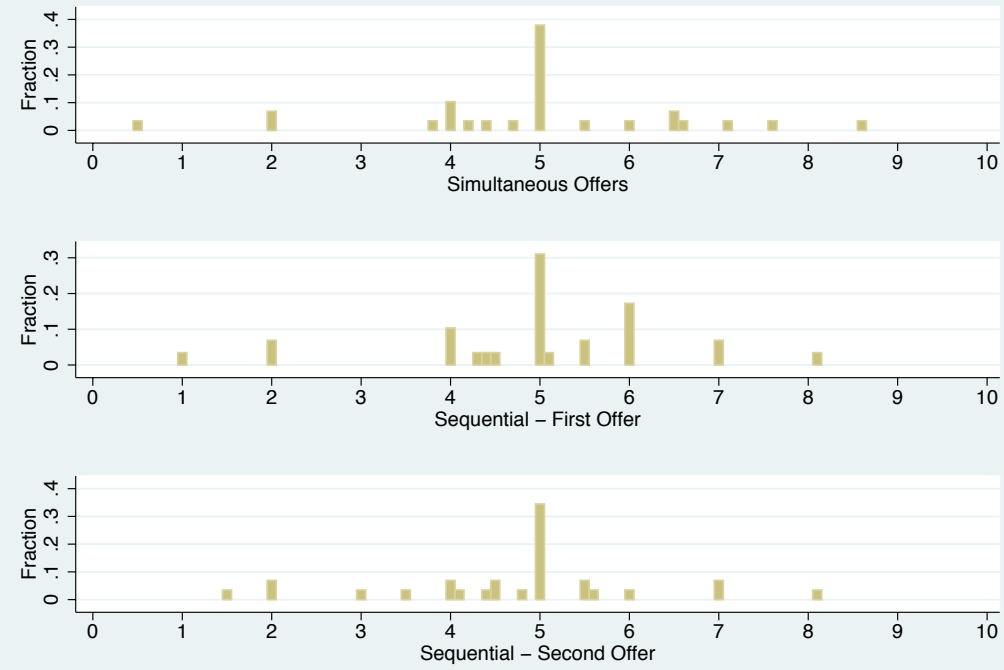
Figure 1: Empirical Density Functions of Proposers' Offers in Different Scenarios



Note: Number of Proposers = 29

Figure 2: Cumulative Distribution Functions of Proposers' Offers to the Recipient (First Sequential Offer vs. Second Sequential Offer)

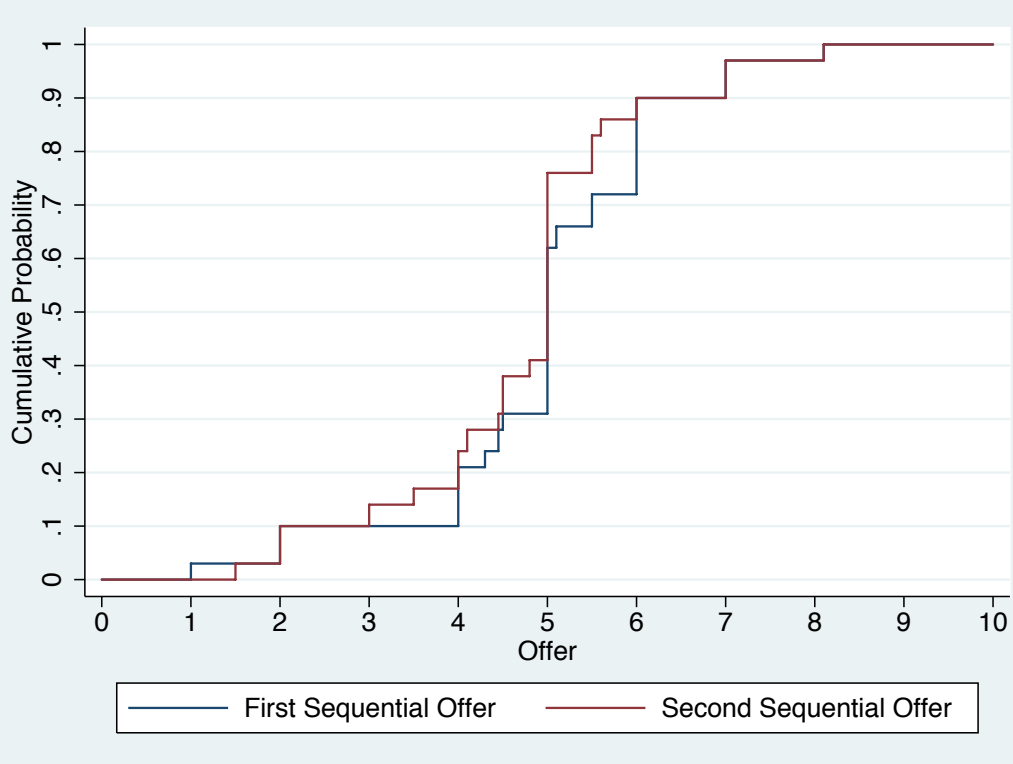


Figure 3: Cumulative Distribution Functions of Proposers' Offers to the Recipient (Simultaneous Offers vs. First Sequential Offer)

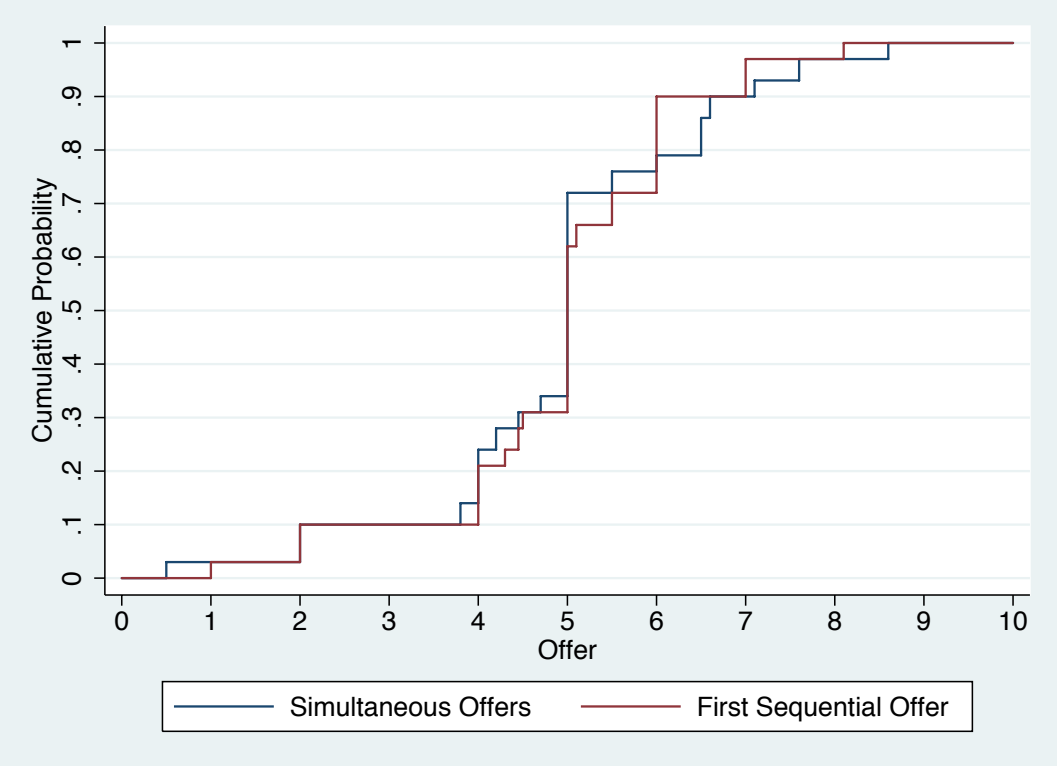


Figure 4: Cumulative Distribution Functions of Proposers' Offers to the Recipient (Simultaneous Offers vs. Second Sequential Offer)

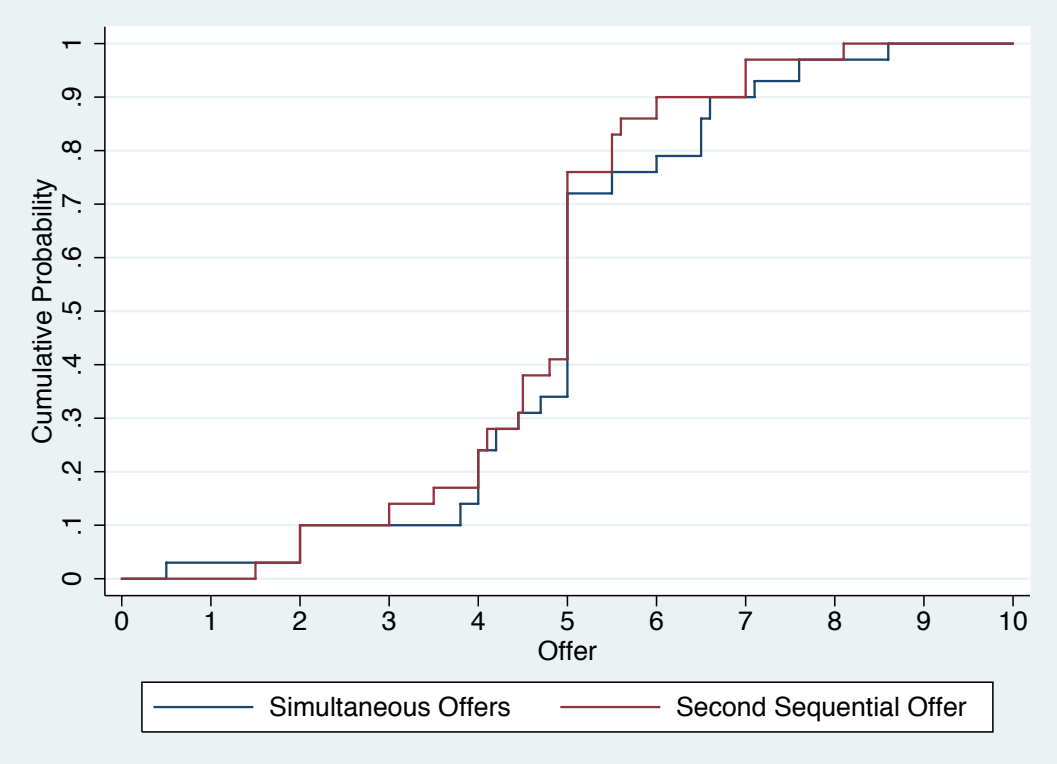


Figure 5: Empirical Density Function of Recipients' Minimum Acceptable Amounts in Different Scenarios

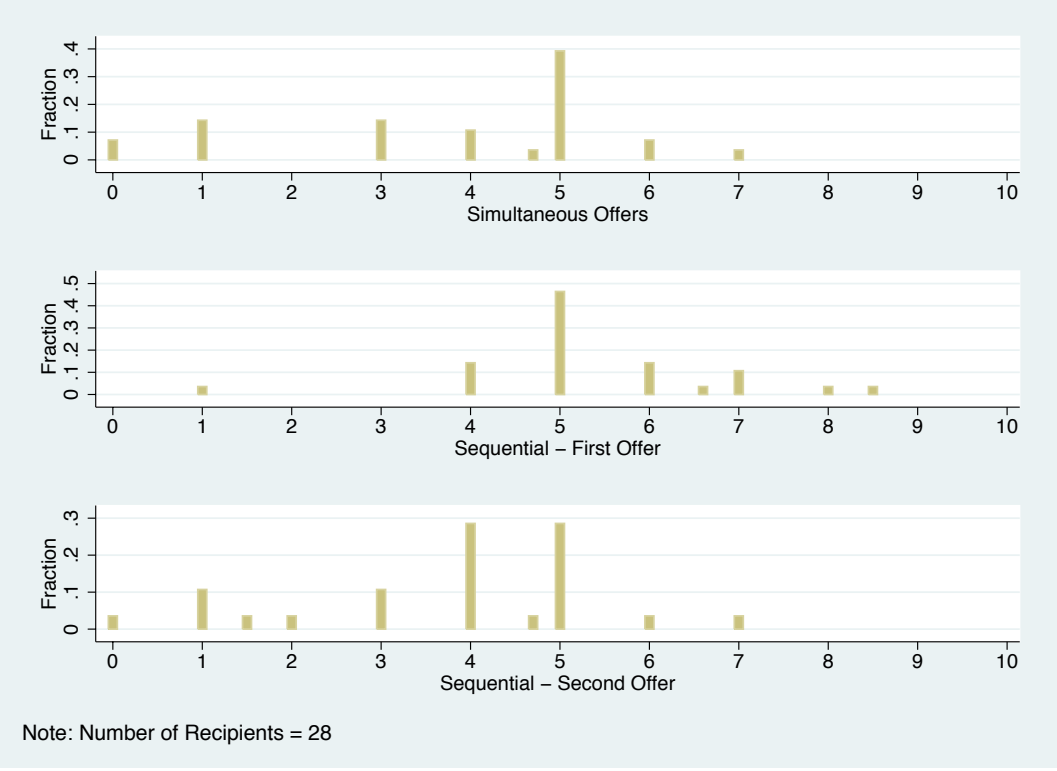


Figure 6: Cumulative Distribution Functions of Recipients' Minimum Acceptable Amounts (First Sequential Offer vs. Second Sequential Offer)

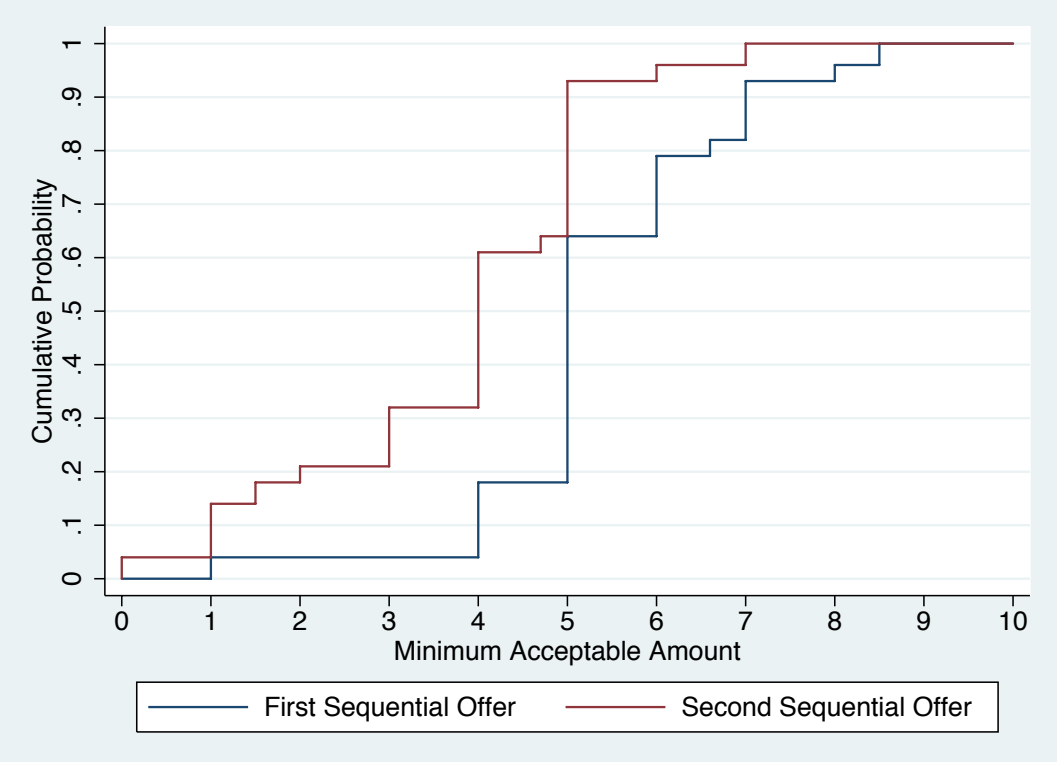


Figure 7: Cumulative Distribution Functions of Recipients' Minimum Acceptable Amounts (Simultaneous Offers vs. First Sequential Offer)

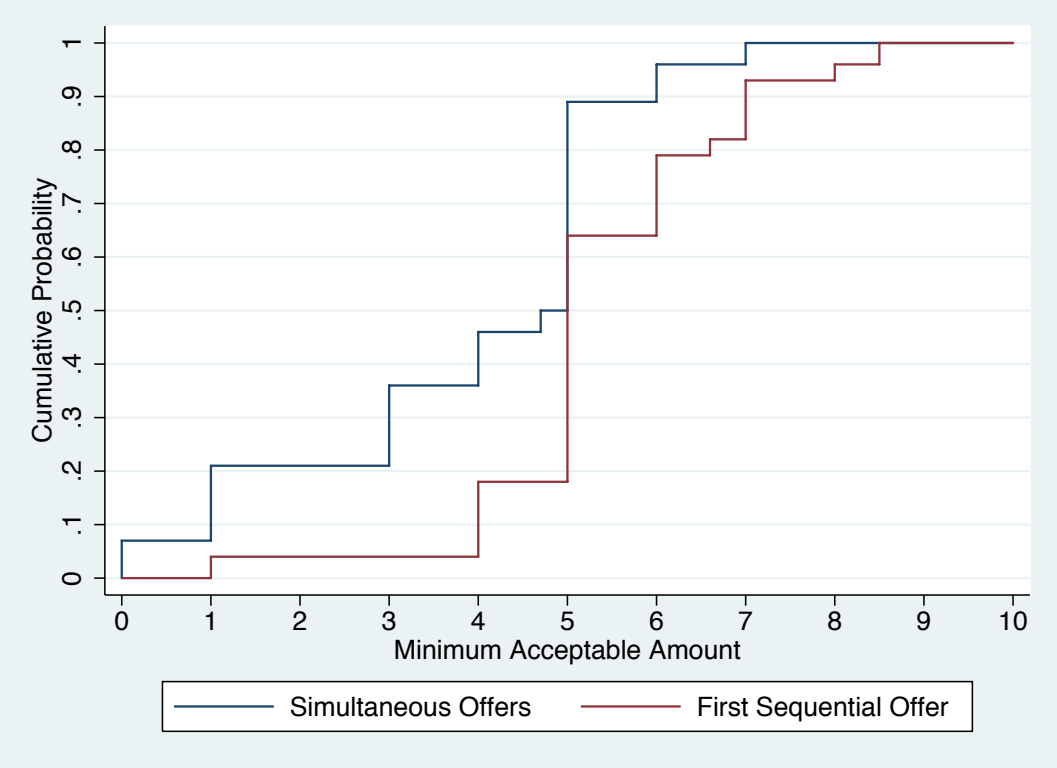


Figure 8: Cumulative Distribution Functions of Recipients' Minimum Acceptable Amounts (Simultaneous Offers vs. Second Sequential Offer)

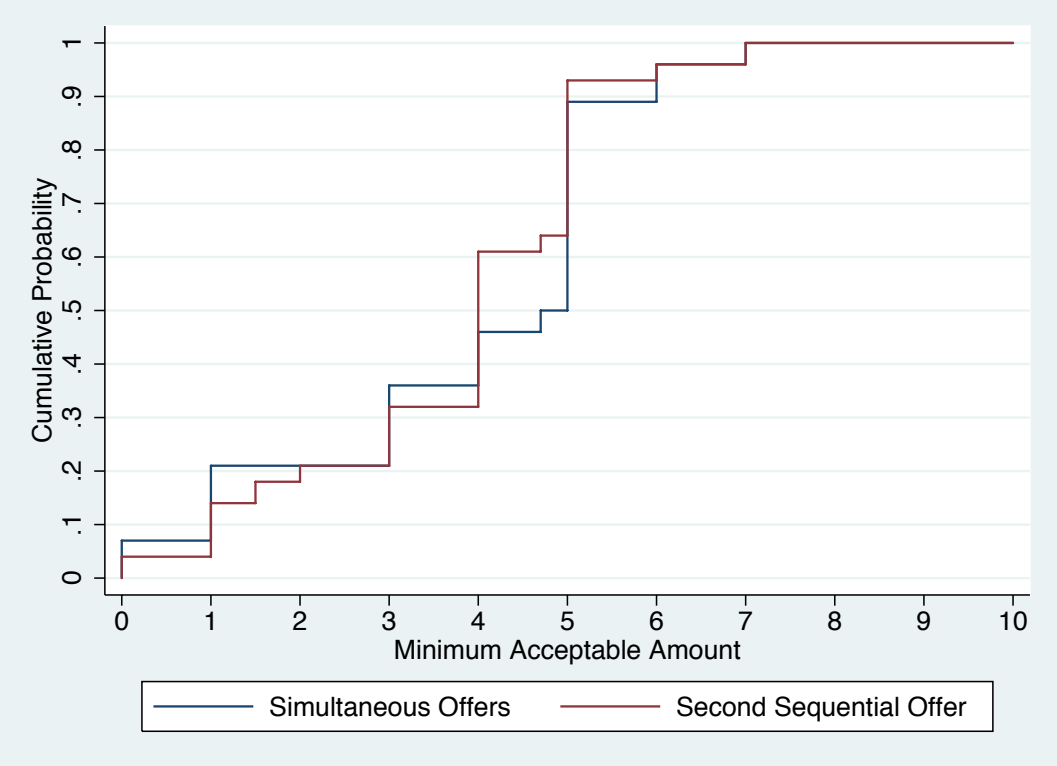


Table 1 – Statistical Tests for Identical Distributions or Identical Means

	Wilcoxon signed-rank test (H_0: identical distributions)		Paired t-test (H_0: identical means)	
	z	*p*-value	*t*-statistic	*p*-value
Panel A: Proposer's Offers				
First sequential offers vs. Second sequential offers	0.89	0.37	0.95	0.35
First sequential offers vs. Simultaneous offers	0.42	0.67	0.09	0.93
Simultaneous offers vs. Second sequential offers	0.14	0.89	0.65	0.52
Panel B: Recipients' Minimum Amounts				
First sequential offers vs. Second sequential offers	4.01	0.0001	4.81	0.0001
First sequential offers vs. Simultaneous offers	3.70	0.0002	4.21	0.0003
Simultaneous offers vs. Second sequential offers	0.61	0.54	0.31	0.76

Note: The p-values are for two-tailed tests.

Appendix (Not for Publication)

INSTRUCTIONS

Welcome

This is an experiment about decision making. Please do not communicate with other people during the experiment. All decisions must be made in private without communication with others. This is very important. You will be paid for participating, and the amount of money you will earn depends on the decisions that you and the other participants make. The entire experiment should be complete within an hour. At the end of the experiment you will be paid privately and in cash for your decisions. A research grant has provided the funds for this experiment.

Your Identity

You will never be asked to reveal your identity to anyone during the course of the experiment. Neither the people conducting the study nor those participating in it will be able to link you to any of your decisions.

In order to keep your decisions private, please do not reveal your choices to any other participant.

Participant Number

We will use the ID number on your record sheet to identify you. You will use this number to collect your earnings at the end of the study. Your earnings will be presented to you in a closed envelope, and the person handing you the envelope will not know the amount of money inside, nor have any information about any decisions made in the experiment.

Your decisions and earnings will be known only to you.

THE EXERCISE

In this exercise you are asked to make allocation decisions under 2 scenarios.

Some participants have been designated as the Proposers and others have been designated as the Recipients. Whether you are a Proposer or a Recipient is randomly determined and it is stated on your record sheet.

At the end of the exercise, one scenario will be randomly selected for real money payouts. All scenarios are equally likely to be selected. The Proposers will be randomly matched with the Recipients and the scenario will be executed using the decisions made. You will not be told each other's identity or who you are matched with. Each participant will be selected for real money payouts once.

In the following scenarios, two Proposers are randomly matched with one Recipient. Each Proposer will be given $10 that he may allocate between himself and the Recipient. The Proposer can keep all the money to himself, keep some to himself and pass some to the Recipient, or pass all the money to the Recipient. The amount kept plus the amount passed must sum to $10.

However, the Recipient can accept or reject an offer by a Proposer. *Before* being told the amount that the Proposer offers to pass to him, the Recipient will write out the minimum amount acceptable.

If the amount the Proposer offers to pass to the Recipient ≥ the minimum amount stated, the offer is accepted: the Recipient receives the amount the Proposer offers to pass to him and the Proposer receives the amount that he has kept to himself.

However, if the amount the Proposer offers to pass to the Recipient < the minimum amount stated, the offer is rejected: neither the Proposer nor the Recipient will receive anything, i.e., both will get zero.

However, the Recipient cannot accept both offers by the Proposers. The Recipient can accept at most one offer from the Proposers. Scenarios 1 and 2 differ in when the Proposers get to make offers to the single Recipient.

Scenario 1: Both Proposers make their offers simultaneously. The higher of the two offers is then compared to the minimum amount (stated by the Recipient before being told the amount the Proposers offer to pass to him).

If the higher offer is accepted, then the Recipient will receive the amount this Proposer offers to pass to him and this Proposer will receive the amount that he has kept to himself. The other Proposer with a lower offer will get zero and the exercise ends.

If the higher offer is rejected, the lower offer is also rejected. Neither the Proposers nor the Recipient will receive anything, i.e., everybody will gets zero and the exercise ends.

Scenario 2: The two Proposers make their offers sequentially. Which Proposer gets to propose first is randomly determined. The first Proposer proposes an amount to pass to the Recipient. This offer is compared to the first minimum amount (stated by the Recipient before being told the amount the Proposers offer to pass to him).

If the first proposal is accepted, then the Recipient will receive the amount the first Proposer offers to pass to him and the first Proposer will receive the amount that he has kept to himself. The second Proposer will get zero and the scenario ends.

If the first proposal is rejected, then the first Proposer will get zero and the second Proposer now gets to propose an amount to pass to the Recipient. This offer is compared to the second minimum amount (also stated by the Recipient before being told the amount the Proposers offer to pass to him).

If the second proposal is accepted, the Recipient will receive the amount the second Proposer offers to pass to him and the second Proposer will receive the amount that he has kept to himself and the exercise ends.

If the second proposal is rejected, then everybody receives nothing and the exercise ends.

Note: In Scenario 2, the Recipient will be asked to make two separate decisions on the minimum amount for the first proposal and for the second proposal respectively.

Record Sheet for Proposer

ID Number:

Scenario 1 – Two Proposers make offers simultaneously to one Recipient: How much out of the $10 that will be given to you, will you pass to the Recipient?

Amount to pass to the Recipient		**$**
Amount to keep to yourself	+	**$**
		$ 10.00

Scenario 2 – Two Proposers make offers sequentially to one Recipient
(i) Assuming that you are the first to propose, how much out of the $10 that will be given to you, will you pass to the Recipient?

Amount to pass to the Recipient		**$**
Amount to keep to yourself	+	**$**
		$ 10.00

(ii) Assuming that you are the second to propose and the first offer was rejected, how much out of the $10 that will be given to you, will you pass to the Recipient?

Amount to pass to the Recipient		**$**
Amount to keep to yourself	+	**$**
		$ 10.00

Please detach along this line

ID Number:

Keep this portion to yourself. Should you be selected for real money payout, you must show your ID number to the experimenter outside the room at the end of this exercise to receive your payment in a sealed envelope.

Record Sheet for Recipient

ID Number:

Scenario 1– Two Proposers make offers simultaneously to one Recipient

Minimum amount	**$**

Scenario 2 – Two Proposers make offers sequentially to one Recipient

(i) Minimum amount for the first proposal	**$**

(ii) Minimum amount for the second proposal (assuming that the first proposal was rejected)	**$**

Please detach along this line

ID Number:

Keep this portion to yourself. Should you be selected for real money payout, you must show your ID number to the experimenter outside the room at the end of this exercise to receive your payment in a sealed envelope

Appendix: Probability Density Function and Cumulative Distribution Function of Proposers' Offers and Recipients' Minimum Acceptable Amounts

Table A1: Proposers' Offers to the Recipient (Simultaneous Offers)

Offers	Frequency	Probability	Cumulative Probability
0.5	1	0.03	0.03
2	2	0.07	0.10
3.8	1	0.03	0.14
4	3	0.10	0.24
4.2	1	0.03	0.28
4.45	1	0.03	0.31
4.7	1	0.03	0.34
5	11	0.38	0.72
5.5	1	0.03	0.76
6	1	0.03	0.79
6.5	2	0.07	0.86
6.6	1	0.03	0.90
7.1	1	0.03	0.93
7.6	1	0.03	0.97
8.6	1	0.03	1.00

Table A2: Proposers' Offers to the Recipient (First Sequential Offers)

Offers	Frequency	Probability	Cumulative Probability
1	1	0.03	0.03
2	2	0.07	0.10
4	3	0.10	0.21
4.3	1	0.03	0.24
4.45	1	0.03	0.28
4.5	1	0.03	0.31
5	9	0.31	0.62
5.1	1	0.03	0.66
5.5	2	0.07	0.72
6	5	0.17	0.90
7	2	0.07	0.97
8.1	1	0.03	1.00

Table A3: Proposers' Offers to the Recipient (Second Sequential Offers)

Offers	Frequency	Probability	Cumulative Probability
1.5	1	0.03	0.03
2	2	0.07	0.10
3	1	0.03	0.14
3.5	1	0.03	0.17
4	2	0.07	0.24
4.1	1	0.03	0.28
4.45	1	0.03	0.31
4.5	2	0.07	0.38
4.8	1	0.03	0.41
5	10	0.34	0.76
5.5	2	0.07	0.83
5.6	1	0.03	0.86
6	1	0.03	0.90
7	2	0.07	0.97
8.1	1	0.03	1.00

Table A4: Recipients' Minimum Acceptable Amounts (Simultaneous Offers)

Min Amount	Frequency	Probability	Cumulative Probability
0	2	0.07	0.07
1	4	0.14	0.21
3	4	0.14	0.36
4	3	0.11	0.46
4.7	1	0.04	0.50
5	11	0.39	0.89
6	2	0.07	0.96
7	1	0.04	1.00

Table A5: Recipients' Minimum Acceptable Amounts (First Sequential Offers)

Min Amount	Frequency	Probability	Cumulative Probability
1	1	0.04	0.04
4	4	0.14	0.18
5	13	0.46	0.64
6	4	0.14	0.79
6.6	1	0.04	0.82
7	3	0.11	0.93
8	1	0.04	0.96
8.5	1	0.04	1.00

Table A6: Recipients' Minimum Acceptable Amounts (Second Sequential Offers)

Min Amount	Frequency	Probability	Cumulative Probability
0	1	0.04	0.04
1	3	0.11	0.14
1.5	1	0.04	0.18
2	1	0.04	0.21
3	3	0.11	0.32
4	8	0.29	0.61
4.7	1	0.04	0.64
5	8	0.29	0.93
6	1	0.04	0.96
7	1	0.04	1.00