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The Ultimatum Game and Gender Effect: Experimental Evidence from Pakistan

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Laboratory experimentation was once considered impossible or irrelevant in economics. Recently, however, economic science has gone through a real 'laboratory revolution', and experimental economics is now a most lively subfield of the discipline. This study attempts to examine answers to questions of the changing behaviour of opposite sexes under conditions of both anonymity and knowledge of gender by playing the ultimatum game in Pakistan. It is observed that the behaviour of males and females in Pakistani society is quite different from that found in earlier studies. Insights from the previous experiments have already shown that normative economic theory had failed in its predictions of human behaviour. Currently, the ultimatum game is widely discussed in behavioural economic literature, and this paper will adjust the traditional ultimatum game into a new form wherein it will be tested in the country (Pakistan) with multidimensional behaviour of subjects. With regard to gender effect specifically, all previous studies came up with somewhat mixed results, since results do not always point in the same direction and it is rather early to draw far-reaching conclusions regarding the behavioural differences of men and women. More facts are required in order to move towards the development of a systematic theory. This work is a small attempt to investigate the changing behaviour of opposite sexes under different controlled conditions.

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Keywords: Ultimatum Game, Human Sex Difference, Social Behaviour

INTRODUCTION

There is substantial diversity in the social and economic behaviour of men and women in most of the societies around the globe. In Pakistan, socio-economic groups behave differently in bargaining. These behavioural differences in both genders may affect wages and other economic outcomes. Here it has been tried to test the behaviour of Pakistani people using the Ultimatum Game. The *Ultimatum Game*[1] has been the basis for many experimental investigations and the outcomes of the ultimatum game are not

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[1]In the ultimatum game (UG), two people, a first-mover (proposer) and a second-mover (responder), are allocated a sum of money, which they can share if they can come to an agreement. Responders decide whether to accept or reject offers from the proposers. Accepted offers are implemented but rejected offers result in both players receiving nothing. Because the proposer is allowed to make a take-it-or-leave-it offer and because the proposer knows any reasonable responder will accept even a little money rather than rejecting an offer, as the economic theory dictates the proposer should receive nearly all the money as something is better than nothing. But the game-theoretic prediction for this game is straightforward. If both players are rational in the sense that each is concerned only with maximising his own profit, proposer should propose to keep all but a penny for himself and give a penny to responder. Responder should accept this proposal since even a penny is better than nothing [Camerer and Thaler (1995) and Güth, *et al.* (1982)].

consistent with the results expected from standard economic theory for one-shot and repeated games [Thaler (1998) and Roth (1995)].

Social Norms defining "*Fairness*" influence outcomes of Ultimatum Game. These norms vary across culture. Accordingly, ultimatum game has been studied in many different cultures [Croson and Buchan (1999); Roth, *et al.* (1991)]. However, we add to this literature by studying, for the first time; ultimatum game in Pakistan also by applying new statistical techniques which have never been used in existing literature. The experiment made in this paper involves four rounds of ultimatum game. In each round the size of the monetary stake remained unchanged and the gender of the players has been recorded. In the first two rounds the players remained mutually anonymous. But in the next two rounds the gender of the player is common knowledge. It had been tried to examine how the behaviour is affected by the knowledge about gender of the players, why do people offer more in their social negotiations, how people learn from their past experience and the consistency of social behaviour with the conventional economic wisdom.

In the following sections a short overview of the related literature on ultimatum game, design of experiment along with the discussion over the experimental results from Pakistan. The final section was the conclusion and policy recommendation.

THEORETICAL FRAMEWORK

The role of gender in human decision-making has been extensively analysed in the literature. More specifically, gender differences have been investigated in the laboratory using several environments one of which is the Ultimatum Game (UG).[2] We now review the literature on effects of Gender on the Ultimatum Game, as a preliminary to our study of this issue in the context of Pakistan.

As far as the Ultimatum Game (UG) is concerned, Eckel and Grossman (2001) conducted the UG experiment specifically designed to test for gender effects in the bargaining process. In their design employs the "game method[3]", they implement an UG which is repeated along eight rounds. Proposers and respondents are matched using a face to face protocol. The sex of a subject's partner is made known by having a group of four proposers seated facing a group of four respondents. Subjects have no information on their partner's identity. They find that women proposals are, on average, more generous than men, regardless of the sex of the partner, and women respondents are more likely to accept an offer of a certain amount. Furthermore, a given offer is more likely to be accepted if it comes from a woman, a result which is interpreted as chivalry. Women paired with women almost never fail to reach an agreement. Our design of experiment is closer to Eckel and Grossman's design. As in our study the players were seated face to face so that the players may see each other and make their ultimatum decision. Contrary to the findings of Eckel and Grossman, we find that males made more generous offers in the case where the gender of the responder was unknown, and also in the case where the responder was know to be female. This difference is most likely due to cultural differences.

[2]See Eckel and Grossman (2005) for an exhaustive revision of differences in economic decisions of men and women. They examined these differences in several experimental scenarios.

[3]In game method the proposer makes an offer which is presented to the responder, who then decides whether to accept or reject the given offer.

In another study, Solnick (2001) conducted a one-shot UG game using the strategy method.[4] This method generates additional data (the minimum willingness can be analysed directly) but is thought to lead to more analytical decision-making states than the game method used by Eckel and Grossman (2001). Gender is communicated by the first name of the counterpart (a practice which Holm (2000) suggests yields the same results as informing the participant "your counterpart is a (fe)male student"; see also Fertshman and Gneezy (2001). The analysis involved two treatments. In first treatment, players remained mutually anonymous while in second treatment the gender of the players was known to both parties (proposer and responders). She analysed the players behaviour using Wilcoxon test and found that both sexes make lower offer to women and that both sexes choose higher minimum acceptable offer (MAO) when he/she faces a woman. In general the highest rejection rate exists when a women player faces a women player. There are two fundamental differences in our study and Solnick's study which are (i) design of experiment, (ii) strategy to disclose player's identity. In Solnick study the strategy method was used whereas we have not used strategy method (methodology of our study will be discussed in coming chapters). Solnick study revealed that players only knew the gender but they cannot see the players themselves while in our study the players were seated face to face without allowing them to talk to each other. Our results are substantially different from those of Solnick, most likely due to cultural differences between Pakistan and USA.

Similarly, Saad and Gill (2001) conducted one shot UG in which subjects face randomly a subject of the same or contrary gender (i.e. man to woman, woman to man, man to man and woman to woman). Here each subject knew the sex of his/her partner. They found that males make more generous offers when pitted against female whereas, females made equal offers independently of the other's sex. Our results are similar to Saad and Gill (2001) but here again there is difference of experimental design. We have tested the player's behaviour under anonymity as well as full gender knowledge where as Saad and Gill tested the player's behaviour with full gender knowledge. Also, we have used non-parametric test and logistic regression analysis to analyse the distributional pattern of offers made and the responders' response to a given offer which was missing in the Saad and Gill's study. In our study the female players have shown learning behaviour when the gender was unknown but this aspect of learning was not discussed in the Saad and Gill's study. However, in the Saad and Gill study an interesting rather more important parameter of physical attractiveness of the subjects was discussed to explore the plausible reasons for the gender differences. They were also of the opinion that the physical attractiveness of the subject has a very important role in determining the behavioural response of the subjects in ultimatum game. Rating the physical attractiveness is not easy because this relates to the mental state of mind where the mood and attitude of the subject also play a pivotal role. Therefore, we have tried to exclude all those confounding parameter which may affect the behaviour of subjects other than gender to observe the natural response of the subjects when they were paired with a subject of opposite sex.

[4]Under the strategy method, the proposer decides the offer and, at the same time, the responder records a minimum acceptable offer. If proposer's offer equals or exceeds responder's minimum acceptable offer, the offer is accepted and the pie divided according to proposer's proposal.

The factor of physical attractiveness influencing the gender decision on the ultimatum game was also discussed by Solnick and Schweitzer (1999). The study revealed that one's own attractiveness did not influence decision making but did influence the decision process of others. In particular, it was found that more was offered to attractive people and to men, even though attractive people and men did not demand more. In this study the expected earnings of attractive people were 8 to 12 percent greater than the expected earnings of un-attractive people, and the expected earnings of men were 13 to 17 percent greater than the expected earnings of women. Thus, the physical appearance significantly influenced the types of offers and demands negotiations. The implications of this study were consistent with Heilman's (1983) and Rynes and Gerhart (1990) findings.

Botelho, *et al.* (2000) postulated the hypothesis that behavioural differences in bargaining in UG stems from the differences in demographic characteristics of the subjects within each country. They used the data previously collected in the USA and Russia to test not only for the effects of nationality on behaviour but also for the effects of other demographic factors. They found that proposer behaviours were fairly similar across USA and Russia but there were substantial differences in behaviour across genders. The average offers made by female subjects in both USA and Russia about 45 percent of pie whereas, male offered 31.5 percent of the pie. The results of this study are also in contradiction to our study.

Sutter, *et al.* (2006) studied the influence of gender and gender pairing on economic decision making in an experimental two-person UG where the other party's gender was known to both subjects. The game was played with four treatments (FF, FM, MF, MM) using the censored Tobit regression analysis it was observed that gender pairing systematically affects the behaviour. Moreover, competition and retaliation was observed which lowered the efficiency when the bargaining partners were having the same gender and vice versa.

The composition of the gender related games also affects the decision of the subjects as examined by Dufwenberg and Muren (2005). They tried to explain how does gender composition influence team decisions. They use dictator game[5] (DG) to address this issue. The results do indicate that there were significant gender effects in group decisions i.e. female-majority groups give more to individual recipient and also choose the equalitarian division more after than male-majority groups do. It was also found that the presence of a man triggers an exaggerated generosity among the women in the group. The results of Dufwenberg and Muren's this study receives some support from the observations already raised by Stockard, *et al.* (1988). In another paper by Dufwenberg and Muren (2004) it was examined experimentally that how a person's generosity depends on the degree of anonymity between given and recipient, as well as on the sex of either party. Here again dictator game was used and it was concluded that women were mere generous than man.

However, to our knowledge there have been no prior studies involving ultimatum game to investigate gender effect in Pakistan.

[5]In the dictator game, the first player, "the proposer", determines an allocation (split) of some endowment (such as a cash prize). The second player, the "responder", simply receives the remainder of the endowment not allocated by the proposer to himself. The responder's role is entirely passive that he has no strategic input into the outcome of the game [Camerer and Fehr (2003)].

DESIGN OF EXPERIMENT

The ultimatum game was tested in the Govt. Postgraduate College Nawabshah, Ghizer, Kharan, Rawlakot and Professional Academy of Common Knowledge, Lahore (PACK) separately at the stake size of Rs 100, consisting of four rounds. The stake size remained fixed through out the study.[6] The advertisement about the game was done through pasting the posters in the institutes. No show up fee was taken from the participants. A short seminar was conducted in order to explain the rules of the game to the students. Thirty pairs of postgraduate students consisting of thirty male and thirty females from each *Govt. College*, were chosen except ten pairs of postgraduate students consisting of ten male and ten female, were chosen from *PACK* for the experiments.

In the first round at *Govt. Colleges*, there were 15 male and 15 female proposers, with 15 male and 15 female responders but in *PACK* there were 5 male and 5 female proposers, with 5 male and 5 female responders. The identity and gender of the players was kept secret in the first two rounds. The experimenter was the only one who has complete knowledge of the player's gender (identity). There was no opportunity for the mutual coordination among the proposers as well as the responders through out the experiment. The proposers were placed in one room and the responders in another. Two persons were assisting the experimenter.[7] In the start of round every player was allotted an identity number. In each round the players (proposers) were given a slip to write their identity number and make their offer. They have only two minutes to make their offer and then the assistants collected the offer slips and took them to the responders to make their decision (either to accept or reject the offer). After making the decision, the slips were taken back and given to the experimenter and he then announced the resulting payoffs to the players. After the announcement the payment was made to the players according to their decided share. After that round the players have to answer a short questionnaire. The same methodology was adapted in the second round with a slight difference that male proposers were making their offers to the male responders and female proposers were making their offers to the female responders. However, the gender was still not the not known to both player's parties.

In the next two rounds (third and fourth) the players were seated face to face and the gender became a common knowledge. But still the players were not allowed to make mutual conversation. Here in the third round, all the male players were chosen to make offers to all the female responders. After that round both the parties have to answer the questionnaire regarding their decision and hand it over to the experimenter. In the fourth round, the role of proposer and responder was swapped within the mixed gender pairs selected in the third round. After all these experimental rounds, the players had passed through a short interview regarding their preferences and their attitude towards the opposite sex.

RESULTS AND DISCUSSION

(i) Round 1

In this round of play the both the player parties were ignorant of the gender of each other and there was no provision of making any bilateral or multilateral conversation

[6]Including all the rounds 1, 2, 3, 4.

[7]One man in the proposer's room and the other in the responder's room from the respective institute.

among them. The hypothesis we were trying to test here is that either the distribution of male and female offer differ significantly from each other or otherwise. In this context two sample Kolmogorov-Simrnov Test (K-S Test),[8] for additional econometric analysis logistic regression model and mean comparison test have been used.

While analysing the offer pattern of male and female in round I, it was observed that offers were not the same, meaning that there were significant differences in the offer pattern of male and female players according to the results of K-S Test (Table 1). As the computed *p-value* was less than significance level ($\alpha = 0.05$), also the computed value of (*Absolute Difference of Cumulative Distribution Functions*) was *D = 0.246* which was higher than the critical value of *D = 0.175* at *n=65* rejecting the null hypothesis.

Table 1

Kolmogorov-Simrnov Test for Distributional Analysis

	Two Sample Kolmogorov-Simrnov Test (Two Tailed Test)		
Variables	Round 1	Round 2	Round 3 and 4
D	0.246	0.138	0.331
P-value	0.025	0.457	< 0.0001
Alpha (Level of Significance)	0.05	0.05	0.05

The gender effect was also analysed by using the test of mean comparison by taking in account the more offer given by either male or female. In Table 2 the results of mean comparison test for male and female offers have been shown for this purpose. It was observed that the male players on the average gave more offers than the female players as average male offers was 40.492 and average female offers was 37.538. These results were statistically significant to reject the null hypothesis of no difference in male and female offers. Graphically, it was represented in Figure 1, which clearly showed that there were substantial differences in the offer pattern of male and female offer curves (both offer curves for male and female players gradually took the same pattern of offer after the offer of Rs 40 and offers made less than Rs 40.

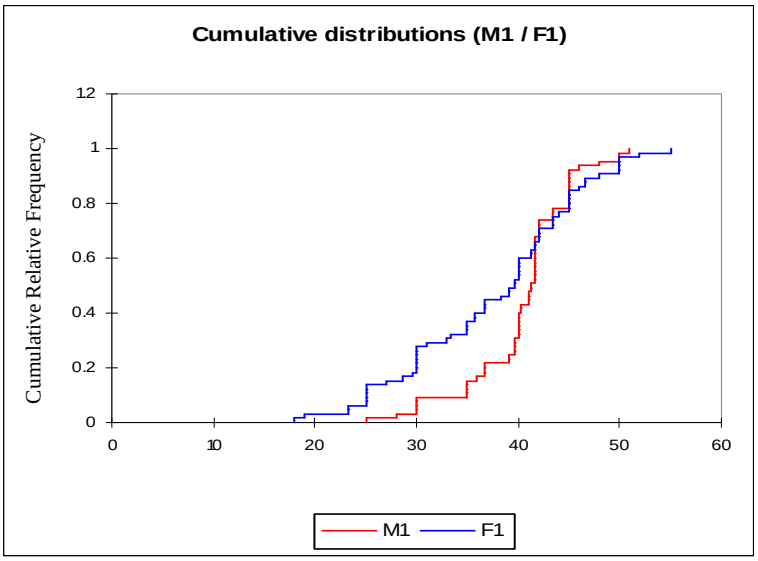
Table 2

Mean Comparison Analysis for Male and Female Offers in Round 1

Variable	Mean	N	SD	Assumptions	T-stat	P-value
F1	37.538	65	8.5697	Equal Variances	–2.39	0.0181
M1	40.492	65	5.0563	Unequal Variances	–2.39	0.0185

[8]This test is used to investigate the significance of difference between two population distributions, based on two sample distributions [Kinji (1999)]. The method used here is that we have segregated the male and female offers with sample size *n1* & *n2*, then we have calculated the cumulative distribution functions *Sn1(Xm)* & *Sn2(Xf*) for male and female sample respectively. Then we have calculated the absolute difference between cumulative distribution functions *Sn1(Xm)* & *Sn2(Xf).* Hence, the maximum value of the difference between *Sn1(Xm)* & *Sn2(Xf*) is calculated denoted as maximum value of *D* and compared with the critical value of the null hypothesis *(Ho: Pm=Pf, H1: Pm≠Pf*). As if the observed value exceeds the critical value the null hypothesis is rejected or otherwise. See Appendix 1 for explanation of Kolmogorov-Simrnov hypothesis.

Fig. 1. Cumulative Distribution Curves for Male and Female Offers in Round 1



The logistic regression function was used to describe the probability of rejection for each given offer by including the gender variable first and then by dropping it. The logistic regression model given below:

$$p(X) = 1 - \frac{\exp(\alpha + \beta X)}{1 + (\alpha + \beta X)}$$

Where, p is the probability of rejection and X is the offer amount, as a proportion of the total stake. The rejection behaviour of each sample then is described by two parameters α and β.

$R = \phi\ (\alpha + \beta\, O + \gamma\, G)$ with gender variable … … … (1)

$R = \phi\ (\alpha + \beta\, O)$ without gender variable … … … (2)

Where: ϕ denotes the Cumulative Density Function for the Standard Normal Distribution.

Where: R = Response of Responders to the proposed offers by the Proposers.
O = Offers made by Proposers to the Responders.
G = Gender of Proposers.

In this specification gender and response of the players were the dummies that take value "1" for female proposers and "0" for male proposers. Similarly, value "1" is also for the offers being accepted by the responders and "0" for the rejected offers.

The results of logistic regression Equation (1) given in Table 3 imply that the role of gender on responder's decision was insignificant. Also the test results do indicate that higher offer rate increases the probability of acceptance for a given offer (i.e., the

Table 3

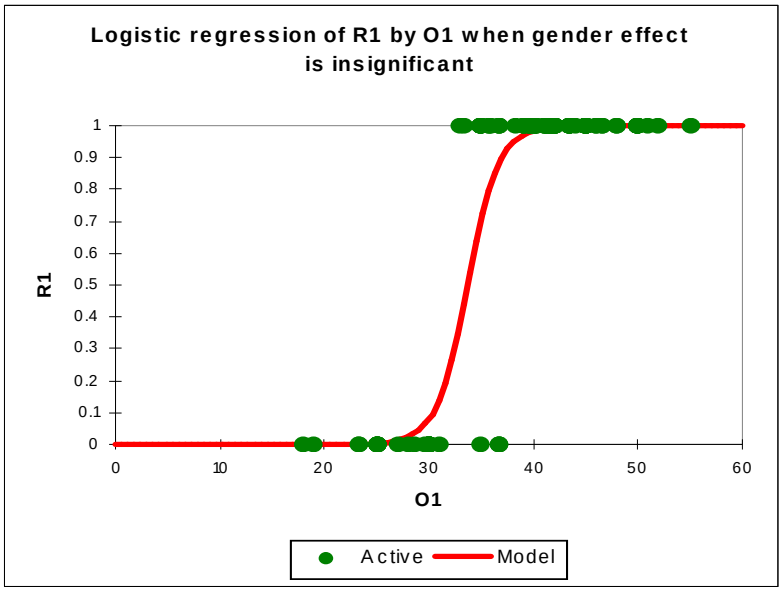
Logistic Regression Model including Gender Variable

	Round 1				Round 2				Round 3 & 4			
Variables	Coefficient	S.E	Z -Stat	P-Value	Coefficient	S.E	Z-Stat	P-Value	Coefficient	S.E	Z-Stat	P-Value
Intercept (C)	–24.7334	6.3252	–3.9102	0.0001	–38.3047	11.3363	–3.3789	0.0007	–23.6378	4.3067	–5.4887	0.0000
Gender (G)	–1.8431	1.2025	–1.5328	0.1253	–2.3009	1.6320	–1.4099	0.1586	–1.0974	0.7365	–1.4899	0.1363
Offer (O)	0.7669	0.1897	4.0419	0.0001	1.1517	0.3422	3.3651	0.0008	0.6369	0.1101	5.7842	0.0000

coefficient of offers i.e. O = 0.7669). Therefore, the response of responder was not influenced by the gender of the players. In-fact there is no difference in rejections by gender—as both the sexes have the same behaviour regarding rejecting the unfair offers. Table 4, clearly showed that there is 100 percent rejection for all the offers below Rs 30 and all the offers above Rs 40 were accepted by both male and females.

Keeping the same phenomenon the logistic regression was also tested by dropping the gender variable from the model. Here, again the test results for Equation (2) given in Table 5 ascertain the results/estimates of the logistic Equation 3 with gender that higher the offer rate the higher will be the acceptance rate. Table 5 and Figure 2, where it was explained that the offer over Rs 40 were {having higher probability} always accepted and the offers below Rs 40 were always rejected.

Fig. 2. Logistic Regression Curve for Round 1



In short, the results of Round 1 do indicate that the pattern of offer for both male and female proposer was different from each other. Male proposers on average offered more than the female proposers; which was consistent with the results observed by Saad and Gill (2001). As Saad and Gill conducted a one shot UG and found that male offered more when paired with female players whereas, the female made equal offers independent of sex of the partner.

(ii) Round 2

The second round of experimentation was also carried out without the knowledge of gender to both the parties. But there was slight change of design that the male players were making offers to male players and female to female.[9] The game was played with complete anonymity on the part of both parties of players.

[9]Experimenter was the only one who was well aware of the change in the design of experiment.

Table 4

Percentage Analysis for Acceptance and Rejection of Offers for Round 1

Offer Range		0 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	81 to 90	91 to 100	Sum
Overall Offers	Male	0.00 (0/65)	0.00 (0/65)	0.09 (6/65)	0.34 (22/65)	0.55 (36/65)	0.02 (1/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	1.00
	Female	0.00 (0/65)	0.03 (2/65)	0.25 (16/65)	0.32 (21/65)	0.37 (24/65)	0.03 (2/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	1.00
Accepted Offers	Male	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.34 (22/65)	0.55 (36/65)	0.02 (1/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.91
	Female	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.26 (17/65)	0.37 (24/65)	0.03 (2/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.66
Rejected Offers	Male	0.00 (0/65)	0.00 (0/65)	0.09 (6/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.09
	Female	0.00 (0/65)	0.02 (2/65)	0.25 (16/65)	0.08 (5/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.34

Table 5

Logistic Regression Model without Gender Variable

	Round 1				Round 2				Round 3 and 4			
Variables	Coefficient	S.E	Z-stat	P-value	Coefficient	S.E	Z-stat	P-value	Coefficient	S.E	Z-stat	P-value
Intercept (C)	–25.2654	6.1479	–4.1095	0.0000	–32.6848	8.9174	–3.6653	0.0002	–24.2138	4.2095	–5.7521	0.0000
O (Offer)	0.7481	0.1768	4.2327	0.0000	0.9523	0.2549	3.7360	0.0002	0.6309	0.1055	5.9782	0.0000

The overall average offer of male players was Rs 41.308 and by female players Rs 38.662 (Table 6). It was observed that out of 65 MM and 65 FF offer, 78 percent of the male and 69 percent of female offers were accepted. However, the average rejection in MM and FF offers were Rs 30.02 and Rs 27.70. This pattern of offers by proposers and responders in comparison to round 1 showed that the both the parties have realised that if they want to earn or want to gain any monetary benefit then they have to make some what fair offer i.e., close to Rs 40 and above as the offers below Rs 40 were mostly rejected by both the parties in round 1. The overall rejection rate in FF and MM offers were 31 percent and 22 percent respectively. A surprising aspect in round 2 was that the female players have shown a little tendency of making some what higher offers because the average offer rate has increased which resultantly decreased the rejection rate of the female offers as compared to round 1[10] but this increase in offer rate is statistically insignificant (Table 8). Conversely, the rejection rates for male offers have increased as compared to round 1.[11] While analysing the said behaviour it was revealed that in Round 1 there were 34 percent and 44 percent of the offers made by female and male players within the range of Rs 31–50 respectively. On the other hand, in Round 2 the offers made by female players for the range of Rs 31–50 increases to 37 percent whereas, the male offers decreases to 41 percent. Therefore, it is safe to say that females have learnt from their past experience and made higher offers and males reduced their offers in wrong anticipation of opponent's behaviour. Thus there was a convergence in behaviour—females increased their offers and males decreased their offers so that, in the second round, their was no significant difference in the male and female offers (unlike the first round).

Table 6

Descriptive Statistics for Round 2

Round 2 (Unknown Gender) Comparison of Offers (n=65)	Percentage		Mean	
	Accept	Reject	Accept	Reject
Female Offers to Female (FF)	69%	31%	Rs 43.49	Rs 27.70
Male Offers to Male (MM)	78%	22%	Rs 44.40	Rs 30.02

Table 7 shows the majority of the male and female offers were in the offer range (41 to 50), i.e. 49 percent (32/65) and 45 percent (29/65) of the pie for male and female proposers respectively with 0 percent rejection rate. The overall offers which have been accepted and rejected falls with in the range of 69 percent (45/65) (female accepted offers) and 78 percent (51/65) (male accepted offers), whereas, the rejection rate for male offers was 22 percent (14/65) and for female offers 31 percent (20/65).

During the interview session, it was concluded that the players have had a tendency to learn and coverage their offers to the average offers i.e. Rs 40 and above. This was also discovered that the players either male or female do not like to have an

[10]In Round 1 female rejection rate was 34 percent and in Round 2 female rejection rate was 31 percent (Tables 4 and 6).

[11]In Round 1 male rejection rate was 9 percent and in Round 2 male rejection rate was 22 percent (Tables 4 and 6).

Table 7

Percentage Analysis for Acceptance and Rejection of Offers for Round 2

Offer Range		0 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	81 to 90	91 to 100	Sum
Overall Offers	Male	0.00 (0/65)	0.00 (0/65)	0.18 (12/65)	0.29 (19/65)	0.49 (32/65)	0.03 (2/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	1.00
	Female	0.02 (1/65)	0.03 (2/65)	0.22 (14/65)	0.29 (19/65)	0.45 (29/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	1.00
Accepted Offers	Male	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.26 (17/65)	0.49 (32/65)	0.03 (2/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.78
	Female	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.25 (16/65)	0.45 (29/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.69
Rejected Offers	Male	0.00 (0/65)	0.00 (0/65)	0.18 (12/65)	0.03 (2/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.22
	Female	0.02 (1/65)	0.03 (2/65)	0.22 (14/65)	0.05 (3/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.00 (0/65)	0.31

offer which is slightly unfair i.e. less than Rs 30. As majority of the offers below Rs 40 were rejected because the players feel it unfair.[12]

For detailed statistical analysis to examine the behavioural responses of the players, in this round of play pooled offer data was used. The results of K-S Test in Table 1 indicated that there were no differences in the distributional pattern of the offers among male and female players as the computed *p-value (p = 0.457)* was greater than the level of significance α *=0.05*. Also the computed value of *D = 0.138* was less than the critical value of *D = 0.175* at *n = 65*. Table 8 showed the results for the test of mean comparison also imply that the offer pattern of male and female did not differ systematically from each other. This behavioural pattern has been presented graphically in Figure 3 showing no variation in the offer pattern of male and females across this round. It was also explained that the average male and female offers in Round 2 were (41.308 and 38.662 respectively) insignificant to show any change in overall average offer pattern of male and female.

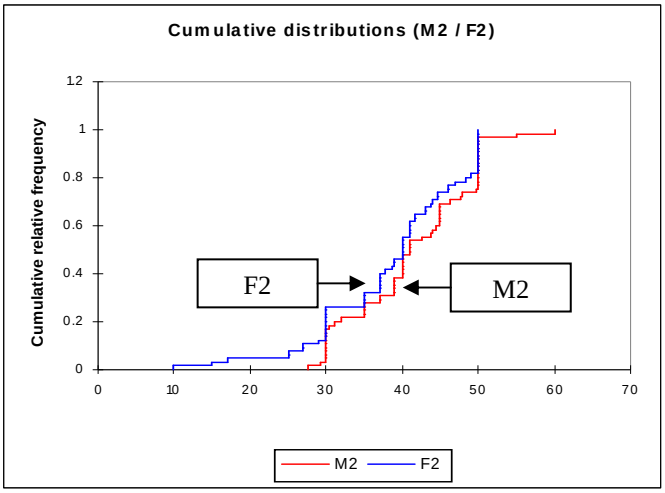
Table 8

Mean Comparison Analysis for Male and Female Offers in Round 2

Variable	Mean	N	SD	Assumptions	T-stat	P-value
F2	38.662	65	9.2505	Equal Variances	1.78	0.0775
M2	41.308	65	7.8281	Unequal Variances	1.78	0.0776

[12]See offer ranges in Tables 4 and 7 and Offer pattern in Figures 1 and 3. Also During the experimental analysis of gender effect it was interestingly observed that as in rounds 1 and 2 the knowledge of gender was not known to both the parties and when they were asked about their behaviour/prediction that what type of offers they were trying to offer to responders and from responders that what type of offers they were expecting and were ready to accept. Both the parties answered (almost 92 percent of the players) that they were trying and expecting such an offer which can made both of them better off so in this pursuit they preferred for fair play.

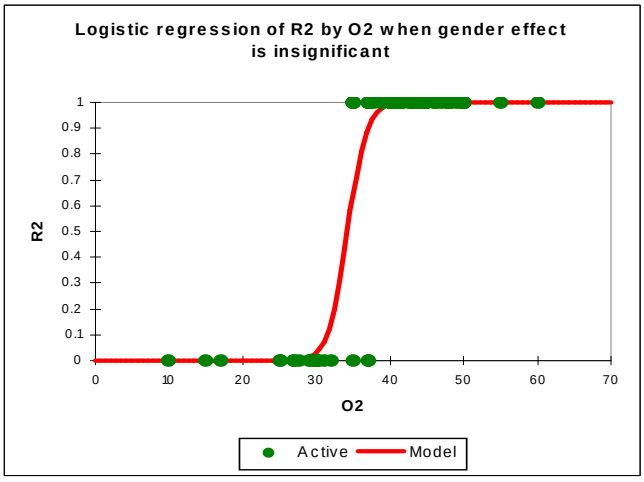
Fig. 3. Cumulative Distribution Curves for Male and Female Offers in Round 2



If we look at Tables 3 and 5 for the logistic regression results for the regression with and without gender variable to analyse the behaviour of the responders it was observed that still the role of gender was insignificant in affecting the responder's behaviour. The results of logistic regression were same as in Round 1 showing that as the offer rates were increasing acceptance rate for the given offers were also increasing. In contrast with Eckel and Grossman (2001), we find that there is no difference in rejection behaviour of males and females conditional on the offer received. However, since females received higher offers, they rejected less often in our experiment.

This behaviour of the players was presented graphically in Figure 4**.** Where it was obvious that as the offer rate was getting closer to Rs 40. The acceptance rate was gradually rising and after Rs 40 showing almost 100 percent acceptance rate. At Rs 30 and below, the rejection rate was 100 percent.

Fig. 4. Logistic Regression Curve for Round 2



The results observed in Round 2 were consistent with the findings of Sutter, *et al.* (2006), Dufwenberg and Gneezy (2004) and Bolton and Katok (1995) in which they employed to play a two player dictator game[13] and found no differences in male and female offers. Similarly, we also found no differences in the offer pattern of male and female in Round 2 and conclude that in this Round of play male and female offers were same. As the structure of our study was based on the repeated games and the players were employed for the four sessions of real money play.

Comparison of Rounds 1 and 2

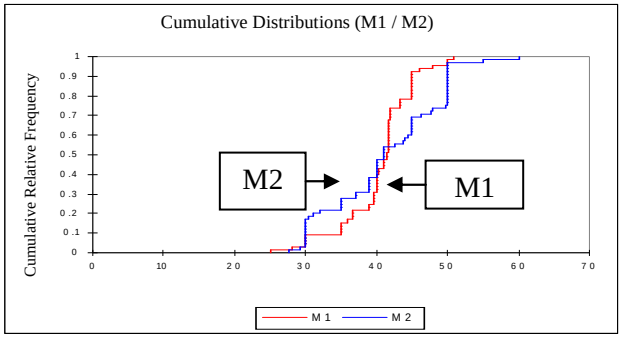
While comparing the male offers in Round 1 with male offers on Round 2 it was observed that the offer pattern of male players was not the same across the rounds as the K-S Test results for analysis male offers in Rounds 1 and 2 rejected the null hypothesis showing significant differences in the offer pattern of male players, because computed *p-value* was lower than $\alpha = 0.05$, also the computed value of *D (0.246)* was higher than the critical value of $D = 0.175$ at $n = 65$ (Table 9). This has been presented graphically in Figure 5**.** On the other hand, the comparative analysis of female offer pattern across both rounds (Round 1 and 2) we found no significant change in the offer pattern of females as the K-S Test results showed in Table 10 accepted the null hypothesis showing no differences in the offer pattern of female players in both these rounds (the computed *p-value* $= 0.614$ is higher than the $\alpha = 0.05$ and also the computed D-value of $D = 0.123$ is lower than the critical value of $D = 0.175$ at $n = 65$). Graphically this behaviour is represented in Figure 6.

Table 9

Kolmogorov-Simrnov Test for Inter Round Gender Analysis

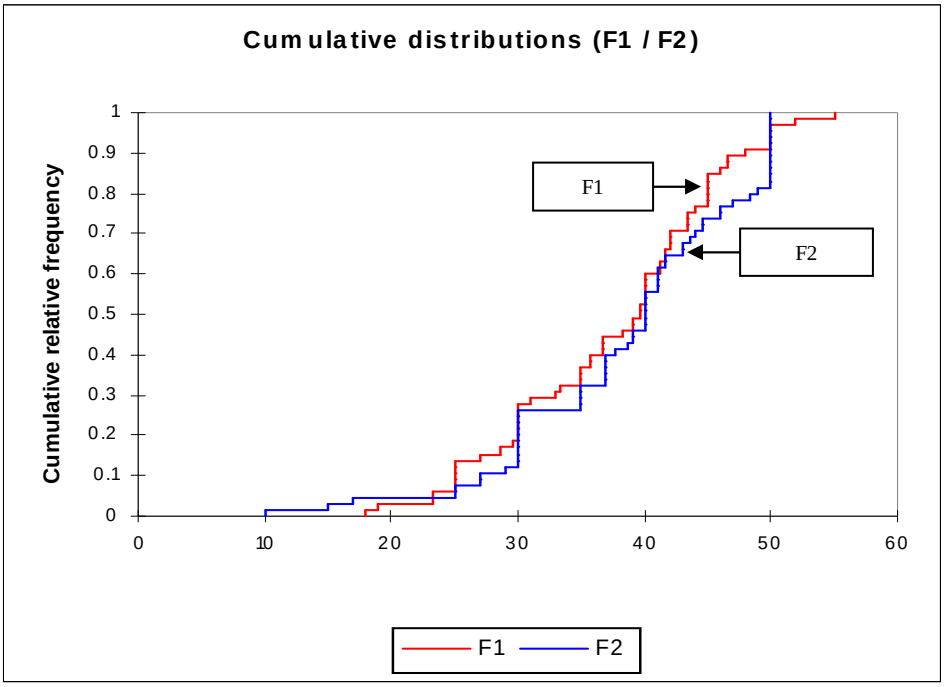
	Two Sample Kolmogorov-Simrnov Test (Two Tailed Test)	
Variables	M1 & M2	F1 & F2
D	0.246	0.123
P-value	0.023	0.614
Alpha (Level of Significance)	0.05	0.05

Fig. 5. Cumulative Distribution Curves for Male Offers in Rounds 1 and 2



[13]The structure of game for Bolton and Katok (1995) and Eckel and Grossman (2001) were same.

Fig. 6. Cumulative Distribution Curves for Female Offers in Rounds 1 and 2



The mean comparison for male offers in Round 1 and male offers in Round 2 also gave a clear indication that on average there were no significant differences among the male and female offers across rounds (Tables 10 and 11).

Table 10

Mean Comparison Analysis for Male Offers in Rounds 1 and 2

Variable	Mean	N	SD	Assumptions	T-stat	P-value
M1	40.492	65	5.0563	Equal Variances	–0.71	0.4818
M2	41.308	65	7.8281	Unequal Variances	–0.71	0.4820

Table 11

Mean Comparison Analysis for female Offers in Rounds 1 and 2

Variable	Mean	N	SD	Assumptions	T-stat	P-value
F1	37.538	65	8.5697	Equal Variances	–0.72	0.4740
F2	38.662	65	9.2505	Unequal Variances	–0.72	0.4740

Rounds 3 and 4

The most distinctive point in both these rounds was that the players were having the complete knowledge of gender as both parties (proposers and responders were seated in-front of each other). Therefore, we have tried to make analysis of the results when the males were proposers and females were responders with results when the females were

proposers and males were responders. We combined all the offer data of all the experimental locations and tried to figure out how behavioural patterns of players changes or affected by the knowledge of gender.

In round 3, when males were making offers to female players the acceptance rate was 93 percent and the average of accepted offers was Rs 50.80. Here, the male proposers have shown a strong tendency of offering more than even split of the money because 30 percent of the offers made were above Rs 50. This clearly showed that the behaviour of male players has changed considerably in comparison to rounds 1 and 2. As there was 68 percent of the male offers made with in the range of Rs 40 to 50. However, in round 4 female players were the proposers and the male players were responders and the behaviour of female players was quite different from previous two rounds. The tendency of offering more than Rs 50 was as low as 3 percent of the offers to male players. However, there is high proportion of female offers in the range of Rs 40 to 50 (even split of money) i.e. 90 percent. The overall average of accepted female offers was Rs 45.37 which was less than the male offers in round 3. Similarly, 74 percent of the female offers in round 4 were accepted by male players and 26 percent were rejected. It was observed that all the offer below Rs 45 were rejected by male players as the average of accepted offers was Rs 45.37 (Tables 12 and 13). During investigation it was found that males were expecting the same altruistic behaviour from females in round 4 but the females were more sensitive to fair play therefore males retaliated and rejected all the offers which were slightly unfair offers i.e., Rs 40 and below. From our interviews, it is clear that this is due to local cultural norms, which differ from those, prevalent in the Western cultures studied.

Table 12

Descriptive Statistics for Rounds 3 and 4

Rounds 3 and 4 (Known Gender) Comparison of Offers (n=130)	Percentage		Mean	
	Accept	Reject	Accept	Reject
Male Offers to Female in R 3 (MF)	93%	7%	Rs 50.58	Rs 31.33
Female Offers to Male in R 4 (FM)	74%	26%	Rs 45.37	Rs 35.25

Table 13

Percentage Analysis for Acceptance and Rejection of Offers for Rounds 3 and 4

Offer Range		0 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	81 to 90	91 to 100	Sum
Overall Offers	M	0.01 (1/130)	0.00 (0/130)	0.02 (2/130)	0.10 (13/130)	0.58 (76/130)	0.22 (28/130)	0.05 (6/130)	0.02 (2/130)	0.01 (1/130)	0.01 (1/130)	1.00
	F	0.00 (0/130)	0.00 (0/130)	0.07 (9/130)	0.32 (41/130)	0.58 (76/130	0.03 (4/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	1.00
Accepted Offers	M	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.05 (7/130)	0.58 (76/130)	0.22 (28/130)	0.05 (6/130)	0.02 (2/130)	0.01 (1/130)	0.01 (1/130)	0.93
	F	0.00 (0/130)	0.00 (0/130)	0.01 (1/130)	0.15 (19/130)	0.55 (72/130)	0.03 (4/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.74
Rejected Offers	M	0.01 (1/130)	0.00 (0/130)	0.02 (2/130)	0.05 (6/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.07
	F	0.00 (0/130)	0.00 (0/130)	0.06 (8/130)	0.17 (22/130)	0.03 (4/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.00 (0/130)	0.26

Here, it can be seen that male have made much higher offers to female players. Therefore, it was obvious that acceptance rate was also high and rejection rate was low. But in response to high offers the female players have not made high offers which the male players were expecting. The female players have not deviated from their over all offer pattern and made the offers in the corridors of even split of money. In response, male players rejected all the offers which were below Rs 45. Comparing the results of both 3rd and 4th round it can be concluded that there has been strong reciprocal effect from the male side by not accepting any offer below Rs 45.

The results of K-S test (Table 1) showed that the null hypothesis of no-difference in male and female offers was rejected, as the computed P-value was lower than the level of significance also the computed value of *D=0.331* was higher than the critical value of *D=0.1193* at *n=130*. Therefore, we can conclude that distribution of male and female offers were statistically different from each other. This has also been explained graphically (Figure 7). In Figure 7, it was quite clear that the offer curves for both male and female proposers have no resemblance and they were showing different pattern of offers. As far as the females are concerned, offers starting from the range of Rs 20 to 30 and it ended up to Rs 50 where as the male offer curve started from the Rs 0 to 20 and ended at Rs 100. The spread of male offers was wider than the female offers as majority of the female offers were clustering within the range of Rs 30 to 50, where as, the majority of the male offers were clustering within the range of Rs 40 to 60 but still there were few outliers (extreme offers very rarely observed) like the offer of Rs 10 and Rs 100.

Results of the test for mean comparison showed that on average male players were offering move as compared to female players i.e. *average male offer = 49.462 and average female offer = 42.746*. These results were also statistically significant to reject the hypothesis of no difference in male and female offers on average and it can clearly be interpreted that distributional gap in the offer behaviour of proposer exist in both rounds 3 and 4 (Table 14). These results are in contradiction with the findings of Solnick (2001), Eckel and Grossman (2001), Dufwenberg and Muren (2005) and Botelho, *et al.* (2000) in which it was found that females on the average gave more to males.

Fig. 7. Cumulative Distribution Curves for Male and Female Offers in Rounds 3 and 4

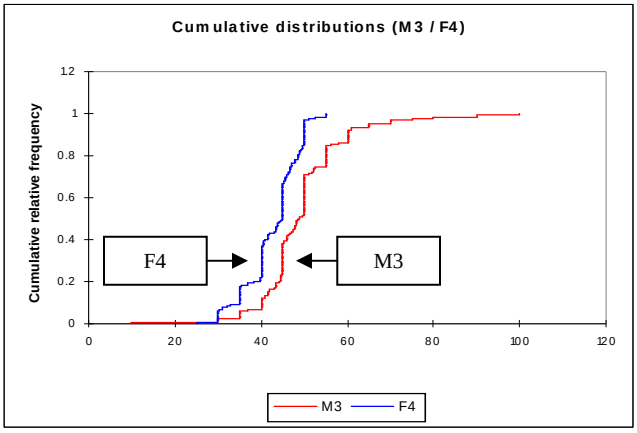


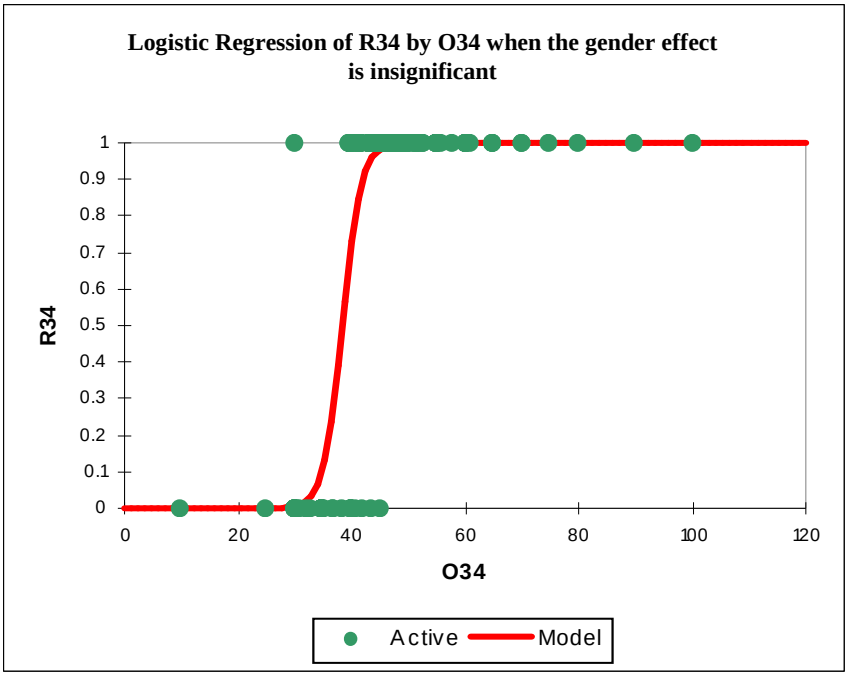
Table 14

Mean Comparison Analysis for Female Offers in Rounds 3 and 4

Variable	Mean	N	SD	Assumptions	T-stat	P-value
M3	49.462	130	10.477	Equal Variances	6.29	0.0000
F4	42.746	130	6.1887	Unequal Variances	6.29	0.0000

It was observed that the results of logistic regression model (with and without gender variable) showed insignificant gender influence. Also the propensity of accepting higher offers was still their, means as the offer rate was increasing the probability of accepting the offer was also increasing (Tables 3 and 5). This same behaviour was also represented graphically in Figure 8 given below.

Fig. 8. Logistic Regression Curve for Rounds 3 and 4



Hence, it was concluded that distribution gap in the responder's behaviour for a given offer were present. Moreover, the behavioural pattern of offering high was triggered by the knowledge of gender as both male and female proposers started offering more as compared to their average offers in Rounds 1 and 2. The effect of gender knowledge was more dominant on the male offers and almost more than 50 percent of the pie was offered. Whereas, the female offers were increased but not more than 50 percent of the pie. Such type of behaviour has not been observed in the literature. The modal (most common and ideal) offer according to ultimatum game theory was 50-50 percent of the pie [Camerer (2003)] and the results of this study support this argument.

Comparison of Pooled Offers of Rounds 1 and 2 with the Offers of Rounds 3 and 4

In order to have a detailed comparison of offer pattern for all the rounds of play with and without the knowledge of gender, the offer data for rounds 1 and 2 was pooled and was then compared with the offer data of rounds 3 and 4.

Table 15

Kolmogorov-Simrnov Test for Distributional Analysis for Pooled Data of Rounds 1 and 2 with Rounds 3 and 4

Variables	Two Sample Kolmogorov-Simrnov Test (Two Tailed Test)
D	0.3654
P-value	7.6071 E-16
Alpha (Level of Significance)	0.05

Here, the K-S test results given in Table 15 clearly reject the hypothesis that both the distribution with gender and without gender knowledge was significantly different. As the computed *p-value* was lower than the significance level and along with that the computed value of *D=0.3654* was higher than the critical value of *D=0.1193*. Hence, it can easily be derived that there were significant differences in the pattern of offers across rounds.

The results also explained the fact that the range where there was high probability of acceptance was (40–60) percent of the pie. The logistic curves presented in Figures 2, 4 and 8 showed that majority of the offers were clustering within the said range of offers. Although, there were few offers which were over 60 percent of the pie with almost 100 percent acceptance rate (as per the ultimatum theory)[14] and there was high rejection rate for the offers below 40 percent of the pie.

CONCLUSION

This study reports the results of a series of experiments designed and conducted to determine the behavioural pattern of people in Pakistan. Unlike many previous studies, we found male offers to be more generous then female offers. Also, knowledge of gender increases the average offer in both MF (Male to Female) and FM (Female to Male) pairs. In particular, males offered more than 50 percent to females in about 30 percent of the cases, whereas this never occurred in female offers to males. Pakistani cultural norms of chivalry and courtesy towards females lead males to make hyperfair offers, and also to expect reciprocity. However, females are trained not to respond to overtures by males, and do not change behaviour. Males expect to be rewarded for high offers, and do not receive this reward and hence reject much more often than they do in earlier rounds[15]. The results of this paper are in contradiction with the evidence that females are more generous than the males [Andreoni and Vesterlund (2001); Eckel and Grossman (2001)]. It was also observed that in this particular study that the males displayed a rather severe reaction for unfair offers.

[14]For detail survey analyses see Camerer (2003) and Roth (1995).

[15]See Tables 13 and 14 offer and rejection pattern of male and female players in Rounds 3 and 4.

Cultural norms differ in Pakistan and Western societies. In West, women can make generous offers to males without being seen as forward or flirtatious. In Pakistan a girl offering more than 50 percent to a boy would be mis-understood as being forward. The third and fourth rounds showed the strong impact of reciprocity. Hyperfair offers by males were not reciprocated by females, and men retaliated by higher rejections. One important finding of this study was that the players did not show any fear of rejection while making their offers, as the male and female players during interviews explained that if they were having any concern for the fear of rejection of their offers they would defiantly offer much more in the other rounds of play. Therefore, we can conclude that the behaviour of the people of Pakistan is in contradiction with the conventional economic thinking [Eckel and Grossman (1996)].

APPENDIX-I

The Kolmogorov-Smirnov test compares two distributions. This test is used for distribution fitting tests for comparing an empirical distribution determined from a sample with a known distribution. It can also be used for comparing two empirical distributions [Massey (1951)].

Note: This test enables the similarity of the distributions to be tested at the same time as their shape and position.

Take sample *S1* comprising *n1* observations, with *F1* the corresponding empirical distribution function. Take second sample *S2* comprising *n2* observations, with *F2* the corresponding empirical distribution function.
The null hypothesis of the Kolmogorov-Smirnov test is defined by:

$$H0 : F1(x) = F2(x)$$

The Kolmogorov statistic is given by:
D1 is the maximum absolute difference between the two empirical distributions. Its value therefore lies between 0 (distributions perfectly identical) and 1 (separations perfectly separated). The alternative hypothesis associated with this statistic is:

$$Ha: F\ 1(x)?\ F\ 2(x)$$

The Smirnov statistics are defined by:
The alternative hypothesis associated with *D2* is:

$$Ha : F1(x) < F\ 2(x)$$

The alternative hypothesis associated with *D3* is:

$$Ha : F1(x) > F\ 2(x)$$

APPENDIX-II

QUESTIONNAIRE

(ROUND #_____ ID # _____)

1. NAME _____
2. EDUCATIONAL QUALIFICATION _____
3. MARTIAL STATUS (MALE/FEMALE)_____
4. AGE _____
5. SALARY/POCKET MONEY (MONTHLY) Rs _____
6. NATIVE CITY / VILLAGE _____

7. **For Proposer**

   Have you made your offer/decision on the basis of: (Tick as appropriate)

   - You Like Fairness
   - You are afraid of Rejection
   - You are kind enough to others (Altruistic)
   - Any other reason explain briefly.

8. **For Responder**

   Have you made your decision ** on the basis of: (Tick as appropriate)
   - You Like Fairness
   - You are kind enough to others (Altruistic)
   - As a Reaction (Reciprocation)
   - Any other reason explain briefly

**= your decision (Accept/Reject) Offer.

APPENDIX-III

DECISION SLIP

Round # _____ For Rupees _____

P1 ID #_____ P1 Offer _____

P2 ID # _____ P2 Decision (A/R)

**** A= Accept R= Reject**

APPENDIX-IV

Abbreviations

M1	–	Offers by male proposers in Round-1
M2	–	Offers by male proposers in Round-2
M3	–	Offers by male proposers in Round-3
F1	–	Offers by female proposers in Round-1
F2	–	Offers by female proposers in Round-2
F4	–	Offers by female proposers in Round-4
R1	–	Offers rejected in Round-1
R2	–	Offers rejected in Round-2
R3	–	Offers rejected in Round-3
R4	–	Offers rejected in Round-4
R34	–	Offers rejected in Rounds-3 and 4
O1	–	Offers made in Round-1
O2	–	Offers made in Round-2
O3	–	Offers made in Round-3
O4	–	Offers made in Round-4
O34	–	Offers made in Rounds-3 and 4
M	–	Male Offers
F	–	Female Offers

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