

Part 2

The ultimatum game

2.1 *The Ultimatum Game*

In 1994, the players of Major League Baseball in the United States of America went on strike. This led to the cancellation of 938 games overall, including the entire post-season and the World Series. Team owners were demanding a salary cap and came up with a new revenue-sharing plan, which required the players' approval. The players' union rejected the offer, which they thought was unfair to the players and merely a way to address problems of disparity among the owners. After prolonged negotiations failed to break the impasse, the acting commissioner Bud Selig called off the rest of the season on September 14. The move to cancel the rest of the season meant the loss of \$580 million in ownership revenue and \$230 million in player salaries. Thus, the players essentially walked away from \$230 million collectively – the average salary of players at this time was about \$1.2 million per year – because of what they considered was an unfair offer. This in turn resulted in a loss of more than twice that amount for the owners.

In February 2007, shareholders of the Tokyo Kohtetsu Company blocked a takeover by a rival steel producer, the Osaka Steel Company, the first time in Japan that shareholders have vetoed a merger approved by the companies' boards. An investment fund, Ichigo Asset Management, started a rare proxy fight against what it saw as an unfair offer from Osaka. Ichigo, which owns 12.6 percent of Tokyo Kohtetsu, had not been against the takeover *per se*, only against the fairness of the

offer. Yoshihisa Okamoto, senior vice president at Fuji Investment Management, said the vote “*sends the message that such unfair offers are unacceptable.*”¹

Colin Camerer, a leading experimental economist at Caltech, tells the following story:

I once took a cruise with some friends and a photographer took our picture, unsolicited, as we boarded the boat. When we disembarked hours later, the photographer tried to sell us the picture for \$5 and refused to negotiate. (His refusal was credible because several other groups stood around deciding whether to buy their pictures, also for \$5. If he caved in and cut the price, it would be evident to all others and he would lose a lot more than the discount to us since he would have to offer the discount to everyone.) Being good game theorists, we balked at the price and pointed out that the picture was worthless to him. (As I recall, one cheapskate (either Dick Thaler or myself) offered \$1.) He rejected our insulting offer and refused to back down.

The picture is essentially valueless to the photographer (worth less than \$1) and of significant value to Camerer (certainly more than \$5). Therefore there are many ways to divide the gains from exchange which would leave both parties with a profit. Yet the photographer was unwilling to accept any price less than \$5 and walked away from a profitable deal.

¹ Reuters. (2007, February 22). ‘A first in Japan: shareholders block a takeover’, New York Times (World Business).

In all of these examples, people are willing to forego money because they consider a particular offer to be unfair. This raises the questions: (1) are humans fair by nature? (2) Does this sense of fairness have economic implications? These are things that I will talk about in this chapter.

Bargaining (haggling, negotiating) is a frequent part of many economic transactions including bargaining for a higher salary in job contracts or haggling over the price of a carpet or a used-car or negotiations between owners and striking workers of a company. Often as a part of the bargaining process, especially in cases where agreement is proving to be elusive, one party makes an ultimatum offer, a situation where that party says “*this is my best offer, take it or leave it...*”. This happens, for instance, in the case of binding arbitration where two sides are dead-locked and have failed to arrive at a compromise despite repeated attempts. If that ultimatum offer is accepted then it leads to a resolution, but if not, then it sometimes means substantial financial losses for both parties involved.

In many such situations where the two sides in a dispute – players and owners, management and union - have reached an impasse one-side, that may have greater bargaining power or less to lose, might make a “*take-it-or-leave-it*” offer to the other side – an *ultimatum*. For instance team owners may join together to lay down an ultimatum to the players’ union and threaten the entire season if the players do not agree to the owners’ ultimatum. If however, the recipient of the ultimatum does decide to “leave it” – possibly because they are unhappy with the offer and the way the available amount on the table is being split, then it usually implies that both sides

end up losing money. Rejecting an offer in these circumstances means that the aggrieved person is willing to forego a substantial amount of money in order to make sure that the other side loses as well. This is akin to cutting off one's nose to spite one's face.

In the early 1980s, Werner Güth, Rolf Schmittberger and Bernd Schwarze, three economists at the University of Cologne, were studying bargaining behaviour. More specifically, Güth and his colleagues looked at what happens when one party makes such a “take-it-or-leave-it” ultimatum offer to the other. What Güth and his colleagues were interested in understanding was: how do people – especially the recipients of such an ultimatum – respond to it? And do the people who make an ultimatum offer anticipate that response?

In order to study this problem, Güth and his colleagues recruited a group of graduate students at their university and had them take part in a simple game which has subsequently become well-known as the “*Ultimatum Game*”. Forty-two participants were paired into groups of twos to form 21 pairs. One player in each pair is called the ‘*proposer*’ while the other is called the ‘*responder*’.²

² Actually Güth and his colleagues called them Player 1 and Player 2 respectively. Different authors use different terms in their papers. Rather than use different terms all the time I will stick to the convention of calling the first player, the proposer and the second player, the responder in the rest of this chapter.

Each proposer was given a sum of money which ranged from 4 marks to 10 marks. Three proposers received 4 marks, three received 5 marks, three received 6 marks, three received 7 marks, three received 8 marks, three received 9 marks and finally three proposers received 10 marks. Each member of the pair knew *exactly* how much money the proposer of the pair was given. Their task was simple. Each proposer was asked to suggest a split of this initial endowment between him and the responder he was paired with. But there was a catch: the responder had to agree for either to receive any money!

That is, suppose a proposer who received 10 marks said “*I want to keep 8 marks and give 2 marks to the responder*” then that offer would be communicated to the paired responder and the responder would have to decide whether to accept this offer. If the responder accepted then the proposer got to keep the 8 marks while the responder received 2 marks. But if the responder did not accept the proposer’s offer then they both got nothing! In the latter case, if the responder turned down the proposer’s offer, then they both ended up with zero marks. The following figure illustrates the situation:

<<Figure 2.1 here>>

The proposers and the responders were seated at opposite ends of a large room and while they were placed in identifiable groups, no proposer ever learned which responder he was paired with. So what happened? Before you proceed, you might want to put the book down for a couple of minutes and think of the following: suppose you were a proposer and had 10 marks (or 10 dollars), what would you do?

How much would you keep? How much would you offer to the responder – someone who is most likely a complete stranger to you and someone you will possibly not meet or interact with in the future? Next, put on your responder hat. You know how much money the proposer you are paired with was given. What is the minimum amount you are willing to accept? 1 cent? 5 cents? 1 dollar? Remember that if you reject the proposer's offer then you both get zero.

Now what should we expect to happen? Before that, let me briefly tell you how economists think through situations like these. Economists, in these cases, rely on the principle of "*backward induction*" which says: start with the decision to be made by the last person and work your way backwards. (If you have ever tried to solve one of those maze-puzzles that appear in newspapers and magazines, then you will know what I am talking about. If you have tried, then it is highly likely that once in a while you have "cheated" and started from the end, i.e. you looked at where you had to go and then figured out how to get there starting from the beginning by working your way *backwards* through the maze.) That's backward induction! In this case then, let us start with the second decision maker - the responder. When the responder is offered an amount of money what should she do? Well, if she is someone who believes that some money is better than no money then she should accept any offer that gives her some money (*even if she is offered a relatively small sum*) because the consequence of turning down the offer means that she will get nothing. So the responder should be willing to accept most offers – even meagre ones! (Of course if the offer is really small – say 10 cents – the responder might be indifferent between making 10 cents and making nothing, in which case the responder might turn the offer down. But we

would expect the responder to accept most non-trivial amounts.) Therefore, if the proposer *anticipates* the responder's reaction – that the responder will be willing to accept most non-trivial amounts, even small ones – then the proposer should offer exactly that, a small amount because the less the proposer offers to the responder, the better off the proposer is (since he gets to keep more of the money) as long as the responder agrees to that division. Suppose we constrain the proposers to making offers in 50 cent increments. Then we really expect those proposers to offer relatively small amounts to the responder – maybe 50 cents, maybe a dollar. Thus in a *Nash equilibrium* of this game we expect that proposers will offer a very small amount to the responder and the responder will accept whatever amount is offered.

In Figure 2.2, I show the various percentages such as 10%, 20%, 30% etc. (out of the initial amount) that the 21 proposers offered to their paired responders. Since different proposers received different starting amounts I need to put all these numbers in percentage terms rather than absolute numbers. The lighter-shaded bars show the number of proposers (out of 21) who offered a particular percentage amount such as the number of proposers who offered 10%, number of proposers who offered 20% etc. The darker shaded bars show the number of rejections, i.e., the number of times a particular offer was turned down. The graph is quite striking. One-third of the proposers (seven out of 21) offered exactly half (50%) of the initial amount to the responder. Seventeen out of 21 proposers (slightly more than 80%) offered the responder *at least 20% or more* of the total amount available. This was surprising to say the least, since the proposers seemed to be offering way more than they had to. The one other puzzling bit here was the rejections. Two of the 21 offers were rejected.

As you can see from Figure 2.2, at the extreme left, there are two proposers who wanted to keep the entire amount (100%) and offered the responder nothing (0%). One of these zero offers is turned down by the responder. This is hardly surprising since the responder would have obtained nothing in either case whether he accepted or rejected the offer. But the surprise is that in one case, a proposer wanted to keep 80% of the available amount and offered the responder 20% but the responder turned this offer down! The proposer in this case had been given 6 marks to start with and he wanted to keep 4.80 marks and offered 1.20 to the responder. But the responder turned down the 1.20 marks in order to make sure that the proposer did not get the 4.80 marks!

<<*Figure 2.2 here*>>

Surprised and intrigued, Güth and his colleagues decided to carry out the exercise again. They brought back the same 42 participants – 21 proposers and 21 responders - a week later and asked them to play the exact same game as before with the same instructions. The only difference was that this time the proposers most likely received a different amount at the start compared to what they received a week earlier (say 8 marks rather than 5) and they were very likely paired with a different responder this time around. The results – presented in Figure 2.3 - were possibly even more striking. Figure 2.3 is very similar to Figure 2.2. As before, the lighter-shaded bars show the number of proposers (out of 21) who offered a particular percentage amount, such as the number of proposers who offered 10%, number of proposers who offered 20% etc.

Again, as before, the darker-shaded bars show the number of rejections, i.e., the number of times a particular offer was turned down.

A number of things stand out in this figure. First, there were fewer 50-50 splits offered by the proposers (three out of 21 or 14% as opposed to seven out of 21 or 33% a week before). But the offers were still very generous. Eighteen out of 21 proposers (close to 86% and almost the same number as a week before) offered at least 20% of the available amount to the responder. Even more striking were the rejections. Six of the 21 offers are rejected. In a number of cases, where the proposer wished to keep 80% or more of the available amount and offered the responder 20% or less, the responders turned down the offer.

<<*Figure 2.3 here*>>

But two responders said “no” when the proposer offered them 25% of the pie. In absolute amounts, in both cases the proposer had 4 marks to start with and had offered the responder 1 of those 4 marks and the responder turned them down. And in one case a proposer, who had received 7 marks to start with, wanted to keep 4 marks (55%) and offered the responder 3 marks (45%) but was turned down giving both zero!

In order to make sure that these results were not being caused by the inability of the participants to understand the instructions, Güth and his colleagues had them participate in a more difficult decision making problem to test their analytical skills.

Their performance in this more difficult task convinced the researchers that lack of understanding was not driving these results.

In reporting these results Güth and his colleagues comment

“...subjects did not deviate from the optimal outcome because of their difficulties in solving the game. The main reason seems to be that the rational solution is not considered as socially acceptable or fair.”

They went on to add that the typical consideration of the responder in this game seems to be as follows: if the proposer left me a fair amount then I will accept; if not and the amount to be sacrificed is not large then I will reject the proposer's offer. Correspondingly, a proposer possibly reasoned like this: even if I offer the responder a small amount, I need to give him a sufficient amount so that he is better off accepting this amount rather than turn me down and force us both to get nothing.

In order to get a better handle on the psychology of the participants, Güth and his colleagues then carried out a further study. Here, they had 37 participants who were asked to allocate 7 marks, but each person was asked to make two decisions – (1) how much would someone in the role of a proposer offer the responder and (2) what was the minimum amount each person was willing to accept as the responder. The idea is this: if someone says that I want to keep 5 marks out of 7 and give the responder 2 marks (and expects the responder to accept that offer) then we would expect that when this same person was a responder and was offered 2 marks then he would gladly accept that amount.

It turns out that the majority of people were remarkably consistent. Fifteen participants out of 32 – as the proposer – offered the exact same amount to the paired responder that they were willing to accept as the responders themselves. That is, if they offered 2 marks out of 7 to the responder then in their role as responder they were willing to accept 2 marks as well. In many of these cases the actual splits proposed was 50:50. Seventeen participants showed an explicit recognition of the fact that in this game, the proposer essentially has the upper hand and thus can be excused for wishing to retain a larger proportion of the available amount. These participants were willing to accept a smaller amount in their role as the responder than they offered to the responder in their role as proposer. That is, suppose as proposers, they offered 3 marks out of 7 to the responder, then as responders they were willing to accept 3 marks *or less* in a clear recognition of the power asymmetry between the two. But while these participants were perfectly willing to make allowances for this asymmetry as the responder, they were often more reluctant to exploit this power as the proposer. (I will have more to say later about this reluctance to fully exploit one's market power to garner more money for one's own self.) There were only five participants out of 37 who offered the responders less money than the minimum amount they were willing to accept as the responder.

These results clearly demonstrated that people's decisions were not being caused by an inability to understand the game or mistakes, but rather that participants obviously had clearly defined notions of what constituted a fair or unfair offer. Proposers were reluctant to make offers that would be construed as being unfair and responders had no hesitation about turning down unfair offers, when made, even if that meant

sacrificing substantial amounts, as long as that sacrifice also caused the person making that unfair offer to suffer.

These results caused a stir. To a large extent, this was because neither unfairness nor a concern for relative payoffs was part of the economist's lexicon at that point. Economists typically tend to rely on the assumption of a rational *homo economicus* who is primarily interested in maximising his monetary returns in a particular situation or more generally his utility (with monetary payoffs featuring as the prominent component of utility). These results suggested that people seemed to care a lot about normative outcomes such as whether an allocation was fair or not, and more importantly, they seemed to be quite obsessed about relative payoffs – i.e. how much do I get as the responder vis-à-vis the proposer – and were willing to give up non-trivial amounts of money to avoid inequitable outcomes. So, for instance, responders seemed to be happy to give up 2 dollars to spite the proposer out of 8 dollars. This leads to the conclusion that people care considerably about the fairness of outcomes. Responders are willing to turn down money if they believe that a particular allocation is unfair. In making allocations proposers make allowances for the fact that an offer may get turned down if it appears unfair to the responder, even if it gives the responder a relatively large payoff in absolute terms.

2.2 *Intentions, as well as outcomes, matter*

One potential confound here is this: when responders turn down inequitable offers – that is, offers which give the proposer a much larger share of the pie compared to the

share of the responder – what is it that they are protesting about? Is it the unfairness of the offer - that the proposer is trying to take more of the money to make himself better off at the expense of the responder? That is, are they acting in accordance to some implicit social norm that prescribes what behaviour is acceptable in a given situation and what is not? Or are the responders dissatisfied with the outcome of the bargaining process and the fact they are relatively worse off compared to the proposers and it is this relative standing that bothers them? It is conceivable that preferences and reactions to allocations are affected not only by the final outcome of the process but also by how the current decision context transpired. People may be far more willing to put up with unfair outcomes if they are the result of environmental or chance factors than the result of a deliberate act by another person. For instance, people are more willing to exact retribution when a plane crashes because a faulty part was not replaced rather than when the crash is caused by a storm.

Sally Blount at the University of Chicago's Graduate School of Business decided to examine this phenomenon of aversion to unfair acts as opposed to protesting unfair outcomes. She had MBA students take part in an ultimatum game under different conditions.

The first condition was the usual ultimatum game, where participants were randomly assigned to the role of proposers and responders. Proposers had US \$10 and got to offer a split of the initial pie and the responders had the right to accept or reject. In the event of a rejection, neither the proposer nor the responder got any money. In a second treatment – called the “*third party*” treatment – participants were divided into

proposers and responders but the actual allocation of the initial amount (US \$10) was decided not by the proposer, but by another disinterested participant who stood to gain nothing from the allocation. The responders had the option of rejecting the allocation decided by the disinterested third party and in the event of rejection, neither the proposer nor the responder got any money. Finally there was a third – “*chance*” - treatment where once again participants were divided into proposers and responders. There was US \$10 to be divided as before, but rather than the proposer or a third party getting to decide, the allocation of the money in this treatment was decided by the spin of a roulette wheel which put an equal chance on each outcome (for instance \$10 for the proposer and \$0 for the responder, \$9 for the proposer and \$1 for the responder and so on).

Before playing the actual game, Blount also asked each participant to state the minimum amount he was willing to accept if assigned to the role of the responder in the game to be played immediately thereafter. If all that the respondents cared about was their *relative standing* vis-à-vis the proposers, that is, they did not want to be too far worse off in monetary terms compared to the proposer, then the minimum acceptable amounts stated by participants in these three treatments should not be different. However, if it is the *intentionality* of the act that matters and people care more about intentional acts of unfairness rather than how much money they get relative to another, then we would expect people to be willing to accept inequitable allocations when the allocation is made by chance (by spinning a roulette wheel) than when the allocation is made by a proposer who stands to gain from the inequity of the offer.

The results clearly demonstrated that it is the *unfairness* of offers, rather than relative payoffs that people care about. In the first treatment, where the offers were decided by the proposer who got to keep more money by offering the responder less, the minimum amount responders were willing to accept was \$2.91 (out of \$10). In the case where the allocations were determined by a disinterested third party, the minimum acceptable amount was \$2.08. But in the case when the offer is decided by chance the minimum acceptable amount was \$1.20. Thus, people were far less concerned by the unfairness of the outcome and the inequity of final payoffs when the division was decided by chance than when it was decided by another human, especially a human who stood to gain by making an inequitable offer. Furthermore, in the first treatment where the proposer got to allocate the money, nine out of 17 proposers offered a 50-50 split to the responder, four offered between \$4 and \$4.50, two offered between \$2.50 - \$3 and two offered the responder only \$0.50. It became quite clear that participants were much less willing to accept large disparities in the payoffs in the condition where the proposer, who had a vested interest in the outcome, decided on the allocation, compared to the participants in the condition where the allocation was decided by chance.

Further evidence that intentions matter came from Armin Falk, Ernst Fehr and Urs Fischbacher of the University of Zürich. They had 90 participants take part in four separate, slightly modified ultimatum games. In each game the proposer is asked to suggest a split of 10 points. (Total points accumulated by the proposers and the responders were later redeemable for cash payments.) But rather than choosing any possible split of the 10 points, Falk and his colleagues restricted their proposers to

making *only one of two choices*. I will call these choices A and B. Furthermore, choice A was *always the same in all four games*. Choice A gave 8 points out of 10 to the proposer and 2 points to the responder. Choice B, however, varied from one game to the next. In one game, choice B gave 5 points to the proposer and 5 points to the responder, i.e., in this game the proposer had a choice between keeping 8 for himself and giving 2 to the responder (choice A) or making an equal split giving 5 to each (choice B). Let us call this the “5/5 game”. In a second game, choice B gave 2 points to the proposer and 8 points to the responder, i.e. in this game the proposer could choose to retain the lion’s share of the pie (8 for him and 2 for the responder) or give away 8 to the responder keeping only 2. Let us call this the “2/8 game”. Finally, in another game, choice B gave 10 points to the proposer and nothing to the responder. This game then offered two inequitable choices to the proposer – one inequitable offer where he kept 8 and offered the responder 2 and one even more inequitable choice where he kept all 10 and gave the responder nothing. I will call this the “10/0 game”.

They also ran a game which provided the proposer with a trivial choice where both choice A and choice B gave 8 points to the proposer and 2 points to the responder. Here the proposer had no choice but to keep 8 and offer 2. I am not going to discuss this game since a discussion of the other three games will suffice to make my point.

In each and every game the responder could reject the proposer’s offer, in which case, they both ended up with nothing. Before I tell you the results, and it is quite likely that you have an intuitive feeling for what to expect, let us think of what we expect to happen in this game in terms of acceptance or rejection by the responders. Once

again, if responders are only concerned with their monetary payoffs then we expect that the 8/2 offer (8 points for the proposer and 2 for the responder) will never be rejected. Intuitively, we would expect that in the “5/5 game” a proposal of 8/2 is clearly perceived as unfair because the proposer could have proposed the egalitarian offer of 5 points for the proposer and 5 for the responder. In the “2/8 game” offering 8/2 may still be perceived as unfair but probably less so than in the “5/5 game” because the only alternative available to 8/2 gives the proposer only 2 points as opposed to 8 points to the responder. Thus, we would expect that the rejection rate of the 8/2-offer in the “5/5 game” is higher than in the “2/8 game”. Finally, offering 8/2 in the “10/0 game” may even be perceived as a fair (or less unfair) action so that the rejection rate of 8/2 is likely to be lowest in this game.

The results were exactly as expected. The rejection rate of the inequitable 8/2 offer was the highest in the first “5/5 game” (44.4%). The 8/2 offers were rejected 27% of the time in the “2/8 game” and only 9% of the time in the “10/0 game”. The variations in these rejection rates suggest that *intentions* driven reciprocal behaviour is a major factor behind them. The rejection rates of the alternative offers (5/5), (2/8) and (10/0) are as follows: nobody rejected the 5/5 offer and only one subject rejected the 2/8 offer. Almost 90% rejected the 10/0 offer when made.

Chimpanzees (*Pan troglodytes*) do not seem to share this human penchant for fairness. In 2007, Keith Jensen, Josep Call and Michael Tomasello at the Max Planck Institute for Evolutionary Anthropology had 11 chimpanzees participate in an ultimatum game with the exact same format as the Falk, Fehr and Fischbacher study

described here except the chimpanzees were dividing 10 raisins rather than money. But, just as in the human study, the proposer chimpanzees had to choose between two offers A and B. Offer A always gave 8 raisins to the proposer and 2 to the responder while choice B varied from one game to the next. In one game, offer B gave 5 raisins to each (“5/5 game”), in a second, offer B gave 2 raisins to the proposer and 8 to the responder (“2/8 game”) and in a third, it gave 10 raisins to the proposer and none to the responder (“10/0 game”). Unlike their human counterparts who routinely turn down 8/2 offers when the alternative is 5/5, chimpanzee responders “*did not reject unfair offers when the proposer had the option of making a fair offer; they accepted all non-zero offers; and they reliably rejected only offers of zero*”.

2.3 Criticisms of the findings of Güth and his colleagues

There were a number of criticisms aimed at the validity and interpretation of these results. Broadly speaking, these questions could be classified into the following categories. First, the critics suggested that we are conditioned from childhood onwards to be sociable and cooperative. Thus, when confronted with a relatively novel situation of the ultimatum game proposers do not quite catch on that they have the upper hand in the transaction and can therefore earmark a larger portion of the available amount, giving the responders a smaller share. That is, proposers make generous offers because they are being altruistic and this does not really have anything to do with the fairness or unfairness of offers. This, of course, does not quite explain why the responders turn money down.

The second criticism was somewhat related to the first and grew out of it. Suppose you brought a group of people into a room and made half of them proposers and half responders. You gave the proposers \$10 to divide between the two. This was like manna from heaven. Clearly the proposer is in a position of strength vis-à-vis the responder. But what entitles the proposer to be a proposer and therefore gain this position? The assignment to roles is purely a matter of chance. In this rather ambiguous situation the proposers might feel less entitled to the money and more inclined to share it fairly with the responders – after all the proposer could easily have been a responder. Elizabeth Hoffman, Kevin McCabe and Vernon Smith, who have done extensive work in the area, put it in the following way. *“It is as if you and I are walking along the street, and we see an envelope on the sidewalk. I pick it up. It contains ten \$1 bills. I hand five to you and keep five.”*

The third criticism was aimed at the relatively small stakes involved. These critics argued that 10 marks was not a large amount and therefore the participants may not even have taken the game seriously. Behaviour would be different and more “rational” if the amounts involved were larger, that is proposers will keep a larger fraction and responders will not be so quick to turn offers down if larger amounts were involved. Turning down a dollar or two is one thing but who would turn down \$10 or \$20?

The fourth criticism involved a more subtle issue and had to do with what is often called *“experimenter demand effects”*. This suggests that even if a proposer is interested in pocketing most of the amount given to him, he may not do so because he

knows that the experimenter can see his decisions and he does not want the experimenter to think of him as greedy. Thus, it is embarrassment that is preventing the proposers from pocketing most of the money. And similarly being observed by the experimenter may compel the responder to reject small amounts because he does not want to appear desperate or look like a push-over.

2.4 *Behaviour in the ultimatum game: fairness or altruism?*

Let us take these criticisms in turn and see if they hold water. First, are proposers motivated by a desire to share? Robert Forsythe, Joel Horowitz, N. E. Savin and Martin Sefton of the University of Iowa answered this question by looking at the differences in behaviour in the ultimatum game and an even simpler game called the “*Dictator Game*”. The dictator game is similar to the ultimatum game in that participants are paired into proposers and responders. The proposers are then given an amount of money such as \$10. They are then told to decide on an allocation of this money between the two. But now the responder does not have a say at all! Thus, any amount the proposer gives to the responder, the latter would have to accept without any option of rejecting that offer.

Here the prediction based on self-interest is clear. The proposer should simply take all the money and give nothing to the responder. But, comparing the behaviour of the proposers in the ultimatum and dictator games can tell us about the motivations of the proposers. Suppose proposers in the ultimatum game were merely motivated by altruism – a desire to share - rather than fear of rejection. If that is that case, then the

offers by the proposers in the two games – the ultimatum game and the dictator game (the latter being purely a decision to share the money) – should be similar. But if proposers in the ultimatum game are motivated by the fear of being punished in the event of unfair offers then we would expect much more generous offers in this game than in the dictator game.

In Figure 2.4, I show the behaviour of the participants from one of the experiments carried out by Forsythe and his colleagues. The darker-shaded bars show the offers made in the ultimatum game while the lighter-shaded bars show the offers made in the dictator game – both in terms of the percentage of the initial amount that the proposer offered to the responder. In both games the proposers were given US \$5 and were asked to suggest an allocation out of this.

<<Figure 2.4 here>>

It is quite clear from looking at the darker-shaded bars in this figure that the proposers in the ultimatum game offer the responders a lot more money than the proposers in the dictator game. It is clear that the modal offer – i.e., the offer made by the majority of participants - in the ultimatum game is 50% of the initial amount available. 55% of the proposers offered the responder \$2.50 out of the \$5.00 given to the proposers at the start of the game. Another 20% offered 40%, i.e. \$2.00 out of \$5.00. Thus three-quarters of proposers in the ultimatum game offered between \$2.00 and \$2.50 out of \$5.00 (i.e., between 40% and 50%) to the responders. In contrast, if you look at the lighter-shaded bars then you can see that the modal offer in the dictator game is

nothing. 42% of the proposers in the dictator game offered nothing to the responder. Another 30% offered 20% of the available amount, i.e. \$1.00. So while 75% of proposers in the ultimatum game offered \$2.00 or more (40% or more) out of \$5.00, just about 70% of the proposers in the dictator game offered a dollar or less (20% or less).

This was powerful evidence against an explanation based on proposer altruism and lent further credence to the argument that both proposers and responders were reacting in accordance with implicit social norms that dictate fairness in allocations. The conclusion was unequivocal. In the dictator game where there is no threat of being punished, proposers are rather parsimonious. But in the ultimatum game, the proposers clearly anticipate the fact that if they make unfair offers to responders then many responders will react adversely to that unfairness by turning down the offer even if the responder has to forego a substantial amount by doing so. Both proposers and responders exhibit that they have a very clear notion of what constitutes fair or unfair in a particular situation and respond accordingly.

2.5 *Raising the monetary stakes in the ultimatum game*

Would behaviour in the ultimatum game be different with higher stakes? Here, one unresolved issue of course is how large is large enough? In 1996, Elizabeth Hoffman, Kevin McCabe and Vernon Smith decided to try the same game with US \$10 and US \$100. US \$100 was certainly a non-trivial amount then, as it is now, especially if you are a student whose opportunity cost of time (whatever is the most they can earn if

they do something else during that time rather than participate in the experiment) is certainly less than \$100 - especially given that the experiment took around 20 minutes to run. Hoffman, McCabe and Smith decided to examine the question of entitlement as well. So besides carrying out one treatment where participants are assigned to a role as proposer or responder randomly exactly as in prior studies, they looked at another treatment where these roles were decided on the basis of performance in a trivia quiz. Those who scored high in the quiz got to be proposers while the rest got to be responders. The proposers in this ultimatum game were told that they have “won” the right to divide this money with the idea that having won this right would imply a greater sense of entitlement among the proposers and might lead to more parsimonious offers.³

What Hoffman, McCabe and Smith found was startling. In those experiments where participants were randomly assigned to the role of proposers and responders, as in the original study by Güth and his colleagues, the offers made by proposers to responders in the game played with \$100 are *remarkably similar* to the offers made in the \$10 game. There are 24 proposers in the \$10 game and 27 in the \$100 game. In both cases the modal offer (i.e. the offer made by a majority of proposers) is 50% - either \$5 out of \$10 or \$50 out of \$100. And in both games, pretty much all the offers ranged

³ It is, of course, debatable whether a trivia quiz creates a genuine sense of entitlement. Those who end up as the “losers” might feel aggrieved and question whether performance in a trivia quiz is an appropriate or adequate way of creating a legitimate entitlement for those who “won”.

between 30% and 50%, i.e. between \$3 and \$5 in the \$10 game and between \$30 and \$50 in the \$100 game. Except, in the \$100 game, there was 1 person who wished to keep the entire \$100 (which was acceptable to the responder) while no proposer wanted to keep it all in the \$10 game. And in the \$100 game there were two subjects who offered \$60 (60%) to the paired responder - that is these two were willing to give up \$60 and keep \$40! Little wonder that these offers were accepted.

When it came to the games where people have “earned” the right to be proposers by doing well on the trivia quiz, offers were more parsimonious. There were 24 proposers who played the \$10 game and 23 who play the \$100 game. There were fewer offers that gave the responder 40% or more and more offers that gave the responder 10%. In this case, a number of proposers appeared to believe that the responders would be willing to accept a smaller portion of the pie, such as 10% (probably because the proposers have “won” the quiz and feel entitled to claim a larger share of the booty). But quite surprisingly, the responders were clearly not willing to accede to this sense of entitlement on the part of the proposers. This was because the rejection rates (i.e. the rate at which proposed offers were turned down by the responders) were much higher in the \$100 game as well. In the \$10 game only three out of 24 offers were rejected while in the \$100 game five out of 23 offers were rejected. Three out of 4 offers where the responder received \$10 were rejected and out of five cases where the responder was offered \$30 with the proposer keeping \$70, two were rejected! Thus, a number of participants in the \$100 game rejected amounts of money that were greater than or equal to the entire stake in the \$10 game. This

suggests that the expectations of what constitutes fair is different between the \$10 and \$100 games.

The Hoffman, McCabe and Smith study suggested that if the roles of proposer and receiver are assigned randomly then offers tended to cluster around 50% and this was true whether the stakes are \$10 or \$100. Thus, multiplying the stakes ten-fold did not lead to any appreciable changes in proposer behaviour. When the roles were assigned on the basis of performance in a trivia quiz, proposers seem to feel entitled to keep more of the money and make more parsimonious offers, but this legitimacy was not necessarily accepted by the responders and, especially in the \$100 game, the parsimony of the proposers led to discord and higher rejection rates.

These results went a long way to answering the proposition that behaviour would be different and more in keeping with the self-interest assumption if only the stakes were higher. It turns out that this is not true, and in fact, if roles are assigned randomly then there is a slight movement towards more equitable offers with increased stakes. But is \$100 high enough? Would behaviour be different if the sum of money was even larger?

One problem with using really large sums of money is that these studies are funded by research grants and most researchers do not have unlimited amounts of money at their disposal. But there is a way out of this and that is to run these experiments in a poorer country. Given that there are large differences in purchasing power, even small sums in developed countries amount to much larger sums in less developed ones. Thus, the

same amount of dollars go a much longer way in poorer countries and allows the researcher to run experiments with stakes that amount to many times the monthly income of participants.

Lisa Cameron decided that to really answer the question about stakes, we need to look at behaviour with even greater amounts of money. In 1994, she travelled to Gadjah Mada University in Yogyakarta, Indonesia. At that time, the per capita gross domestic product of Indonesia was US \$670, which was about 3% of the gross domestic product in the US. Cameron had participants play the ultimatum game with 5,000 Indonesian rupiahs, 40,000 Indonesian rupiahs and 200,000 rupiahs (approximately US \$2.50, US \$20 and US \$100 respectively with the then exchange rate of US \$1 = 2,160 Indonesian rupiahs). The largest of these three stakes were approximately three times the average monthly expenditure of the participants. These were unarguably high stakes.

It is possible behaviour may be different if we were dealing with millions of dollars but most of us are not dealing with millions on an every day basis. Furthermore, it is not clear if that would make a difference either. If Bill Gates was playing an ultimatum game with Warren Buffet – those are the people who can afford to play the ultimatum game with millions of dollars - and Buffet offered Gates US \$200,000 out of US \$1 million then it is quite conceivable that Gates might turn the offer down. \$200,000, after all, does not mean as much to Gates as it does to most of us.

Table 2.1 shows the offers made by the proposers using the three different amounts. The average amount offered is around 40% in all three cases and the modal amount is 50% in each case.

<<*Table 2.1 here*>>

Surprisingly, or in the light of what I have said above, not surprisingly, in the game with 200,000 rupiahs, offers of 10% and 20% of the available amount (20,000 and 40,000 rupiah respectively) were rejected by the responders. In the 40,000 rupiah game, offers of 25%, 30% and 35% (10,000, 12,000 and 14,000 rupiahs respectively) were turned down as well. Cameron's conclusion: the examination of proposer behaviour in these games does not show any movement towards the Nash equilibrium outcome as the stakes increases. Remember, Nash equilibrium reasoning suggests very small offers by proposers and acceptance by responders. Cameron goes on to conclude that "*...proposer behaviour is invariant to stake changes*", i.e., offers do not become more parsimonious even where large sums of money are concerned. Possibly because, as I pointed out above, in the case of inequitable offers of 25% of the available amount or less, responders routinely turn down substantial amounts of money if they feel that the offer is unfair.

Cameron also found that there was an increase in the rates of acceptance of offers as the stakes increase but she suggests that this may not necessarily reflect a greater willingness on the part of the responders to accept a given amount but is rather due to the fact that as the stake size grows, proposers in general tend to make more generous

offers which makes those offers more likely to be accepted. So, if Warren Buffet did get together with Bill Gates to play the ultimatum game chances are Buffet will offer Gates 40% - 50% of the pie and Gates will accept!

2.6 *Fear of punishment or fear of embarrassment?*

What about the criticism that generous offers by proposers are caused by an unwillingness to appear “greedy” in the eyes of the experimenters who can observe the decisions made? Elizabeth Hoffman, Kevin McCabe, Keith Shachat and Vernon Smith ran some dictator game experiments using a complicated “*double-blind*” protocol. Normally in experiments, a participant is not aware of who he is paired with but the experimenter can see all the decisions. Thus, there is anonymity between the participants but not between the participants and the experimenter. This protocol is called “*single-blind*”. A double-blind protocol refers to a situation where the decisions made by all participants are completely anonymous in that neither the other participants nor the experimenter learns what a particular participant decided.⁴

⁴ Double-blind protocol in medical studies refers to an even more stringent condition where even the principal researcher does not know which patient is assigned to which group – for instance, which patient is in the treatment group and which is in the placebo group. This would dictate that all experimental sessions are run with research assistants who have no idea about the researcher’s hypotheses or purpose. While this is feasible, it is often not practicable and in any case the evidence, at least in the case

Usually experimental economists carry out double-blind protocols by assigning letters or numbers to participants and participants then picking a letter or number at random. Participants then make decisions on pieces of paper which are deposited into a locked box so that the experimenter cannot see those decisions. The experimenter then pays the participants on the basis of the numbers or letters assigned and deposits these payments into another locked box. Participants pick up the payment that matches their letter or number from the locked box using keys given to them at the beginning of the session. The experimenter does not know which participant was assigned a particular letter or number and therefore has no way of matching the decisions with a particular participant.

Using this complex protocol guarantees that the participants will be convinced that no one – neither the other participants nor the experimenter – will ever learn what each individual participant decided. Hoffman and her colleagues actually ran another even more stringent double-blind protocol where they used one of the experimental participants as the monitor for the entire session. This participant, who was taught what to do at the beginning of the session, was in charge of running the entire session and did not have any prior knowledge about the experimenters' purpose. Furthermore, Hoffman and her colleagues also looked at a treatment where not only did they use a double-blind protocol but also reinforced the proposer's sense of entitlement to the

of studies in experimental economics, suggests that this does *not* make a big difference.

money by having them participate in a trivia quiz where those in the top half of the group got to be proposers while the rest were responders.

In previous dictator experiments, around 20% of proposers offered nothing to the responder, while another 20% offered half the available amount. When Hoffman and her colleagues looked at dictator games where the right to be a proposer was “earned” on the basis of performance in the trivia quiz, 40% of the proposers offered nothing and another 40% offered only 10% or 20% of the pie to the responder. When they added the double-blind protocol on top of that – i.e. proposers earned the right by winning in the trivia quiz and there was anonymity between both participants and between the participant and the experimenter – over two-thirds of proposers offered nothing and 84% offered 10% or less. Hoffman and her colleagues suggested that being observed by the experimenter – and possibly thought “greedy” – seemed to matter and that it is conceivable that it is this fear of being thought greedy that leads to generous offers in the ultimatum game rather than allowances for implicit social norms of fairness or the fear of being punished for unfair offers.

Of course, this elaborate double-blind protocol coupled with a sense of entitlement generated by winning the quiz might have created a different type of experimenter demand effect. It is possible that participants may have construed the elaborate procedures as a “signal” that they really should keep the money given that most transactions in real-life are often not nearly as anonymous as this.

Gary Bolton at Penn State and Rami Zwick at the University of Auckland provided an eloquent answer to this question and demonstrated beyond doubt that it was the fear of punishment that was driving behaviour in the ultimatum game. Bolton and Zwick compared the behaviour of participants in the ultimatum game with another game that they called the “*impunity game*”. Let me explain the impunity game first. In the impunity game players are paired up into proposers and responders exactly as in the ultimatum game. Also exactly as in the ultimatum game, the proposer is given a certain sum of money and asked to suggest a split of this money between the proposer and the responder. The responder is informed about the split offered by the proposer and asked whether he accepted or rejected that allocation. If the responder accepts the offer then the allocation is implemented with the proposer keeping the amount he wanted to and the responder getting the rest. However if the responder rejects the offer, *then the proposer still gets the amount he wanted to keep but the responder gets nothing*. So the difference with the ultimatum game is that in the impunity game a rejection by the responder does not have the power to hurt the proposer by taking money away from him. The threat of punishment to the proposer for making an unfair offer is removed in the impunity game.

Here is what Bolton and Zwick proposed to do. They decided to look at behaviour in the ultimatum game, first with a double-blind protocol which preserves anonymity between the participants and the experimenter and then with a single-blind protocol where the experimenter gets to observe participant decisions. They also decided to compare the behaviour of the proposers in the ultimatum game with that in the impunity game. The reasoning is as follows: suppose proposers make generous offers

in the ultimatum game because they do not want to be perceived as being greedy or unfair by the experimenter. Then we should expect to see less generous offers in the double-blind ultimatum game where the experimenter could not observe individual decisions as compared to the single-blind protocol where the experimenter could see all decisions. On the other hand, if generous offers in the ultimatum game are driven by the fear of being punished in the event of making an unfair offer, then we should observe far more parsimonious offers in the impunity game where there is no threat of punishment (since even if the responder rejects the offer in this game the proposer still gets to keep the amount he wanted for himself) compared to the ultimatum game where the responders rejection will cost the proposer his share of the pie.

Bolton and Zwick also made a change to the way the games were carried out. In most prior studies proposers were given an amount (say US \$10) and asked to suggest a split of this amount between the proposer and the responder. The changes made by Bolton and Zwick included the following. First, each proposer played the game ten times but each time the proposer was paired with a different responder. In each round the proposer had US \$4 and in each round the proposer could make one of two choices – (1) an *equitable* choice which gave US \$2 to both the proposer and the responder and (2) an *inequitable* choice which gave the proposer more money than the responder.

But this inequitable choice was different in different rounds. Sometimes the inequity in payoffs was small, while in other cases the difference was larger. More specifically the proposer could choose one out of five inequitable offers – {\$2.20, \$1.80}, {\$2.60,

\$1.40}, {\$3.00, \$1.00}, {\$3.40, \$0.60}, {\$3.80, \$0.20}. Since each proposer played ten games, he faced each of these above five choices twice. Notice that, in each of the five choices, the sum adds up to \$4 and that the first of these five offers is more equitable than the last which gives the responder only \$0.20 (i.e. 5% of the pie) and the level of inequity increases between the first and the last choice. Once again, if participants are motivated by purely monetary considerations then the obvious self-interested preferences dictate that the proposer should choose the {\$3.80, \$0.20} split and the responder should accept. More generally we would expect the proposer to choose the inequitable payoffs predominantly and regardless of which inequitable offer is chosen, we expect the responder to accept.

Again, to remind you about the central comparison here, if it is experimenter observation that matters then we would expect proposers to choose the inequitable offer more frequently in the double-blind ultimatum game as compared to the single-blind ultimatum game. On the other hand, if it is the fear of punishment that is the primary motivation behind proposer choices then we expect more inequitable choices in the impunity game, where the responder cannot retaliate to the inequity by rejecting the offer, compared to the ultimatum game where rejection is meaningful and deprives the proposer of his payoff.

The results clearly supported the punishment hypothesis. In the single-blind ultimatum game, 56% of all proposer choices were one of the inequitable choices and around 20% of these offers were rejected. The equitable offer of \$2 each for the proposer and the responder was never rejected by the responder. Rejection rates were

also higher as the offers became more inequitable. The choices in the double-blind ultimatum game were not all that different from those of the single-blind ultimatum game. There was a small increase in the proportion of inequitable offers by the proposers – 63% of the offers were inequitable ones in the double-blind protocol as opposed to 56% in the single-blind protocol. Once again there were also substantial rejections by the responders. Bear in mind what we said before. It is possible that responders may reject small offers in the ultimatum game in order not to be seen as desperate or a push-over by the experimenter. Using this logic we would expect many more responders to accept small offers in the double-blind ultimatum game as opposed to the single-blind ultimatum game. Remember that the responder could be offered \$1.80, or \$1.40, or \$1.00 or \$0.60 or \$0.20 out of \$4. Table 2.2 provides a break-down of rejection rates

<<*Table 2.2 here*>>

A few things stand out from this table. First, offers that were grossly inequitable – offering the responder only 20 cents out of the \$4 available - were turned down in every single case regardless of whether the experimenter could observe actions (single-blind protocol) or not (double-blind protocol). Furthermore, more than 50% of offers that gave the responder \$1 or less are turned down. Overall the differences between the two treatments – single-blind versus double-blind - were not very pronounced. To observe really different behaviour one must look at the impunity game where the threat of punishment was removed. Here 98% of the offers made by the proposers were inequitable offers and *none of these – not even when the proposers*

offered the responder \$0.20 out of \$4 – were turned down! The evidence was incontrovertible. When the responders could not retaliate by rejecting unfair offers the proposers felt no compunction in making inequitable offers; and when the responders knew that their rejection was not going to hurt the proposer, the responders did not bother engaging in such punishment either.

2.7 Do norms of fairness differ across cultures?

Most of the above studies used university students as participants and were concentrated on participants in the United States and, in the case of the original study by Güth and his colleagues, Germany. It should be clear from the discussion above that the prevailing norm as to what constitutes a fair offer influences behaviour in the ultimatum game. But different cultures may have very different ideas of what constitutes “fair”. Thus while the above studies may provide us clues regarding what university students in western market-based economies conceive as fair, is it possible to generalise those results to other countries and other cultures?

The first attempt to answer this question was undertaken by Alvin Roth and his colleagues, Vesna Prasnikar, Masahiro Okuno-Fujiwara and Shmuel Zamir during 1989-1990. Roth and his colleagues decided on an ambitious project which involved recruiting university students across four different locations – Pittsburgh, Ljubljana (in Slovenia which used to be part of Yugoslavia), Tokyo (in Japan) and Jerusalem (in Israel). This was one of the first attempts to look at behaviour in the ultimatum game across a number of (very) different cultures. A typical session had 20 participants and

they were divided into 10 pairs of proposers and responders. Each of the ten proposers interacted with each of the 10 responders so that by the end of the session each participant had participated in 10 rounds of play. Needless to mention, proposers and responders were anonymous to one another and were identified by numbers only. In the U.S.A., in every round, each proposer had US \$10 to divide. In keeping with purchasing powers prevailing at the time, the amount to be divided was made equal to 400,000 dinars in Yugoslavia, 20,000 yen in Japan and 20 shekels in Israel. However because these amounts were different, proposers in each country were asked to suggest a division of 1000 tokens where total tokens earned by a participants were converted into real money at the end of the session.

An ambitious cross-country project like this poses a number of ancillary problems. Two of these are (1) language effects and (2) experimenter effects. The first one refers to the fact that, since the instructions to participants are written in four different languages (English, Hebrew, Japanese and Slovenian), this might lead to differences in behaviour. For instance, as these authors point out, the words “bargaining”, “negotiating” and “haggling” are roughly synonymous but quite possibly convey very different messages depending on which word is being used. Pepsi for instance, much to its chagrin, found out about the pitfalls in translation when Pepsi’s tag-line “*Come alive with the Pepsi generation*” translated into “*Pepsi brings your ancestors back from the grave*” in Chinese. Along the same lines Frank Perdue’s chicken slogan, “*It takes a strong man to make a tender chicken*” was translated into Spanish as “*It takes*

an aroused man to make a chicken affectionate." Coors beer's slogan, *"Turn it loose"*, was translated into Spanish to read as *"Suffer from diarrhoea"*.⁵

This problem is handled by first writing out the instructions in English and then translating them to the language of the country concerned and then back-translating them into English to make sure that the act of translating the instructions does not distort the meaning of the instructions. The initial translation and back-translations are done by different people. The second problem arises from the fact that different people are running the experiments in different countries and there is a chance (possibly low) that the participants may respond differently to the different demeanours or personalities of the different experimenters. This problem was solved by having each of the experimenters run sessions in Pittsburgh. By keeping the location fixed, any differences in behaviour due to a particular experimenter's personality can be pin-pointed. The Slovenian data was gathered by Prasnikar, who also ran the first Pittsburgh sessions, with Roth observing. The remaining Pittsburgh data were gathered by Zamir (who also ran the experiments in Jerusalem) and Okuno-Fujiwara (who ran the sessions in Tokyo as well) with Roth and Prasnikar observing. There were no systematic differences in behaviour based on who was running the session.

Figure 2.5 shows the types of offers made in the four locations. In this figure I show what happened only in the tenth (and last) round of interactions. It is conceivable that

⁵ I need to thank Nandita Basu for providing me with these examples.

participants, particularly proposers, engage in some amount of experimentation – i.e., trying out different things – in the first few rounds. Furthermore, they probably learn valuable information from both acceptances and rejections of offers during those early rounds. Thus it stands to reason that the offers made in the very last round reflect in-built preferences and norms better than the data from the first few rounds.

<<*Figure 2.5 here*>>

The graph looks complicated but really is not. The horizontal axis shows the percentage of the amount available that the proposer offered to the responder. The vertical axis shows the proportion of offers that offered a particular percentage to the responder. There are four sets of bars. The first set shows the offers that were made in Israel. The second set shows the offers made in Japan. The third shows the offers in Yugoslavia and the final set of bars (at the very end) shows the offers made in the USA. So looking at the bars for Israel – the very first set – we find that no one offered 0% to the responder. About 5% of offers gave the responder 10% of the pie while another 5% offered 17.5%. 10% of offers gave the responder 20% and 32% offered the responder 40%.

A few things stand out from this figure. Not surprisingly the proposers seldom offered more than 50% of the pie to the responder. (There is one exception. In the United States – look at the very last set of bars – around 10% of all offers in the last round were “hyper-fair” in that these proposers offered 52.5% of the pie to the responder keeping only 48.5%, a lower share. Of course these offers were all accepted.) Second,

overall the offers look similar in that in no country do we see extremely parsimonious offers as the theory predicts.

But if we look more closely then there are differences. One thing that you should notice is that in Israel (the very first set of bars) the modal offer (i.e. the offer made by the most subjects) is 40%. Around one-third of all offers gave the responder 40% of the pie. In Japan (the second set of bars) there are two modes – 40% and 45%. Roughly 25% of offers each were of either 40% or 45%. However in Yugoslavia and the USA, the modal offer is 50%. 30% of all offers in the last round gave the responder 50% in Yugoslavia and 40% of offers gave 50% to the responder in the US. Statistical tests confirmed the following: offers in the USA and Yugoslavia were equally generous, while the offers in these two countries were more generous than the offers in Japan which in turn was more generous than offers in Israel.

If we now look at the rejection rates then we find that across all rounds roughly 28% of all offers were rejected in the US, 29% in Yugoslavia, 22% in Japan and 28% in Israel. Thus while the rejection rates were broadly similar across countries, what was surprising is that if we look at the tenth and final round only, then we find that the rejection rates in the two low offer countries – Japan and Israel – were actually lower than the other two. Rejection rates in the tenth and final round were 14% and 13% respectively in the two low-offer countries, Japan and Israel, and these rates were lower than the 19% and 23% rejection rates in U.S.A. and Yugoslavia respectively. Looking at these patterns of behaviour one could hypothesise that the difference among subject pools is in something like their “aggressiveness” or “toughness.” But if

it is indeed the case that there are differences in aggressiveness across the four countries then we would expect the responders to share that characteristic. This should then lead to high rates of disagreement and rejected offers in the two countries (Japan and Israel) where the offers are low in general. But that is not the case. Instead, the two countries where offers are low (Japan and Israel) do not exhibit any higher rates of disagreement than the high-offer countries (U.S.A. and Yugoslavia).

The authors conclude:

“This suggests that what varies between subject pools is not a property like aggressiveness or toughness, but rather the perception of what constitutes a reasonable offer under the circumstances. That is, suppose that in all subject pools it seems reasonable for the first mover to ask for more than half the profit from the transaction and that what varies between subject pools is how much more seems reasonable. To the extent that offers tend toward what is commonly regarded as reasonable, and assuming that offers regarded as reasonable are accepted, there would be no reason to expect disagreement rates to vary between subject pools, even when offers do. Our data thus lend some support to the hypothesis that the subject-pool differences observed in this experiment are related to different expectations about what constitutes an acceptable offer... Consequently, we offer the conjecture that the observed subject-pool differences are cultural in character.”

The work done by Roth and his colleagues went a long way towards addressing the issue of cultural differences. Their results showed that there were both similarities and

differences across cultures. The similarity was that in no country were the proposers as parsimonious as the theory would suggest and the vast majority of offers gave the responders 20% or more of the pie. But there were differences. The modal offers were lower in Japan and Israel compared to Slovenia and the US and offers in general were less generous in the former two countries compared to the latter two.

2.8 *An even more ambitious cross-cultural study*

But, while it is true that the four above countries do represent very different cultures, are students across these countries all that different? Maybe the students are much more alike than the citizens of these nations at large. If so, then maybe we should look further and deeper to search for cultural differences in behaviour. In the mid-1990s a far more comprehensive cross-cultural study of behaviour in the ultimatum game than anything attempted before was initiated under the auspices of the MacArthur Foundation Norms and Preferences Network.

Joseph Henrich, an anthropologist at the University of California-Los Angeles (UCLA) was undertaking field work among the Machiguenga, a group of horticulturalists in the tropical forests of south-eastern Peru. Henrich had heard about the ultimatum game results discussed above from his advisor Robert Boyd. Henrich decided to have the Machiguenga play the ultimatum game. Henrich's findings were surprising and deviated substantially from the findings of studies prior to this. The Machiguenga behaved very differently from the participants in the studies mentioned above. The most common offer made by Machiguenga proposers was 15% and

despite many low offers, not a single offer was rejected. This was doubly surprising given that Machiguenga live in small villages where people interact with other village members quite regularly and have very limited contact with strangers – an environment that we would expect would make the people more pre-disposed towards sharing, reciprocal motivations and fairness.

Henrich shared his findings with Robert Boyd, a noted anthropologist at UCLA and Colin Camerer, a leading experimental economist at Caltech. Both Boyd and Camerer were also members of the Norms and Preferences Network. The obvious question was this: were the Machiguenga results anomalous or were these results indicative of far more substantial cultural variations in behaviour that is not captured by the predominantly student participants in the previous studies? Boyd and Herbert Gintis, who were at this time the directors of the Preferences Network, decided to organize and fund a tremendously ambitious programme of cross-cultural experimental work.

They put together a group of 12 experienced field researchers working in 12 countries over 5 continents and gathered data for 15 small-scale societies exhibiting a wide variety of economic and cultural conditions. The 15 societies studied included the Orma in Kenya, the Hadza and the Sangu in Tanzania, the Torguud Mongols and the Kazakhs in Mongolia, the Lamalera in Indonesia, the Au and the Gnau in Papua New Guinea, the Achuar in Ecuador, the Machiguenga in Peru, the Tsimane in Bolivia, the Mapuche in Chile and the Ache in Paraguay. Three of these are foraging societies, six practise slash-and-burn horticulture, four are nomadic herding groups and three are sedentary, small-scale agricultural societies.

Needless to mention, given the complexity of the task involved it was impossible to control for differences in language or experimenters (as Roth and his colleagues did). Thus the researchers, who were already involved in anthropological field work in these countries, carried out the experiments on their own in these respective societies using the local language or local dialect. The experimenters tried to maintain anonymity by having proposers make offers and responders make acceptance/rejection decisions in seclusion, still given the small-knit nature of many of these communities the level of anonymity is certainly less than in usual laboratory studies of behaviour.

The findings, published in 2004 in the book '*Foundations of Human Sociality*' edited by Joseph Henrich, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr and Herbert Gintis, suggested that (1) there is no society where behaviour is commensurate with the extreme self-interest hypothesis that posits that proposers would keep a lions' share of the pie; (2) there is much more variation between groups than has been previously reported. The norm of what constitutes fair behaviour varies substantially across these societies and, more importantly, this variation coincides with differences in the patterns of interaction in every day life.

Table 2.3 provides a broad overview of behaviour in the ultimatum game across these diverse societies. I have arranged the societies in increasing order of the average offers made. As you can see the variations are substantial. At the low end we have the Machiguenga, Quichua and Hadza (small camp) where the average offers are around

25% of the pie and the modal offer also hovers around the 25% mark. (Remember in the Roth et al. study the lowest mode was in Israel and that mode was 40% of the pie.) At the other end of the spectrum we have the Achuar, Orma, Ache and Lamalera. Among the Achuar and the Orma, proposers on average offer a little more than 40% of the pie which is very similar to what we find in the industrialised country studies. The Ache and the Lamalera are even more generous and on average make “hyper-fair” offers where the proposers on average offer a larger share of the pie (51% and 58% respectively) to the responders.

Looking at the column for rejection rates we find that these rates tend to be low. In industrialized nations on average five out of 10 (50%) offers that give the responder less than 20% are rejected. But regardless of whether the offers are in general parsimonious, as among the Machiguenga and the Quichua, or very generous, as among the Achuar, Orma, Ache and Lamalera, very few offers are rejected. This suggests broad agreement among the proposers and responders as to what constitutes a fair offer in these societies. Strangely enough among the Machiguenga and the Quichua where the average offer is around 25% and the modal offer is also around 25%, these low offers are readily accepted by the responders as are the much more generous offers made among the Achuar, Orma, Ache and Lamelera where the average and modal offers hover around half the pie.

<<Table 2.3 here>>

The large variations across the different cultural groups suggest that preferences or expectations are affected by group-specific conditions, such as social institutions or cultural fairness norms. While it is difficult to pin-point the causes of behavioural differences across these extremely diverse societies, to the researchers involved in this work, two reasons stood out. The first of these, that seems to predict whether offers are generous or stingy, is the payoff to cooperation – i.e., how important and how large is a group's payoff from cooperating in day-to-day economic production. For instance, among the Machiguenga, who are entirely economically independent and rarely engage in productive activities that involve others besides family members, the proposers made very low offers. On the other hand, Lamalera whale hunters, who go to sea in large canoes manned by a dozen or more individuals requiring close cooperation between them, make more generous offers.

The second factor that seemed to have predictive power in explaining offers was the extent of market integration. How much do people rely on market interaction in their daily lives? The researchers found that by and large those who engage in greater interaction make more generous offers in the ultimatum game. It seems then, that the more market oriented a society is, the more equitable are the offers made by the proposers. The researchers tentatively suggest one plausible explanation of this behaviour. When faced with a novel situation (the experiment), the participants looked for analogues in their daily experience asking “*What familiar situation is this game like?*” and then act in a manner appropriate for that situation.

Once again the primary lesson arising from this very broad and ambitious cross-country study is that a social norm regarding what is a fair allocation - rather than pure self-interest – is the primary driving force behind offers in the ultimatum game even though that actual norm is substantially different from one society to another. Thus, offers in some societies such as the Machiguenga and the Quichua are very low while those among the Ache and Lamalera are more generous but in all cases there is little conflict between proposers and responders showing that while the idea of what is fair may be different *across* these societies, *within* those societies there is broad agreement regarding this and both proposers and responders behave in accordance with this mutually shared understanding of what constitutes a fair offer.

2.9 *What does a preference for fairness have to do with economics?*

As I pointed out in the introduction, the starting point of much economic thinking is the assumption of individual rationality implying that in most situations involving strategic decision-making the people making those decisions care primarily about their own monetary payoffs or their utility where that utility is mostly a function of the monetary payoffs accruing to them or their kin. In most economic transactions, individuals (or households) are attempting to maximise their utility while businesses are attempting to maximize their profit. Typically such attempts at maximising utility or profit do not involve overt moral or ethical considerations or notions of what is fair. This idea is not new. Two hundred and thirty years ago, in 1776, Adam Smith, generally considered the progenitor of modern economics, writing in his book '*An Inquiry into the Nature and Causes of the Wealth of Nations*' put it thus:

“It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own self-interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages.”

While moral philosophers may object to this rather Hobbesian view of human nature, as I pointed out in the introduction, in order to build models which can deliver realistic predictions about behaviour in real life one needs to start somewhere and see how far that gets us. The assumption of rational self-interest is the one that economists start with. As I have shown you this is not *always* wrong and does predict the behaviour of some. And, as I also pointed out in the introduction, if you started with a rosy-hued view of human cooperation you would be disappointed as well and more importantly make incorrect predictions. The truth, as with most things in life, is more nuanced and lies somewhere in the middle. More importantly, as I have tried to convince you, very often tendencies towards rampant self-interest are moderated by notions of fairness.

Fairness as a constraint on profit-making

One of the early attempts to understand whether norms of fairness may act as an active constraint on profit-seeking or might lead to different outcomes than the ones predicted by the self-interest model was undertaken by Daniel Kahneman, a psychologist at Princeton, and two economists Jack Knetsch of Simon Fraser University and Richard Thaler of Cornell in the mid-1980s. They used an extensive

questionnaire to understand people's predispositions towards a multitude of strategies adopted by businesses. Here is an example:

A hardware store has been selling snow shovels for \$15. The morning after a large snowstorm, the store raises the price to \$20.

Respondents were asked to rate this move as (1) completely fair; (2) acceptable; (3) unfair and (4) very unfair. Out of 107 respondents to this question, 82% considered this unfair or very unfair.

Their findings illustrate the role that norms of fairness play in day to day pricing decisions and how these norms can serve as a constraint on unfettered profit-making. Kahneman and his colleagues provide a number of examples of this phenomenon. Below I discuss some of these.

(i) Exploitation of Increased Market Power

The market power of a business reflects the ability of the business to charge its customers a higher price. For instance, in the event of a snow-storm the seller obviously has increased power to raise the price because people's need for the shovels has increased. Very often, faced with an emergency people wish to stock up on essentials; this creates an opportunity for the seller to jack up the prices of those commodities. By and large respondents seem to believe that such price-gouging is unfair because such an action would constitute opportunistic behaviour. There are a number of examples of the opposition to exploitation of shortages:

A severe shortage of Red Delicious apples has developed in a community and none of the grocery stores or produce markets has any of this type of apple on their shelves. Other varieties of apples are plentiful in all of the stores. One grocer receives a single shipment of Red Delicious apples at the regular wholesale cost and raises the retail price of these Red Delicious apples by 25% over the regular price.

Only 37% of 102 respondents considered this price increase acceptable. Similarly, firms with market power often use that power to increase profits by charging different customers different prices depending on their willingness to pay a higher price. Movie theatres charge a much higher price for admission on evenings during the week and weekends than during a week day. Airline companies charge a much higher price to those customers buying tickets at the last minute compared to those who bought their tickets way in advance for the same class of service. This is referred to as “*price discrimination*” where the seller is essentially trying to get from each customer the most that he is willing to pay for the good.

But the survey results suggest the addition of a further restraint. Many forms of price discrimination were considered outrageous.

A landlord rents out a small house. When the lease is due for renewal, the landlord learns that the tenant has taken a job very close to the house and is therefore unlikely to move. The landlord raises the rent \$40 per month more than he was planning to do.

Out of 157 respondents only 9% thought this was acceptable while a whopping 91% considered this unfair. On a different question, a majority of respondents thought it unfair for a popular restaurant to impose a \$5 surcharge for Saturday night reservations. The near unanimity of responses to questions like these indicates that pricing strategies that deliberately exploit the dependence of a particular individual is generally considered offensive by most.

(ii) The context for pricing decisions

The next two questions look at what happens when a business increases price in an attempt to protect its profit.

Suppose that, due to a transportation mix-up, there is a local shortage of lettuce and the wholesale price has increased. A local grocer has bought the usual quantity of lettuce at a price that is 30 cents per head higher than normal. The grocer raises the price of lettuce to customers by 30 cents per head.

A landlord owns and rents out a single small house to a tenant who is living on a fixed income. A higher rent would mean the tenant would have to move. Other small rental houses are available. The landlord's costs have increased substantially over the past year and the landlord raises the rent to cover the cost increases when the tenant's lease is due for renewal.

These increases were considered acceptable by 79% and 75% of the respondents respectively. This suggests that it is acceptable for firms to protect themselves from losses even if this means raising prices.

But 77% of 195 respondents thought the following was unacceptable.

A small company employs several workers and has been paying them average wages. There is severe unemployment in the area and the company could easily replace its current employees with good workers at a lower wage. The company has been making money. The owners reduce the current workers' wages by 5 percent.

The rule seems to be that the seller can certainly protect himself against losses. But in the last instance the firm is lowering wages not to cover losses but to exploit that fact that workers are now finding it more difficult to find jobs in the region and this places the worker at a disadvantage vis-à-vis the firm.

(iii) Enforcement

68 percent of respondents in this survey said they would switch their patronage to a drugstore five minutes further away if the one closer to them raised its prices when a competitor was temporarily forced to close; and, in a separate sample, 69% indicated they would switch if the more convenient store discriminated against its older workers. In traditional economic theory, compliance with contracts depends on enforcement. But buyers and sellers may be willing to abide by norms of fairness even in the absence of any explicit enforcement. The following scenarios illustrate:

If the service is satisfactory, how much of a tip do you think most people leave after ordering a meal costing \$10 in a restaurant that they visit frequently?

The average tip (as stated by 122 respondents) was \$1.28

...in a restaurant on a trip to another city that they do not expect to visit again?

Here there are 124 respondents and the average tip is \$1.27. The respondents evidently do not treat the possibility of enforcement as a significant factor in the control of tipping. This is entirely consistent with the widely observed adherence to a 15% tipping rule in the US even by one-time customers who have little reason to fear embarrassing retaliation by an irate server.

My first job out of graduate school was at Washington State University in the Pacific North-West of the United States. When I left my position at Washington State to start a new job at Wellesley College, my wife and I decided to drive across the country from Washington to Boston. The first night we stopped at Butte, Montana. I had never been to Butte before this and I sincerely doubt that I will go back there again. I don't even remember the name of the restaurant where we ate dinner. But I do remember leaving a 15% tip after dinner. We did the same thing over the next few days in places like Rapid City, South Dakota and Youngstown, Ohio – places that I doubt we will visit again.

The important question though is: do firms, which the theory assumes maximise profits, also fail to exploit some economic opportunities because of unenforceable

compliance with rules of fairness? The following questions elicited expectations about the behaviour of a garage mechanic dealing with a regular customer or with a tourist:

[A man leaves his car with the mechanic at his regular] / [A tourist leaves his car at a] service station with instructions to replace an expensive part. After the [customer/ tourist] leaves, the mechanic examines the car and discovers that it is not necessary to replace the part; it can be repaired cheaply. The mechanic would make much more money by replacing the part than by repairing it. Assuming the [customer/tourist] cannot be reached, what do you think the mechanic would do in this situation?

Roughly the same proportion of respondents (60% in the case of the *regular customer* and 63% in the case of the *tourist*) thought that the mechanic will make more money by replacing the part. Here again, there is no evidence that the public considers enforcement a significant factor. The respondents believe that most mechanics (usually excluding their own) would be less than saintly in this situation. However, they also appear to believe that the mechanics that would treat their customers fairly are not motivated in each case by the anticipation of sanctions.

(iv) Fairness in labour markets

Given that norms of fairness seem to apply to a variety of pricing decisions, we would expect that this might extend to labour markets as well. In labour markets it is often observed that the wages paid to workers do not decline even in the face of persistent unemployment when firms could easily hire workers more cheaply and therefore could choose to offer lower wages even to the existing workers. But very often

whether a particular transaction is considered fair or not depends on what the relevant reference point is. Market prices and the history of previous transactions between a seller and a buyer can serve as reference transactions. The role of prior history in wage transactions is illustrated by the following two questions:

A small photocopying shop has one employee who has worked in the shop for six months and earns \$9 per hour. Business continues to be satisfactory, but a factory in the area has closed and unemployment has increased. Other small shops have now hired reliable workers at \$7 an hour to perform jobs similar to those done by the photocopy shop employee. The owner of the photocopying shop reduces the employee's wage to \$7.

Out of 98 respondents 17% thought this was acceptable while 83% considered this unfair. I will have more to say on this particular topic of fairness in labour markets in Part 3.

Economic Consequences

The findings of the study by Kahneman and his colleagues suggest that

“many actions that are both profitable in the short run and not obviously dishonest are likely to be perceived as unfair exploitations of market power....Further, even in the absence of government intervention, the actions of firms that wish to avoid a reputation for unfairness will depart in significant ways from the standard model of economic behaviour.”

The above is all fine and good but after all, the results reported above are based on responses to survey questions and, as I pointed out in the introduction, at times actual

behaviour does deviate from stated attitudes. For instance, a respondent might say that he will not patronise a firm that is engaging in price-gouging by jacking up the price of an essential commodity in an emergency but when push comes to shove the buyer might easily give in. Now the problem here is that it is very hard to show that people are *not* buying something in protest since it is impossible to prove a negative.

Bradley Ruffle, of Ben Gurion University in Israel, decided to set up an experiment to test if buyers do indeed refrain from buying at prices they consider to be unfair. Ruffle focused on situations where the seller puts a price-tag on his product and the buyer has the option of either buying at that price or not buying at all. In economics these are referred to as “posted-offer” institutions. Most retail stores operate on this principle in the sense that when you walk into the store each item has a price tag and you can either buy at the indicated price or not and there is no scope for haggling over the price. The car company Saturn in the USA, for instance, has a no haggling policy as opposed to most other car-sellers who allow for negotiations over the price. Honda has a similar no-haggling policy in New Zealand with a fixed price for their cars. Such a no-haggling policy turns the sale of these cars into a posted-offer institution. Economists have usually tended to focus exclusively on the behaviour of sellers in such a context without realising that if buyers are motivated by norms of fairness and care about relative payoffs then they might actually refrain from buying which in turn has implications for these markets.

In a posted-offer market sellers post prices which buyers can either accept or reject. Acceptance yields the seller a payoff determined by the difference between the price

he posts and his cost on each unit sold. The buyer earns the difference between his valuation for the good and the price that he pays. If the buyer rejects the price then neither party earns any surplus. Thus a posted-offer institution is a natural multi-player extension of the ultimatum game.

What does valuation of a good mean? The idea behind valuation is this: economists assume that when a person buys a good, that person has a maximum price he is willing to pay depending on the satisfaction (happiness/utility) that he gets from it. Suppose you are willing to pay \$200 to go see Bruce Springsteen play at Giants stadium. Why are you willing to pay \$200? Because you have thought about the satisfaction you will derive from attending this event and you think that at the most this is worth \$200 to you. Now suppose you manage to get a ticket for \$150. Then, in the parlance of the economist, you have enjoyed a surplus of \$50, which is your “*consumer surplus*”. So anytime you are willing to pay a certain amount for something and you end up paying less than the maximum you were willing to pay, you enjoy a surplus. The “*producer surplus*” on the other hand is the difference between the price at which a seller sells the good and the cost of producing it. “*Producer surplus*” is essentially an alternative term for profit.

Ruffle recruited 92 participants at the University of Arizona and set up a series of posted-offer markets with buyers and sellers. It is assumed that the sellers are selling a homogeneous good. In each market buyers and sellers interact for 20 rounds. In each round the sellers have a number of units of a homogeneous good available for sale. In each round the buyers are assigned a particular valuation for each unit of the good that

he buys. Similarly in each round the seller is assigned a particular cost for each unit that he sells. Ruffle looks at the impact of a number of different conditions:

(1) *Number of buyers and sellers*: in some cases there are *two* buyers in the market while in other cases there are *four* buyers. The number of sellers is always held constant at *two*.

(2) *Relative profits of the buyers and the sellers*: Compared to the buyer, the seller always enjoys a much larger share of the profit on each unit sold. In some cases the seller's share is *three* times that of the buyer. Suppose it costs the seller \$12 to produce a t-shirt. The buyer is willing to pay as much as \$20 for it. In this case the total surplus to be split is $(\$20 - \$12) = \$8$. Suppose the seller puts a price of \$18 on the shirt and the buyer agrees to buy it. Then the seller gets a surplus of $(\$18 - \$12) = \$6$ while the buyer gets a surplus of $(\$20 - \$18) = \$2$. Thus the seller's share of the surplus (\$6) is three times that of the buyers (\$2). In other cases the seller's share of the profits is *six* times that of the buyer. Suppose, as in the previous example, the buyer's valuation is \$20 while the seller's cost is \$13 rather than \$12. In this case the total surplus is $(\$20 - \$13) = \$7$. Suppose the seller quotes a price of \$19 and the buyer buys at that price. Then the seller's share of the surplus is $(\$19 - \$13) = \$6$ while the buyer's share is $(\$20 - \$19) = \$1$; therefore the seller's share of the surplus is six times that of the buyer's.

(3) *Information available to buyers and sellers*: Finally, in some cases the buyers know the sellers' costs and the sellers know the valuations of the buyers while in

other cases the buyers and the sellers not only know the costs and valuations respectively but *in addition they are shown the profit that each party will make for various transactions*. The intention here is to make “*the earnings inequality salient to the buyers in an attempt to incite them to forego profitable purchases*”.

What Ruffle finds is that indeed “*demand withholding*” by buyers - where the buyers essentially refuse to buy at prices which gives most of the surplus to the sellers - is a factor in these markets. The effect of such withholding is more pronounced when (1) there are two buyers rather than four; (2) when the surplus accruing to the seller is six times that accruing to the buyer and (3) when the buyers are made aware of this inequitable distribution of the surplus by providing them with information about the profits accruing to each party. In one session of this particular treatment, one buyer boycotted the market *entirely* for 6 out of 20 periods thereby foregoing the possibility of earning any money. Bear in mind that if the buyer participates then the buyer will make positive profit but these profits will be small compared to the ones that the seller will make. By not participating at all the buyer is making sure that neither he nor the seller makes any money at all. This is very similar to turning down small offers in the ultimatum game except here such rejection comes in the explicit context of a market transaction.

Such demand withholding does often induce the sellers to lower the price charged in later periods and a lower price in turn implies a more equitable sharing of the surplus between the buyer and the seller. The fact that two buyers are often more successful in acting in a coordinated manner and withholding demand compared to four buyers can

be explained by appealing to the fact that the choice to withhold poses a free-rider problem for the buyers. Buyers benefit from withholding prices (since that would result in lower prices and a greater share of the surplus for them later on) but each buyer prefers the other buyers to do the withholding. Such coordinated action to withhold demand proves more successful when there are two buyers as opposed to four buyers. Four buyers are often much less successful in upholding the covenant with sellers resisting buyers' attempts at demand withholding and charging higher prices. Eventually one or more of the buyers gives in. Two buyers, on the other hand, manage to coordinate much better and are successful at driving prices down.

Ruffle concludes:

“For a given price, the punishment to sellers of rejecting a profitable purchase is greater the more extreme the earning inequality. The observation that, for a given number of buyers, withholding is more frequent the larger the surplus inequality is therefore consistent with fairness.”

Concluding remarks

In this chapter I have provided evidence that people are willing to turn down a deal offering substantial monetary amounts if they believe that they are being treated unfairly. This unfairness can take two forms. At one level people care about relative payoffs in the sense that they might reject offers that give the other party a lot more than them. To paraphrase the economist Robert Frank, this concern for relative standing can be summed up succinctly by saying that a person would feel quite happy

if he is driving a BMW if everyone around him is driving a Toyota but the same person would be quite unhappy if the people around him were driving Porsches. (Or as Frank humorously comments: a person is happy as long as he makes more than his wife's sister's husband.)

But at the same time I have shown that rejection of offers cannot be attributed to a concern for relative standing only. Intentions matter as well. People are perfectly happy to accept inequitable offers generated by computers (where no attribution of intentions is possible) but unwilling to accept the same offers if made by another human, especially if that human stands to benefit from the offer being accepted.

However I should point out that a recent study by Gary Bolton, Jordi Brandts and Axel Ockenfels suggests that at times a fair procedure can be a substitute of a fair outcome. That is, people might be willing to accept an unfair offer if they believe that the offer was the result of implementing a fair policy. In their study proposers in an ultimatum game have three choices initially – (A): a hyper-fair offer of (200, 1800) i.e., 200 experimental dollars for the proposer and 1800 for the responder; (B): an equitable offer of (1000, 1000) and finally (C): an inequitable offer of (1800, 200). They found that 41% of the inequitable offers (C) were rejected. In a second study the offers were generated by throwing dice rather than being generated by an actual human proposer. They looked at an *asymmetric* lottery which puts a very high - 98% - probability on the inequitable offer C and a *symmetric* lottery which puts an equal 33% probability on all three choices. They found that the rejection rates of the inequitable offer C were very similar with the *asymmetric* lottery and with human

proposers but the rejection rates were much lower for the *symmetric* lottery. The authors conclude that the fairness of the outcomes and the fairness of the procedures both matter and that a fair procedure may be a substitute for a fair outcome.

This study appears to be quite similar to the one conducted by Sally Blount, yet there is a subtle difference. In Blount's study people were willing to accept unfair offers when these offers were chosen by a lottery but not when they were made by other participants. In the study by Bolton and his colleagues, people were willing to commit *beforehand* to accepting the outcome of a lottery knowing fully well that the outcome may be bad for them *as long as they were certain that the lottery itself was fair, that is the lottery placed a roughly equal probability on the fair and unfair outcomes.*

Finally, I have also shown that notions of fairness may vary across cultures in that offers that are considered unfair and routinely turned down in one society are readily accepted in others. Social norms operational in different societies may dictate what is fair and what is not.