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How Does Voice Matter? Evidence from the Ultimatum Game

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Abstract

Prior research in economics and psychology has shown that process can matter in determining outcomes in many social situations. In particular, the opportunity to express one's opinion—voice—has been found to be highly influential. However, little is known about the channels through which voice may operate. In this paper, we develop a simple economic model of voice to explore these channels. We show that individuals value voice for: 1) its effect on outcomes, 2) its inherent value, or 3) its role in signalling one's social standing. Through the introduction of a hypothetical round in the standard ultimatum game, we were able to test the channels of voice directly by observing recipients' responses to offers which are lower than what they asked for. Our experimental results suggest that voice works primarily through its inherent value which appears to exceed its contribution to the perception of procedural fairness. Further, unlike voice which softens the impact of an unfair outcome, the possibility for voice may have dichotomous effects.

1. Introduction

Deep seated in standard economic theory, utilitarian consequentialism has led economists to evaluate different states of the world based exclusively on their pecuniary outcomes. Non-pecuniary effects such as the fairness of the outcome, or distributive fairness, and the *means* by which different states are attained are typically ignored in the individual welfare maximization exercise. The failure to incorporate these non-pecuniary effects into economic models has amounted to poor predictions in some of them; a classic example is the ultimatum game. Inaccurate predictions from this game and similar ones have driven researchers to incorporate concerns for distributive fairness into economic models. While there is now a general consensus that concerns for distributive fairness have a non-negligible impact on outcomes, the role that process plays in determining outcomes remain ambiguous.

One aspect of process which appears to have a profound impact on decision is *voice*: the act of expressing one's opinions. Some studies found that people perceive the process as fairer when voice is allowed even when the outcome is unfavourable to them (Lind et al., 1980; Van den Bos, 1999). The perceived fairness of the process is known in the psychological literature as *procedural fairness.* This positive association between voice and procedural fairness has been established in various social contexts, such as participatory decision-making (Greenberg and Folger, 1983) and performance appraisal and compensation plans (Greenberg, 1990; Miceli and Lane, 1991). Further, the opportunity for voice often increases the acceptance of decisions made by authorities even if the outcome is unfavourable (Vidmar, 1992; Lind et al., 1993; Peterson, 1999). These findings echo a long tradition in social theory—spanning from Jean Jacque Rousseau's general will to Jurgen Habermas's theory of depoliticization— that voice has a strong influence on social decisions.[1] However, there are few studies which explicitly test the mechanisms of voice apart from attributing the value of voice to procedural fairness and little is known about the channels in which voice affects the likelihood that one will accept an outcome.

Drawing on a typology of procedural fairness as characterized by Dolan et al. (2007), we postulate that an individual values voice because 1) voice helps achieve fairer or more efficient outcomes, a consequentialist interpretation; 2) voice has inherent value in its own right and 3) adherence to an individual's voice reflects that individual's social standing since it implies that

[1] See Jurgen Habermas, "Technology and Science as 'Ideology,'" in *Towards a Rational Society* (Boston: Beacon Press, 1970), pp. 81-122.

his or her views are worth hearing (Thibaut and Walker, 1975). While it is technically difficult to distinguish each of these effects and to test for their existence separately, we propose a variation of the ultimatum game which allows us to test for the relative influence of these three mechanisms of voice on decisions.

A standard ultimatum game involves the division of an allotted sum of money between an offerer and a recipient. The offerer offers a portion of the allotted sum to the recipient who accepts or rejects the offer. If the recipient accepts, the two players distribute the allotted sum according to the offerer's proposed distribution. If the recipient rejects, none of the players win the money. To test the three effects of voice, we propose a variant of the ultimatum game in which we randomly allow some of the recipients to have voice while explicitly and implicitly denying others the opportunity, similar to the experimental designs used by Folger (1977) and van des Bos (1999). Recipients who were explicitly denied the chance to voice their opinions were told that some recipients were randomly selected to voice their opinions but they were not chosen. Implicit denial of voice coincides with the standard ultimatum game since recipients were *not* informed that some recipients were randomly selected to voice their opinions but they were not chosen. The recipients in the voice group, on the other hand, will be given the opportunity of one-way communication with the offerers, expressing their preferred distribution of the allotted sum of money and providing a justification on why their views should be adopted. This information will then be conveyed to the offerers, who will then decide whether to propose an offer which the recipient desires.

The novelty of our ultimatum game lies in the introduction of a hypothetical round before real offers were made to elicit recipients' responses to low unfair offers. The offers in the hypothetical round, referred to as the hypothetical offers, were deliberately set at values that were likely to be lower than what recipients with voice were likely to propose so that we could observe their reactions their opinions about the division were ignored. Further, to ensure that the recipients respond to the offers made in the hypothetical round (hypothetical offers) in the same way as they would have responded to the offers made by the real offerers, the recipients were told that they would not be able to change their acceptance or rejection decisions if the real offers were equal to the hypothetical offers. Comparing the rejection rates in the hypothetical round across the voice group, the explicit no-voice group and the normal group, we are then able to deduce which of the three effects of voice that we outlined is the dominant effect.

We map the different notions of voice into our experimental design as follows. First, if individuals value voice only because it gives them better outcomes (a consequentialist position), the individuals with voice are equally likely to reject unfair low offers as those without voice since only the outcome matters. Second, if the inherent value of voice is dominant, individuals with voice are less likely to reject unfair low offers than those without voice. Finally, if voice is primarily an embodiment of one's standing, individuals with voice will be more likely to reject unfair low offers (below what they proposed) than those without voice when their opinions are not adopted. Using regression analysis, we can distinguish which of the three channels is the dominant channel through which voice predominantly affects the likelihood that one will accept an unfair outcome.

In addition, we asked the recipients to rate the fairness of procedures before the actual offers were made. The procedural fairness ratings allow us to conduct three tests. First, we test whether a higher rating of procedural fairness increases the likelihood that one will accept an unfair outcome. Second, we test the hypothesis that promoting procedural fairness is one of the attributes, if not the main attribute of voice by which voice influences the decision to accept an unfair outcome. Third, we test whether the possibility of voice for some promotes procedural fairness of the game and, in turn, influences one's decision to accept an unfair outcome. Since in most real life circumstances not everyone will have an opportunity to voice their opinions, the findings about the explicit no-voice group have important implications about whether the possibility of voice for some is sufficient to increase the probability of offer acceptance and whether it improves the perception of the fairness of a situation.

The next section describes the simple economic model underlying our hypotheses. Section three explains the details of the experiment. The findings of the experiment are then provided in the fourth section followed by the conclusion.

2. The Economic Model

In standard game theoretic model of the ultimatum game, the recipient will accept any positive offer, i, as long as $i > 0$ since only pecuniary payoffs matter to the recipient. However, experimental evidence from ultimatum games has repeatedly contradicted the predictions of game theoretic models: recipients are likely to reject low offers and sometimes very high offers as well. Meyer (1992) restricted the offers to 20% and 30% and found that rejection rates are 68%

and 39% respectively for a total sample size of 62. Sanfrey et al. (2003) repeated the ultimatum game ten times to 19 recipients who were told that they were playing the game with different partners for each game. They found that the rejection rates of offers that were 10%, 20% and 30% of the allotted sum were approximately 60%, 50% and 10%. Further, offerers were often found to offer half of the allotted amount (Kahneman et al., 1986; Thaler, 1988; Roth et al., 1995; Hoffman, McCabe, and Smith, 1996; List and Cherry, 2000), which recipients will always accept. These results suggest that individuals have notions of equitable distributions and individuals do care about distributive fairness.

There have been several studies which attempt to extend the classic game theoretic model of ultimatum game to better predict fit these findings. In particular, Rabin (1993) attributed the rejection of unfair offers in the ultimatum game to negative reciprocity – one's act of harming people who treated them unfairly, even if substantial cost is involved; Fehr and Schmidt (1999) and Bolton and Ockenfels (2000), on the other hand, explained the phenomenon by difference aversion models; while Charness and Rabin (2001) incorporated features of difference aversion, social welfare and reciprocity models in their model and found that social welfare and reciprocity are the main motivations to one's decision to accept the offer.

We draw from the features of these models and outline a simple conceptual model to capture the preference of a recipient in a two-person ultimatum game when voice is allowed. Since we do not intend to explore the full interactions between the offerer and the recipient or the equilibrium outcome of the game, we focus on the utility function of the recipient of the offer.

Unlike the reciprocity models where the offerer's payoff has a direct impact on the recipient's utility, we assume that the decision to accept or reject an offer is solely self-interested. The recipient's utility is affected by his or her payoff if he or she accepts the offer, the degree of distributive fairness associated with the offer received and whether he or she has the opportunity to voice his or her opinions. The recipient's utility function is specified as:

$$U = U(i, f_d, v)$$

where *i* refers to the offer made to the recipient in the ultimatum game and f_d and v represent the importance of distributive (or outcome) fairness and voice respectively to the recipient's well-being. Since distributive fairness depends on the offers made to the recipients, we have:

$$f_d = f_d(i, i^*)$$

where distributive fairness can be viewed as a symmetric inverted u-shaped function which depends on the gap between the proposed offer and the objectively equitable offer which is denoted by i^*. Distributive or outcome fairness decreases the further one is from the objectively fair offer.

If distributive fairness is accounted for and $U(\cdot)$ is a monotonic increasing function of f_d, $U(\cdot)$ inherits the inverted u-shaped property of f_d. The utility function can then be characterized such that for offers lower than the critical value, $\hat{\imath}$, the utility derived from accepting the offer is negative, and thus the recipient rejects all offers below $\hat{\imath}$, with the normalization that utility is equal to zero if the offer is rejected[2]. The existence of $\hat{\imath}$ in turn depends on the concavity of f_d and ultimately $U(\cdot)$. Therefore, a recipient may reject an unfair offer purely out of concern for distributive fairness.

How does voice enter the utility function and in what form? We formulate three possible types of utility functions based on three potential roles that voice may play.

Model 1: If voice is only valuable because it provides utility-improving outcomes (the consequentialist view), then v does not enter the utility function directly and so the recipient's utility function is given by $U = U(i, f_d)$.

Consider the additively separable utility function for the recipient j involved in a two-player game:

$$\boldsymbol{U_j(i_j) = \theta i_j - \alpha(i_j - i^*)^2} \quad (1)$$

where i_j refers to the offer made to the recipient. The first tem is the value of the pecuniary payoff and the second term represents preferences for distributive fairness. A simple application

[2] Since the utility function is inverted u-shaped, it is possible that recipients will also reject offers above a second critical offer, $\hat{\imath}_h$. However, as our experiment focuses on unfair low offers made to the recipients, we will not discuss unfair high offers above a second critical offer, $\hat{\imath}_h$.

of the equity theory will posit i^* to take the form $\frac{i_j+i_k}{2}$, where $k \neq j$[3]. The relative weight that the recipient places on pecuniary payoff as compared to distributive fairness is given by α/θ, where $\alpha/\theta = \infty$ refers to strict preference for distributive fairness and $\alpha/\theta = 0$ refers to strict preference for material well-being[4]. Voice does not enter the utility function explicitly but it may influence the offers made by the offerers.

Model 2: If voice has an inherent value of its own, the recipients' utility function is given by $U = U(i, f_d, v)$ where v can be treated as an independent argument of the utility function. In this case, $U(\cdot)$ is strictly increasing in v. Moreover, v does not depend on i.

Extending equation (1) we can specify Model 2 as:

$$\boldsymbol{U_j(i_j) = \theta i_j - \alpha(i_j - i^*)^2 + v} \quad (2)$$

where v is a parameter representing the utility one derives from voicing his or her opinion. For instance, voice may affect one's utility through improving perceptions of procedural fairness or voice may generate value simply by allowing individuals to state their case. Insofar as these effects of voice exist regardless of whether one's opinions are adopted, voice has an unambiguous positive impact on one's utility.

Model 3: If voice promotes feelings of self-worth and one's social standing, the recipients' utility function is given by $U = U(i, f_d, v)$ where $U(\cdot)$ is monotonic increasing in v. Standing refers to the status within a group, which in our case is the experimental group that is randomly assigned. Unlike the dictator game where the outcome of the game is solely decided by the offer, the outcome of an ultimatum game is determined jointly by both the offerer and the recipient. Therefore, the player's standing becomes relevant in this context. When respect is shown for

[3] This specification of the utility function is similar to a specification by Bolton and Ockenfels (2000). However, while we use the second term to represent concern for distributive fairness, Bolton and Ockenfels used the term to demonstrate individuals' difference aversion.

[4] Bolton and Ockenfels (2000) had specified the same model with a similar interpretation. In their paper, $\alpha = 1$ represents strict narrow self-interest while $\alpha = 0$ represents strict relativism, that is, players care only about relative payoffs. The distributively fair division is referred to as the social reference point. Fehr and Schmidt (1999) allow asymmetric effects of advantageous unfair outcomes and disadvantageous unfair outcomes.

one's opinions, feelings of positive standing are enhanced (Tyler and Bies, 1990) and thus utility increases. Expressing respect in terms of voice, we have as $v = v(i, \bar{\imath})$ where $\bar{\imath}$ represents the offer which the recipient had voiced to the offerer[5]. The recipient's standing is determined by the perception of the extent to which the offerer considered his or her views. Lower offers than $\bar{\imath}$ reflect deliberate neglect of the recipient's standing and thus decrease the recipient's utility. As such v is a strictly increasing function of i for $i < \bar{\imath}$. In principle, individuals can perceive higher offers as furthering respect or standing. Thus v may be increasing for all i.

Model 3 can be specified as:

$$\boldsymbol{U_j(i_j) = \theta i_j - \alpha(i_j - i^*)^2 - \beta(\bar{\imath}_j - i_j)} \quad (3)$$

It can be shown for all $\bar{\imath}_j$, the threshold value of offer, $\hat{\imath}$, lower than which the offer will be rejected, is decreasing in β. Therefore, if voice embodies one's standing, a recipient with voice will be less likely to accept a low offer than a recipient without voice.

Figure 1 illustrates the differences in the utility functions of the three models[6]. The allotted sum to be shared between the offerer and the recipient is 10 dollars. The M1 curve denotes the utility function which coincides with Model 1 – the outcome-oriented or consequentialist interpretation of voice. The M2 curve denotes the utility function which coincides with Model 2, where voice has an inherent value in itself, which is treated as a constant parameter in the plot. The M3 curve describes the utility functions where voice is valued for respect or standing and standing decreases in disadvantageous unfair offers i.

In Figure 1, we assume a relative importance of income compared to distributive fairness ($\alpha < \theta$), so that recipients have the highest utility when offer is more than 5 dollars. With our normalization of the utility of rejecting an offer as zero, recipients will accept an offer if the resulting utility is greater or equal to zero. Therefore, in this example, recipients will always accept offers greater than 5 dollars even though the offer is distributively unfair to the offerer.

[5] We assume that $\bar{\imath}$ is exogenously determined so that we do not derive $\bar{\imath}$ in terms of a strategy that is determined in the game theoretic sense. It should also be noted that $\bar{\imath}$ reflects the recipient's perception of his or her self worth in the game which may not be equivalent to i^*, the objectively fair offer.

[6] The parameter values used are: $\theta = 1,\ \alpha = 0.4\ \ v = 2, \beta = 0.85\ and\ i^* = \bar{\imath} = 5.$

However, the recipient may not enjoy the highest utility even when the offer is equivalent to the entire allotted sum as he or she cares about distributive fairness.

We can interpret the plots in Figure 1 by first imagining that a recipient in a standard ultimatum game has a utility function similar to M1 curve. This recipient will always accept an offer above or equal to approximately 2.5 dollars and reject otherwise. Suppose that this recipient is allowed voice. If voice has an impact as predicted by Model 1, the utility function of this recipient remains as M1 curve. In other words, this recipient values voice only for its effects on outcomes, including preferences for fairness. Relative to this case, we have the two other channels for voice. If voice has an inherent value of its own, the utility function of this recipient is shifted upwards by a constant parameter so that his utility is now represented by M2 curve. In this example, the inherent value of voice is sufficient such that when voice is allowed, this recipient is willing to accept a low offer of 2 dollars and reject otherwise. In other words, a recipient with M2-type utility function is *less* likely to reject a low offer as compared to a recipient with M1-type utility function when voice is allowed[7]. On the other hand, if voice reflects one's standing and v is a strictly increasing function in offers, the utility function of this recipient changes from M1 to M3 when voice is allowed. From Figure 1, the recipient will reject an offer of 2 dollars as well as an offer of 3 dollars. Therefore, we can posit that a recipient with M3-type utility function is *more* likely to reject a low offer as compared to a recipient with M1-type utility function when voice is allowed[8].

[Figure 1]

3. The Experiment and Experimental Design

3.1 Participants

[7] By "less likely", we mean that the range of offers which the recipient will reject is smaller if he has M2-type utility function than the range of offers of a recipient who has M1-type utility function. Due to heterogeneity in utility functions however, even with smaller rejection ranges, some recipients may still reject a low offer.

[8] Theoretically, it is possible that voice has both inherent value in itself and embodies one's standing at the same time. Therefore, the ultimatum game only allows us to deduce which is the dominant effect between the two and not whether one exists while the other does not.

An invitation email was sent to all first and second year undergraduates in Nanyang Technological University, Singapore, notifying them of the experiment. Participation in the experiment was voluntary. Students received SGD $2 for participating in the experiment, in addition to their payoffs, if any, from the experiment. A total of 150 students completed the experiment. The summary statistics of the participating students are presented in Table 1. 53% of participants were male. Students from different course majors participated in the experiment, 41% of which majored in engineering or natural sciences, 24% majored in social sciences, 12% majored in humanities and 23% majored in business or accountancy. . It is noteworthy that Economics majors only accounted for 2% of the sample. This is important since Economics majors were more likely than students of other majors to have heard of the ultimatum game experiment and therefore may be prone to react in the way standard economic theory predicts (to accept all positive offers).

Participants were randomly assigned the roles of recipients and offerers. Of those assigned the roles of recipients, they were further randomly assigned to one of six cells: 3 types of voice conditions (voice, explicit no-voice, normal) with 2 types of offers (hypothetical offer of $2, hypothetical offer of $3). The offerers were randomly assigned to either the voice group or the others group.

3.2 Experimental Procedure

Participants were gathered at a computer lab for the experiment. The participants were informed that there would be strict anonymity for this experiment and they were identified for payment only through an identification number that was randomly generated by the computer program. The experiment was administered through an interactive computer program.

The ultimatum game experiment involves a division of $10 (Singapore) between an offerer and a recipient. At its core, it involves the offerer making a proposal to the recipient on how the $10 should be allocated between them. After the offer is made, the recipient has to decide whether to accept or reject the offer. If the recipient rejects the offer, both the offerer and the recipient will receive only the token of appreciation for participating in the experiment. If the recipient accepts the offer, the offerer and the recipient will receive the $10 according to the agreed division in addition to the token of appreciation.

To test how voice affects the recipients' decision to accept the offer, we devise three separate scenarios for the participants playing the role of the recipients, henceforth referred to as voice, explicit no-voice and normal scenarios, following van de Bos' (1999) terminology. In the voice scenario, recipients were allowed to communicate to the offerers what they thought should be the division and their reason why (through the computer program) before the offerers make a proposed division. This group of recipients will be referred to as the voice group. In the explicit no-voice scenario, recipients were told that some of the participants of the experiments were randomly selected to convey to the offerers their opinions and the reasons for their desired division, but they were not selected. This group of recipients will be referred to as the explicit no-voice group. Recipients in the normal group play the standard ultimatum game where participants were not informed that a voice option was available to some of the other participants.

The explicit no-voice group serves as complementary test to the voice group. It allows us to test if the possibility to voice one's opinion (when one is not chosen to do so) has the same effect as the actual opportunity to voice one's opinion, in terms of the effect on offer acceptance and perceptions of procedural fairness. If the possibility for voice is no different from the actual opportunity to voice, procedural fairness ratings of the voice and the explicit no-voice group will be identical. The probability of accepting the unfair offer will also be identical for the two groups. Alternatively, the possibility of voice may affect the recipients differently as compared to the actual opportunity to voice. If a recipient knew she was not chosen to voice, her disappointment may lead her to view the procedure as more unfair than if everyone had the opportunity to voice or even if everyone had no opportunity to voice. Procedural fairness ratings would then be lower in the explicit no-voice group than the voice group and even the normal group, which may in turn affect the probability of offer acceptance. Apart from its effect on procedural fairness, the presence of an explicit no-voice group also allows us to test whether the possibility of voice has inherent value in itself that will increase the likelihood that one will accept a low offer.

There were two possible sets of instructions for the offerers. The only distinction between these two sets of instructions was that offerers who were matched with the voice group were instructed to view the opinions of the voice group before proposing an offer. The offerers matched to the implicit and explicit no-voice groups simply proposed an offer[9]. The rules of the

[9] The full instructions are provided on request.

ultimatum game were explained to the participants with variations depending on the role and scenario they to which they were assigned.

After the recipients were presented the instructions to the experiment, the recipients in the voice group provided their opinions on their desired division, including their reason for the division. All three groups of recipients were then told to first complete a hypothetical round before they were entered into a random draw which would determine if they were to be matched to an offerer. To elicit respondents' reactions to the hypothetical offers as though they were real offers, respondents were told that their responses in the hypothetical round would be automatically evoked if the offerer made the same offer as the hypothetical offer. In other words, the recipient were told that they would not have a second chance to revise his or her acceptance decision should the offerer propose the same division as was provided in the hypothetical round. Finally, after the hypothetical round, the recipients were asked to rate the procedural fairness of the experiment.

The hypothetical round is a novel feature which we introduced into the standard ultimatum game to facilitate the testing of all three models, particularly Model 3. Recall that Model 3 states that voice essentially represents one's standing. When one's views are ignored, his or her standing is undermined and therefore he or she is more likely to reject a low offer. In most ultimatum games involving two players, the offerers are found to offer 50% of the allotted sum most of the time. As such, the probability that a recipient's opinion would be disregarded is likely to be extremely small. Coupled with the difficulty in obtaining a large sample size in an experimental setup, this makes it almost impossible to conduct a statistical analysis to test the appropriateness of Model 3 and distinguish between the models. Therefore, to test Model 3, we need to ensure that the offers made to the recipients in the voice group are always less than what they suggested to the offerers. At the same time, the offers made to the recipients cannot be too high or too low such that recipients will almost always accept or reject the offer. Since it is unlikely that the standard ultimatum game will be able to satisfy all these conditions, we introduced a hypothetical round where recipients were asked to respond to hypothetical offers. The hypothetical offers were fixed at either 20% or 30% of the allotted sum, the levels which are documented to have non-negligible rejection rates as well as non-zero acceptance rates. The non-negligible rejection rates suggest that the minimum acceptable offers for most respondents are in

the range of 20% to 30%. This serves as assurance that most recipients will suggest offers higher than 20% or 30% of the allotted sum to the offerers.

In the hypothetical round, the recipients were randomly offered either $2 or $3 and asked if they would accept this hypothetical offer. To provide a sufficient incentive for the recipients to deliberate the hypothetical offers, the participants were informed at the start of the game that there was a twenty percent chance that they would be randomly selected for a matched game. The participants were told whether they were selected for the matched game only after they had completed the hypothetical round. For the participants who were not selected for the matched game, the experiment was terminated after the hypothetical round. Without this experimental design, it would not have been possible to test for the three possible voice effects with even our large number of subjects.

It should be noted that while the experiment is customised to allow us to test Model 3, the introduction of the hypothetical round and having the hypothetical offers in the stated range do not hinder the tests for Model 1 or Model 2. This is because the magnitudes of the hypothetical offers are only consequential in the context of Model 3, but not in the other two models, since the impact of voice is universal for the entire set of offers in the latter. Restating the hypotheses, Model 3 predicts that recipients in the voice group are more likely to reject the hypothetical offers as compared to the recipients in the normal group because the recipients' views were ignored; Model 2 predicts that recipients in the voice group are less likely to reject the hypothetical offers as compared to the recipients in the normal group since voice increases utility for all levels of offers; Model 1 predicts that recipients in the voice group are just as likely to reject the hypothetical offers relative to the recipients in the normal group, as voice is only an instrument that may improve the offer that is made and its success or failure in doing so does not affect the recipient's utility.

Since the acceptance decisions in the hypothetical round are sufficient for our analysis, theoretically, no real offerers are required. However, the existence of offerers is imperative in eliciting the true responses of the recipients in the hypothetical round and to insure that the subjects were being treated honestly by the experimenters.

4. Results

Recall that in the hypothetical rounds, we assigned low values of "$2" or "$3" for offers as we anticipated that recipients offered the opportunity to suggest their preferred offers would likely suggest ones higher than the hypothetical offers. Indeed, except for only two of the recipients in the voice group, all other participants proposed offers higher than the hypothetical offer which they eventually received. Those two recipients were eliminated from our subsequent analysis to facilitate our testing of Model 3. The total sample size used in the following analyses is 148. Of the remaining recipients in the voice group, 71.7% proposed equal divisions to the offerers, citing fairness or equity as the reason for their proposal. This suggests that an equal share of $5 for each player may be what most recipients think of as distributively fair.

We analyze the effects of voice by comparing the difference in acceptance rates between the voice group and the normal group. These differences must be attributed to either to the inherent value of voice or the value of voice in promoting one's standing in the game. If the inherent value of voice is dominant, individuals with voice would be more likely to accept unfair low offers than the recipients in the normal group. If voice is primarily an embodiment of one's standing, the recipients with voice would be less likely to accept unfair low offers than those without since the hypothetical offers were strictly lower than their proposed divisions.

Table 2 reports the recipients' acceptance rates for the low offers. The overall acceptance rates for a hypothetical offer (either $2 or $3) for voice group, explicit no-voice group and the normal group are 50%, 47% and 36% respectively. Despite the differences in percentages, taken collectively, there is no statistically significant difference in the raw acceptance rates across the three groups ($\chi^2(2) = 2.273$, $p < 0.321$). Comparing the voice group and the normal group, there is a 14% difference in the acceptance rate ($\chi^2(1) = 2.019$, $p < 0.155$) while a 11% difference in the acceptance rate exists between the explicit no-voice and normal group ($\chi^2(1) = 1.2927, 0.256$).

[Table 2]

Apart from the raw offer acceptance rates, we compare the procedural fairness ratings across the three groups in Table 3. As expected, a higher proportion of recipients in the voice group rated the procedure of the game to be at least "somewhat fair" than in the other two groups

(52.17% in the voice group compared to 34.69% in the explicit no-voice group and 43.4% in the normal group, $\chi^2(2) = 2.955, p < 0.228$). Comparing the voice group and the explicit no-voice group only, recipients who knew they were not selected to voice their opinions have significantly lower procedural fairness ratings than recipients who had the opportunity to voice ($\chi^2(1) = 2.955, p < 0.086$). Comparing the explicit no-voice group and normal group, recipients who knew they were not selected to voice their opinions do not have higher procedural fairness ratings than recipients who did not know they were not selected to voice their opinions ($\chi^2(2) = 0.761, p < 0.383$). Therefore, the results seem to suggest that the procedure is perceived to be fairer when all participants in the experiment go through the same procedure. Another interesting phenomenon that is observed in Table 3 is that although the proportion of recipients who rated the game to be very unfair was the highest in the explicit no-voice group, this group also documented the highest proportion of recipients who rated the procedure as very fair.

[Table 3]

Table 4 displays the results of a probit regression for offer acceptance. Regression I tests whether the opportunity for voice (the voice group) or the possibility of voice (the explicit no-voice group) has effects on the offer acceptance rates, controlling for the effect on procedural fairness, while regression II tests the hypothesis that procedural fairness alone is sufficient to explain offer acceptance rates. Regression I, which is the preferred model, shows that a recipient in the voice group is significantly more likely to accept an unfair offer than the control group, even though her opinion on the division is not adopted. This result coincides with the prediction of Model 2 which states that voice has an inherent value of its own. Moreover, since the coefficient of the voice dummy remains significant after controlling for the recipients' ratings of procedural fairness, the inherent value of voice exceeds its effect on procedural fairness.

One possible explanation for this key result is that the recipients value the ability to state their case, irrespective of the impact that their opinions will have on the outcome or their general sense of fairness about the procedures. Tyler et al. (1985) described this as the 'value-expressive' aspect of voice. In regression I, the coefficient of the dummy representing the no-voice group is positive, although not significant. This suggests that the possibility of voice is insufficient to increase the probability that one would accept an unfair offer. The voice and explicit no-voice

dummies are excluded from regression II to test if the perception of procedural fairness alone is sufficient to influence the probability of offer acceptance. The results show that the perception of procedural fairness has a positive but not significant impact on the probability of offer acceptance. This implies that the perception of the fairness of the procedures may increase the probability that one will accept an unfair offer only marginally if at all.

In both regressions, the coefficient of the dummy representing the hypothetical of $2 is negative, which is the correct sign despite being statistically insignificant. In terms of recipients' characteristics, the results show that male recipients are less likely to accept an unfair offer than female recipients, suggesting that males may care more about fairness than females. This finding was also documented in Eckel and Grossman (2001) where women respondents were found to be more likely to accept a given offer in an ultimatum game regardless of the gender of the offerer. Apart from gender, we also included the majors of the recipients in regression (2) in Table 4. There are some differences in the acceptance behaviour between recipients of different majors. In particular, recipients who major in business or accountancy are significantly less likely to accept an unfair offer as compared to recipients who major in engineering or natural sciences.

[Table 4]

Recall that the explicit no-voice group has the highest proportion of recipients rating the procedures to be "very unfair" as well as the highest proportion of recipients rating the procedures to be "very fair". Coupled with the substantial proportion of recipients who rated the procedure to be at least "somewhat fair", it seems likely that for some recipients in the explicit no-voice group, the possibility of voice improved their perception of procedural fairness relative to when voice is disallowed. Thus we conducted an additional regression on recipients from the explicit no-voice group and the normal group, excluding the voice group. We included an interaction term between the dummy variable for being a member of the explicit no-voice group and the procedural fairness ratings to test if recipients with different evaluations of procedural fairness in the explicit no-voice group have different probability of offer acceptance. If the possibility of voice improves the perception of procedural fairness for some recipients in the explicit no-voice group and in turn makes those recipients more likely to accept the hypothetical offers, the coefficient of the interaction term will be positive and significant.

The results are presented in Table 5. Similar to the results in Table 4, the coefficient of procedural fairness rating is not statistically significant. The coefficient of the dummy which represents the explicit no-voice group in regression IV is also not statistically significant. This implies that the possibility of voice has little or no inherent value of its own. The coefficient of the interaction term of these two variables, however, is significant and positive in the regression IV. A simple calculation shows that only when a recipient in a no-voice group has a procedural fairness rating of more than 5.65 will he or she be more likely to accept an unfair offer than a recipient in the control group. This result provides preliminary evidence that when an individual is not selected to voice his or her opinion, the perception of the fairness of the procedure of the game may then become critical in determining whether he or she is willing to accept an unfair offer.

[Table 5]

5. Conclusion

In this study, we developed a simple model that illustrated the channels through which voice could affect utility. We then applied the model using a novel variation of the classic ultimatum game. The simplicity of the ultimatum game provides an excellent context to test the impact of voice as it involves real decisions to be made about whether to accept or reject an unfair outcome. We maximized the power of our experiment by introducing an experimental design with an initial hypothetical round of offers structured so that recipients were led to reveal their true attitudes towards the unfair offers in the initial round. Following our theoretical model, we explored three possible impacts of the opportunity to voice on one's utility: the outcome or consequentialist value of voice, the inherent value of voice, and the role of voice in providing standing.

After controlling for the effect of procedural fairness, recipients who had the opportunity to voice their views about the division to the offerers were significantly more likely to accept the unfair offers as compared to the recipients in a normal ultimatum game, even when their opinions were ignored. Recipients who are not chosen for the version of the voice group but were aware of the opportunity that some others had to express voice were also more likely to accept the unfair offers as compared to the recipients in a normal ultimatum game, although this

result is not significant. The improvement in acceptance rates of unfair offers in the voice group provides evidence that the effect of voice lies is its inherent value and not its role in providing social standing or improving outcomes. Further, the inherent value of voice appears to exceed its contribution to the perception of procedural fairness since the opportunity to voice did not significantly improve individuals' perception of procedural fairness and procedural fairness did not appear have a significant influence on the recipients' decision to accept an unfair offer. Further experimental investigations would be useful to pinpoint the values that voice embodies.

The results from the explicit no-voice group also reveal that in aggregate, the possibility of voice does not improve the individuals' perception procedural fairness compared to when voice is not allowed at all. However, individuals who perceive the procedures to be fairer because of the possibility of voice are more likely to accept an unfair offer than those who perceive the procedures to be less fair. This suggests that while voice may soften the impact of an unfair outcome, the possibility for voice may have dichotomous effects.

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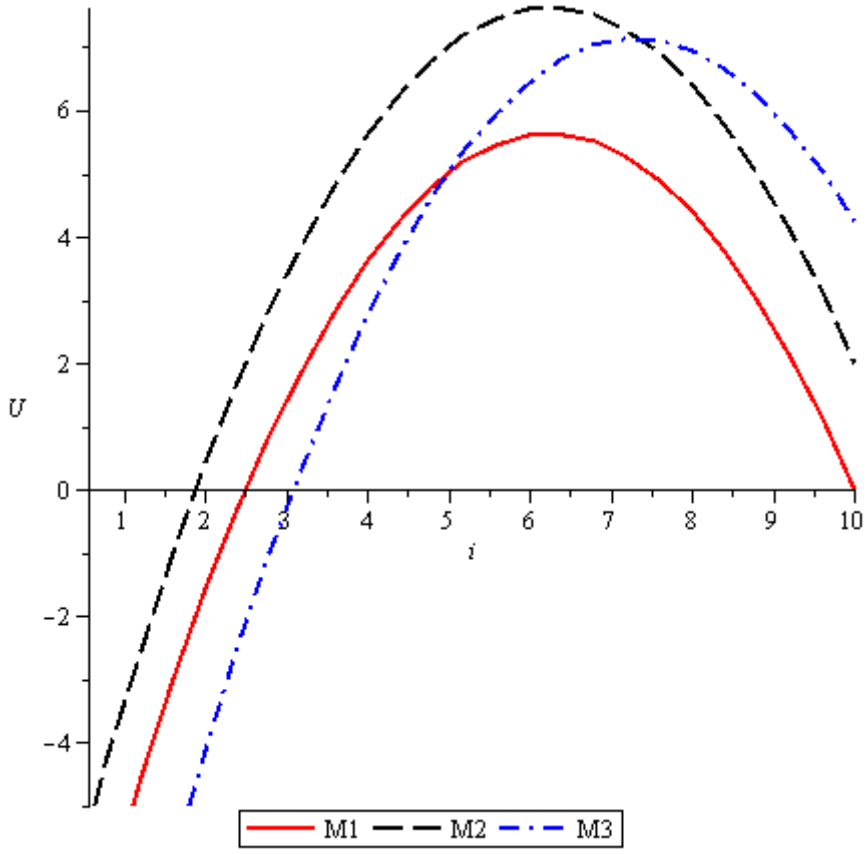
Figure 1 Utility Functions of The Three Models



Notes: $\theta = 1,\ \alpha = 0.4,\ v = 2, \beta = 0.85\ and\ i^* = \bar{\imath} = 5$

Table 1 Summary Statistics of Participants' Characteristics

Characteristics	Percentage
Male	52.7
Course Major	
Engineering and Sciences	41.2
Social Sciences	23.7
Business and Accountancy	23.0
Humanities	12.2

Table 2 Acceptance Rates of Unfair Offers for Voice, Explicit No-Voice and Normal Groups

	Voice		Explicit No-Voice		Normal	
Offers	$2	$3	$2	$3	$2	$3
Acceptance Rate	0.56	0.48	0.38	0.57	0.37	0.35
Sample Size	25	23	26	23	30	23
Combined Acceptance Rate	0.50		0.47		.036	
Sample Size	48		49		53	

Table 3 Procedural Fairness Ratings across Voice, Explicit No-Voice and Normal Groups

Procedural Fairness Ratings	**Voice (%)**	**Explicit No-Voice (%)**	**Normal (%)**
Very Unfair	2.17	8.16	3.38
Unfair	15.22	18.37	19.59
Slightly Unfair	30.43	38.78	33.78
Slightly Fair	32.61	20.41	26.35
Fair	19.57	10.2	14.19
Very Fair	0	4.08	2.7

Table 4 Probit Regression of Acceptance of Hypothetical Offers of Either $2 or $3 by Voice, Explicit No-Voice and Normal Groups

	Accept Hypothetical Offer	
VARIABLES	(I)	(II)
Offer of $2	-0.129	-0.132
	(0.221)	(0.220)
Voice	0.520*	
	(0.274)	
No Voice	0.303	
	(0.261)	
Procedural Fairness	0.00232	0.015
	(0.096)	(0.095)
Male	-0.158	-0.183
	(0.240)	(0.238)
Major		
Business/Accountancy	-0.699**	-0.577*
	(0.318)	(0.300)
Social Sciences	0.17	0.173
	(0.300)	(0.298)
Humanities	-0.175	-0.122
	(0.366)	(0.363)
Constant	-0.138	0.0636
	(0.481)	(0.450)
Observations	148	148
Log-likelihood	-95.62	-97.55

Notes: Robust standard errors in parentheses
** represents $p < 0.05$, * represents $p < 0.1$

Table 5 Probit Regression on the Acceptance of Offer by the Explicit No-Voice and the Normal Groups

VARIABLES	Accept Offer	
	III	IV
Offer of $2	-0.256	-0.254
	(0.261)	(0.265)
No-Voice	0.300	-0.922
	(0.262)	(0.774)
Procedural Fairness	-0.0108	-0.211
	(0.112)	(0.166)
No-Voice X Procedural Fairness		0.374*
		(0.223)
Male	-0.281	-0.289
	(0.285)	(0.284)
Major		
Business/Accountancy	-0.663	-0.731*
	(0.419)	(0.425)
Social Sciences	-0.0393	-0.0598
	(0.343)	(0.348)
Humanities	-0.341	-0.345
	(0.423)	(0.413)
Constant	0.114	0.794
	(0.526)	(0.665)
Observations	102	102
Log-likelihood	-65.82	-64.51

Notes: Robust standard errors in parentheses
** represents $p < 0.05$, * represents $p < 0.1$