Title: When words speak louder than actions: the self-image signaling role of voice in the ultimatum game

Short Title: The self-image signaling role of voice

Authors: Qiyan Ong [a], Yohanes Eko Riyanto [a], Steven M. Sheffrin [b], Walter E. Theseira [a]

Affiliations:
[a] Division of Economics, Nanyang Technological University, 14 Nanyang Drive, Singapore 637332
[b] Murphy Institute and Department of Economics, Tulane University, 108 Tilton Hall, New Orleans, LA 70115, USA

Email addresses: ongq0005@ntu.edu.sg (Q. Ong), yeriyanto@ntu.edu.sg (Y.E. Riyanto), smsheffrin@tulane.edu (S.M. Sheffrin), wetheseira@ntu.edu.sg (W.E. Theseira).

Corresponding author: Dr. Walter E. Theseira, Division of Economics, 14 Nanyang Drive, Singapore 637332. Tel: (+65) 6592-1768

ABSTRACT

The desire to voice opinions has driven democracy movements and fueled the growth of social media. However, it is unclear why people value voice, and whether exercising voice affects subsequent behavior. Models of identity and self-inference posit that voice has value as a self-image signal: by speaking up, we demonstrate to ourselves that we possess desirable qualities. We investigate whether words can substitute for more costly actions that also self-signal desirable qualities – such as the act of rejecting an unfair offer in the ultimatum game. Our experiment modifies the ultimatum game to allow responders to bid to voice their opinions to a third party with no influence over the outcome of the game. We find that 63% of responders are willing to pay an average of 34% of their endowments for the opportunity for voice, even when their messages are not communicated to the proposer and have no strategic value. Crucially, expressing voice to a third party results in responders being willing to accept offers that are 15% lower. We find contrasting results – responders demand higher offers – in a comparison treatment where voice is communicated to the proposer. Our results suggest encouraging the expression of voice may ease acceptance of unpopular decisions, but only when people perceive their self-image will not be harmed.

Highlights

We test whether voice is valued as a self-image signal, using the ultimatum game

Most responders are willing to pay to voice a message about the game to a third party

These third party messages have no strategic value because they cannot affect payoffs

Responders who voice to a third party are more willing to accept a lower offer

Voice may be a substitute for more costly actions that also affect self-image

Keywords: voice | self-image | identity | self-signal | ultimatum game

JEL Codes: D03, D63, C91

1.0 Introduction

Individuals often express strong opinions to third parties about decisions that concern them. The rapid growth of social media platforms, such as Twitter or Facebook, is driven in part by the desire of people to express their voice on issues ranging from public policy to problems at work.[1] But even in democracies, an individual opinion – as with an individual vote – has negligible impact on outcomes. In particular, why do people expend effort voicing opinions to third parties when they could instead be communicating directly with the decision makers who matter?

One possible reason, suggested by behavioral models of self-inference and identity, is that voicing opinions to third parties serves as a display or signal of desirable qualities that the speaker *wishes to possess* (Akerlof and Dickens 1982; Rabin 1994; Akerlof and Kranton 2000; Benabou and Tirole 2002). These models of identity build on evidence that suggests our own self-image is to a considerable extent constructed by our own actions (Bem 1972; Quattrone and Tversky 1984; Bodner and Prelec 2003; Tonin and Vlassopoulos 2013), just as our public image is a result of the behavior we display to the world (Bernheim 1994; Ariely, Bracha and Meier 2009; Gneezy et al 2012). For instance, a lamb at work may well be a lion at home when describing their workday. It is irrelevant that the employee never actually 'stands up' to the boss; there is no need to, because the employee will have convinced themselves that they are the *kind of person who does*. In other words, talk can be a substitute for action. A key implication is voice to third parties could act as an important 'safety valve', allowing people to improve their self-image sufficiently that they accept adverse decisions (detrimental policy reforms; negative work appraisals) they might otherwise act strongly against (protesting in the street; quitting in disgust).

This paper examines the value and effect of voice on behavior using a modified ultimatum game experiment, which confronts participants directly with the possibility of receiving an adverse decision. We first test whether people value voice sufficiently to pay for it, even when such voice is to a third party and so has no strategic value. Second, we test for whether voice to third parties improves self-image, obviating the need for people to use more costly signals such as rejection of an unfair offer to demonstrate their own resolve or positive qualities.

[1] Expressing voice on social media can be costly. From 2011 to 2012, the National Labor Relations Board reviewed 35 cases involving employee conduct on social media. In a number of those cases, employees were disciplined or fired for postings made on social media. The NLRB has ruled that existing laws such as the National Labor Relations Act which protect the right of employees to discuss certain work-related topics also extend to communications on social media.

1.1 Ultimatum Game Rejection Behavior as a Signal

An ultimatum game provides subjects with a strong but costly opportunity to signal certain qualities to themselves and others. In the ultimatum game, two subjects, a proposer and responder, must decide how to split a sum of money. The proposer offers a particular distribution of the sum, and the responder decides whether to accept or reject the proposed offer. If the responder rejects the offer, neither subject gets anything. The game is typically played once only between anonymized subjects. In general, proposers often offer close to half of the allotted sum and responders frequently reject offers that deviate too far from an even split of the allotted sum (Roth 1995; Hoffman, McCabe and Smith 1996; Cameron 1999). We focus on responders' rejection behavior. Rejecting any positive offer is irrational if responders are purely motivated by monetary payoffs, since accepting even a dollar is always better than rejection which earns nothing. One possible explanation, amongst others, is that rejection is a social signal that convincingly demonstrates the responder's belief in principles such as equality or reciprocity (Camerer 2003).

While past research has often assumed rejection sends a signal to the proposer (or to society in general), another interpretation is that rejection is also a *self-signal*. That is, responders may reject unfair offers because they wish to demonstrate to themselves that they are strategic, fairness-loving, or tough bargainers who are willing to forgo monetary rewards in the pursuit of their principles (Tirole 2002; Benabou and Tirole 2009). This argument is supported by evidence from a private impunity game in Yamagishi et al (2009), which documents that a substantial proportion of responders are unwilling to accept unfair offers even when nobody else observes, or is affected, by their rejection decisions.[2] Although Yamagishi et al (2009) interpret rejection in the private impunity game as support for the role of emotions as a commitment device, we believe their experiment provides strong evidence that rejection is valued as a powerful self-signal. Accordingly, this paper tests for whether voice and rejection behavior are substitute self-signals: does voicing an opinion on the ultimatum game make responders more willing to accept an unfair offer?

1.2 Predictions Based on the Self-Signaling Effect of Voice

If expressing voice is a self-signal that enhances self-image, we expect that people will be willing to pay to express their voice purely because they value the self-signaling

[2] In the private impunity game, the proposer is allowed to dictate the allocation of a sum, and is not informed that the responder has the option to reject the offered allocation. The proposer is effectively playing a dictator game. The responder may reject the sum, but rejection will have no effect on the proposer's payoff, and rejection is not even communicated to the proposer. The proposer is completely unaffected by the responder's decision, and the responder is aware of this. Therefore, no-one is affected by rejection except the responder themselves.

effect. That is, they will pay just to voice to a third party, even if the third party does not affect the outcome of the ultimatum game in any way. Next, we expect that when self-image is enhanced by voice, responders will expect to receive better offers, since feelings of entitlement and self-image are likely to be linked. Finally and crucially, we expect that responders who voice out will be more willing to accept an unfair offer, because they will have already 'proven to themselves' by voicing their opinion that they are no pushover. Accordingly, they have less need to rely on the rejection decision as a self-signal of their resolve. We discuss these predictions in greater detail in the methods section.

Our predictions are restricted to the case of third-party voice, and exclude the case where voice is expressed to an instrumental party such as the proposer. This is necessary to isolate the effect of voice as a self-image signal from other competing mechanisms that may allow voice to affect responder behavior. After all, voice in direct communications to the proposer also has a strategic role - the responder may wish to prevaricate, bluff, or threaten the proposer. The responder may well perceive that their social image and reputation is directly at stake, and emotions resulting from the 'confrontation' may affect their behavior. Direct communications, to the extent that it resembles a negotiation, may also evoke self-serving biases in the mind of the responder (Babcock and Loewenstein 1997). For these reasons, we believe that analyzing the self-image effects of voice to the proposer is best left to future research. Nonetheless, we recognize it is important to compare the effects of voice to a third party with voice to the proposer, and so include both treatments in our experiment, with a discussion of the results.

2.0 Methods

2.1 Experimental Procedures

We recruited 354 participants for our modified ultimatum game experiment. When participants checked in for the experiment, they were randomly assigned to the role of proposer or responder and segregated by role in two separated computer laboratories. All participants were told they would receive S$5 for attendance, and could earn more depending on their decisions during the study.[3] Next, the rules of the ultimatum game were explained: A sum of S$20 was allocated to each proposer-responder pair; the proposer's role was to determine the division of the S$20 sum, and the responder's role was to accept or reject the proposed division. All participant interactions took place solely through the experimental

[3] Currency in the experiment was denominated directly in Singapore Dollars (S$). In 2013, one Singapore Dollar was worth about $0.80 United States Dollars.

computer system. Participants were completely anonymous to each other and to the experimenters, as they were only identified by randomly-generated codes.

We introduced voice to the ultimatum game by giving responders the opportunity to bid to send a message to a third party (the experimenter) concerning the payoff distribution, prior to the proposer making their offer decision. This treatment is labeled "Bid for Voice to the Experimenter" (BVE). Crucially, we asked subjects to tell the third party what *they would have told the proposer if they had the chance.* Specifically, this message consists of two parts, 1: Their preferred distribution of the $20 sum, and, 2: The reasons why the proposer should adopt their distribution. We emphasized that the proposer would not receive the message, and only the experimenter would see their message. Because the third party does not influence the outcome, we can abstract away from the strategic use of voice in the BVE treatment, and assume that responders are affected solely by the self-signaling effect of voice in their subsequent decision making. To provide a contrast to the pure self-signaling effects of voice, we also conducted a companion treatment labeled "Bid for Voice to the Proposer" (BVP) which replicates the BVE treatment except that responders were told they were bidding to send a message to the proposer (and, of course, the message was actually sent).

Our manipulation for voice can be compared to previous studies which have examined restricted communications in the ultimatum game. Unlike Roth (1995) and Schmidt and Zultan (2005), where the content of communications (game-related or game-unrelated), varies, our experiment varies the target (third party or proposer) and whether communications are sent at all. In addition, our manipulation is based on pre-offer messages, unlike Xiao and Houser's (2005) study which instead examines post-offer communications and expressions of discontent. More closely related studies include Greiner et al (2012), who examine pre-play messages in the dictator game, and Ong et al (2012) in particular which also considers pre-offer messages in an ultimatum game. A crucial difference between our experiment and past work is that we require responders to pay for the right to send a pre-offer message. Because we impose costs for voice, we can determine whether responders truly value voice for its self-image signaling effects, and reduce the possibility that demand effects caused by the unusual nature of the voice treatment drive the results.

Rather than specify a fixed price for voice, we elicit willingness to pay for voice using the Becker-DeGroot-Marschak (BDM) mechanism (Becker, DeGroot and Marschak 1964). We asked responders to state their maximum willingness to pay for voice, from S$0.00 to S$4.00 in fifty-cent increments. These bids were then privately compared against individually randomly drawn prices ranging from S$0.50 to S$4.00, also in fifty-cent increments. If the

bid equaled or exceeded the drawn price, the responder was given voice (and the drawn price was deducted as payment from earnings).[4] Otherwise, the responder was not allowed to send a message. The BDM mechanism has several desirable features. Because successful responders pay randomly drawn prices instead of their actual bids, a responder's best strategy is to bid their maximum willingness to pay for the opportunity for voice. Responders were allowed to bid S$0 for the opportunity for voice, which is certain to fail since the minimum random price is $0.50. This ensures that obtaining voice is always costly, so all responders with voice have positive value for voice. Because our experiment requires responders to pay for voice, this introduces the concern that responders are self-selected into voice. However, the BDM mechanism is superior to simply charging a fixed price for voice because it assigns voice randomly, conditional on the price paid. In robustness tests, we restrict our analysis only to those responders who actually bid positive amounts for voice, and find no cause for concern that self-selection drives the results.

After the bidding stage, responders who won their bids were asked to compose their messages, which were then sent onwards. All responders were then told by computer to wait while their matched proposers were making decisions on the offer.[5] Immediately after proposers made their decision, we used the strategy method to elicit the responders' acceptance strategy profile for all possible offers made by proposers (Selten 1967; Brandts and Charness 2011). Specifically, the responders were required to indicate whether they would accept or reject each possible offer (the offer space was limited to $1.00 increments from $0 to $20 inclusive). From the results, we inferred the responders' minimum acceptable offers (MAOs) by identifying the proposers' offer amount which induces the responders to switch from rejection to acceptance. Responders' acceptance decisions were then matched to proposers' offers to determine whether responders had "accepted" or "rejected" proposers' offers. The strategy method allows us to capture responder behavior beyond the margin of direct rejection or acceptance. This is vital given that most ultimatum game offers tend to be accepted since they are close to even splits.

Before proposers' offers and the outcome of the game were revealed to responders, we elicited responders' expectations of offers by asking them "How much do you think the proposer will allocate to you?" We also conducted a demographic survey, through the computer system, collecting information on gender, course major, and nationality. Finally, we

[4] Since all participants earn S$5 as a show-up fee, there is no risk of any participant completing the experiment empty-handed.

[5] Responders in the BVP treatment were additionally reminded that their matched proposer was reading the message.

also collected 'ex-post' messages from respondents who did *not* win the opportunity for voice, by asking them what they *would have* told the proposer if they had the opportunity. Note that these 'ex-post' messages should have no effect on any behavior, because we elicit them only after all decisions are made. We analyze these 'ex-post' messages in the results section, and show that they are substantively different from messages sent by responders who won the opportunity for voice.

When the participants had answered all of the questions, the outcome of the game was revealed to them. They were then instructed to collect their payment in sealed envelopes, marked with their previously randomly-assigned identification codes. These sealed envelopes were placed on a designated table and arranged randomly for collection. The full text of the experiment is available in the supplementary information.

2.2 Voice as a Self-Image Signal

Voice may affect decision making by altering the self-image of the communicator, independent of any strategic role. Models of identity and self-inference posit that individuals are uncertain about their own 'true' dispositions and actively strive to better understand themselves, through undertaking self-signaling actions that would allow them to demonstrate to themselves the 'kind of person' they would like to be (Akerlof and Dickens, 1982; Rabin, 1994; Akerlof and Kranton 2000; Benabou and Tirole, 2002). However, to test for the effect of voice on self-image, we need an experimental context where self-image concerns are already known to affect decision making.

We use the ultimatum game because of existing evidence that responders re-affirm their own self-image through their acceptance or rejection decisions. While the literature generally argues rejections in the ultimatum game are driven by social preferences such as inequity aversion or reciprocity, Tirole (2002) provides an alternate explanation, suggesting that responders consider their own rejection decisions to be self-signals of their own qualities as strategic, fairness-loving, or tough bargaining individuals. As discussed earlier, Tirole's model of rejections as self-signals is supported by evidence in Yamagishi et al (2009), where a substantial proportion of responders reject unfair offers in the private impunity game.

Our experiment thus investigates whether voice is a substitute self-signal for rejection decisions in the ultimatum game, which also reinforce self-image. Our experiment provides responders with the opportunity to bid to send a message to a third party, the experimenter. The role that voice plays as a self-image signal is also supported by psychological research on self-perception theory. Voice provides an opportunity for self-image signaling because internal cues such as people's thoughts, intuitions, and feelings are ambiguous. When people

express their opinions, internal cues become external cues and allow them to engage in introspection as though they were external observers to those opinions (Bem, 1972).

The self-image signals contained in voice are no different from 'conventional' signals in that the receiver must believe the signal is credible. Requiring the responder to bid for the opportunity to voice thus serves a dual purpose. First, it screens out those who place no value on the self-image signal whatsoever. Second, it ensures the expression of voice is costly, enhancing the credibility of the self-image signal for those who bid successfully. In addition, by requiring the respondent to construct and send a message to a third party through the same formal mechanism used to communicate with the proposer, we ensure that the responder has to incur some psychic costs in formulating and expressing their message.

If indeed voice has an intrinsic value as a self-image signal, then people should be willing to pay for it. The following prediction should hold:

Prediction 1: *Responders are willing to submit positive bids for the opportunity to voice their opinion to a third party, i.e. the experimenter, even if the latter cannot influence the outcome from the ultimatum game.*

While the value of voice can be inferred from bidding behavior, assessing the effect of voice on self-image is more difficult. It is likely that people have varying self-image concerns in the context of the ultimatum game. Some may be concerned with being treated fairly, while others may wish only to maximize earnings. Rather than ask about 'self-image' directly, we instead ask responders about their subjective expectations of the offer they will receive from the proposer. We expect self-image to be positively correlated with offer expectations, as individuals with greater self-regard are likely to expect the proposer to treat them better:

Prediction 2: *Responders who are able to voice their opinion to a third party will have higher expectations for offers than those who do not have voice.*

Increased self-image should also have meaningful implications for behavior in the ultimatum game. As discussed earlier, the literature demonstrates that the rejection of unfair offers in the ultimatum game can be construed as a self-image signal in the spirit of models of self-inference (Tirole 2002; Yamagishi et al 2009). We further argue that responders view voice and the acceptance or rejection decision as substitute self-image signals. If a responder

has already used voice to bolster their self-image, it is less necessary for them to also rely on the rejection decision to confirm their identity. This implies that a responder who has recently sent a strong self-image signal through voice will require a lower minimum acceptable offer than a responder without voice, because potential damage to their self-image from accepting a lower offer will have been offset by the exercise of voice. Therefore, we predict that:

Prediction 3: *Responders who voice to a third party will improve their self-image, and therefore require lower minimum acceptable offers than those who do not voice*.

Finally, in addition to its role as a self-image signal, voice also has an instrumental and strategic role in the BVP treatment. The presence of instrumental and strategic reasons for voice should increase the number of responders who bid and their respective bid amounts in the BVP treatment relative to the BVE treatment:

Prediction 4: *(i) More responders are willing to bid for the opportunity to voice to the proposer than to a third party. (ii) Responders are willing to bid greater amounts for the opportunity to voice to the proposer than to a third party.*

3.0 Results

3.1 Sample

A total of 354 undergraduate subjects from Nanyang Technological University, Singapore participated in our experiment. All subjects were recruited through open solicitation. The solicitation email explained that subjects would earn cash payments based on their decisions during the experiment. No other inducement or penalty was offered for participation or lack thereof. Participation was balanced in gender across treatments with slightly more males (56%) overall.

[INSERT TABLE 1 HERE]

Table 1 presents descriptive statistics of the participants. Average earnings for responders in the BVP and BVE treatments were S$11.78 and S$12.39, respectively. Average earnings for proposers in the BVP and BVE treatments were S$12.72 and S$13.38, respectively.[6] The average duration of our experiment was 45 minutes.

[6] Our tables and analysis provide more detail on responders than on proposers as our interest is in responder behavior. Additional details on proposer behavior not reported in this paper are available from the authors, as is the dataset collected from the experiment.

The composition of participants was similar across ultimatum-game role assignments: 56% of proposers and 57% of responders were male; 61% of proposers and 56% of responders were Singaporeans; 13% of proposers and 13% of responders were Malaysians; and 11% of proposers and 12% of responders were Chinese. The remaining participants were from other Asian countries such as Indonesia and India. Students from differing course majors participated in the experiment: 49% of proposers and 47% of responders majored in Engineering; 19% of proposers and 19% of responders majored in Business; and 14% of proposers and 15% of responders majored in Humanities or Social Sciences. The remaining participants majored in Science or Communications.

3.2 Main Results

3.2.1 Responders have positive willingness to pay for voice, even to a third party with no influence over the payoffs

[INSERT FIGURE 1 HERE]
[INSERT FIGURE 2 HERE]

We begin by examining whether responders are willing to pay for voice at all, and whether there are differences in willingness to pay by voice treatment condition. Figure 1 shows most responders (63%) were willing to pay positive amounts for the opportunity to voice their opinions to the experimenter in the BVE treatment. Conditional on placing bids above S$0, the average amount bid for voice to the experimenter was S$1.72, or about one-third of the total experimental endowment. Figure 2 shows that while more responders were willing to pay in the voice to the proposer treatment (82% vs 63%; $\chi^2 = 7.893$, $P < 0.005$), the conditional average amount bid for voice was similar at S$1.60. These results indicate that expressions of opinion have inherent value, since a substantial fraction of responders were willing to pay for voice to a third party. The evidence is consistent with our hypothesis that voice is valued as a self-signal for improving self-image, and supports predictions 1 and 4.

3.2.2 Responders with voice to a third party expect higher offers, but are actually willing to accept lower offers

[INSERT TABLE 2 HERE]

[INSERT FIGURE 3 HERE]

We now turn to examining the effects of voice on responder behavior and self-image, summarized in Table 2 which presents responder behavior by our voice conditions. First, we consider the effect of voice on responder expectations, shown in Figure 3. Responders with voice to the experimenter expected higher offers than those without voice (S$9.96 vs S$9.39; $z = 1.699$, $P < 0.089$)[7]. This result cannot be explained by a belief that communications were successful in convincing proposers to raise their offer, since no messages were transmitted. It is consistent with the hypothesis that voice can positively affect a person's self-image and hence their expectation that they deserve (and will get) better offers, and supports prediction 2. We found a similar increase in the expected offer from responders with voice to the proposer (S$10.33), although here the cause could also be the belief that communications were effective.

[INSERT FIGURE 4 HERE]

Second, we examine how voice affects willingness to accept low offers. Figure 4 shows that responders with voice to the experimenter were willing to accept significantly lower offers than responders with no voice (S$6.52 vs S$7.72; $z = -2.644$, $P < 0.017$). We believe this difference is consistent with substitution between voice and the rejection decision, as self-image signals. Responders who boost their self-image with voice may feel less need to reject a poor offer to prove their self-worth, supporting prediction 3. Since this is our key finding, we thoroughly examine this result for robustness in the next section.

3.2.3 Responders with voice to the proposer, by contrast, demand higher minimum offers

[INSERT FIGURE 5 HERE]

However, we also find the contrasting result, illustrated in Figure 5, that responders with voice to the proposer require higher minimum offers than those with voice to the experimenter (S$8.43 vs S$6.52; $z = -2.68$, $P < 0.007$) or indeed those with no voice at all. We believe this indicates the self-image effects of voice depend strongly on whether the person voicing expects that his or her opinion should be taken seriously. That is, the self-image effects differ depending on whether the voice is to a decision maker, or to a third party.

We note that actually sending messages to proposers did not result in higher offers received (Voice to Proposer: S$9.13; All Others: S$9.05; $z = 0.584$, $P < 0.560$). The actual offers received were similar across voice conditions (No Voice: S$9.11; Voice to

[7] We refer to responders whose bids were not successful in both the BVE and BVP treatments collectively as responders without voice because their behaviors are not statistically different across treatments (difference in expected offers: $z = 0.260,\ P < 0.795$; difference in minimum acceptable offers: $z = 0.395,\ P < 0.693$). If we restrict this comparison to only responders without voice in the BVE treatment, the corresponding statistical results are $z = 1.483,\ P < 0.138$.

Experimenter: S$8.80; Voice to Proposer: S$9.13), and as a result, actual rejection rates were similar across voice conditions (No Voice: 23%; Voice to Experimenter: 20%; Voice to Proposer: 20%). We believe this is consistent with typical proposer behavior in an ultimatum game. The lack of any effect of direct communications on proposer offers is in our view consistent with the fact that most proposers already make close-to-fair offers in the standard ultimatum game without communications, so there is minimal room for improvement through direct communications.

3.2.4 Regression analysis confirms that responders with voice to the experimenter have consistently lower minimum acceptable offers than other groups

[INSERT TABLE 3 HERE]

Table 3 presents ordinary least-squares regressions of the determinants of MAOs, confirming our finding that responders who voiced to the experimenter had consistently lower MAOs than the other groups. Column (1) shows that responders who voiced to the experimenter (the baseline group) had significantly lower MAOs, by an average difference of S$1.20, compared to those without the opportunity for voice. However, responders who voiced to the proposers actually had higher MAOs, by an average difference of S$1.91, compared to those voicing to the experimenter. The differences in MAOs between responders voicing to the experimenter and the other groups remain even after controlling for responders' characteristics such as gender, course majors, and nationality (see column (2)).

4.0 Robustness Tests

4.1 Self-Selection

Because subjects had a choice in bidding for voice, one concern is that our results reflect self-selection amongst the responders rather than a treatment effect of voice. For example, 40% of the responders without voice bid S$0 for voice, whereas all responders with voice must have bid at least S$0.50. If valuations for voice are correlated with ultimatum game behavior, our findings may reflect self-selection into voice, rather than treatment effects of voice.

To address this concern, we first note that the BDM mechanism already introduces a degree of randomization into the voice assignment process, because a random price is drawn for each subject independently. Subjects with the same bids for voice – provided they bid neither S$0 nor S$4.00 – are effectively randomized into or out of voice by the BDM

mechanism.[8] Of course, the extent of randomization is reduced as bids increase. However, we note that bidding more than one's true valuation for voice is not incentive compatible, since it risks paying more for voice than it is worth. Empirically, only a small proportion of responders bid the ceiling amount of $4.00. The extent of self-selection based on valuations for voice is therefore mitigated by the BDM mechanism.

Next, we conduct a series of regressions where we control directly for the bid values, in case willingness to pay for voice is correlated with underlying attitudes toward MAOs in the ultimatum game. We also control for income effects later in this series of regressions. We also restrict our regression analysis to subjects who bid at least S$0.50 and above for voice. We view this as a more rigorous test of the treatment effects of voice because we expect that bias resulting from self-selection should be greatest along the S$0 margin: Subjects who refuse to pay any amount at all for voice are likely to differ the most from those with positive valuations for voice. If our results are largely driven by self-selection into voice, we should find very different magnitudes of effects when we restrict the analysis to only subjects with positive valuations for voice. Table 4 presents results from regressions on restricted subsets of the sample.

[INSERT TABLE 4 HERE]

The first column (1) in Table 4 examines and compares the treatment effect of voice to the experimenter on MAOs, compared to no voice and voice to the proposer. The regression model is identical to column (1), Table 3, except that the sample in Table 4 is restricted to subjects with positive valuations for voice. Strikingly, the magnitudes of the estimated effects in the restricted sample are similar to those estimated from the full data. This indicates self-selection may be less of a concern, since we would expect the largest effects of self-selection to manifest as differences between the behavior of those with positive valuations for voice and those with S$0 value.

In columns (2) and (3) of Table 4, we include responders' willingness to pay for the opportunity for voice in the regression as a further control. The differences in MAOs remain statistically significant, and those in column (2) are virtually identical in magnitude to those in column (1). In column (3), we attempt to examine whether willingness to pay for voice influences MAOs differentially by treatment assignment. However, our model places high demands on the restricted dataset and so is a poor fit ($F(5,22) = 2.14$, $p < 0.065$). We note

[8] For example, a bid of $2.00 (which is higher than the mean bid of $1.72 amongst those with positive valuations for voice) would only have a 62.5% probability of being accepted.

that the MAOs of responders with voice to the experimenter are still below those with no voice, even though the difference is not statistically significant in column (3).

As a final check on the self-selection issue, we note that our results are similar to those in the literature where voice was purely randomly assigned, without any possible self-selection through bidding or payments. The most directly comparable study is that by Ong et al. (2012), in which responders were purely randomly assigned to one of three conditions: No voice, voice to the experimenter, and voice to the proposer. Their findings are comparable in that responders with no opportunity for voice and responders with the opportunity for voice to proposers had higher MAOs than those with the opportunity for voice to the experimenter. Hence, we are confident that our estimates represent a treatment effect of voice rather than a self-selection effect arising from the bidding process through which voice was assigned to the subjects.

4.2 Income Effects

We are also concerned about the possible role of income effects on our results. Because responders were required to pay for the opportunity for voice, responders with voice have lower endowments than responders without voice. If responders have a particular minimum 'income target' for participating in an experiment, then responders who voice to the experimenter may be willing to accept lower offers than those without voice, in order to maximize the odds of meeting their income target. We show that income targeting is unlikely to drive our results, in two ways.

First, if income targeting was a major factor in our results, we should be less likely to find any difference in MAOs between responders with voice to the experimenter and voice to the proposer, because there was no difference in the distribution of the cost of voice incurred by these two groups of responders ($z = 0.112$, $p < 0.911$). Columns (3) and (4) of Table 2 shows that responders paid an average of S$1.48 for the opportunity for voice to the proposers and an average of S$1.44 for the opportunity for voice to the experimenter. Income targeting alone cannot explain why the MAOs of responders voicing to the experimenter were significantly different from those of responders voicing to the proposers.

Second, we directly control for the cost of voice in a series of regressions to determine whether MAOs were affected by income targeting (see Table 4, columns (4) and (5)). Because responders without voice incurred no costs, we restricted our sample further to only those responders who voiced. We found no statistical relationship between the cost of voice and MAOs. There was also no evidence of any difference in how the cost of voice affected

responders who voiced to the experimenter and those who voiced to the proposers. As shown in column (5), the interaction terms between the cost of voice and the treatments were not significant. These results indicate that income targeting motivations do not explain differences in MAOs, and that a treatment effect of voice itself is a more likely explanation for our findings.

4.3 Textual Analysis

If voice is used to improve self-image in the ultimatum game, we would expect responders with voice to use their messages to assert and improve self-identity. Previous research documents a close connection between language and evaluations of identity (Gelman and Heyman 1999; Walton and Banaji 2004). We use two strategies to analyze our messages. First, we used computerized textual analysis with the Linguistic Inquiry and Word Count software (LIWC; Pennebaker, Booth and Francis 2007) as this may be more consistent than human judges who often disagree on interpretation (Tausczik and Pennebaker 2010). Second, we compare the messages sent by our responders with voice, to our 'control' group messages which were collected by ex-post survey from responders who failed to obtain the opportunity for voice.

We compare the linguistic characteristics of three groups of messages: 28 messages to the proposer, 23 messages to the experimenter, and 120 messages collected by ex-post survey.[9] LIWC allows us to analyze the grammatical structure of the messages sent, and to measure whether the messages contained broader concepts such as fairness, money, and positive and negative emotions.[10] Table 5 presents the results.

[INSERT TABLE 5 HERE]

The most common message sent consisted of a suggested allocation of S$10 for the proposer, supported by a fairness-based argument such as *"This is the fairest."* Using LIWC, we defined a fairness-based argument to be any message containing keywords such as "fair," "equal," and "even." According to this criterion, 61% of the messages sent to the proposer or experimenter were fairness-based, and 43% of the messages combined a suggested distribution of $10 with a fairness-based argument. There were no statistically significant

[9] There were 55 responders who won the opportunity for voice. However, 4 of these responders reported only their preferred distribution of the $20 and did not report their reasons. We required responders who won the right to send a message to submit their desired allocation, but we imposed no restrictions on the content of the message.

[10] LIWC compares each word in a message to a database that associates words with concepts or constructs, allowing us to assess whether a message expresses a particular concept. For an overview of the advantages and limitations of computerized text analysis methods, see Tausczik and Pennebaker (2010).

differences in the likelihood of using a fairness-based argument, regardless of the recipient or whether the message was collected ex-post. ($\chi^2(2) = 2.3139$; Pr=0.314).

To investigate the self-identity content of messages, we analyze the grammatical person used in the message. Consider two messages which appeal to norms of fairness: *"Lets just divide this half and half. I think this should be the fairest way right-"*, vs. *"It is the most fair payoff"*. The first message is framed in the 1st person singular, which more clearly asserts identity than the second message which is indefinite. Responders with voice were substantially more likely to use the 1st person singular in their messages, compared to responders who provided us with their messages ex-post. 61% of the messages sent to the proposer and 70% of the messages sent to the experimenter used the 1st person singular, compared to only 31% of the messages collected ex-post. This difference is highly significant ($\chi^2(2) = 17.3925$; Pr=0.000).

While usage of the 1st person singular should be linked to self-identity, a 1st person plural reference ('we') may indicate a shared sense of identity, perhaps as a tactic to increase the odds that a proposer will adopt the responder's suggestion. E.g. "*$10 each is fair to both of us, so we both have the earnings. Otherwise the one getting lesser will not feel happy, and if reject, then we both won't get anything."* Supporting this analysis, we find responders were more likely to use the 1st person plural when sending messages to the proposer, compared to responders sending messages to the experimenter. 71% of messages sent to the proposer used the 1st person plural, compared to 43% of messages sent to the experimenter. Only 33% of messages collected ex-post used the 1st person plural. These differences are also highly significant ($\chi^2(2) = 14.4021$; Pr=0.001).

There were few other significant differences between messages sent under different conditions. As might be expected, messages sent as voice on average contained more words and were more likely to reference money and to express positive emotions or concepts ('win', 'benefit'), than messages collected ex-post. Less than a quarter of messages used negative emotions such as threatening words or references to potential losses, e.g., *"Anything lower than S$10, I'll reject and we both get nothing."*

Overall, our textual analysis indicates our experimental design was understood by participants, and is consistent with our hypotheses regarding the effect of voice on self-identity. Responders wrote longer messages and were more likely to use the self-assertive 1st person singular when sending messages under voice, regardless of whether the target was the proposer or the third party. This suggests responders used the purchased opportunity for voice to assert their self-identity. Responders also appeared aware of the identity of the target of

their message, as they were more likely to use the 1st person plural ('we') and frame messages in terms of common interests when sending messages to the proposer.

4.4 Welfare Effects

Although the evidence presented thus far indicates that voice did affect responder MAOs, do these effects have practical significance? At first glance, it appears that voice, or the lack of it, had no effect on agreement rates in the ultimatum game. Similar proportions of responders across voice treatment conditions rejected proposers' offers: 20% of those voicing to proposers, 20% of those voicing to the experimenter, and 23% of those with no voice rejected offers. There was no statistically significant difference between these group proportions ($\chi^2 = 0.192$, $p < 0.908$). Because winning the opportunity for voice was costly in our experiment, voice effectively reduced the total joint payoffs of proposers and responders. Both groups of responders with voice had similar average joint payoffs (to experimenter = S$24.56; to proposers = S$24.52), and these joint payoffs were lower than those for responders with no voice (S$25.41). Strikingly, this also implies that voice in our experiment was ineffective as a communications device; responders who voiced to proposers were not able to secure any better offers than those who did not communicate with proposers.

Although these results appear to imply that voice has a negligible impact on aggregate outcomes, a different picture emerges when we consider that our results show voice effectively extends the feasible set for agreement in the ultimatum game – but largely through the self-image signaling mechanism. In any negotiation or dispute, a larger feasible set, or mutually acceptable range of outcomes, increases the likelihood of a successful resolution. Responders who voiced to the experimenter expanded their feasible sets because voice improved their self-image and increased the likelihood that they would accept less favorable offers. However, this larger feasible set had a minimal effect on earnings in our experiment, because, as in other ultimatum games, our proposers generally made offers well above the MAOs of our responders. Taken together, our results show that voice has the potential to improve outcomes in situations where the self-image enhancing properties of voice expand the feasible set, and where disagreements over the feasible set occur at the margin.

4.0 Discussion

Relatively little is known about why people value the opportunity to voice their opinions, and how allowing them to voice their opinions affects their subsequent behavior.

This paper provides evidence suggesting a role for voice as a self-image signal. We demonstrate that people value the opportunity for voice even when they know their messages will not be communicated to decision makers. We also show that exercising voice increases a responder's willingness to accept unfavorable outcomes, but only when voice is communicated to a third party with no influence over the outcome. Textual analysis of the messages further supports these results; responders with voice were significantly more likely to use self-referential pronouns, which are markers for self-identity, compared to responders who provided messages ex-post. Our evidence also provides further support for the view that self-identity, far from being a fixed construct, is determined in part by individuals observing their own behavior.

Our work provides distinct but complementary insights to a growing body of research that examines how voice and language affects behavior in situations beyond those traditionally examined in economic games. For instance, observers perceive behavior as being more central to identity when described using nouns ('carrot-eater') rather than verbs ('eats carrots') (Gelman and Heyman 1999; Walton and Banaji 2004). Bryan et al (2011) find that potential voters asked to express opinions about the importance of voting are more likely to actually vote in the future, when the survey questions are phrased using nouns rather than verbs. While the past research relies on the connection between linguistic cues and behavior, our paper shows that one important channel through which expressing voice can affect behavior is simply because voice can be a direct substitute for more overt actions that might improve self-image. In common terms, some people may be 'all talk and no action' precisely because 'talk' is a substitute for action, where self-image is concerned.

However, our present research does not completely explain how voice affects self-image in the considerably more complex setting of negotiations or direct communications between a responder and the proposer. Our results indicate such direct communications actually decrease a responders' relative willingness to accept an unfavorable outcome. We believe one explanation for this difference lies in how responders interpret the offers made to them. We conjecture that responders who communicate directly with the proposer are more likely to interpret the offer with reference to the message they sent, compared to responders voicing to the experimenter. For example, a less-than-fair offer in the absence of communications does not necessarily reflect on the self-image of the responder. But a less-than-fair offer coming as a 'reply' to a request for fair treatment may imply that the proposer is deliberately ignoring the responder's opinion. Accepting such a less-than-fair offer would send a powerful self-image signal that the responder agrees that their opinion can be safely

ignored. This line of reasoning suggests that the self-image signaling effects of voice are contingent on the type of communication that takes place.

The right to express one's voice is generally considered a fundamental human right. However, authorities across the world exhibit sharply divergent attitudes towards the expression of opinion. While some governments (and corporations) harshly suppress negative opinions, others actually embrace voice by protecting the rights of individuals to express themselves, even if such expressions appear to hinder policy goals or make governance more difficult. From a purely strategic perspective, suppressing opinions only makes sense if actual acts of discontent (e.g. sabotage, public disorder) are likewise suppressed rather than exacerbated, and encouraging opinions is only helpful if people are more likely to come to terms with adverse policies than otherwise. Our results suggest that allowing people to express their opinions may indeed serve to quell greater and more disruptive expressions of discontent. However, our results also point to an important qualification. When opinions are directly expressed to a decision maker, people may perceive any resulting lack of meaningful policy change as a slight to their self-image. Giving people the impression that their views matter and can be expressed may make them feel better about the decisions that are ultimately made, but not when the unfavorable decisions are perceived to be informative about their self-image.

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Figure 1: Responders' reservation price for voice to the experimenter

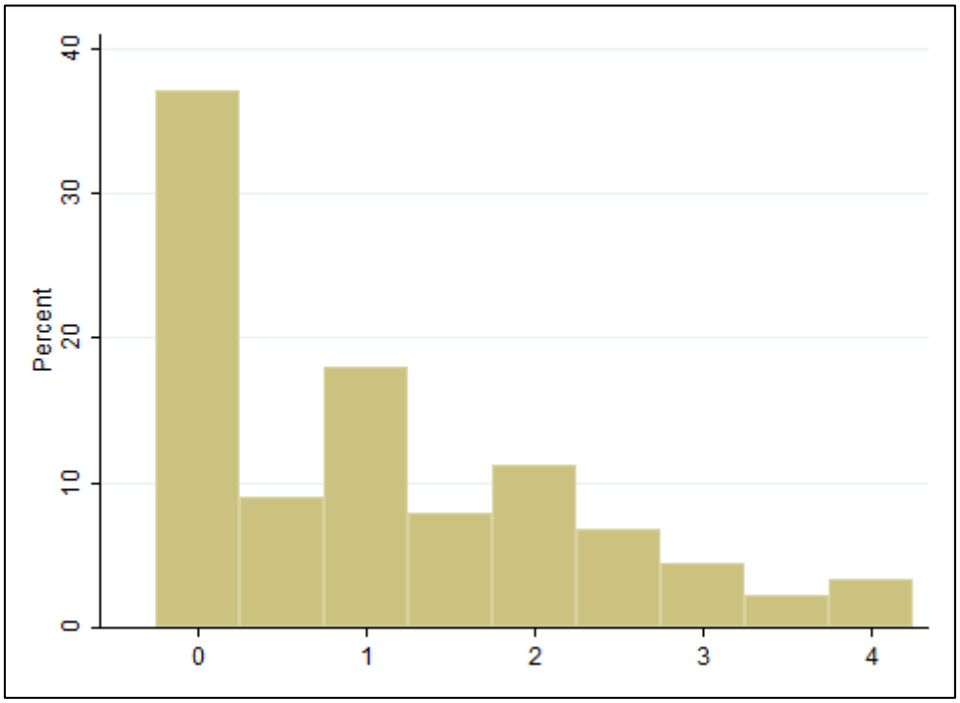

Figure 2: Responders' reservation price for voice to the proposer

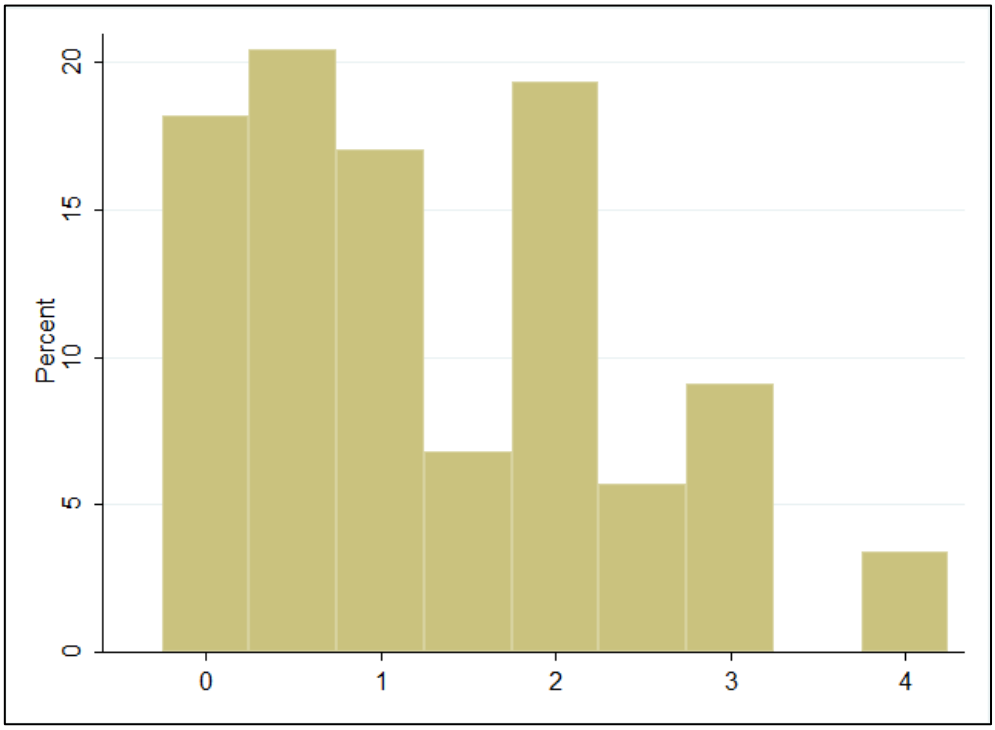

Figure 3: Expected offers of responders who voiced to the experimenter and responders who did not voice

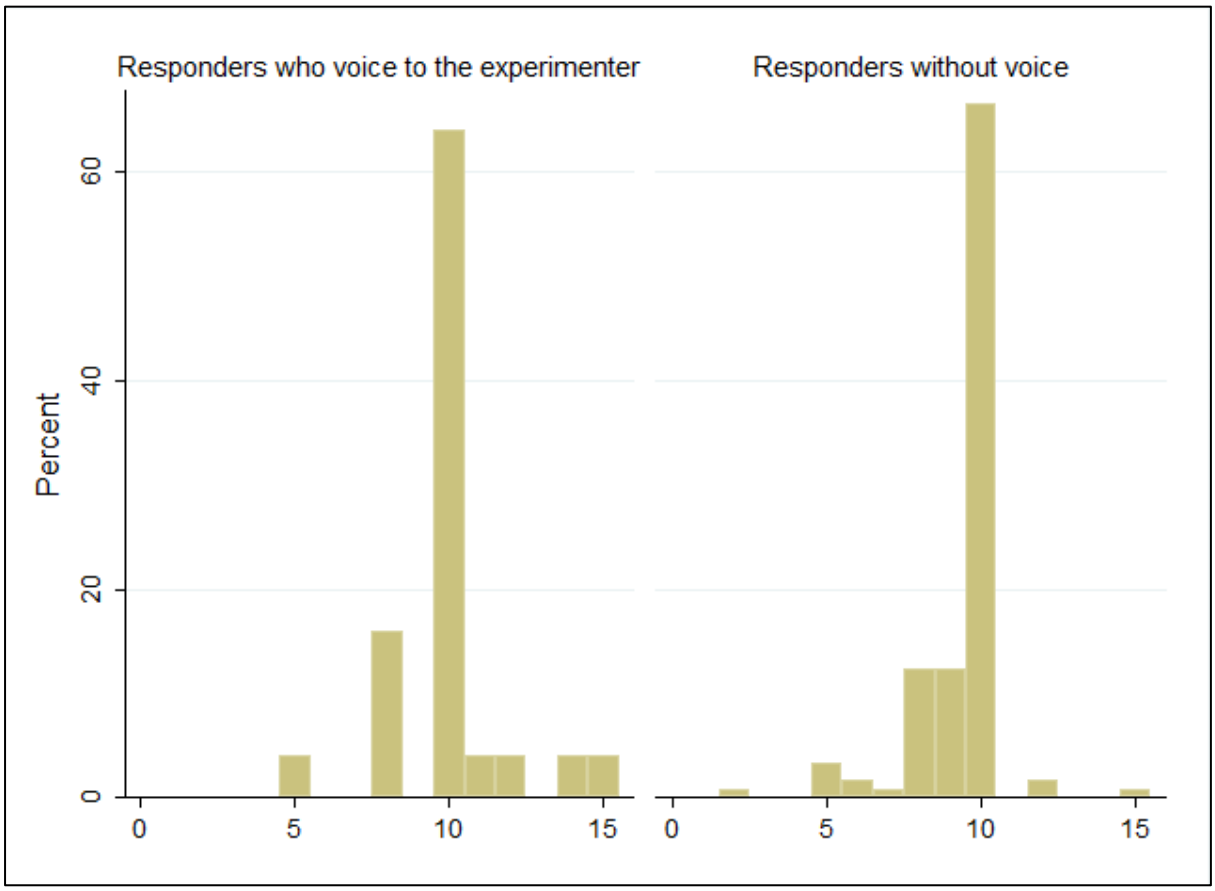

Figure 4: Minimum acceptable offers of responders who voiced to the experimenter and responders who did not voice

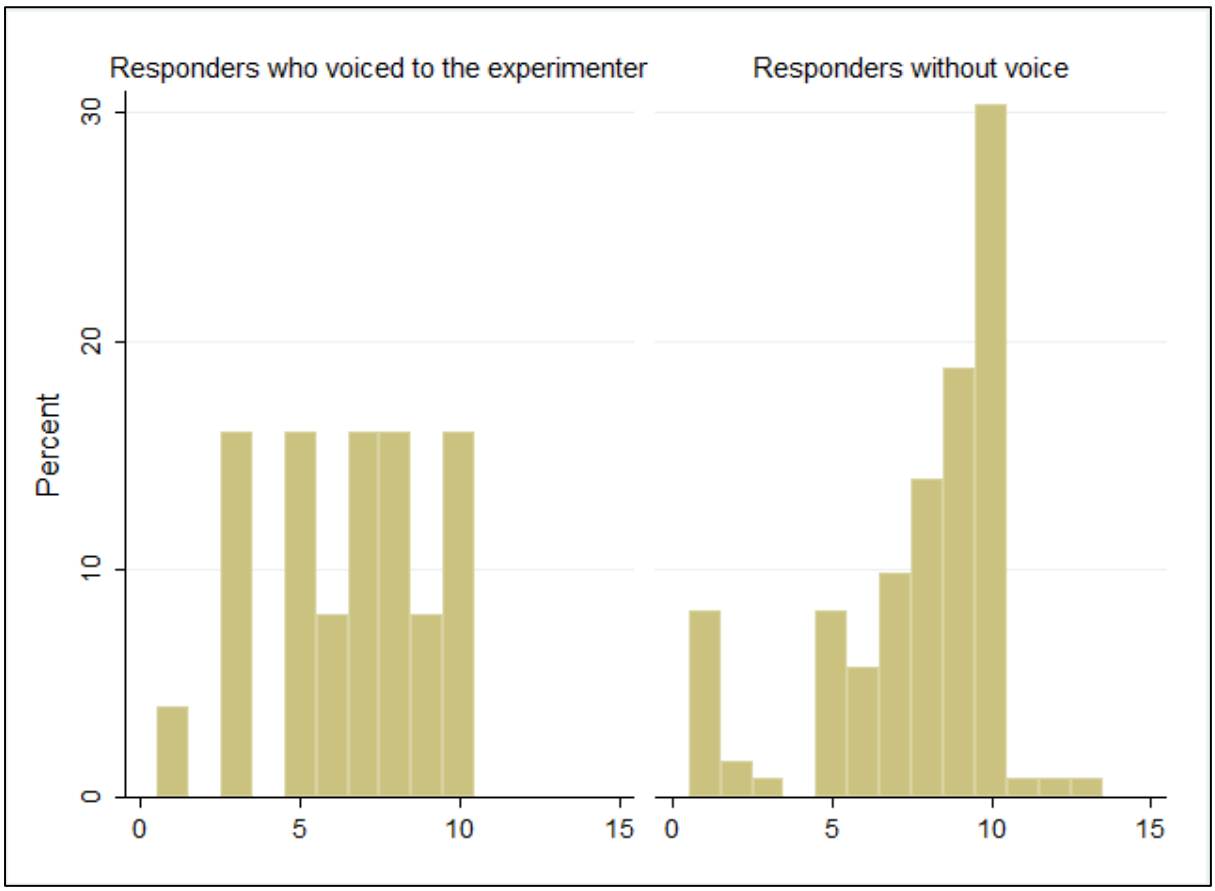

Figure 5: Minimum acceptable offers of responders who voiced to the proposer

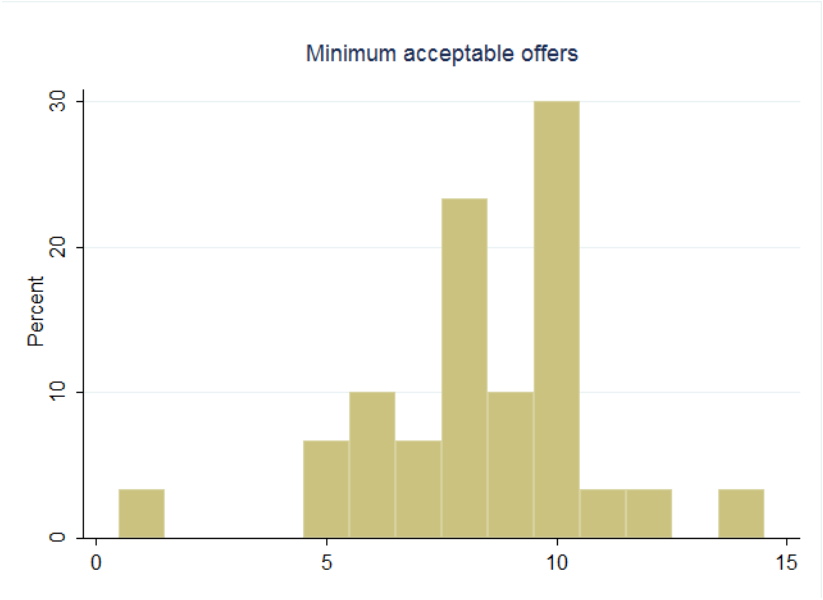

Table 1: Descriptive Statistics of Proposers and Responders, by Assignment to Treatments

	All Proposers (N = 177)	All Responders (N = 177)	Responders Assigned to BVP (N = 88)	Responders Assigned to BVE (N = 89)
Variable	Mean (Std. Dev)	Mean (Std. Dev)	Mean (Std. Dev)	Mean (Std. Dev)
Willingness to Pay for Voice (Bid Amount)		\$1.20 (1.11)	\$1.31 (1.08)	\$1.08 (1.14)
WTP for Voice, Conditional on Bid > 0		\$1.66 (0.98)	\$1.60 (0.97)	\$1.72 (0.99)
Cost of Voice		\$0.45 (0.82)	\$0.51 (0.40)	\$0.40 (0.76)
Minimum Acceptable Offer		\$7.67 (2.73)	\$7.75 (2.94)	\$7.60 (2.53)
Offer Extended	\$9.07 (1.93)			
Expected Offer		\$9.63 (1.55)	\$9.68 (1.47)	\$9.57 (1.64)
Offer Received		\$9.07 (1.93)	\$9.13 (1.63)	\$9.01 (2.19)
Earnings	\$13.05 (4.48)	\$12.09 (4.27)	\$11.78 (4.34)	\$12.39 (4.19)
Demographics				
Male	55.93%	56.50%	56.82%	56.18%
Course Majors				
Engineering	48.59%	46.89%	45.45%	48.31%
HSS	14.12%	15.25%	14.77%	15.73%
Business	19.21%	18.64%	19.32%	18.00%
Other Schools	18.08%	19.21%	20.45%	17.98%
Nationality				
Singaporean	61.02%	55.93%	54.55%	57.30%
Malaysian	12.99%	12.99%	14.77%	11.12%
Chinese	11.30%	11.86%	13.64%	10.11%
Other Nationalities	14.69%	19.21%	17.05%	21.35%

Table 2: Responder Behavior by Voice Condition

	All Responders With No Voice (N = 122)	All Responders With Voice (N = 55)	Responders Voicing to Proposer (N = 30)	Responders Voicing to Experimenter (N = 25)
Variable	Mean (Std. Dev)	Mean (Std. Dev)	Mean (Std. Dev)	Mean (Std. Dev)
Willingness to Pay for Voice (Bid Amount)	\$0.71 (0.78)	\$2.28 (0.98)	\$2.13 (1.03)	\$2.46 (0.89)
Cost of Voice	\$0.00	\$1.46 (0.83)	\$1.48 (0.90)	\$1.44 (0.77)
Expected Offer	\$9.39 (1.49)	\$10.16 (1.58)	\$10.33 (1.27)	\$9.96 (1.90)
Minimum Acceptable Offer	\$7.72 (2.77)	\$7.56 (2.67)	\$8.43 (2.46)	\$6.52 (2.58)
Offer Received	\$9.11 (1.95)	\$8.98 (1.89)	\$9.13 (2.00)	\$8.80 (1.78)
Earnings	\$12.49 (4.31)	\$11.19 (4.06)	\$11.32 (4.13)	\$11.04 (4.05)
Rejected Offer	23%	20%	20%	20%
Textual Characteristics				
Word Count	19.75	29.82	34.07	24.65
1st Person Singular ("I")	31%	65%	61%	70%
1st Person Plural ("We")	33%	59%	71%	43%

Table 3: OLS Regression of Responders' MAOs

	(1)	(2)
(Base Group: Voice to Experimenter)		
No Voice	1.201**	1.198**
	(0.569)	(0.595)
Voice to Proposer	1.913***	1.816***
	(0.678)	(0.665)
Male		0.53
		(0.434)
Majors (Base Group: Engineering)		
Humanities & Social Sciences		0.117
		(0.606)
Business		-0.133
		(0.595)
Other Majors		0.025
		(0.571)
Nationalities (Base Group: Singaporean)		
Malaysian		(0.373)
		(0.554)
Indonesian		-1.273
		(0.888)
Chinese		-0.403
		(0.595)
Other Nationalities		-0.576
		(0.669)
Constant	6.520***	6.511***
	(0.511)	(0.754)
Observations	177	177

Notes: Robust standard errors in parentheses. *p<10 percent, **p<5 percent, ***p<1 percent

Table 4: OLS Regressions of Responders' MAOs on Willingness to Pay for Voice (WTP) and Price of Voice

	(1)	(2)	(3)[a]	(4)	(5)
(Base Group: Voice to Experimenter)					
No Voice	1.316**	1.355*	2.338		
	(0.598)	(0.695)	(1.52)		
Voice to Proposer	1.913***	1.923***	3.586**	1.952***	3.088**
	(0.680)	(0.698)	(1.673)	(0.701)	(1.474)
WTP for Voice		0.0307	0.449		
		(0.267)	(0.559)		
No Voice * WTP for Voice			-0.379		
			(0.698)		
Voice to Proposer * WTP for Voice			-0.715	0.096	0.179
			(0.709)	(0.417)	(0.417)
Price of Voice				-0.165	0.247
				(0.540)	(0.773)
Voice to Proposer * Price of Voice					-0.76
					(0.953)
Constant	6.520***	6.445***	5.415***	6.520***	5.725***
	(0.512)	(0.818)	(1.421)	(1.006)	(1.365)
Observations	128	128	128	55	55

Notes: Robust standard errors in parentheses. *p<10 percent, **p<5 percent, ***p<1 percent
Responders with $0 bids for voice excluded from results in this table; responders without voice additionally excluded from (4) and (5)

[a] This model cannot be rejected by the F-test at 10% significance level.

Table 5: Characteristics of Text Messages Sent by Responders

Message To:	Word Count	1st Person Singular ('I')	1st Person Plural ('We')	Mentioned Fairness	Mentioned Money	Positive Affect	Negative Affect
Proposer (n=28)	34.07	60.71%	71.43%	64.29%	67.86%	67.86%	21.43%
Expt. (n=23)	24.65	69.57%	43.48%	56.52%	52.17%	69.57%	30.43%
Test Statistics (Prop. Vs. Expt.)	Pr = 0.088	$\chi^2(1)$= 0.4332 Pr=0.510	$\chi^2(1)$= 4.0728 Pr=0.044	$\chi^2(1)$= 0.3193 Pr=0.572	$\chi^2(1)$= 1.3030 Pr=0.254	$\chi^2(1)$= 0.0171 Pr=0.896	$\chi^2(1)$= 0.5393 Pr=0.463
Ex-Post (n=120)	19.75	30.83%	32.50%	71.67%	38.33%	48.33%	15.83%
Test Statistics (All)	Pr = 0.002	$\chi^2(2)$= 17.3925 Pr=0.000	$\chi^2(2)$= 14.4021 Pr=0.001	$\chi^2(2)$= 2.3139 Pr=0.314	$\chi^2(2)$= 8.5426 Pr=0.014	$\chi^2(2)$= 5.9565 Pr=0.051	$\chi^2(2)$= 2.8674 Pr=0.238

Note: Each column reports the percentage of messages in that treatment category containing any keywords related to that column's concept. Statistical tests are based on chi-squared tests of independence except for the word count column where a one-sided t-test is employed.