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ABSTRACT

Why are individuals willing to pay costs in order to express their voice in decision-making settings? Research suggests voice provides a strategic opportunity to improve outcomes, or the perceived fairness of outcomes. This paper proposes that people are willing to expend resources to express their views to learn about themselves through "self-image signaling." We distinguish between these differing interpretations of voice through a modified ultimatum game where responders are assigned opportunities to bid for voice, either to the proposer or to a third party. Strikingly, 63% of responders are willing to pay on average 34% of their endowments for the opportunity for voice, even when their messages are sent to a third party and thus hold no strategic value. The act of expressing voice appears to change a responder's willingness to accept offers, suggesting that voice's effects on self-image could be as important as any strategic or communications function.

JEL: D03, C91

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The Self-Image Signaling Roles of Voice in Decision-Making

Before important decisions are made in many settings such as the workplace, politics or business, individuals often have the opportunity to provide inputs into the decision-making process. It is commonly believed that giving people the opportunity to provide inputs improves their satisfaction with the decisions and results in better outcomes. For example, negotiations may be less likely fail if the parties involved have the opportunity to voice their opinions, policies more likely to be successful if the stakeholders have been consulted beforehand, and workers less likely to behave in ways that are costly to firms if they have the opportunity to express their opinions about their remuneration and their needs at work.

Previous research has focused on the role of voice in improving perceptions of procedural fairness and subsequent satisfaction with the decisions made (Folger 1977; Lind & Tyler, 1988). However, recent evidence by Ong, Riyanto & Sheffrin (2012) shows that voice affects people's decisions in ways apart from its effect on procedural fairness. These diverse findings suggest that the mechanisms through which voice matters and how it matters are not well understood.

In this paper, we propose that people value voice for its ability to convey positive information about their own self-image, by providing a favorable and credible self-image signal about their own positive qualities. The need for self-image signaling arises because individuals are often uncertain about the kind of person they are. For example, they may be unsure about their skills as a negotiator, their status in the community, or their self-identity in general. It is not merely enough to reflect upon the issue; individuals have to engage in costly actions, displays, and vocalizations in order to start a process of self-inference to understand themselves (Benabou & Tirole, 2009; 2011; Bodner & Prelec, 2003). We label such actions self-image signals in the spirit of recognizing these as costly demonstrations that credibly reveal some information about a person's own qualities. We posit that voice can serve as a self-image signaling mechanism.

When people voice their opinions, they typically do so to some audience, whether in person or through some media. The audience's reaction to a person's speech or writings reveals how others regard that person, and whether the claims made by that person are accepted by society. Therefore, one channel through which voice affects self-image is through what we call a social channel; by studying the reaction of an audience to one's voice, a person can infer their own self-image. The effects of the social channel of voice are

consistent with existing findings that people care about how others perceive them (Ariely et al. 2009; Grossman 2010; Gneezy et al., 2012).

However, there is an alternate channel through which voice could influence self-image – the self-channel. When people voice their opinions, they also listen to themselves. Voice provides a self-channel for self-image signaling because internal cues, such as people's thoughts, intuitions and feelings, are ambiguous. When people express their opinions, internal cues transform to external cues, and allowing people to engage in introspection as if they are external observers (Bem, 1972). Many academics have enjoyed the feeling of becoming increasingly convinced of the accuracy of one's arguments merely through the act of formulating them on paper!

While the self-channel for self-image signaling is always present when one voices, in ordinary life the effects of the social and self-channels are often combined. The difficulty comes when the two channels – social and self – deliver conflicting information. A speaker will not know whether the channels conflict until they observe and interpret the audience's response. For example, a worker who is recounting his contributions to the company during a performance appraisal may perceive himself to be a capable employee (self-channel) while his boss may perceive otherwise. Only when his boss denies him a promotion or pay increase (social-channel) will he realize that he may not be as capable as he believes he is. However, before his boss denies the worker a promotion or pay increase, the worker may genuinely believe that he is capable and that his boss shares his sentiments due to self-serving biases (Babcock & Loewenstein, 1997).

We construct an experiment that tests whether voice has an effect as a self-image signal, and we also distinguish between the social and self-channels of voice. In our experiment, subjects play an ultimatum game where some responders are randomly chosen to have the opportunity to bid to send a message concerning the payoff distribution either to the proposer, or to a third party (the experimenter), with no influence over the outcome. The ultimatum game framework allows us to measure whether voice has an effect on a responder's self-image through the responder's acceptance decision. We consider the responder's acceptance decision to be a more credible proxy for self-image than non-incentivized self-reports, because the acceptance decision has real consequences for the subject's monetary payoffs, thereby serving as a credible signal of one's self-image. (Tirole 2002; Yamagishi et al 2009) The standard one-shot ultimatum game is used instead of an extended bargaining or negotiation game, because we wish to focus on the role of voice in

affecting the responder's own decision making, and as such by design limit the proposer's response to communicating only the offer itself.

We provide evidence for the self-image signaling role of voice by first demonstrating that people are willing to pay for the opportunity for voice, even when voice serves no plausible instrumental purpose, consistent with our argument that voice is valued for its self-image signalling properties. We find that 63% of responders are willing to pay an average of $1.72 or 34% of their initial endowments for voice, even when told explicitly that their messages will only be sent to a third party rather than to proposers.[1]

Second, we show that voice affects decision making: Responders are more likely to accept relatively unfavourable offers when they have had the opportunity to 'listen to themselves' by sending a positive self-image signal through voice to a third party. Responders with voice to a third party are willing to accept $1.20 less in offers (out of a $20 pool), compared with responders without the opportunity to voice. However, this effect is moderated when responders voice to the proposer, because the potential conflicting response from the social-channel (the proposer's offer) reduces the value of the self-image signal from voice. Responders with voice to their matched proposers actually ask for $1.91 more than responders voicing to a third party.

We show that our results are more consistent with a causal effect of voice on decision making, rather than a self-selection effect resulting from those with greater willingness to pay for voice being selected into voicing. The impact of self-selection into voice is greatly attenuated by our use of the Becker-DeGroot-Marschak (BDM) mechanism for assigning voice based on the bids, which as explained later, introduces a degree of randomization for the opportunity to voice, conditional on the same bid being submitted. We also directly control for willingness to pay for voice in our regressions, and show that this willingness to pay has no correlation with the acceptance or rejection decision. As a further robustness test, we restrict the analysis to comparing only those individuals with positive willingness to pay for voice, and obtain essentially the same results. Taken together, we argue that while there may be self-selection into voice inherent to our experiment design, the existence of this self-selection does not by itself invalidate our claim that there is a causal effect of voice on decision making through the self-image channel.

To our knowledge, our study is the first to measure and use people's willingness to pay for the opportunity for voice to identify the self-image signaling role of voice. Our paper

[1] All monetary values are in Singapore Dollars. One Singapore Dollar was worth about $0.80 U.S. Dollars during the period the experiments were conducted.

differs from related studies on "cheap talk" in the sense that our focus is not on documenting whether and how responders engage in cheap talk to strategically influence proposers' allocation decision[2]. Rather, we reconcile responders' cheap-talking behavior as part of a self-image signaling exercise (Farrell & Rabin, 1996)[3]. Our objective is to establish that people value voice for its self-signaling abilities, and that the signals from voice and hence decisions made differ depending on who people have an opportunity to talk to.

Method

Participants

A total of 354 participants participated in our experiment, half of which were assigned to the BVP treatment (voice to proposer) and the other half to the BVE (voice to experimenter) treatment. An invitation email was sent to all undergraduates of Nanyang Technological University, Singapore, notifying them of the experiment. Participation in the experiment was voluntary. Average earnings for responders in BVP and BVE treatments were \$11.78 and \$12.39 respectively. Average earnings for proposers in BVP and BVE treatments were \$12.72 and \$13.38. The average duration of our experiment was 45 minutes.

Descriptive statistics of the participants of our experiment are provided in Table 1. The composition of participants was similar across ultimatum game role assignments: 56 percent of proposers and 57 percent of responders were male. 61 percent of proposers and 56 percent of responders were Singaporeans, 13 percent of proposers and 13 percent of responders were Malaysians, 11 percent of proposers and 12 percent of responders were Chinese. The remaining participants were from other Asian countries such as Indonesia and India. Students from different course majors participated in the experiment; 49 percent of proposers and 47 percent of responders majored in engineering, 19 percent of proposers and 19 percent of responders majored in business, 14 percent of proposers and 15 percent of responders majored in humanities or social sciences. The remaining participants majored in sciences or communications.

[INSERT TABLE 1 HERE]

[2] See Croson, Boles and Murnighan (2003) and Ong, Riyanto and Sheffrin (2012) for a documentation of cheap talking strategies and how they could influence the outcome of the ultimatum game.

[3] Cheap-talking strategies could be consistent with self-image signalling. For instance, responders whose self-image depends on adhering to principles of fairness may invoke those principles in relating their intentions to reject an unfair offer to proposers.

Experimental Procedure

Participants received $5 for showing up to participate in the experiment. Upon arrival, participants were randomly assigned to one of the two computer laboratories used for the experiment. Participants in one of the laboratories were assigned the role of the proposers, while participants in the other laboratory were assigned the role of responders. Proposers and responders were randomly matched to each other, and each pair was allocated a sum of $20 to share. The proposers were to decide how to divide the $20, whilst the responders were to decide whether to accept or reject the proposers' offer. In the case of a rejection, neither player received any part of the $20. Players were also informed that the game was only played once. The entire experiment was administered using a web-based computer program.

We depart from the classic ultimatum game by offering responders the costly opportunity to provide their inputs into the decision process before offers are made, through expressing their opinions about their desired offers. Unlike Roth (1995) and Schmidt & Zultan (2005), where the content of pre-decision communications is the treatment variable (game related or game unrelated), our experiment varies whether the target of communication is the proposer, or the experimenter. Further, we allow responders to provide inputs in the decision making process before offers are made, while previous studies have instead examined post-offer communications and expressions of discontent (Xiao & Houser, 2005)[4].

We have two treatments in our experiment. The treatments differ in whether the responders in the ultimatum game have the opportunity to bid to send a message to the proposers with whom they were matched, or to the experimenter, who has no control over the outcome of the game. In the bid for voice to proposers (BVP) treatment, responders were given the opportunity to pay to send a message to proposers to communicate their desired distribution of the allotted sum of money (through the computer program) and provide a short justification on why their views should be adopted. In the bid for voice to experimenters (BVE) treatment, responders were told that they could not communicate with the proposers, but they could pay to send a message to tell the experimenter their preferred distribution and the reason why their views should be adopted. It was emphasized that while the experimenter would not interfere with the outcome of the game, the experimenter would be able to see their expressed opinions.

[4] See Greiner, Guth & Zultan (2012) for pre-play communication in dictator games.

We used the Becker-DeGroot-Marschak (BDM) mechanism to elicit responders' value for voice (Becker et al., 1964). In this mechanism, responders had to submit a bid for the opportunity for voice, ranging from \$0 to \$4.00 in fifty-cent increments. Responders were informed their bids would be matched against a randomly drawn number from \$0.50 to \$4.00, also drawn in fifty-cent increments. If a responder's bid was lower than the randomly drawn price, the responder lost the opportunity for voice. If a responder's bid was greater than or equal to the randomly drawn price, the randomly drawn price was deducted from the responder's endowment[5] and the responder could proceed to send a message to either the proposer or the experimenter, depending on the treatment. Since successful responders only pay the randomly drawn prices instead of their actual bids, a responder's best strategy is to submit a bid that corresponds to their maximum willingness to pay for the opportunity for voice. Note that responders were also allowed to bid \$0 for the opportunity for voice. However, since the minimum random price is \$0.50, a \$0 bid surely fails, and serves as a screening mechanism to ensure that all subjects who expressed voice had positive valuations for voice. Besides serving as a means to ensure truthful elicitation of responders' valuations for voice, the BDM mechanism also introduces a degree of randomization for voice.

After the bidding stage was completed, responders who won the bids were asked to send a message consisting of their desired allocation and the reason why proposers should consider their opinions. However, only responders in the BVP treatment had their messages sent to the proposers. Following the composition and transmission of the message, responders were told through the computer screen that their matched proposers were reading their messages, and that they would proceed to the next stage once the proposers had finished reading the message and making their decision on the offer. In the BVE treatment, responders were told instead that their messages had been sent to the experimenter, and that they would have to wait for the proposers to finish making decisions on the offer before proceeding to the next stage.

We adopt the strategy method (Selten, 1967; Brandts & Charness, 2011) to elicit the responders' acceptance strategy profile for all possible offers that could be made by proposers. The responders were presented with 21 possible offers, ranging from 0 dollars to 20 dollars in one dollar increments. For each possible offer, the responders had to indicate whether they would accept or reject that offer if that was what the proposers offered. From these we infer the responders' minimum acceptable offers (MAOs). Responders' acceptance

[5] Since the participants were given a \$5 endowment for showing up for the experiment, they could well afford to pay for the highest bid of \$4, without incurring a loss from participating in the experiment.

decisions were then matched to proposers' offers to determine if responders had "accepted" or "rejected" proposers' offers. Responders accepted (rejected) an offer if the offer made to them was above (below) their MAO.

Before proposers' offers and the outcome of the game were revealed to responders, we elicited responders' first order beliefs by asking them "How much do you think the proposer will allocate to you?" We also solicited information on gender, course major and nationality. When the participants had answered all 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 identification numbers. These sealed envelopes were put on a designated table and arranged randomly for collection.

Voice and Self-image

Voice can affect decision making by altering the self-image of the communicator, independent of any strategic role that voice holds as a communications medium. Research on cognitive dissonance, self-manipulation of "diagnostic" actions and self-signaling suggests that individuals are often uncertain about their own dispositions or self-image and evaluate their disposition through a combination of self-inference and social inference (Akerlof & Dickens, 1982; Rabin, 1994; Benabou & Tirole, 2002; Turillo et al., 2002). For example, individuals are found to make choices to affirm their imperfect, self-serving beliefs regarding their self-image (Quattrone & Tversky, 1984; Bodner & Prelec, 2003); individuals' decisions also differ when their decisions are made in public (Ariely et al., 2009; Gneezy et al., 2012). These studies suggest that individuals receive signals about their self-image from their own actions, from the way others perceive or treat them, and from their perception of how others treat them (Bernheim, 1994; Babcock & Loewenstein 1997; Benabou & Tirole, 2009). Their self-image in turn affects their self-esteem and thus has implications for their own decision making.

These same general considerations apply to the standard ultimatum game. A vast amount of evidence now exists showing that proposers often offer close to half of the allotted sum and responders frequently reject offers which are less than 30 percent of the allotted sum (Roth, 1995; Hoffman et al., 1996; Cameron, 1999). While the literature often models rejections in the ultimatum game as resulting from inequity aversion or reciprocity, Tirole (2002) instead suggests that responders consider their own rejection decisions as evidence that they are strategic, fairness-loving or tough bargainers. Therefore, they are willing to

forgo monetary rewards to provide credible self-signals and preserve their self-image. Yamagishi et al. (2009) provide further support for the argument that responders' rejection decisions are self-signaling actions taken to preserve responders' self-image. They show that a substantial proportion of responders reject unfair offers in private impunity or dictator games where rejection clearly increases the extent of inequality and has no reciprocal effects on the proposers.

The introduction of the opportunity for voice to the ultimatum game adds another self-image signaling mechanism for the responders. As outlined earlier, voice allows responders to infer their self-image, both through listening to their own voice as though they were impartial observers (the self-channel) and through observing the reactions of their audience to their opinions (the social-channel). To isolate the effect of the self-channel, we assigned subjects to the BVE treatment where they had the opportunity to bid to send a message to the experimenter. Subjects who paid for voice in that treatment were essentially able to 'listen' to their own message (the self-channel) regarding their rights or reasons for a certain distribution, without any feedback from their 'mute' audience (the experimenter). In the absence of any social-channel feedback, we expect that subjects in the BVE treatment rely entirely on the content of the self-channel for self-image inference, as far as voice is concerned.

In contrast, subjects assigned to the BVP treatment had the opportunity to bid to send a message to the proposer. While we expect that the self-channel of voice continues to operate in the BVP treatment, the crucial difference is that the social-channel is now active. Subjects who use voice to strengthen their self-image by making claims on their rightful share of the proceeds now face the possibility of receiving negative feedback from proposers. An unfavourable offer, when received directly after a voiced message, is a strong indication that the proposer does not agree with the subject's favourable view of themselves. In our terms, the social-channel's report may conflict with the self-channel's report, greatly weakening or eliminating any positive self-image signalling effect of voice.

We test whether voice has a self-image signaling effect by evaluating whether subjects are willing to pay for the opportunity for voice to the experimenter, and to what extent this willingness to pay differs from subjects paying for the opportunity to voice to the proposer. We do not deny that voice serves instrumental purposes, particularly in the ultimatum game where participants may believe communications could improve payoffs or promote a more equitable outcome (Thibaut & Walker, 1978; Levanthal, 1980). However, subjects know that paying to voice to the experimenter has no instrumental value since their

messages will not be shown to the proposers. Hence, if responders are willing to pay for the opportunity to voice to the experimenter, it is preliminary evidence that there is positive self-signaling value in voicing to the experimenter[6]. The relative importance of the self-image signal as a motivation for voice can be inferred by comparing the proportion of subjects willing to pay for voice to the experimenter, to that proportion willing to pay for voice to the proposer.

We next consider how the self-image signal of voice affects the decision to accept or reject an offer. As discussed earlier, rejections in the ultimatum game have also been interpreted as self-image signals. Many responders choose to reject insultingly low offers and forgo a paltry few dollars, in return for preserving their positive self-image as tough or strong individuals (Tirole 2002). We argue our experiment generates two distinct self-image signals. One signal is voice, which may further be spilt by the self and social-channels, and the other signal is the acceptance or rejection decision.

Our approach to interpreting behaviour in this multiple-signal environment is to assume that subjects act on some measure of the average aggregate signal received. In our view, this assumption places the least restriction on the way subjects interpret or decide amongst signals. We recognize that decision makers in a multiple-signal environment have been shown to exhibit self-serving biases by only recalling signals consistent with their desired conclusions, or by interpreting ambiguous information in their favour (Quattrone & Tversky, 1984; Sanistioso, Kunda & Fong, 1990; Loewenstein & Moore 2004). However, we argue that if subjects are indeed biased towards accepting only the most favourable signals, we should be less likely to find any significant differences in behaviour between our different voice treatments.

The treatments thus differ by whether both the voice signal and the decision signal are present, and by whether the voice signal is moderated only through the self-channel, or through both the self and social-channel. The simplest case is that of a subject who either places no value on voice, or fails to win the bid for voice. Subjects without voice, regardless of treatment assignment, participate in the standard ultimatum game, where their only self-image signal consists of their acceptance or rejection decision. We expect such subjects to exhibit the benchmark ultimatum game behaviour, which is that responders would reject

[6] While responders may pay for the opportunity for voice to send a favourable self-image signal about themselves, it does not imply that responders who are unwilling to pay for the opportunity for voice have poor self-image signals. Responders' willingness to pay for the opportunity for voice also depends on how uncertain they are about themselves. If responders are very certain of the kind of person they are, the marginal return from self-inference is small and hence responders may be unwilling to pay for the opportunity for voice even though voicing sends a favourable self-image signal.

significantly unfavourable offers but otherwise accept offers close to the fair split. Within this group of responders, we do not expect any differences in behaviour based on their (unsuccessful) valuations for voice, because voice must actually be articulated to have any self-image signalling effect.

The BVE treatment, where subjects bid for voice to the experimenter, allows us to examine the effect of the voice signal, as moderated through the self-channel. Responders who voice to the experimenter effectively 'listen to themselves' without the possibility of receiving feedback from the audience. We assume that subjects who bid for voice are rational and only do so if they would use the opportunity to send positive self-image signals; few people stand in front of mirrors and talk to themselves with the intent of lowering their self-esteem.[7] The self-image signal from voice is thus likely to be positive, and will ameliorate the negative self-image signal from accepting an unfavourably low offer. We therefore expect that responders in the BVE treatment who voice will be willing to accept lower offers, compared with responders without voice.

However, in the BVP treatment, where subjects bid for voice to the proposer, the effects of the voice signal are moderated by both the self and social-channel. Responders now receive feedback, in the form of the proposers' offers, on whether their impressions of their self-image are shared by others. At least some of the time, proposers will show that they disagree with responders' positive self-image reports by returning unfavourably low offers. Responders are thus likely to receive conflicting information through the self and social-channels; they tell themselves that their claims are rightful, but receive offers suggesting the opposite. When facing such a potentially conflicting self-image signal from voice, we argue that responders will tend to seek the clarity of the self-image signal from the acceptance or rejection decision instead. We expect that responders in the BVP treatment will be less likely to accept a low offer, compared with responders who voiced to the experimenter.

To summarize our hypotheses, we expect that responders will have positive willingness to pay for voice to the experimenters, if voice has value as a self-image signal. Decomposing the self-image signal of voice into the self and social-channel, we expect that listening to the self-channel by itself will improve the speaker's self-image, leading responders who voice to the experimenter to place less emphasis on the rejection decision as a self-image signal. Responders with voice in the BVE treatment will be more likely to accept unfavourable offers. However, when the social-channel of voice is also present, responders

[7] Of course, recalling Robert De Niro as Travis Bickle in *Taxi Driver*, we note that not all people who speak to themselves in mirrors - especially when brandishing firearms - are necessarily rational.

will face potentially conflicting self-image signals from voice and so will place greater emphasis on the rejection decision as a self-image signal. Responders with voice in the BVP treatment will be less likely to accept unfavourable offers by comparison.

Results

Willingness to Purchase the Opportunity for Voice

Figure 1 presents responders' reservation price for voice. We find that 82 percent of responders in the BVP treatment were willing to pay for the opportunity to voice to their matched proposers and 63 percent of the responders in the BVE treatment were willing to pay for the opportunity to voice to the experimenter, supporting our conjecture that voice has a self-image signaling effect. While responders who purchased voice to their proposers may have also been motivated by the belief that communications would increase their payoffs, instrumental reasons cannot explain why such a large proportion of responders were willing to pay for voice to the experimenter. It is striking that the proportion of responders willing to pay for voice to the experimenter exceeds three-quarters of the proportion willing to pay for voice to the proposer.

Comparing the distribution of bids for voice between BVE and BVP, we find that while the average amounts bid by responders in the BVE treatment are lower, at $1.08 (BVE) compared with $1.31 (BVP), the distributions share common support. Responders who are bidding for voice to the experimenter potentially value the opportunity to self-signal as much as those bidding for voice to the proposer, even though the latter group may have mixed self-signaling and instrumental motivations. Indeed, conditional on placing bids above $0, the average bid of responders in the BVE treatment is $1.72, which is comparable with that of responders in the BVP treatment at $1.60. Taken together, these findings suggest that the self-image signaling motivation for purchasing voice could be as important as, if not more important than, any strategic communications motivation. Responders were willing pay to voice because they care about their self-image and wish to enhance their self-image through voicing.

[INSERT FIGURE 1 HERE]

Figure 2 presents the offers responders expected to receive, as elicited from responders immediately prior to notification of the actual offers. We view responders' expected offers as indicative not only of beliefs regarding their paired proposer, but also of their own self-image: responders with more positive self-images should be more likely to report higher expected offers, all else equal. We did not provide responders with incentives for accurately estimating expected offers, so it is more likely that expected offers could be biased by responders' self-image beliefs. Overall, responders who voiced had a higher distribution of expected offers compared with those who did not (Wilcoxon rank-sum test: $z = 3.538$, $p < 0.000$). Although the median expected offer remained \$10 (an even split) across all responder groups, it is noteworthy that responders who voiced were more likely to expect 'more-than-fair' offers in their favor than those without voice. In particular, the distribution of expected offers was higher for responders who voiced to the experimenter compared with responders without voice, even though no actual communication to the proposer took place. ($z = 1.699$, $p < 0.089$). This is consistent with a role for voice in positively affecting one's self-image beliefs, independent of any plausible communications role which might lead to higher expectations of the offer.

[INSERT FIGURE 2 HERE]

We compare the relative strengths of the instrumental or strategic motivation for voice with the self-image enhancing motivation for voice, by contrasting the willingness to pay of respondents in the two treatments. Compared with the BVE treatment, a larger proportion of responders in the BVP treatment were willing to pay a positive price for voice ($\chi^2 = 7.893$, $p < 0.005$), and the distribution of their reservation prices for voice was also significantly higher ($z = 1.757$, $p < 0.0789$). While these results suggest that strategic motivations could be important, recall that the proportion of responders in the BVE treatment with positive prices for voice already exceeded three-quarters of the proportion in the BVP treatment. Overall, this suggests that while mixed instrumental and self-image enhancing motivations may have induced responders in the BVP treatment to bid more than those in the BVE treatment, the bulk of the motivation for voice is likely rooted in the self-image motivation. In any case, voice was not instrumentally or strategically useful: We find that the average offer made by proposers who received messages from responders was \$9.13, which was not significantly

different from the average offer of $9.05 made by proposers who did not receive any message from responders; the distribution of offers was also similar ($z = 0.584$, $p < 0.560$).

Minimum Acceptable Offers

Figure 3 presents the distribution of responders' MAOs, which provide further evidence for the effects of voice on self-image. Recall our hypothesis is that voice, through the self-channel, provides a positive self-image signal and hence makes it more likely that responders can accept a lower or more unfavourable MAO. Responders in the BVE treatment who voiced to the experimenter had the lowest MAOs of all groups (mean MAO = 6.52), compared both with responders who did not voice at all (mean MAO = 7.72) as well as with responders in the BVP treatment who voiced to the proposer (mean MAO = 8.43). The distribution of MAOs of responders voicing to the experimenter was also lower, compared with responders with no voice ($z = -2.644$, $p < 0.017$) as well as with responders voicing to the proposer ($z = -2.68$, $p < 0.007$)[8].

[INSERT FIGURE 3 HERE]

OLS regressions of the determinants of MAOs, presented in Table 3, confirm our findings that responders who voiced to the experimenter have consistently lower MAOs than other groups. Column (1) shows that responders who voiced to the experimenter (the baseline group) had significantly lower MAOs, by an average difference of $1.20, compared to those who did not have the opportunity for voice. However, responders who voiced to the proposer actually had higher MAOs, by an average difference of $1.91, than those voicing to the experimenter. The differences in MAOs between responders voicing to the experimenter and those from other groups remains even after controlling for responders' characteristics such as gender, course majors, and nationality, as presented in column (2).

[INSERT TABLE 3 HERE]

[8] We did not find any difference in the distribution of MAOs of responders from the BVP treatment and BVE treatment who did not voice ($z = -0.560$, $p < 0.576$).

Overall, the results are consistent with our hypothesis that voice, through the self-channel, acts as a positive self-image signal, allowing responders to accept lower MAOs than they would otherwise. It is clear that voice affects responder behavior, since responders who were able to voice to the experimenter were willing to accept significantly lower MAOs than responders with no voice. We further isolated the positive self-image signaling effect of voice to the self-channel by demonstrating that responders who voice to the proposer, and hence receive feedback through the social-channel, require significantly higher MAOs than responders who only experience the self-channel.

Robustness Tests: Self-Selection and Income Effects

In this section, we show that our results are consistent with an actual treatment effect of the act of voicing itself, rather than biased self-selection into our treatment groups, or income effects due to the cost of voice. The self-selection problem is linked to the bidding process for voice, which implies that responders without voice tend to have lower valuations for voice. For example, 40% of the responders without voice bid $0 for voice, whereas obviously all responders who voiced to the experimenter or proposer must have bid at least $0.50 for voice. If valuations for voice in turn were correlated with attitudes towards MAOs, this suggests that our findings may reflect unobserved heterogeneity rather than treatment effects of voice.

To address this concern, we first note that the Becker-DeGroot-Marschak mechanism already introduces a certain degree of randomization into the voice assignment process, because a random price is drawn for each subject individually. Subjects bidding the exact same amount for voice – provided they bid neither $0 nor $4.00 – can still be assigned to voice or no voice by the BDM mechanism. The extent of self-selection based on valuations for voice is therefore mitigated by the BDM mechanism. While higher bids increase the likelihood of being assigned to voice, we can control directly for the bid values in our regressions to estimate whether willingness to pay for voice itself is a proxy for underlying attitudes towards MAOs in the ultimatum game.

Besides directly controlling for bid values for voice in our regression, we also restrict attention to the sample of subjects with positive valuations for voice, excluding those with $0 values for voice from the analysis. We do so because we are concerned that the relationship between valuation for voice and unobserved attitudes towards ultimatum game is discontinuous at the $0 margin: The relatively small proportion of respondents who refused

to pay any amount for voice may simply hold very different attitudes from others. Restricting the analysis to only those with positive valuations for voice is also a more rigorous test. If our results are in fact driven by self-selection between those who have positive valuations for voice and those with $0 valuations for voice, we should find no effects, or very different magnitudes of effects, in the restricted sample. Results are presented in Table 4.

[INSERT TABLE 4 HERE]

Column (1) of Table 4 shows that responders without voice still have higher MAOs compared to responders who voiced to the experimenter, even after we exclude responders with zero valuations for voice from the analysis. Strikingly, the magnitudes of the estimated effects in the restricted sample are very similar to those estimated from the full data. While self-selection may exist, there appears to be little detectable difference in behavior between responders with positive valuations for voice, and responders with $0 valuations for voice. This is a credible test in our view, as one would expect the largest difference caused by self-selection to manifest itself along this margin.

In column (2) and (3), 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 virtually identical in magnitude in column (2) to those in column (1). We show further in (3) that responder's willingness to pay for voice has no differential effect on MAO by treatment assignment. There is also no evidence from column (3) which may suggest that the influence of responders' willingness to pay for voice on their MAOs varies across treatments since we cannot reject the null hypothesis that the model in column (3) is a good fit ($F(5,22) = 2.14$, $p < 0.065$).

As a final check, we note that our results are similar to those in the literature where voice is randomly assigned without any possibility of self-selection introduced by bidding or payments. The most directly comparable study is one by Ong, Riyanto and Sheffrin (2012) where responders are randomly assigned to have no voice or to have the opportunity to send a message to the experimenter or the proposer. This paper's findings that both responders who had no opportunity to voice and responders who had the opportunity to voice to the proposer had higher MAOs compared to responders who had the opportunity to voice to the experimenter are comparable to theirs. Hence, we are more confident that our estimates represent a treatment effect of voice rather than a self-selection effect arising from the bidding process by which voice is assigned to subjects.

We are also concerned about possible income effects that may drive our results. Since responders have to pay for the opportunity for voice, the bidding process resulted in lower endowments for responders with voice, compared to responders without voice. If responders have the same "income target" for participating in the experiment, responders who voiced to the experimenter will be willing to accept lower offers than responders who did not voice in order to increase 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 is a major factor explaining our results, we should be less likely to find any difference in MAOs by whether voice was to the experimenter or to the proposer, since there is no difference in the distribution of the cost of voice incurred by these two groups of responders ($z = 0.112$, $p < 0.911$). Responders paid an average of \$1.48 for the opportunity to voice to proposers and an average of \$1.44 for the opportunity to voice to the experimenter. Income targeting alone is unlikely to explain why the MAOs of responders voicing to the experimenter are significantly different from MAOs of responders voicing to the proposer.

Second, we can directly control for the cost of voice to determine if MAOs are affected by income targeting, in columns (4) and (5) of Table 4. Since responders without voice incurred no costs, we restrict our sample to only responders who voiced. We find no statistical relationship between the cost of voice and MAOs. There is also no evidence that the cost of voice affected responders who voiced to the experimenter and responders who voiced to the proposers differently, as the interaction terms between the cost of voice and the treatments were not significant in column (5). These results suggest that income targeting motivations are not a factor in determining MAOs, and that a treatment effect of voice itself appears to be a more likely explanation for our findings.

Welfare Effects

While the evidence thus far suggests voice does affect responder MAOs, the question is whether these effects have practical significance. It is costly to provide and exercise voice in real life, but judging by the prevalence of voice in decision procedures, there is clearly a general presumption that voice can improve aggregate outcomes. In the ultimatum game, one mechanism by which voice could improve mutual outcomes is through the self-image signaling effect, where responders become less likely to reject unfavorable offers. Another mechanism is through the instrumental role of voice, where communications could improve

the likelihood of the proposer extending a mutually acceptable offer. As before, we exploit the fact that our design assigns some responders to voice only to the experimenter, to identify separately the effect of voice as a self-image signaling mechanism on outcomes, from any instrumental effects of voice.

At first glance, it appears that voice, or lack thereof, has no effect on agreement rates in the ultimatum game. We find that a similar proportion of responders across voice treatment conditions rejected proposers' offers: 20 percent of those voicing to proposers, 20 percent of those voicing to experiments, and 23 percent of those with no voice, rejected their offers. There was no statistically significant difference between these group proportions ($\chi^2 = 0.192$, $p < 0.908$). Because winning the opportunity for voice is costly in our experiment, voice effectively reduces the total joint payoffs of proposers and responders. Both groups of responders who voiced have similar average joint payoffs, (to experimenter = \$24.56; to proposer = \$24.52), and these joint payoffs are lower than those for responders with no voice (\$25.41). Strikingly, this also implies that voice is ineffective as a communications device in our experiment; responders who voiced to proposers were not able to secure any better offers than those who did not communicate with proposers.

While these results seem to imply voice has negligible impact on aggregate outcomes, a different picture emerges when we consider the impact of voice on the feasible set for agreement in the ultimatum game. In any negotiation or dispute, a larger feasible set, or mutually acceptable range of outcomes, increases the likelihood of a successful resolution. Voice expands the feasible set when responders voice to the experimenter, because voice improves their self-image and makes it more likely they will accept less favorable offers. However, this larger feasible set had minimal effect on earnings in our experiment, for as with other ultimatum games, our proposers generally made offers well above the MAOs of our respondents. Taken together, our results show that voice has the potential to improve outcomes in situations where the self-image enhancing properties of voice make it more likely for parties to a dispute to compromise on their feasible sets.

Conclusion

The case for allowing people to provide input in decisions that affect them is typically based on fairness, democratic ideals, and the possibility that information sharing can lead to

better outcomes. Yet relatively little is known about why people perceive the opportunity to voice their opinions to be valuable and how allowing them to voice their opinions affects their subsequent decisions. This paper shows that the opportunity for voice allows people to engage in self-image signaling. We do so by demonstrating that people value the opportunity for voice, even when they know that their voice will not be communicated to the relevant party, and hence cannot influence the decisions of others. We also show that exercising voice increases a decision maker's willingness to accept unfavourable outcomes, but only when voice is communicated to a third party with no influence over the outcome. Existing models, which attribute the value of voice to its ability to strategically influence how others make decisions, could not explain these findings.

Although opportunities for voice in many settings are motivated by the hope of reducing costly and disruptive disagreements, our results suggest the need for caution. Giving people the impression that their views matter may make them feel better about decisions that are made, but not when the decisions are perceived to be informative about their self-image.

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Figure I Responders' reservation price for voice by treatment

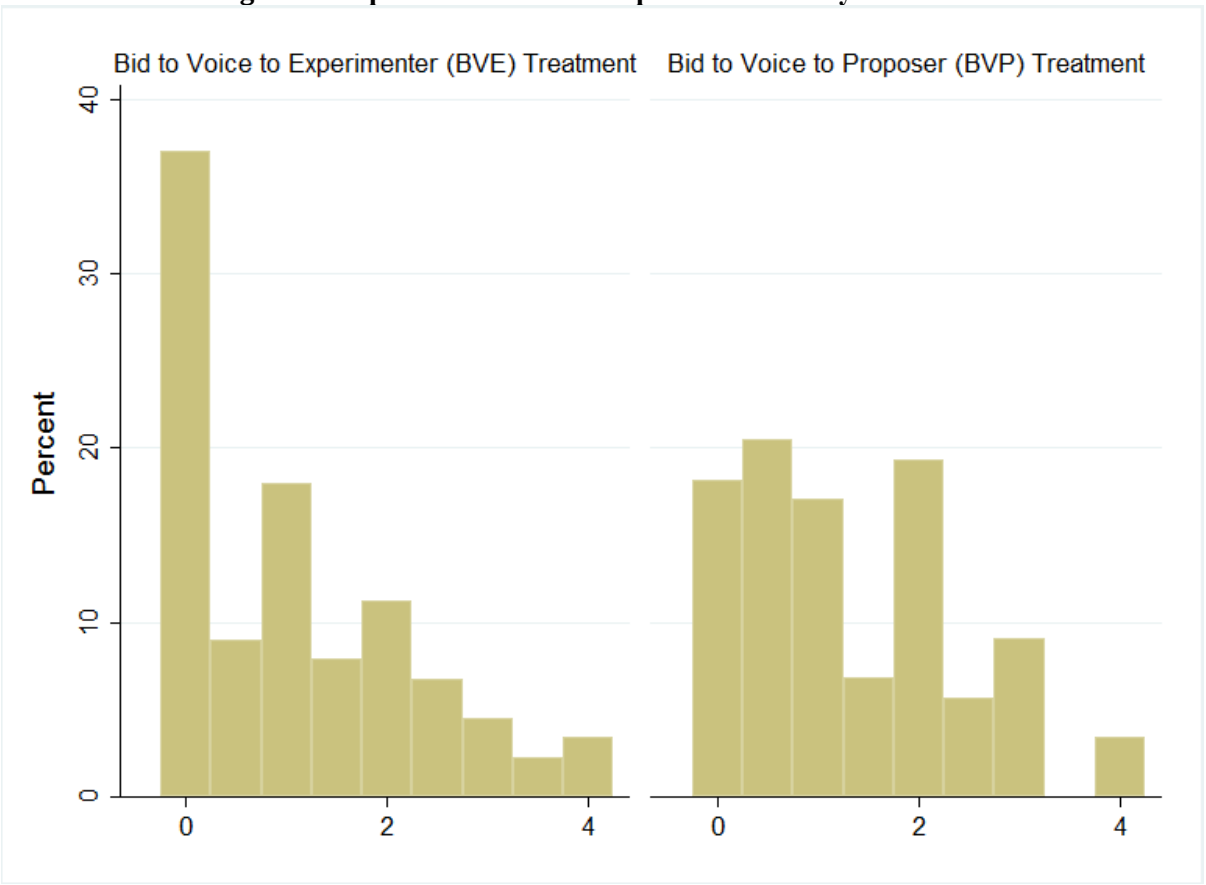

Figure II Responders' Expectation of Offers

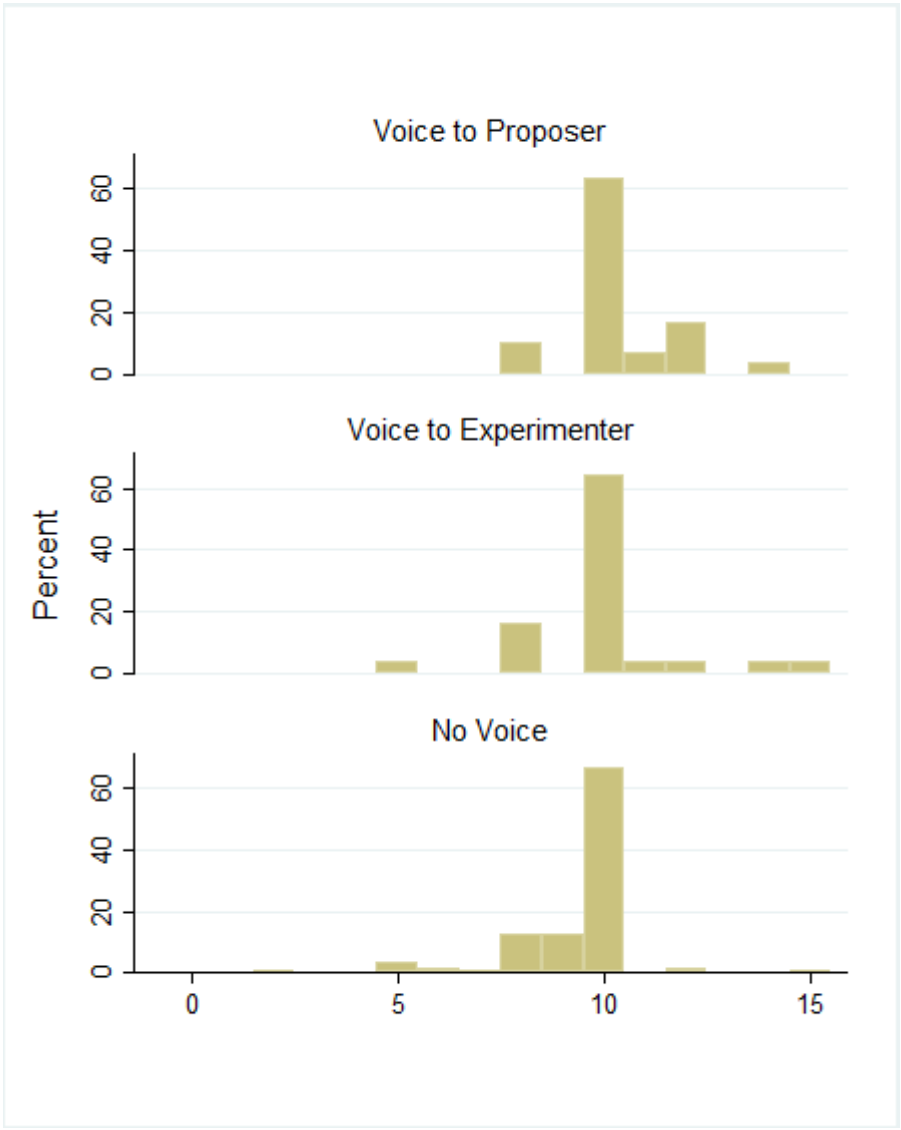

Figure III Responders' Minimum Acceptable Offers

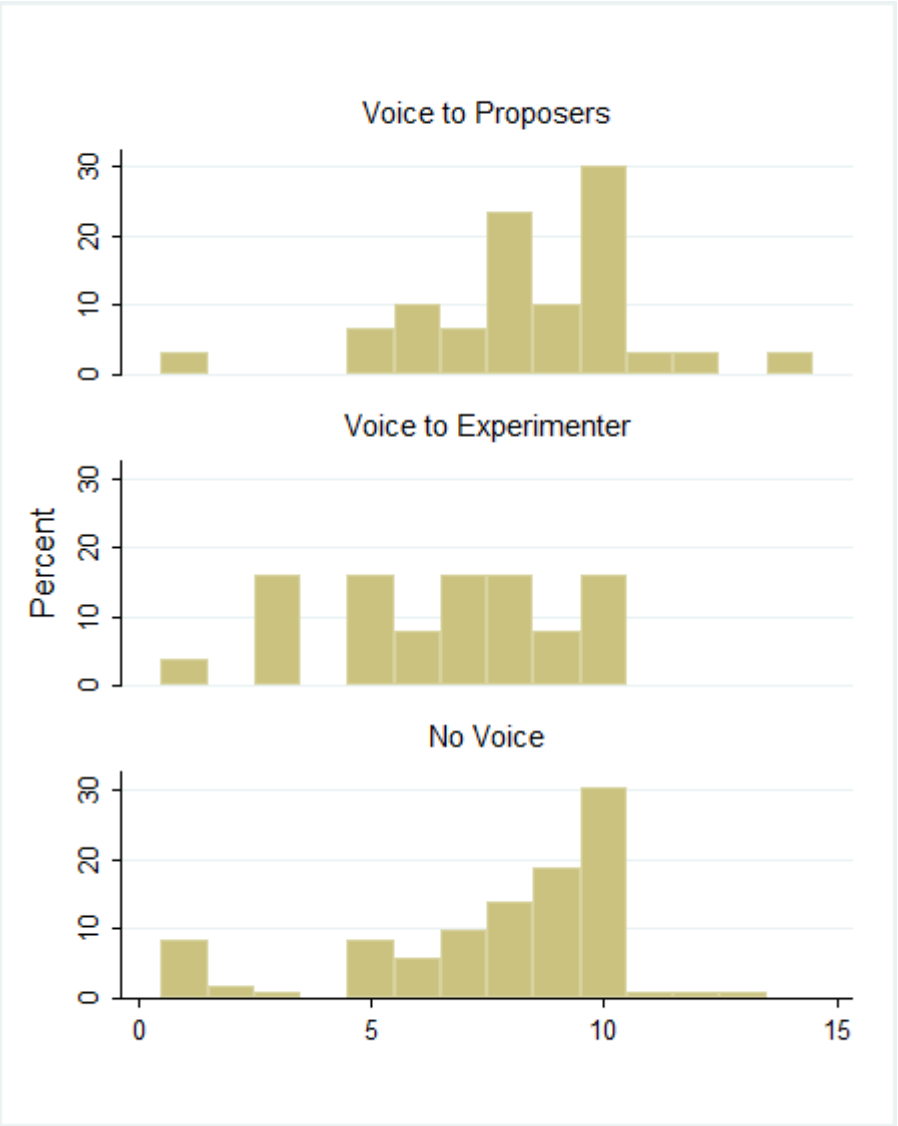

Table 1: Descriptive Statistics of Proposers and Responders, by Assignment to Treatments

	All Responders (N = 177)	Responders Assigned to BVP (N = 88)	Responders Assigned to BVE (N = 89)	Proposers (N = 177)
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	\$12.09 (4.27)	\$11.78 (4.34)	\$12.39 (4.19)	\$13.05 (4.48)
Demographics				
Male	56.50%	56.82%	56.18%	55.93%
Course Majors				
Engineering	46.89%	45.45%	48.31%	48.59%
HSS	15.25%	14.77%	15.73%	14.12%
Business	18.64%	19.32%	18.00%	19.21%
Other Schools	19.21%	20.45%	17.98%	18.08%
Nationality				
Singaporean	55.93%	54.55%	57.30%	61.02%
Malaysian	12.99%	14.77%	11.12%	12.99%
Chinese	11.86%	13.64%	10.11%	11.30%
Other Nationalities	19.21%	17.05%	21.35%	14.69%

Table 2: Descriptive Statistics of Responders, by Actual 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)
Minimum Acceptable Offer	\$7.72 (2.77)	\$7.56 (2.67)	\$8.43 (2.46)	\$6.52 (2.58)
Expected Offer	\$9.39 (1.49)	\$10.16 (1.58)	\$10.33 (1.27)	\$9.96 (1.90)
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)
Demographics				
Male	54.92%	60.00%	60.00%	60.00%
Course Majors				
Engineering	48.36%	43.64%	46.67%	40.00%
HSS	14.75%	16.36%	16.67%	16.00%
Business	19.67%	16.36%	16.67%	16.00%
Other Schools	17.21%	23.64%	20.00%	28.00%
Nationality				
Singaporean	58.20%	50.91%	50.00%	52.00%
Malaysian	12.30%	14.55%	13.33%	16.00%
Chinese	9.02%	18.18%	26.67%	8.00%
Other Nationalities	20.50%	16.36%	10.00%	24.00%

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 valuations excluded in this table ; responders without voice additionally excluded from (3) and (4)

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