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The Value of Voice in an Experimental Labor Market

Preliminary version

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Abstract

Procedural fairness research has argued that giving people a voice in decision-making procedures leads to increased outcome satisfaction and enhanced compliance with decisions. The impact of voice on agents' motivation to perform well is investigated in a simple gift-exchange experiment, thereby testing the *fair wage-fair process-effort hypothesis*. Before principals set wages, they decide whether or not to allow agents to voice their opinion by communicating their desired wages. Agents respond to principals' wage offers and voice/no voice choices by choosing effort levels. We find a significant impact of voice on average effort levels. Principals who (a) give agents a voice and (b) offer high wages induce, on average, a higher performance and hence earn higher payoffs than principals who offer the same wage without voice. However, we also observe negative voice effects: agents who are given voice react to low wages with lower efforts than agents who were not given voice. Thus, a voice that is perceived to have no influence is even more detrimental than not giving a voice at all.

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1 Introduction

Employment relationships are typically characterized by incomplete contracts just stipulating a wage payment without specifying agents' performance, thereby offering agents strong incentives for shirking. Reciprocity may solve the conflict of interest very well: Robust empirical evidence points to effort increasing on average in the generosity of the wage offered by the principal (Fehr et al. 1993, 1997, Fehr and Gächter 1998, Güth et al. 2001). Thus, the idea that labor contracts are based upon mutual gift exchanges (Akerlof 1982, Akerlof and Yellen 1988) has attracted much interest, although efficiency wages, obviously, have a downside: they are to be offered to all workers, but affect reciprocal individuals only.¹ This results in high cost with only part of it being effective. The question occurs whether principals can induce the desired behavior of agents by different (costless) means. Following an impressive literature in social psychology (Greenberg 1990, Leventhal 1980, Lind and Tyler 1988) and first economics applications (Aldashev et al. 2009, Dur 2009, Frey et al. 2004, Trautmann 2009), we hypothesize that agents will also make fairness judgements about the wage determination process, which subsequently affect their behavior. This paper analyzes whether agents reward principals not only for setting fair wages (and thereby making a monetary gift to employees) but also for providing a fair wage determination process (and thereby making a non-monetary gift) by providing considerable efforts. Thus, we suggest to consider procedural fairness in addition to purely outcome-oriented approaches.

Procedural fairness theory assumes that individuals pay particular attention to and place importance on decision-making procedures (Potter 2006). Indeed, there is substantial empirical evidence and increasing recognition

¹Fehr and Gächter (2004) estimate the proportion of reciprocity-minded experimental workers to be about 40 to 66%, whereas only 20-30% act purely out of selfishness.

that not only outcomes but also procedures leading to them can affect individuals' attitudes and behavior. Procedures have consistently been shown to matter in a broad range of areas and settings. In organizational contexts, it has been shown that procedures influence negative employee behavior, e.g. theft (Greenberg, 1990), as well as employees' job satisfaction and organizational commitment (Lowe and Vodanovich, 1995), organizational change (Tyler and De Cremer, 2005), turnover intentions (Olkkonen and Lipponen, 2006) or mentoring relationships (Richard et al., 2002).

Among various factors which determine whether people perceive a procedure to be fair, the right to participate in the decision making process has turned out to play a predominant role in people's procedural fairness evaluations. This right can vary from the mere possibility to voice one's opinion to the active participation in the decision-making process. This paper studies possible effects of the lowest realization level, namely *voice*: a person who is granted voice has the right to express the own preferences and opinions during the decision-making process (Hirschman, 1974).² In particular, we follow Folger (1977) in implementing voice as the opportunity to express one's own perception of just deserts to an allocator in an allocation decision similar to our principal-agent setting.

This work synthesizes two literatures: it places emphasis on perceptions of procedural fairness and voice, and incorporates important lessons about gift exchanges. According to the standard fair wage-effort hypothesis (Akerlof and Yellen 1988), employees are assumed to have an idea of a wage level that they consider fair. If the actual wage falls short of the fair wage, employees reduce their effort accordingly. In a simple extension of the gift-exchange approach, which is just as intuitive as the standard model, we will test whether employees perceive not only a fair wage, but also a fair treatment to be a kind of gift. Analogous to the standard model, we propose the hypothesis that reciprocal employees respond to a fair wage and to voice

²The procedural fairness literature points to a strong correlation between voice opportunities and procedural fairness. People who are allowed to voice their opinion generally rate the decision-making process as more fair (Brockner and Wiesenfeld 1996, Folger et al. 1979, Lind et al. 1990). Colquitt et al. (2001) found in a meta-analysis that voice explains 26% of the variance in perceptions of procedural fairness.

with a high work performance. We explore the consequences of a hypothesis concerning worker behavior, which we shall call the *fair wage-fair process-effort hypothesis*. According to this hypothesis, workers have a conception of a fair wage and of a fair wage determination process. Insofar as the actual wage is less than the fair wage, effort is assumed to be increasing in wage. In this case, voice is assumed to have a negative effect on effort: workers who were granted the opportunity to express their own perception of a fair wage but receive less than it supply less effort than those workers who received the same unfair wage but were not given voice. Beyond the fair wage, voice has a positive effect on effort provision.

Whereas fair procedures generally trigger positive responses, voice - usually assumed to increase procedural fairness - has repeatedly been shown to cause negative effects if it involves negative outcomes (low wages). Greenberg and Folger (1983) suggest that having voice in decision-making results in less satisfaction with negative outcomes when decision makers fail to respond to inputs. Similarly, recent work shows that voice alone may not be enough (Ulbig 2008, Hibbing and Theiss-Morse 2002, Gangl 2000): people react positively only when voice leads directly to a better outcome. Voice with little influence, however, seems to produce more negative reactions than no voice. Negative voice effects have been explained by frustration (Folger 1977) or sham (Lind and Tyler 1988).³ Taken together, we hypothesize a positive voice effect in case voice goes along with fair wage offers, and a negative voice effect in case of an unfair wage.⁴

³Cohen (1985) explains the effect with recipients judging procedures which include the opportunity for voice, as an insincere attempt to give an allocation the trappings of fairness rather than a real attempt to solicit views. Then, the recipient will not experience any enhancement of procedural fairness from the voice procedure and thus is expected to view the outcome dissatisfying. Besides, the author states that negative voice effects occur likely in situations where allocators received whatever they did not pay to recipients as given here.

⁴By hypothesizing that reactions depend not only on the procedure but on the outcome, we follow a consequentialist approach in procedural fairness theory which seems to be the predominant one in economic theory (e.g. Trautman 2009, Aldashev et al. 2009, Van der Weele 2009). According to it, people care about procedures because procedures affect outcomes. Voice is not seen to matter as an end in itself (non-instrumental reasoning), but as a means to an end. People's desire to express their opinion is thus directly linked to their view that these arguments influence the standard models are based on utilitarianism

The standard gift-exchange game (Fehr et al. 1993, Fehr et al. 1998, Charness 2003) involves two players, a principal and an agent.⁵ First, the principal makes an employment offer to an agent by specifying a wage. Second, the agent reacts to the wage offer by choosing an effort level.⁶ The higher the chosen effort level, the higher the effort cost is. The combination of wage and effort determines outcomes and monetary payoffs for both players. We modify the game a) by asking the agent what his idea of a fair wage is and b) by inserting a process stage in which the principal has to decide if she grants her agent the right to voice or not. If the principal decides in favor of voice, then the agent retains the right to inform the principal about a fair wage. If she decides against voice, she does not learn about the preference of her agent. Thus, the crucial feature in the analyzed principal-agent setting is the principal's choice whether or not to give the agent a say in the wage determination process.

We test whether agents' effort decisions depend (positively or negatively) on (a) the wage level, on (b) the discrepancy between chosen and fair wage, and on (c) the procedure (voice/no voice). From a game-theoretical perspective, none of these variables has an influence on behavior as effort is not stipulated in the contract and voice is nothing than cheap talk: the principal is not obliged to consider the agent's view. The fair wage-effort hypothesis, however, suggests from a purely outcome-oriented view on social preferences that agents reciprocate high/fair wages with high work efforts. If procedural fairness is an issue, voice becomes relevant and may induce employees to provide a different effort than without voice. As discussed before, we propose the fair wage-fair process-effort hypothesis: for high (fair) wages, we expect voice to induce agents to exert high efforts, for low (unfair) wages, we expect voice to affect effort provision in a negative manner. Thus, we test the hypothesis that there are "hidden returns" and "hidden costs" of voice.⁷

which requires that every choice is judged only by the consequent states of affairs.

⁵See Camerer (2003) and Gächter and Fehr (2001) for reviews.

⁶Following Gächter and Fehr (2001), effort can be interpreted as the monetary equivalent of the disutility of work, which increases in the effort chosen. Most importantly, efforts in experimental games set incentives that can be thought of being isomorphic to real world effort choices which are perceived as being onerous.

⁷We call these possible benefits and costs hidden in the sense that they escape our

Within our experimental design, we are able to account for positive as well as negative voice effects. Indeed, we find on average a negative voice effect for low wage levels and a pronounced positive effect for high wage levels. Principals who (a) give agents a voice and (b) offer high wages induce, on average, a higher performance and hence earn higher payoffs than principals who offer the same wage without voice. However, we also observe negative voice effects: agents who are given voice react to low wages with lower efforts than agents who were not given voice. Thus, a voice that is perceived to have no influence is even more detrimental than not giving a voice at all. Our results emphasize the importance of procedural fairness in general and voice in particular and provide first evidence for the fair wage-fair process-effort hypothesis.

A control treatment shall clarify the precise impact of voice on agents' motivation. Are the observed effects due to agents' procedural fairness evaluations per se or did they occur because agents value the decision of principals to give them voice? Thus, we analyze whether intentions and the attribution of volition play a role. Following Charness (2004), we test whether employees behave differently when choosing an effort level, depending on whether the employer or a random mechanism chooses a fair (voice) or an unfair wage determination process (no voice).

As far as we know, the experiment reported in this paper is the first incentivized experiment testing the impact of voice on work efforts. Voice effects in the labor context are very hard, if not impossible, to study with field data as in real world contracting relationships there are always intervening factors and motivations inseparably present at the same time. Besides, the strength of controlled laboratory experiments is that different individual behavioral patterns are observable in one setting. By using the strategy method (Selten 1967) to elicit agents' preferences, we gained direct information about individual types and are able to estimate the proportion of different worker types.⁸ We refer to the considerably practical relevance of voice in the orga-

attention if our reasoning is based on the assumption that people are exclusively self-interested (Fehr and List 2004, Falk and Kosfeld 2006).

⁸The agents' main task in the experiment is to make eight decisions, half of them under voice, the other half under no voice. In both cases, agents had to indicate - in an incentive

nizational context by studying its hidden returns and costs. If voice would induce similar effort increases such as the payment of a high wage, then the instrument would represent the more efficient alternative. Thereby, we shed light on the effectiveness of two prevailing management tools used to influence agents' behavior, monetary incentives and fair treatment. In doing so, we contribute to the recent literature dealing with procedural effects in labor market relations (see, e.g., Abeler et al. 2009, Dur 2008, Aldashev et al. 2009).

In the next section, we first present the experimental design and describe the behavioral predictions (Section 2). In Section 3, we discuss the main results. The concluding discussion can be found in Section 4.

2 Experimental Design and Procedures

2.1 Experimental Design

2.1.1 Main Treatment

This experiment is intended to study the potential impact of voice on agents' motivation to perform well in a simple principal-agent setting. Therefore, we apply a version of the bilateral gift-exchange game in the labor market context (Fehr et al. 1993, Fehr et al. 1998). The standard game is as follows: first, a principal specifies a wage w . Then, the paired agent can react by choosing an effort level e . Note that effort is not stipulated in the contract, reflecting the common assumption of incomplete contracts in labor market models. The combination of wage and effort determines outcomes and monetary payoffs for each pair of participants.

The crucial feature of our experimental design is the principal's choice whether or not to allow the agent to voice his opinion in the decision-making process about the wage. Thus, the principal can choose between *voice* and *novoice*. In the former case, the principal learns the agent's *desired wage level* before choosing a wage.⁹ If the principal chooses *novoice*, the agent's

compatible way - how much effort they want to exert for each feasible wage.

⁹Note that choosing voice does not imply that principals have to consider agents' pref-

preference remains private. In any case, principals knew that agents were informed about their choice.

The experiment starts with the procedural stage. Agents (A) choose their *desired wage*, $\hat{w} \in \{20, 40, 60, 80\}$. Simultaneously, principals (P) decide on whether or not to grant voice to the agent. If P has chosen *voice* (*no voice*), she gets (no) information on A's choice of \hat{w} . In the decision stage, P and A play a standard gift-exchange game. P decides on w . Again, feasible wages were restricted to $w \in \{20, 40, 60, 80\}$. Before observing Ps' decision on wage and voice, the agents decide how much effort $e \in [0.1, 0.2, \dots, 1]$ they want to provide in any case. Exerting effort is costly for agents. Agents were asked to make eight effort decisions: they could choose an effort level e in the event that their principals granted voice and in the event that they were denied voice for any feasible w . Thus, we used the strategy method to elicit agents' preferences.

Each principal was given an endowment of 100 chips. The payoff function of principals is given by:

$$\pi = (100 - w)e, \tag{1}$$

where w denotes the actual wage, e is the agent's effort with e being between 0.1 and 1.0, inclusive. The agent's utility function in this game is given by:

$$U = w - c(e), \tag{2}$$

where $c(e)$, an increasing function in e , represents the cost of effort. Below is the schedule of cost as a function of effort:¹⁰

erences when choosing a wage. Thus, the desired wage was not enforceable and the choice of voice did not restrict the principal's choice set.

¹⁰This functional form was used in Fehr et al. (1998) and Charness (2004). It ensures that profits are non-negative; more effort leads to greater joint income, so that higher levels of effort are encouraged from the standpoint of total welfare.

Table 1: Schedule of cost

e	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
$c(e)$	0	1	2	4	6	8	10	12	15	18

2.1.2 Control Treatment

In order to check for the robustness of our results and to identify possible interpretations, we ran a control treatment where the *Voice/No Voice* decision is not made by the principal but given exogenously to the agent. Thus, in the procedural stage, principals make no decision and agents make the same decision as before, i.e. they state their *desired wage*, $\hat{w} \in \{20, 40, 60, 80\}$. By comparing agents' effort choices in the control and the main treatment, we are able to interpret whether attribution of volition in choosing a wage determination procedure has a significant effect on subsequent costly effort provision. Thus, we test whether causal attribution influences the level of costs an individual is willing to incur to benefit another person. Do people value the opportunity for voice per se (exogenously given), or do they value voice because it is granted by the authority (volitional case)? Procedural fairness research emphasizes that individuals are quite concerned with whether decision makers are trying to be fair and respectful or self-interested and disrespectful; when the latter set of attributions predominate, empirical evidence suggests that people are less likely to provide a high work level. Thus, we should expect stronger effort reactions in the volitional case and less extreme decisions in the unintentional case.

2.2 Experimental Procedures

As indicated in figure 2, each session consisted of a procedural stage, a decision stage, the estimates and a post-experimental questionnaire.¹¹ Partic-

¹¹In this section, we describe procedures and conduct of the main treatment, which were similar to the control treatment except for the procedural stage. The procedural stage was missing in the control treatment.

Table 2: Sequence of events

stage	task
procedural stage	P chooses between <i>voice</i> and <i>novoice</i> A decides about the desired wage \hat{w}
decision stage	P decides about the wage w A decides about e for any w and <i>voice/novoice</i>
beliefs stage	elicitation of P's first order beliefs on efforts elicitation of A's second order beliefs on efforts
questionnaire stage	A and P filled in a post-experimental questionnaire

Participants were informed about the payoff functions described before and were required to calculate both agents' and principals' payoffs in three exercises with hypothetical wage-effort pairs. These exercises were reviewed, insuring that subjects understood the payoff mechanism. In particular, subjects were forced to understand that higher effort meant higher earnings for principals, but lower earnings for agents. The experiment was only played once, i.e., there were no repetitions and the participants knew this. At the end of a session, all participants were paid privately according to the rules.

The procedures were as follows: upon arrival, subjects were randomly assigned a role either as a principal or as an agent. Agents and principals were seated in different rooms. One principal was randomly paired with one agent. In both stages, the procedural stage and the decision stage, players made their decisions simultaneously.

In the procedural stage, principals could choose between *voice* and *novoice*. In the event that principals chose voice, the desired wage card of their agent was given to them in an envelope. If they chose no voice, they received a similar looking, but a blank yellow card. Note that choosing voice did not imply that principals had to consider the wage. At the same time, we asked agents about their opinion on the right wage offer in the particular situation. Agents were given yellow cards, called "desired wage card", and were asked to write their individual desired wage on this card. They knew that principals could choose whether they wanted to see that card or not.¹²

In the decision stage, participants played a gift-exchange game. As we

¹²Thus, agents had an incentive to reveal their true beliefs.

made use of the strategy method for eliciting agents' effort choices, principals and agents could make their decisions at the same time. Principals chose a wage $w \in \{20, 40, 60, 80\}$. Before learning their principal's actual decisions, the agents had to decide on the effort level $e \in [0.1, 0.2, \dots, 1]$ for any feasible w and for both possible cases, (a) the principal giving the agent process control (choice of *voice*) and (b) denying process control (choice of *novoice*). We used the strategy method mainly for two reasons: first, we gained direct information about individual types. Second, as we expected most principals to choose voice, the method allowed us to observe behavior at rarely-reached decision nodes like the no voice-cases or high wages.

Although the use of the strategy method does not affect the game-theoretic predictions, insights from psychology and behavioral economics suggest that the application could affect behavior. It is plausible that the strategy method weakens possible treatment effects since participants consider their reactions to be hypothetical, and not as actual choices of other players. Since the strategy method is less emotionally arousing than the direct elicitation method (Fehr et al. 2002), participants find themselves in a "cold", instead of a "hot" environment (Brandts and Charness 2000). Indeed, Casari and Cason (2009) report significant differences between both methods within the trust game (which is very similar to the gift-exchange game studied here). The authors suggest that learning that one is trusted by another person, and then being given an opportunity to reciprocate, may be different from specifying a contingent strategy to be carried out in the event that one is trusted. In particular, they find that the strategy method generates lower levels of measured trustworthiness. This finding suggests that efforts would be higher if we had used the direct elicitation method. However, we should not overestimate the differences between both methods. Whereas only a few studies reported differences (Casari and Cason 2009, Brosig et al. 2003), the vast majority did not find significant differences (Brandts and Charness 2000, Cason and Mui 1998, Fischbacher and Gächter 2008, Oxoby and McLeish 2004).

Next, we elicited participants' beliefs on efforts. Thus, we are able to assess the correlation between beliefs and choices, which we expect to differ between types of players. Following Manski (2002, 2004), expectations

may critically affect the behavior of participants in experiments. By learning prior subjective expectations of participants, experimentalists receive valuable information which they can use to interpret individuals' behavior (see e.g., Bellemare et al. 2008, Neugebauer et al. 2009, Fischbacher and Gächter 2008). Thus, we tried to obtain empirical evidence on the expectations that subjects hold, through elicitation of subjective beliefs. Principals who chose voice were asked to forecast agents' effort choices as a response to the actual wage and the choice of voice. In addition, we asked them for their counterfactual beliefs: what do those principals who have chosen voice think their agents would have chosen had they chosen no voice, and vice versa.¹³ Furthermore, we elicited agents' beliefs about principals' expectations, thus eliciting agents' second-order beliefs. We asked agents: what do you think were the expectations of the principal concerning your effort decision (a) in the case of principals choosing voice, and (b) in the case principals choosing no voice? All those questions were asked directly after principals and agents made their decisions.

To give subjects appropriate incentives to reveal their expectations, we rewarded them according to the accuracy of their estimates. In addition to their earnings from the gift-exchange game, we also paid participants 1 Euro if their estimation was correct. Principals received 0.75 Euro if their estimation deviated by .1 from agents' actual effort choice, 0.50 Euro if their estimation was off the actual choice by .2 and so on. Agents received 1 Euro for each correct estimation of their principals' expectations (second-order belief) with any deviation of .1 resulting in a deduction of 25 cents. Thus, each subject could receive up to 2 Euro in addition to their other experimental earnings.

After all payoff-relevant decisions had been made and beliefs had been elicited, participants received a "feedback-sheet", informing the players about the actual decisions and resulting payoffs. Then, subjects filled in a post-experimental questionnaire (see Appendix). Apart from demographic data and questions checking participants' understanding of the game, we solicited participants' subjective judgements on procedures and outcomes. Those items were presented in a completely randomized order. The items were mea-

¹³Counterfactual beliefs have also been elicited e.g., by Falk and Kosfeld 2004.

sured using a 7-point Likert-type Scale (1: I strongly disagree, 7: I strongly agree). By asking up to four questions, we measured (1) the perceived fairness of the wage determination process (*procedural fairness*), (2) people’s general attitudes towards trust (*trust*), (3) individual satisfaction with the wage determination process (*procedural satisfaction*), and (4) perceived influence in the wage determination process (*influence*). Included in the questionnaire were also items concerning the outcome: we assessed perceived outcome fairness as well as outcome satisfaction. Outcome was understood as either the wage offer or the final payoff resulting from wage and effort. Thus, we measured four additional concepts: (5) *fairness of wage offer*, (6) *fairness of payoff*, (7) *satisfaction with wage offer*, and (8) *satisfaction with payoff*. We computed reliable scales by averaging those items which belong together. Thus, we created eight indices.

At the end of a session, all participants were paid privately according to the rules described before. The non-computerized experiment was conducted at the University of Trier in September and November 2009. Participants were students from all study fields with no previous experience in economic experiments. We used the software ORSEE for managing recruitment (Greiner 2004). A total of 112 participants took part in this experiment, 58 in the main treatments and 54 in the control treatment. Average earnings, including a 2.50 Euro show-up fee, were 10.10 Euro for participating in the experiment that lasted less than an hour.

2.3 Behavioral Predictions

Previous empirical evidence suggests that there is heterogeneity with respect to individuals’ preferences. As our experimental design allows to observe different behavioral patterns, we assume the existence of three different types of agents: (1) *selfish* agents who are only interested in maximizing their own payoff, (2) *reciprocal* agents who are motivated by outcome-oriented reciprocity in particular, and (3) agents being endowed with *procedural preferences*, i.e., people who care not only about the outcome by itself but for

the way these outcomes come about.¹⁴

Suppose that players are purely selfish. In this case, agents are expected to choose the lowest possible e , that is $e = .1$ in our game, as this effort choice implies with $c(e = 0.1) = 0$ the lowest possible cost for the agent. Neither voice nor wages are expected to affect effort choices of type-1 players.

Many people, however, do not act in a purely selfish manner. The standard gift-exchange model, supported by robust experimental evidence¹⁵, predicts significantly positive effort choices following generous wages (standard fair wage-effort hypothesis). We call these players reciprocal agents or type-2 players. We suggest that these agents choose efforts which increase in wages but are the same for a voice and a no voice procedure.

Most importantly, we restrict our attention not only to a outcome-based analysis of reciprocal behavior, but take potential procedural explanations into account. A large literature in the social sciences suggests that a significant fraction of individuals cares about the way an outcome is received. The possibility that participants have procedural preferences motivates the *fair wage-fair process-effort hypothesis*. Accordingly, type 3-players are assumed to reciprocate their fairness perceptions of wages and wage determination processes by corresponding effort choices. In particular, we hypothesize that agents provide a better performance in case of *voice* than in case of *novoice* above a certain wage level \dot{w} . If the actual wage level is less than \dot{w} , efforts are expected to be higher in case of *novoice* than in case of *voice*.

$$e_{voice} \leq e_{novoice} \quad \text{if} \quad w < \dot{w} \quad (3)$$

$$e_{voice} \geq e_{novoice} \quad \text{if} \quad w \geq \dot{w} \quad (4)$$

This hypothesis is build upon a consequentialist reasoning: people care about procedures because procedures affect outcomes. Voice is not seen to matter as an end in itself but as a means to an end. It is valued only to the extent to which it promotes favorable outcomes. Contrary to this view, non-

¹⁴Note that types are mutually exclusive.

¹⁵See, e.g., Fehr et al. 1993, Fehr and Gächter 2000

instrumental reasoning would suggest individuals to attribute an intrinsic value to the process itself. In this case, we should expect a positive or a negative voice effect for any wage.

A positive voice effect means that people value a voice procedure per se, thus providing a better performance in case of *voice* than in case of *novoice* for any wage level:

$$e_{voice} > e_{novoice} \forall w, \quad (5)$$

A negative voice effect may be due to frustration or sham: people may judge procedures which include the opportunity for voice as an insincere attempt to give an allocation the trappings of fairness rather than a real attempt to solicit views. Then, agents will not experience any enhancement of procedural fairness from the voice procedure and thus are expected to view the outcomes dissatisfying. Those agents provide a better performance in case of *novoice* than in case of *voice* for any wage level:

$$e_{novoice} > e_{voice} \forall w. \quad (6)$$

3 Results

The present section provides a first overview on the experimental results.

3.1 Agents' Behavior

Figure 1 presents a summary of the data. It shows that agents' average effort choices differ depending on the principals' choice whether to give voice or not. Thus, we state our first result.

Result 1. *We observe a voice effect. On average, agents behave like the fair wage-fair process-effort hypothesis suggests: voice decreases effort in case of low wages, and increases effort in case of high wages.*

Figure 1 shows that the opportunity for voice does not always yield higher efforts. Instead, the effect goes as suggested in different directions depending

Table 3: Effort choices under voice/no voice

variable		wage			
		$w = 20$	$w = 40$	$w = 60$	$w = 80$
e_{voice}	mean	0.141	0.341	0.690	0.828
	(sd)	(0.102)	(0.206)	(0.260)	(0.310)
$e_{novoice}$	mean	0.169	0.393	0.628	0.759
	(sd)	(0.107)	(0.193)	(0.260)	(0.317)
$\delta(e_{novoice} - e_{voice})$	mean	0.0276	0.0517	-0.0621	-0.0690
	(sd)	(0.0591)	(0.1184)	(0.1115)	(0.1606)
	p	.018*	.026*	.006**	.028*

on the wage offered. At the lowest wage 20, average effort is considerably lower with voice than without. The same is true for the moderate wage of $w = 40$. However, at the medium wage $w = 60$ and the highest wage $w = 80$, average efforts in the voice situation exceed those in the no voice case. Table 3 provides an overview on effort choices under voice and no voice respectively. We computed a (paired) t-test (two-sided) and found that effort differs significantly between both cases for all wages (p -values between .006** and .028*).

Result 2. *We observe a positive and a negative voice effect depending on the offered wage: average performance at high wages $w \in \{60, 80\}$ is higher if the principal allows the agent to voice his opinion than if she does not (positive voice effect for high wages). Average performance at low wages $w \in \{20, 40\}$ is lower if the principal allows the agent to voice his opinion than if she does not (negative voice effect for low wages). For any wage holds: effort choices differ significantly between voice and no voice (t-test, two-sided).*

Remember that we used the strategy method to elicit agents' preferences. Thus, we are able to quantify the heterogeneity among agents: less than 7% of all agents show pure selfish behavior in that they choose the smallest effort

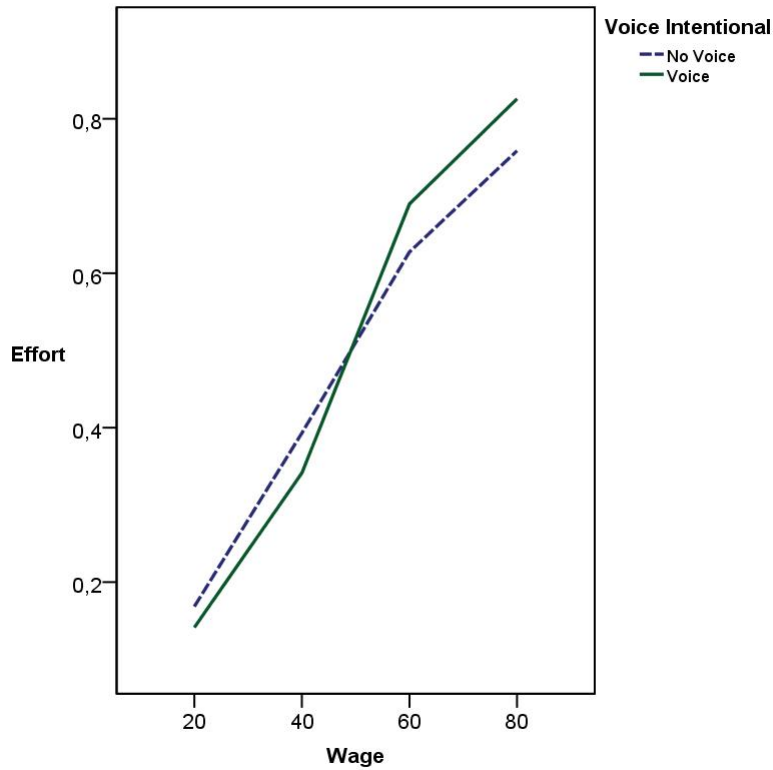


Figure 1: Average effort depending on wage and procedure

available. These agents neither react to voice nor to wages but always choose 0.1 (type 1). Less than 14% belong to type 2 and are thus pure homines reciprocans (type 2). These agents are not affected by the procedure but show an increasing performance with increasing wages according to the fair wage-effort hypothesis. The majority are type 3 agents: they react to both wages and the voice/no voice decision of the principal. Nearly 80% show procedural preferences. Figure 2 shows the schedules of all agents sorted by type.

Result 3. *We observe procedural preferences for a majority of agents (80%).*

The hypothesis that voice affects behavior concerns only those agents that show a preference for procedures at all. Thus, we focus on type 3 responders,

who also form a clear majority. Remember that type 2 and 3 are not mutually exclusive, meaning that agents who have procedural preferences may also have reciprocity considerations in mind, but not necessarily. To measure the strength of the relationship between wages and effort choices for type 3 agents, we used the Pearson Correlation coefficient and found a positive, highly significant correlation with $r = .80$, $p < .001$ (two-sided). Thus we state the following observation:

Result 4. *Agents with procedural preferences show clear reciprocal behavior on average.*

Next, we analyze the behavior of agents who care about procedures in more detail. Thus, we now turn to agents' different behavioral reactions to voice and no voice respectively. Again, as we used the strategy method, we are able to differentiate between various behavioral patterns. Figure 2 shows individual schedules. We find three different behavioral patterns: mixed voice effects as suggested by the fair wage-fair process-effort hypothesis, positive, and negative voice effects.

The majority group consisting of more than 43% of agents with procedural preferences shows mixed voice effects. This group behaves as the average agent does: up to a certain (but individually varying) wage level \hat{w} , agents choose less effort in the event of voice than in the event of no voice. Beyond that certain wage level \hat{w} , agents show a positive voice effect. These patterns suggest that those agents value voice only if leads to better outcomes and thus provide evidence for consequentialist procedural fairness theories.

The next observed group of agents reacts positive to voice. For any offered wage, these individuals choose an effort level in the event of voice which is at least as high as in the event of no voice. At least for one wage, the effort in the event of voice exceeds the effort in the event of no voice. We find that nearly 40% belong to this group, called 'positive voice effect-group'. These agents seem to value the voice procedure per se, independent of the outcome. The observation of this type provides empirical evidence for non-instrumental procedural fairness theories.

Table 4: Distribution of types

distribution	type 1 (selfish agents)	type 2 (reciprocal agents)	type 3 (procedure-minded agents)
	6.9%	13.8%	79.3%
positive voice effect			39.1%
negative voice effect			17.4%
mixed voice effect			43.5%

The last group of agents reacts negative to voice. In the 'negative voice effect-group', agents choose an effort level in the event of no voice which is at least as high as in the event of voice ($e_{novoice} \geq e_{voice}$) for any wage. At least for one wage, $e_{novoice}$ exceeds e_{voice} . This is the smallest group, with about 17% of all procedural minded agents belonging to it. Those agents either choose a smaller effort level for voice than for no voice for low wages and the same effort for higher wages, or they always choose a lower level in the voice case than in the no voice case with the exception of the desired wage level, where effort is the same. This suggests that there are people that dislike voice if the process leads to an unfavorable decision. Again, the observation of this type provides empirical evidence for non-instrumental procedural fairness theories. Table 4 provides a summary of the distribution of types.

Result 5. *There is strong heterogeneity among the agents who have procedural preferences. We observe agents who react positive or negative to voice per se (non-instrumental reasoning) and others who value voice only to the extent it promotes more favorable outcomes (consequentialist reasoning).*

3.2 Control treatment

A control treatment allows to check whether the principals' voice/no decision drives the results and thus agents react to the perceived good or bad

Table 5: Effort choices under exogenous voice/no voice

variable		wage			
		$w = 20$	$w = 40$	$w = 60$	$w = 80$
e_{voice}	mean	0.126	0.296	0.578	0.789
	(sd)	(0.045)	(0.134)	(0.276)	(0.274)
$e_{novoice}$	mean	0.148	0.304	0.519	0.711
	(sd)	(0.070)	(0.145)	(0.251)	(0.306)
$\delta(e_{novoice} - e_{voice})$	mean	0.0222	0.0074	-0.0593	-0.0778
	(sd)	(0.0698)	(0.0958)	(0.1083)	(0.1476)
	p	.110	.691	.009**	.011*

intentions rather than to different procedures. Both treatments are identical except the fact that principals do not choose whether to grant voice or not, but voice/no voice is given exogenously to the agents. To isolate the effect of the principals decision in the procedural stage, we compare agents' effort choices in the main and the control treatment. First, we consider agents' effort decisions in the control treatments. Table 5 provides an overview on effort choices under $voice_{ex}$ and $novoice_{ex}$ respectively. We computed a (paired) t-test (two-sided) and found that effort differs significantly between both cases for high wages (p -values of .009** for $w = 60$ and $p = .011^*$ for $w = 80$).

Result 6. *Again, we observe a positive and a negative voice effect depending on the offered wage: average performance at high wages $w \in \{60, 80\}$ is higher if agents are allowed to voice their preference. Average performance at low wages $w \in \{20, 40\}$ is lower if agents were allowed to voice their preferences than if they were not. However, effort choices differ significantly between voice and no voice only for high wages (t-test, two-sided).*

Now, we compare effort choices in the main and the control treatment. By using an (unpaired) t-test (two-sided), we do not find any significant differences between agents' choices in both treatments. Thus, agents' behavior

Table 6: Effort choices for $\Delta w = w - \hat{w}$

	Δw						
	-60	-40	-20	0	+20	+40	+60
n	5	21	25	25	20	4	0
mean	.100	.138	.296	.668	.810	.975	n/a
sd	.000	.087	.165	.263	.288	.050	n/a

is not a reaction to principals' decision to grant voice, but seems to be driven by the mere fact of having a voice or not in the wage-determination process.

Result 7. *There is no significant difference between agents' effort choices in the main and the control treatment. Thus, agents' seem not to react to principals' process decision, but to the process per se.*

3.3 Effects of discrepancies between actual and desired wage

Whereas effort choices depending on the actual wage offer and voice/no voice is of great interest, the inclusion of the desired wage seems to be worthwhile. Thus, let us turn to agents' desired wage choices \hat{w} in combination with principals's wage offers and subsequent reactions.¹⁶ By considering agents' reactions towards the difference $\Delta w = w - \hat{w}$, we get an impression of how a deviation from the desired choice affects behavior. Table 6 presents mean effort choice for $\Delta w = w - \hat{w}$. Average effort choices are clearly increasing in Δw . For example, in case agents would get 60 wage units less than claimed (the largest possible negative deviation), they react on average by choosing the lowest possible effort level $e = .1$. If principals exactly meet agents' claim (i.e. $\Delta w = 0$), the average effort choice is seemingly high with $e = .668$. In case, principals exceed agents' claim, mean effort choices increase further. Note that a positive deviation of 20 wage units results in a rather moderate

¹⁶Of course, this analysis makes only sense in case of voice.

Table 7: Pairwise comparison of effort choices under different Δw
(p-values, Mann-Whitney test, two-sided)

	$\Delta w = -60$	$\Delta w = -40$	$\Delta w = -20$	$\Delta w = 0$	$\Delta w = +20$	$\Delta w = +40$
$\Delta w = -60$		.300	.013	.001***	.001***	.006*
$\Delta w = -40$	.300		.000***	.000***	.000***	.000***
$\Delta w = -20$	.013	.000***		.000***	.000***	.001***
$\Delta w = 0$	.001***	.000***	.000***		.025	.017
$\Delta w = +20$	.001***	.000***	.000***	.025		.197
$\Delta w = +40$	.006*	.000***	.001***	.017	.197	

increase in comparison to the striking decrease caused by a negative deviation. By using a non-parametric Kruskal-Wallis test, we find that average efforts differ significantly between different Δw with $p = .000^{***}$.

Next, we compare effort choices pairwise under any available Δw by using a Mann-Whitney test (two-sided).¹⁷ Table 7 provides appropriate p -values.

3.4 Principals' Behavior

Principals were asked to make two decisions and to state their (paid) beliefs on agents' efforts. Let us first consider principals' choices of whether or not to allow agents to voice their opinion. About 86% of all principals allowed their paired agent to voice their opinion, thus asking them to state their desired wage. Only 14% decided against voice.

Result 8. *A majority of principals (86%) decided in favor of voice.*

After that, principals were asked to offer their paired agent a wage. Only 7% decided in favor of the lowest wage available, $w = 20$. About 55% chose a wage of 40, 38% decided in favor of $w = 60$. None of them chose $w = 80$, the highest wage available.

¹⁷ $\Delta = -60$ does not appear in the table due to the fact that we do not have any observations for this case.

Result 9. *A majority of principals (55%) chose a wage of $w = 40$.*

As the proportion of principals who chose no voice is too small to compare voice and no voice situations, we focus on those who were informed about the paired agent's desired wage. When comparing the desired with the actual chosen wage, we find that about 46% follow their agents' suggestions, whereas 54% do not. In cases where principals did not accept the agents' proposed wage, the desired wage exceeded the actual wage.

Furthermore, we elicited principals' beliefs and counterfactual beliefs about agents' effort choices for the offered wage. Thus, we asked principals about their expectations on agents' effort choices in the event that they allowed them to voice their opinion and in the event they denied the agent this opportunity. Nearly 83% expected a higher performance in the voice case. About 10% expected a negative voice effect in that performance in the voice case is believed to be lower than in the no voice case. Less than 7% of all principals did not expect any voice effect: they believed that agents chose the same effort in the voice and in the no voice condition.

Result 10. *A majority of principals (83%) expected a positive voice effect.*

Furthermore, we ran a t-test to analyze whether principals' expectations on agents' effort choices in case of voice significantly differ from their expectations in case of no voice. We found a highly significant differences with $p = .004$ (t-test, two-sided).

Result 11. *Principals had significantly different expectations on agents' performance in case of voice than in case of no voice ($p = .004$, t-test, two-sided).*

From those few having chosen no voice, 50% believed that voice would have a negative effect on performance. All in all, these findings suggest that principals choose or do not choose voice for strategic reasons: An overwhelming majority made their voice/no voice choice depending on the believed effects.

Result 12. *An overwhelming majority of principals chose voice or no voice for strategic reasons: they chose the option which they expected would bring them the highest payoff.*

4 Discussion

The question of the proper motivation of employees by granting voice is of potentially great economic significance and the topic of this paper. We investigated the issue by studying people’s behavior in a controlled laboratory experiment within the convenient gift-exchange game. In particular, we analyzed how agents perceive the principals’ decision whether or not to give agents’ the opportunity to voice their opinion about the desired wage and how this affects the agents’ behavior in terms of effort provision. We conducted an experiment in which principals could decide either to allow their agents to voice their opinion (*voice*) or to deny agents this opportunity (*no voice*). No direct costs were incurred by choosing voice. Nevertheless, negative behavioral effects may occur and thus providing “hidden costs” to the principals. Moreover, the procedural fairness literature also suggests positive voice effects, thereby providing “hidden returns”.

From a game-theoretic point of view, neither the wage itself nor voice should not have any effect on employee’s subsequent behavior (i.e. effort choice) because effort is not stipulated in the contract and voice is nothing than cheap talk: the principal is not obliged to consider the agent’s view. However, we do find clear empirical evidence for the *fair wage-fair process-effort hypothesis*: The largest fraction of agents reacts negatively to voice up to a certain wage, and positively beyond that wage. Those people seem to value voice as a means to an end. Thus, for the average agent holds that giving people a voice in the wage determination process is not a substitute for fair payment: a voice that is perceived to have no influence can be more detrimental than not perceiving a voice at all. These findings are not driven by principals’ choice whether or not to grant voice to agents, but by the fact that voice is given or not. Thus, agents do not react to principals’ procedurals choice, but to the process per se.

Considering the possible positive effects employees can accumulate by offering voice, such as employee compliance and satisfaction, some organizational decision makers may be tempted to engage in a sham. This work shows that employees are well advised not to attempt sham: when workers detect they have been victims of a sham, strong negative consequences in terms of decreased workers' effort are to be expected.

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6 Appendix

6.1 Appendix A: Instructions

The original instructions for employers and employees were in German. English instructions are also available. They will be sent upon request.

6.2 Post-experimental questionnaire

The original post-experimental questionnaires were in German. They will be sent on request. This appendix reprints a translation. Questions 1-5 and 6-33 are sorted by the main category they belong to. To avoid order effects we used random-generated sequences to present the questions to participants. None of the original questionnaires contained the order we use here.

6.2.1 Questionnaire for employees

At the end of the experiment, we would like to ask you to fill in a short questionnaire.

1. Participation number: _____

2. Gender:

male female

3. Age: _____

4. Field of study: _____

1. The instructions were clear and comprehensible.

I strongly disagree I strongly agree

2. I tried to earn as many chips and thus as many Euros as possible.

I strongly disagree I strongly agree

3. I thought twice about each decision.

I strongly disagree I strongly agree

4. I would take part in an economic experiment again.

I strongly disagree I strongly agree

5. I enjoyed taking part in the experiment.

I strongly disagree I strongly agree

The following items test perceived influence

6. I had an influence on the employer's decision about the wage.

I strongly disagree I strongly agree

7. Employees who were allowed to voice their opinion about the desired wage had indirect control over the wage decision to some degree.

I strongly disagree I strongly agree

8. I value the opportunity to voice my opinion independently of the question whether I am able to influence the decision of the employer or not.

I strongly disagree I strongly agree

The following items test trust

9. In general, one can trust people.

I strongly disagree I strongly agree

10. Nowadays, you cannot rely on anyone.

I strongly disagree I strongly agree

11. When meeting strangers it is better to be careful than to trust someone straight away.

I strongly disagree I strongly agree

12. I could trust the employer to make the right decision about the wage.

I strongly disagree I strongly agree

The following items test voice

13. The employer gave me to a sufficient extent the opportunity to express my views before making a decision about the wage.

I strongly disagree I strongly agree

14. I was allowed to express my views during the decision-making process.

I strongly disagree I strongly agree

15. My suggestion on the wage was considered by the employer

I strongly disagree I strongly agree

The following items test procedural fairness perceptions

16. The decision-making process that ultimately led to the wage offer of the employer was fair.

I strongly disagree I strongly agree

17. I consider the procedure determining my wage fair.

I strongly disagree I strongly agree

18. The way by which my wage has been determined was fair.

I strongly disagree I strongly agree

The following items test procedural satisfaction perceptions

19. The procedure that led to my wage increased my chances to get the wage I preferred.

I strongly disagree I strongly agree

20. I am satisfied with the procedure through which the wage offer came about.

I strongly disagree I strongly agree

21. I am not satisfied with the way my wage was determined.

I strongly disagree I strongly agree

The following items test perceived outcome fairness with regard to the wage decision

22. The employer's decision about the wage was fair.
 I strongly disagree I strongly agree
23. My wage is justified.
 I strongly disagree I strongly agree
24. The wage offered by the employer was not fair.
 I strongly disagree I strongly agree
- The following items test for perceived outcome fairness with regard to the overall outcome*
25. The overall outcome seems fair to me as an employee.
 I strongly disagree I strongly agree
26. The overall outcome is fair for the employer.
 I strongly disagree I strongly agree
27. The overall outcome is equally fair for both, the employer and the employee.
 I strongly disagree I strongly agree
- The following items test perceived outcome satisfaction with regard to the wage decision*
28. I am satisfied with the employer's decision about the wage.
 I strongly disagree I strongly agree
29. The offered wage fulfilled my expectations.
 I strongly disagree I strongly agree
30. The employer's wage decision is not justifiable.
 I strongly disagree I strongly agree
- The following items test perceived outcome satisfaction with regard to the overall outcome*

31. The overall outcome was satisfying to me as an employee.

I strongly disagree I strongly agree

32. The overall outcome fulfilled my expectations.

I strongly disagree I strongly agree

33. The employer will be satisfied with the overall outcome.

I strongly disagree I strongly agree

The following item tests employees' emotional perception of having no voice

34. How do you feel in case the employer did not allow you to voice your opinion before he determined your wage? _____

35. Space for comments, suggestions, critique _____

Thank you very much for participating.

6.2.2 Questionnaire for employers

At the end of the experiment, we would like to ask you to fill in a short questionnaire.

1. Participation number: _____

2. Gender:

male female

3. Age: _____

4. Field of study: _____

1. The instructions were clear and comprehensible.

I strongly disagree I strongly agree

2. I tried to earn as many chips and thus as many Euros as possible.

I strongly disagree I strongly agree

3. I thought twice about each decision.

I strongly disagree I strongly agree

4. I would take part in an economic experiment again.

I strongly disagree I strongly agree

5. I enjoyed taking part in the experiment.

I strongly disagree I strongly agree

The following items test perceived influence

6. The employee had influence in my decision about the wage.

I strongly disagree I strongly agree

7. Employees who were allowed to voice their opinion on the desired wage had indirect control over the wage decision to some degree.

I strongly disagree I strongly agree

8. Employees value the opportunity to voice their opinion independently of the question whether they are able to influence the decision of the employer or not.

I strongly disagree I strongly agree

The following items test trust

9. In general, one can trust people.

I strongly disagree I strongly agree

10. Nowadays, you cannot rely on anyone.

I strongly disagree I strongly agree

11. When meeting strangers it is better to be careful than to trust someone straight away.

I strongly disagree I strongly agree

I strongly disagree I strongly agree

12. I could trust the employee to make the right decision about the quantity of work.
- I strongly disagree I strongly agree
- The following items test for voice (manipulation check)*
13. I gave the employee to a sufficient extent the opportunity to express his views before I made the decision about the wage.
- I strongly disagree I strongly agree
14. The employee was allowed to express his views during the decision-making process.
- I strongly disagree I strongly agree
15. I considered the employee's wage suggestion.
- I strongly disagree I strongly agree
- The following items test procedural fairness perceptions*
16. The decision-making process that ultimately led to my wage offer was fair.
- I strongly disagree I strongly agree
17. I consider the procedure determining the wage to be fair.
- I strongly disagree I strongly agree
18. The way I determined the wage was fair.
- I strongly disagree I strongly agree
- The following items test procedural satisfaction perceptions*
19. The procedure that led to my wage offer increased the employee's chances to get the wage he preferred.
- I strongly disagree I strongly agree
20. The employee should be satisfied with the procedure through which the wage offer came about.

I strongly disagree I strongly agree

21. The employee is certainly satisfied with the way his wage was determined.

I strongly disagree I strongly agree

The following items test perceived outcome fairness with regard to the wage decision

22. My decision about the wage was fair.

I strongly disagree I strongly agree

23. The wage I proposed was justified.

I strongly disagree I strongly agree

24. My wage offer was not fair.

I strongly disagree I strongly agree

The following items test perceived outcome fairness with regard to the overall outcome

25. The overall outcome is fair for me as an employer.

I strongly disagree I strongly agree

26. The overall outcome is fair for the employee.

I strongly disagree I strongly agree

27. The overall outcome is equally fair for both, the employer and the employee.

I strongly disagree I strongly agree

The following items test perceived outcome satisfaction with regard to the wage decision

28. The employee will be satisfied with my decision about the wage.

I strongly disagree I strongly agree

29. The offered wage will fulfill the employee's expectations.

I strongly disagree I strongly agree

30. I think that the employee will not consider my wage decision justifiable.

I strongly disagree I strongly agree

The following items test perceived outcome satisfaction with regard to the overall outcome

31. The overall outcome was satisfying to me as an employer.

I strongly disagree I strongly agree

32. The overall outcome has fulfilled my expectations.

I strongly disagree I strongly agree

33. The employee will be satisfied with the overall outcome.

I strongly disagree I strongly agree

The following item tests for employers' beliefs about employees' emotional perception of having no voice

34. What do you think the employee feels in case the employer did not allow him to voice his opinion before she determined the wage? _____

35. Space for comments, suggestions, critique _____

Thank you very much for participating.

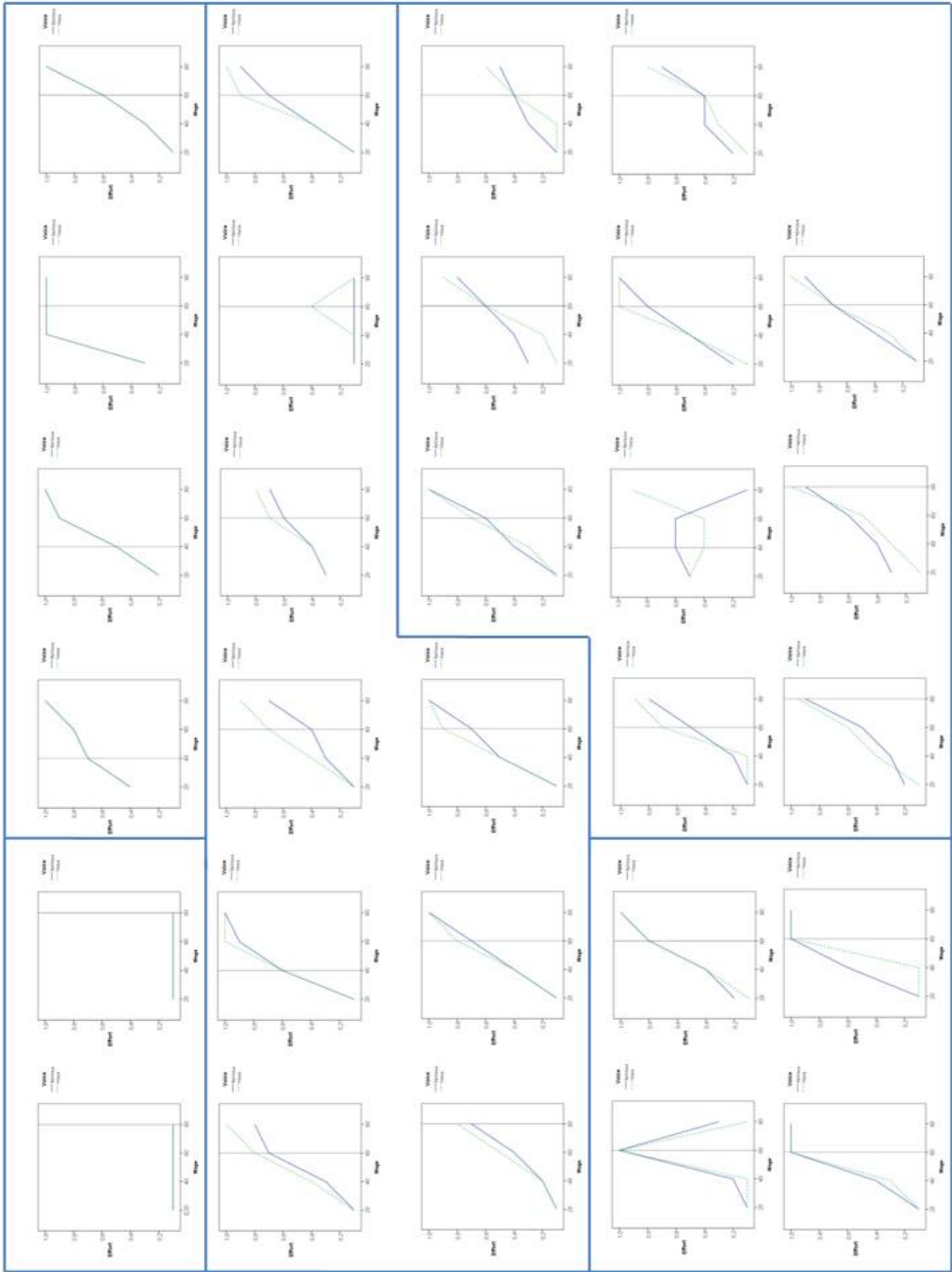


Figure 2: Player Types