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Transparency and fairness in organizational decisions: An experimental investigation using the paired ultimatum game

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Abstract

Organizations often keep secret their decisions about what employees receive (e.g., salary, budgets, benefits) to manage fairness concerns. We propose that this can be counter-productive because of a mechanism we call the "escalation of deservingness under secrecy", where the existence of peers can inflate one's own sense of deservingness, even when the actual allocations to peers are unknown. Building on the ultimatum game, we developed a Paired Ultimatum Game (PUG) in which a player and a peer respondent engage with the same offeror simultaneously but with no direct competition between respondents. Across three experiments- a live interaction study as well as two scenario studies- using the PUG, we analyze the conditions under which transparency may be better than secrecy in preventing the escalation of deservingness perceptions.

Introduction

Behavioral strategy research recognizes that individuals in organizations view the fairness of decisions that affect their pay, career opportunities, budgets and bonuses against the backdrop of what their peers receive (e.g., Zenger, 1994; Nickerson & Zenger, 2008; Larkin, Pierce & Gino, 2012; Lee & Puranam, 2017; Gartenberg & Wulf, 2017). Organizations often adopt policies that may restrict the visibility of such resource allocation decisions (Gely & Bierman, 2003; Colella, Paetzold, Zardkoohi & Wesson, 2007; Nickerson & Zenger, 2008). The key premise underlying a policy of secrecy is that it prevents comparisons of receivers' allocations with those of their peers. Such comparisons can engender envy and conflict, dishonesty, perceptions of unfairness, and loss of privacy (Colella et al., 2007; Larkin et al., 2012; John, Loewenstein & Rick, 2014; Bamberger & Belogolovsky, 2017) that may indeed be detrimental to organizational outcomes.

However, the theory and evidence for the effectiveness of secrecy-based regimes remains inconclusive in behavioral strategy research. Although there is evidence that pay secrecy is negatively related to task performance (Bamberger & Belogolovsky, 2010; Belogolovsky & Bamberger, 2014) and employee mutual helping (Bamberger & Belogolovsky, 2017), these findings are not unequivocal. There is also evidence that shows that pay secrecy is positively related to market performance and discretionary behaviors (Tremblay & Chênevert, 2008; see Colella et al., 2007 for a review of costs and benefits of pay secrecy). As a result, an understanding of how secrecy versus transparency may impact organizational outcomes is important. Furthermore, pay disclosure may impact key organizational outcomes like performance and cooperation among organizational agents. The choice of secrecy versus transparency of allocations thus becomes a key design

parameter for organizational designers, as it can affect productivity and ultimately organizational performance.

In this paper, we investigate a specific theoretical mechanism that pertains to fairness concerns about allocations made under secrecy. In doing so, we attempt to explain the pattern of mixed results on the effects of secrecy on organizational performance. The mechanism we propose builds on the research that shows that implicit comparisons with peers do not cease simply because the outcomes of those peers are unknown (Belogolovsky & Bamberger, 2014; Ho & Su, 2009). As a result, even under conditions of secrecy, people may escalate perceptions of what is considered a fair allocation to oneself. This Escalation of Deservingness under Secrecy (EDS) as a theoretical mechanism offers a potential explanation not only for *why* but also *when* secrecy may be preferable to transparency in organizational decisions.

To be clear, EDS may not be the only possible mechanism through which secrecy can have adverse organizational consequences. Other mechanisms could include a weakened perceptual link between pay and performance, or a general sense of distrust in the organization's procedures and practices (e.g., Colella et al., 2007; Belogovsky & Bamberger, 2014). We believe EDS merits independent consideration as it has the potential to parsimoniously explain both why secrecy can lower motivation (without additional assumptions about pay-for-performance or organizational justice perceptions) as well as the conditions under which it can still be better than transparency. It also has practical implications. In choosing between a policy of secrecy versus transparency, the organization designer must estimate the extent of EDS and compare it to the impact of transparently unequal offers on recipient's perception of deservingness. Consider a simple organization

with one hierarchical superior and two peers: ego and alter. As long as ego's own view of what she deserves (when the amount offered to peer is secret) is smaller than the actual amount that the peer is receiving, then keeping the payments secret is better from the superior's perspective, else transparency is better.

Since we wish to test a specific theoretical mechanism, we conducted laboratory experiments (also see Bamberger & Belogovsky, 2010, 2017). Such experiments have the advantage of producing causal inference about an abstract mechanism without the need for numerous controls. However, experimental evidence cannot claim to reproduce real-world phenomena. Rather, they help to establish the empirical plausibility of the theorized mechanism under investigation as a sufficient explanation.

In adopting this approach, we build on the tradition of prior work that has sought to examine important organizational issues through controlled experiments in the laboratory (e.g., Agarwal et al., 2012; Burton & Obel, 1988; Cyert & March, 1963; Guetzkow & Simon, 1955; Lanaj, Hollenbeck, Ilgen, Barnes & Harmon, 2013; Malhotra & Murnighan, 2002; Reitzig & Maciejovsky, 2015; Raveendran, Puranam & Warglien, 2015). We find support across three experiments for our central theoretical prediction that uncertainty about offers to others may lead to perceptions of unfairness and therefore lowers willingness to accept offers to self. Our findings have the potential to shed light on a theoretical mechanism underlying the effects of secrecy and stimulate further research into these processes in field data. An important caveat in this regard is that our experiments do not feature any effort (or performance outcomes) by the recipients of resources, making direct comparisons to organizational situations untenable. Rather, we set up a simple but abstract situation in which there are no ex-ante plausible differences in deservingness

across recipients. Hence, we can study the effect of transparency or secrecy on their perceptions of what they think of as a fair allocation to themsleves.

Fairness Perceptions under Secrecy & Transparency

According to equity theory, people experience inequity if they perceive that rewards are not proportional to deservingness for everybody within a reference group (Adams, 1965). However, the tendency for people to be overconfident (e.g., Moore & Healy, 2008) can exaggerate the perception of one's own deservingness. As Larkin, Pierce, and Gino (2012) note, this can explain why employees are likely to see inequality as inequity when they receive less (Martin, 1982; Zenger, 1994), but may not perceive inequity when they receive more than others (Fershtman, Gneezy & List, 2012). To the extent that perceptions of inequity cause employee behavior that is harmful to the organization (e.g., shirking, sabotage, conflict), keeping allocation decisions secret may be beneficial to the organization.

However, even when allocations to peers are unknown, peer social comparisons will continue to operate simply because peers exist (Festinger, 1954) and are identifiable (Haran & Ritov, 2014). This is why altering the salient reference group is an organization design solution to the problem of social comparison and envy (Nickerson and Zenger, 2008). Under conditions of secrecy, in which allocations to peers are unknown, employees still make conjectures about what their peers receive to determine how much they should receive if inequity is to be avoided. Such conjectures may be inaccurate, with employees over- or underestimating what their peers receive. The implications for the fairness of over- versus under- estimating allocations to peers are not the same. If receiving less than a peer

is far less desirable than receiving more, it may be prudent for an employee to ask for more than what one would typically ask for in the absence of a peer, all else being equal.

To illustrate our argument, consider a scenario in which a reward of $8 with a total utility of 10 units is acceptable to an individual in the absence of a peer. The same $8 reward when a peer is present should confer less utility because of the possibility that the peer receives a reward of more than $8, as well as the disutility from this outcome. We believe this is likely because of the robust empirical regularity that individuals experience significant disutility from perceived inequity (e.g. Fehr & Schmidt, 1999; Ho & Su, 2009), coupled with the general tendency of loss aversion (Kahneman & Tversky, 1979). Together these imply that in the absence of any information about offers to others, the disutility from possibly receiving less than others should in general outweigh the utility from possibly receiving more (Fliessbach et al., 2012; Tricomi, Rangel, Camerer & Doherty, 2012). To compensate, the absolute amount of the reward expected by the individual should rise to a value greater than $8. This is the escalation of what one deserves under secrecy (EDS), which occurs even when the offeror may be offering in reality the same amount ($8) to both recipients. Note that we did not assume any other sources of differences in deservingness here, such as those based on the performance or efforts of the employees. Just the mere presence of a peer (who is receiving an unknown allocation) should inflate the notion of what is considered fair in an interaction with a superior.

Lawler's early work (1965) provides some face validity, although not rigorous evidence for our argument. He reported that managers over-estimated their peer and subordinate's pay when pay was secret. EDS does not require this over-estimation but would certainly be strengthened by it. To the best of our knowledge, the implication of this

for one's perception of a desired allocation to self has neither been stated nor tested before (see also Colella et al.'s (2007) argument suggesting this is a promising yet unpursued line of research). This argument leads to the first hypothesis:

H1: Perceptions of the allocation one deserves are higher in the presence of a peer whose allocation is a secret, compared to the case where there is no peer.

EDS implies that uncertainty about secret offers to others is a potential source of perceptions of unfairness (even if the actual offers are equitable), which therefore lower willingness to accept. An important corollary of EDS therefore is that when offers to peers are transparent and seen to be equitable, people should perceive such situations as fairer than the cases where the offers to peers are secret (a de-escalation of deservingness under transparency). The reasoning for this assertion follows the same logic as for EDS. Individuals derive utility from both the monetary value of the allocation they receive and the equity they perceive with reference to their peers. Increasing the equity perceived with reference to peers can allow for a decline in the monetary value of the allocation, thus keeping the overall level of equity produced by the offer unchanged. In other words, when peers transparently receive an allocation that seems fair relative to oneself, individuals may be willing to accept a smaller absolute allocation and still perceive it to be fair.

For instance, if a reward of $8 with a total utility of 10 units is acceptable to an individual when no peer is present, then an offer of 10 units of total utility should also be acceptable to him when a peer is present. If this individual receives a positive utility of 2 units from an equitable parallel reward to the peer (cf Van den Bos et al, 1998), then the utility from the reward itself (and possibly that from the equity relative to the offeror of that reward) can be as low as 8 units and still be as acceptable as a reward that produces 10

total utility units in the absence of a peer. It is thus reasonable to expect an increase in willingness to accept offers when transparent and equal offers are made to peers relative to the case in which offers to peers are secret. This change in perception of what a fair allocation to self is under transparency leads us to the second hypothesis:

H2: Willingness to accept an allocation increases in the presence of a peer who is known to be receiving an equal allocation, compared to the case where the same allocation to the peer is secret.

To the best of our knowledge, these hypotheses have not been directly examined to date. However, in research testing the existence of peer-induced equity considerations, Ho and Su (2009) did collect relevant data using ultimatum games (UGs). When we reanalyzed their data, we found evidence consistent with our Hypothesis 2. Offers of 10% or less were accepted 43% of the time by the players in their UGs as long as they believe another player to be receiving a comparable offer. This outcome is in stark contrast to the overwhelmingly high rejection rates found in simple UG when offers are below 20% (Sanfey, Rilling, Aronson, Nystrom & Cohen, 2003). However, Ho and Su's (2009) evidence is indicative rather than conclusive for our Hypothesis 2 because they did not randomly assign offer values to peers or cover the range of possible offers, as testing this hypothesis was not the primary objective of their study. Their study also did not cover Hypothesis 1. Therefore, the impetus on us was to formally design a study to test both hypotheses.

Study Paradigm - Paired Ultimatum Game

We used a three-party version of the Ultimatum Game (Ho & Su, 2009) that we call the Paired Ultimatum Game (PUG) as the primary paradigm to test our hypotheses. The UG and its variants are widely used to study concepts such as fairness, costly

punishments, gift-giving, and power (Pillutla & Murnighan, 1996; Wang et al., 2011). In the UG, one player (the offeror) begins with an endowment of a given amount (e.g., $5). The offeror proposes a division of the endowment amount (e.g., $2 out of $5), and the respondent decides whether to accept or reject the offer. If the offer is accepted, the endowment is split as proposed (i.e., $2 to respondent, $3 to offeror); if it is not, both players get nothing (i.e., $0 to both). Studies show that most respondents who are offered less than 20% of a total amount choose to reject those offers, with the rejection rate increasing as respondent shares become smaller (Oosterbeek, Sloof & Van De Kuilen, 2004; Sanfey et al., 2003).

Our goal is to understand how the introduction of a peer affects a respondent's perceptions of what constitutes a fair offer. To rule out any considerations of competition with the peer and focus purely on fairness related issues, a non-competing peer is operationalized as a peer respondent whose actions do not influence the allocation outcome of the focal respondent, even if both are dealing with the same offeror.

<Insert Figure 1 About Here>

Accordingly, in PUG, one offeror makes two separate and simultaneous offers to two respondents; R1 and R2 (see Figure 1). The endowment to offeror is the same across both pairs of offers to the two respondents (e.g., $5 to be split between offeror and R1, and $5 to be split between offeror and R2), but the outcome of the game between offeror and R1 does not affect the outcome of the game between offeror and R2. Finally, the offeror receives the average payoff of the two games. Therefore, the magnitude of the maximum payoff that an offeror and respondents can receive in PUG is the same as that in UG.

To give a more analytical version of the reasoning for our two hypotheses in the context of UG and PUG: consider that a responder receives utility of $x \in [0,1]$ from an allocation of x when no peer is present (UG), and utility of $x-\phi$ where $\phi \in [0,1]$ when a peer who is receiving an unknown amount is present (PUG). While the respondent would like to receive as high a value of x as possible, let the probability of actually receiving such allocation from the offeror be $(1-x)$. The situation is symmetric for any peer respondent in PUG, though the value of ϕ may differ. While there is no material interdependence between respondents (because offers come from different buckets), our context bears a resemblance to auctions in the sense of one respondent winning when other loses. This resemblance is however a superficial one. In a sealed bid second price or first price auction, the value to self is fixed, and bidding strategy is common knowledge. Neither is true in our case. When the actual offers (and perceptions of what other respondents consider fair allocation to be) are unknown, the respondents cannot reach an equilibrium in "best response" to each other.

However, each respondent wants to ensure getting more than the other, and so escalates their perceptions of their own deservingness up to the point where the diminished probability of receiving this offer makes further escalation sub-optimal. Therefore, the respondents can reach an equilibrium with respect to the offeror in terms of how much they can expect and receive. There is an equilibrium in what the respondent expects and what the offeror allocates at $x=1/2$ in UG and $x=(1+\phi)/2$ in PUG. The second is larger than the first as long as $\phi>0$ (disutility from secret offer to peer exists), which is our first hypothesis. A non-negative utility from transparent and equal offer to peers corresponds to a case where $\phi \leq 0$. In this case, it is easy to see that the utility of a given

offer in PUG is likely to be higher (and the equilibrium values of offers and perceptions of a fair allocation are lower) with a transparent offer to peer, relative to the case of a secret offer to peer. That is our second hypothesis. In the Technical Appendix, we give more generalized versions of these results.

Ethics Statement

The authors sought and obtained approval of the Institutional Review Boards at one of their institutions for each of the studies. All participants had to be 18 years of age and above. In Experiment 1, one set of responses was removed as one of the participants did not meet the age criterion. All participants were briefed about the procedures of the experiment and had given their written consent before participating in the experiment. The written consent forms were stored as required by the Institutional Review Boards. All participants recruited from a student research pool in Experiment 2, on Prolific in Experiment 3, and on Amazon Mechanical Turk for supplementary studies read the procedures of the experiments and gave their consent by clicking on the appropriate option before participating in the experiments (see Table 1 for roadmap of experiments).

<Insert Table 1 About Here>

Experiment 1

In our first experiment, we tested our first hypothesis that the mere presence of a (non-competing) peer, even in the absence of any information on the offer to the peer, inflates the respondent's perception of a fair offer to self. To measure perceptions of what constitutes a fair offer to self, we relied on the strategy method in UG (see, for example, Mitzkewitz & Nagel, 1993; Solnick & Schweitzer, 1999; see Bahry & Wilson, 2006 for a

discussion on why the strategy method may be useful in assessing respondent behaviors; also see Brandts & Charness, 2011 for a review on direct response versus strategy method), which elicits minimum acceptable offers (MAOs) reported by respondents before they knew what was actually being offered. Simultaneously, offerors were asked to report their proposed offers before they knew the MAOs of respondents.

Participants

We recruited one hundred and sixty-six undergraduate students (92 male, 71 female and 3 did not report gender) with an average age of 18.7 years from an engineering institution in India. Participants enrolled in the study voluntarily. They were aware that they could earn a monetary reward depending on the outcomes of their actions in the study. As we had no prior information to estimate the effect size, we targeted 60 participants (offerors and respondents) in each condition. Eventually, we had between 52 and 60 participants in each condition due to attrition between sign-up and show-up.

Study Design

Participants were randomly assigned to one of three conditions (*UG*, *PUG Unaware*, *PUG Aware* described below) to play a 10-round ultimatum game with the strategy method (Solnick & Schweitzer, 1999, see Appendix 1 for full instructions). Participants were further randomly assigned to be either an offeror or a respondent. Each participant played the same role in all ten rounds and interacted with the same counterpart. The study was conducted in three seminar rooms – one for offerors, and two for respondents. For each experimental session, all participants were in the same condition. In the first session, the experimenters divided participants across two rooms. Participants were given instructions and role information in each room; all participants in room one were

given information sheets for Offerors in UG condition, while those in room two were given information sheets for Respondents in UG condition. In the second session, the experimenters divided participants across three rooms. Participants in room one were given information sheets for Offerors in PUG unaware condition, and participants in rooms two and three were given information sheets for Respondent in PUG unaware condition. The same process was repeated in the third session, with participants in room one receiving information sheets for Offerors in PUG aware condition, and participants in rooms two and three were given information sheets for Respondent in PUG aware condition.[1] Participants were not aware of who they were paired with. The researchers collected all responses (offers and MAOs) on pen and paper questionnaires and distributed them to their counterparts.

Participants were informed at the beginning of the study that one of the ten rounds would be chosen at random, and the participants would be paid on the basis of the outcome of that round. Whereas the hypothesis can be sufficiently tested with one round, we conducted 10 rounds to determine not only whether our hypothesized effects exist, but also how long they persist in the face of minimal amounts of feedback about peer respondents and outcomes (Pillutla & Murnighan, 1996).

[1] An additional variant of PUG in which the offer to the peer respondent was known had to be dropped because of printing errors in the instructions. Although the 60 participants in this variant of the game were told that they would know what the peer respondent had received before deciding their MAO, a document they read indicated that they would not receive this information, which confounded our intended manipulation and left the participants confused about the actual situation. As a result, we dropped all of these participants from this condition in our analysis. Data from the study are uploaded to an online appendix at Open Science Framework: http://bit.do/pug_osf.

Ultimately, there were 52 participants (26 respondents and 26 offerors) in the *UG* condition, 54 (36 respondents and 18 offerors) in the *PUG unaware* condition, and 60 (40 respondents and 20 offerors) in the *PUG aware* condition.

UG Condition

Participants in the UG condition played the standard UG using the strategy method. There was an endowment of 500 INR[2] to the offeror. The respondent indicates a minimum acceptable offer (MAO) between 0 INR to 500 INR, while the offeror proposes an offer between 0 INR to 500 INR. If the MAO is equal to or lesser than the offer, then the respondent receives the offer and the offeror receives the remaining. If the MAO is greater than the offer, then both parties receive nothing. This serves as our control condition.

PUG Unaware Condition

We use two variants of the PUG. In the *PUG unaware* condition, only the offerors knew that they were engaging with two respondents simultaneously. In other words, from the perspective of the respondent, there was no difference between *PUG unaware* and *UG*, but their behavior could differ because of potential differences in how the Offeror behaved in the two cases. In this condition, the respondents indicate their MAO (between 0 INR and 500 INR) and the offeror proposes two offers (between 0 INR and 500 INR) simultaneously, one offer to each respondent. This variant served as our second control condition.

PUG Aware Condition

In this variant of the PUG, both respondents were aware that the offeror was simultaneously engaging another respondent. Similar to the previous condition, the respondents indicate their MAO (between 0 INR and 500 INR) and the offeror proposes

[2] 500 INR is equivalent to 25.31 USD according to purchasing power parity adjustments at the time of study

two offers (between 0 INR and 500 INR) simultaneously, one offer to each respondent. However, the respondents were not aware of the magnitude of the offer to the other respondent. This variant served as our main treatment condition of interest. After round one (the focus of our Hypothesis 1), in addition to own outcomes, participants were also aware whether the offer cleared between the offeror and the other respondent at the end of every round.

Results and Discussion

<Insert Figure 2 About Here>

<Insert Table 2 About Here>

Figure 2 shows the MAOs of the respondents in the three conditions across the ten rounds. The results of all mean comparisons are summarized in Table 2. In Round 1, there was no difference in the mean MAO between *UG* (M = 203, [141, 264]) and *PUG unaware* (M = 188, [140, 235]; p = .69, 95% CI [-91, 61]. In line with our prediction, the mean MAOs in *PUG aware* (M = 309, [260, 358]) were greater than the mean MAOs in *PUG unaware* (M = 188, [140, 235]; p < .01, 95% CI [55, 188]). We also found that the mean MAOs in *PUG aware* (M = 309, [260, 358]) were greater than the mean MAOs in *UG* (M = 203, [141, 264]; p = 0.01, 95% CI [29, 183]). This pattern of differences continued and remained statistically significant for Rounds 1 to 5. After Round 5, however, the difference in MAOs across the conditions was no longer significant at conventional levels (p = 0.12) (see Table 2).

There was no difference in the offers made by the offerors across the *UG*, *PUG unaware*, and *PUG aware* conditions in any of the rounds. From the perspective of the offerors, they were always playing a series of materially unrelated UGs with a pair of agents.

This is also consistent with no differences between respondent's behavior in *PUG Unaware* and *UG*. This evidence rules out any possibility that the offerors were hedging outcomes across respondents in PUG (relative to UG).

Supplementary Results

We also conducted an online scenario study with participants on Amazon Mechanical Turk to replicate our findings in a different subject pool. Our results were consistent with the findings in support of Hypothesis 1 in Experiment 1. We found that respondents in PUG reported greater MAOs than respondents in the UG (refer to Supplementary Study 1 - Scenario Calibration Study for full details)

Experiment 2

In this experiment, we test H2 in a scenario (accepting or rejecting a hypothetical salary for a job offer) among a sample of business school students. We aim to test the empirical phenomenon of transparency versus secrecy in allocations. We chose this setting as our participants were seeking employment during the time of this study. This increases the face validity of the study to examine our phenomenon in the field in more naturalistic settings.

Participants

We recruited participants from a university in Singapore as part of their course requirements for research credits. We targeted 25 participants in each of our four conditions but realized 91 out of a target of 100 participants. Their average age was 22.1 years; 37 were male, and 54 were female.

Study Design

Participants completed the study online via the Qualtrics survey platform. Upon registration for the study, they received a link to the informed consent webpage. Participants were randomly assigned to one of two conditions (*PUG Secrecy condition* and *PUG Transparent condition*). Participants read a scenario asking them to imagine themselves receiving a job offer with a monthly salary of either $2,000 or $2,300 (two sub-conditions) out of a maximum of $3,000 (see Appendix 2 for the full scenario). We chose these amounts keeping in mind the results from our reanalysis of data from Ho and Su (2009) indicating that equity effects were stronger for low absolute values of offers.

Subsequently, participants were asked whether they would accept or reject the job offer. To focus on the effects of secrecy versus transparency, we examined whether the likelihood of acceptance of offers in *PUG Transparent* was greater when the offers to peers were known compared to when offers to peers were not known, for the same magnitude of an offer to self.

Ultimately, there were 46 participants (26 female and 20 male, average age 22.02 years) in the *PUG Secrecy* condition, and 45 (28 female and 17 male, average age 22.13 years) in the *PUG Transparent* condition (see Appendix 4 for a detailed breakdown).

PUG Secrecy Condition

Participants read a scenario asking them to imagine themselves receiving a job offer with a monthly salary of either $2,000 or $2,300 (out of a maximum possible salary of $3,000). This range was intentionally designed to be on the lower end of the salary that recent graduates received. Participants were not informed of the salary that was offered to a peer candidate but were aware of the presence of the peer candidate who also received a job offer from the same organization for a similar position (see Appendix 2 for full scenario

text). After reading the scenario, participants were asked to indicate on a 5-point Likert scale how likely they will be to accept the job offer (1=definitely not to 5=definitely yes).

PUG Transparency Condition

Participants read a scenario asking them to imagine themselves receiving a job offer with a monthly salary of $2,000 or $2,300 (out of a maximum possible salary of $3,000). Participants were informed that an equal monthly salary was offered to a peer candidate from the same organization for a similar position (e.g., $2,000 to the focal participant, $2,000 to peer candidate). After reading the scenario, participants were asked to indicate on a 5-point Likert scale how likely they will be to accept the job offer (1=definitely not to 5=definitely yes).

Manipulation Check

Participants were asked to indicate how transparent the company was in terms of salary offers to candidates (1=none at all to 5=a great deal).

Results and Discussion

The transparency manipulation was successful as participants in the transparent condition indicated higher mean levels of pay transparency (M = 3.29, [2.96, 3.62]) as compared to participants in the secrecy condition (M = 1.96, [1.67, 2.24]; $p < .01$, 95% CI [.90, 1.76]).

First, we compared how likely participants were to accept offers in the transparency and secret conditions. As predicted in H2, we found that participants in the transparency condition reported a higher likelihood to accept the job offer (M = 3.40, [3.12, 3.68]) than participants in the secrecy condition (M = 2.93, [2.65, 3.22]; p = .02, 95% CI [0.07, 0.86]).

We found that across the lowest offer of $2,000, participants in the transparency condition reported a higher likelihood to accept (M = 3.25, [2.85, 3.65]) than participants in the secrecy condition (M = 2.58, [2.19, 2.98]; p = 0.02, 95% CI [0.12, 1.21]). However, at the higher offer amount of $2,300, there was no difference in acceptance rates between participants in the transparency condition (M = 3.57, [3.15, 3.99]) and those in the secrecy condition (M = 3.32, [2.92, 3.71]; p = .37, 95% CI [-0.31, 0.81]). This study provides support to our prediction that transparency, coupled with equal offers, would increase acceptance rates (see Table 3). The effect is stronger for lower offers, as we also found in the reanalysis of data from Ho and Su (2009).

<Insert Table 3 About Here>

Supplementary Results

We also tested H2 with the scenario version of the UG and PUG using the direct response method using participants from Amazon Mechanical Turk. We varied various offer amounts and asked participants to indicate if they would accept or reject the offers. Our results were consistent with the findings of Experiment 2. We found that across equal offers, the mean acceptance proportion in PUG Secrecy was lower than that in PUG Transparency. We also found that an offer of $0.01 out of a pot of $5.00 given simultaneously and visibly to two peers was accepted with a probability of nearly 36%, whereas in UG only 14% accepted it (see Supplementary Study 2 - PUG Scenario Study for full details).

Experiment 3

A key limitation of Experiment 2 is that we only had conditions of secrecy and transparency, which are the extremes of minimum uncertainty and maximum uncertainty

about offers to peers. There were no conditions with varying levels of uncertainty. A second limitation is that we only had conditions with equal pay to peers, but no conditions with unequal pay to peers. Therefore, we cannot definitively claim that the effect of transparency on own willingness to accept only occurs under equal offers- it might occur for unequal offers as well, though prior literature strongly indicates this is unlikely (Fehr and Schmidt, 1999).

We therefore designed a comprehensive scenario study to address the limitations of Experiment 2. Using a sample of full-time employees, we aim to test the impact of varying levels of uncertainty in allocations while also manipulating (in)equity of allocations to peer respondents, as well as the level of allocation to self as we did before in Experiment 2. We improved upon the design of Experiment 2 by adding two new conditions of uncertainty to the paired ultimatum game paradigm, and an additional treatment of equal, lower, or higher offers to peers (manipulation of advantageous and disadvantageous inequity). This yielded a full factorial design of 4 x 2 x 3 (4 levels of uncertainty x 2 absolute levels of offer x 3 levels of (in)equity) with a total of 24 possible conditions. We omitted four of these conditions for logical reasons, because under full secrecy, inequity relative to a peer is undefined. See Table 4 for a summary description of the conditions.

<Insert Table 4 About Here>

Participants

We recruited participants from Prolific, which is a panel based in the U.K that is established for recruitment of subjects for academic research. We targeted 50 participants for each of our twenty conditions and obtained 1,000 participants. Their average age was

36.3 years; 393 were male, and 607 were female. 982 were working full time, 12 were working part time, and 6 were not working at the time of response. All except 10 participants were citizens of the United Kingdoms. Participants were paid 1.50 pounds for their time spent participating and this was not contingent on factors of the study design.

Study Design

Participants completed the study online via the Qualtrics survey platform. Upon registration for the study, they received a link to the informed consent webpage. Participants were then randomly assigned to one of twenty conditions after they provided their consent.

Manipulations

Uncertainty - We manipulated uncertainty by varying the degree of information about the offer amount to peer respondent in four different ways. First, in the *full secrecy* condition, similar to Experiment 2, participants had no information about the offer amount to peer respondent. Second, in the *partial secrecy* condition, participants had information on the past offers made by the offeror to past respondents, specifically whether the offers were equal or unequal. This created some uncertainty, as past behavior is not a perfect predictor of what the peer respondent will receive in the current setup. Third, in the *risk* condition, participants were given information about the exact range of possible offer amounts to peer respondent. Fourth, in the *transparent* condition, participants were given information about the exact offer amount to peer respondent (see Appendix 3 for the full scenario).

Level of pay - In the *high level of pay* condition, participants received $3.00 offers (out of $5). In the *low level of pay* condition, participants received $1.50 offer (out of $5).

We chose these amounts keeping in mind the results from Experiment 2 and Supplementary Study 2 where we found significant differences between transparency and secrecy at lower absolute levels of offers.

Inequity - In the *equal* condition, participants were given information that the offer amount made to peer respondents was equal. In the *advantageous inequity* condition, participants were given information that the offeror gave a lower offer amount to peer respondents. In the *disadvantageous inequity* condition, participants were given information that the offeror gave a higher offer amount to peer respondents.

We did not collect data on four conditions (5, 9, 17, 21) in Table 4 as they were logically undefined. Under full secrecy, participants could not be given any information about the offer amount to peer respondent. Therefore, they could not be told whether the offer amount is equal, higher, or lower.

Manipulation Checks

Uncertainty - Participants reported their perceived uncertainty of the offer amount to peer respondents by responding to the following question "On a scale from 1 to 5, how uncertain are you about the offer amount made to Respondent-J?" (1=none at all to 5=a great deal).

Inequity - Participants reported their perceived equality of the offer amount to peer respondent by responding to the following question "On a scale from 1 to 7, relative to the amount offered to you, how much do you think the amount offered to Respondent-J is?" (1=greatly lower to 7=greatly higher)

Dependent variable

Willingness to accept After reading the information about the scenario, participants reported their willingness to accept the offer on a 7-point Likert scale (1=not at all to 7=Definitely).

Mediator

Fairness To test the mechanism of EDS, we asked respondents to report their perceived fairness of the amount offered to them on a 7-point Likert scale (1=extremely unfair to 7=extremely fair). The central process in EDS is an escalated perception of what is considered a fair allocation to oneself. Therefore, besides measuring willingness to accept, we also measure the participant's subjective sense of fairness of an offer. To prevent demand effects, we asked these questions after the main dependent variable of *willingness to accept*.

Results and Discussion

Manipulation checks

The uncertainty manipulation was successful as participants in the *Full Secrecy* conditions indicated higher mean levels of uncertainty than those in the other three conditions. The equality manipulation was also successful as participants in the *Advantageous Inequity* conditions indicated perceiving the offers to peer as lower than those in the other two conditions (see Table 5 for mean values).

<Insert Table 5 About Here>

Main Effects

Table 6 reports the main aggregate effects of each orthogonally manipulated factor. In this segment, we report the results of each manipulation on willingness to accept.

Inequity Received theory and prior evidence suggest that inequity creates disutility and reduces willingness to accept. Disadvantageous inequity (i.e. receiving less than others) hurts; interestingly even advantageous inequity (i.e. receiving more than others) is less preferred to receiving the same (Fehr & Schmidt, 1999; Ho & Su, 2009). We replicated these in our study. We found that participants who received higher offers than peers (advantageous inequity condition; N=302, M=5.08, 95% CI [4.92, 5.24]) and participants who received lower offers than peers (disadvantageous inequity condition; N=299, M=4.49, 95% CI [4.32, 4.66]) reported lower willingness to accept than participants who received equal offers with peers (equal condition; N=300, M=5.50, 95% CI[5.38, 5.63]; equal vs. advantageous: $p < 0.01$, 95% CI [.23, .63]; equal vs. disadvantageous: $p < 0.01$, 95% CI [.81, 1.22]). As expected, participants who received lower offers than peers reported the lowest willingness to accept (advantageous vs. disadvantageous: $p < 0.01$, 95% CI [.36, .82]). Thus, our Experiment 3 confirms prior theoretical predictions and empirical evidence on the avoidance on inequity.

Level of pay As was found in Experiment 2, and also in the data gathered by Ho and Su (2009), willingness to accept in general increases with the level of the offer, independent of any equity considerations. Participants who received a high offer (N=497, M=5.33, 95% CI reported greater willingness to accept than participants who received a low offer (N=503, M=4.72, 95% CI [4.60, 4.85]; $p < 0.01$, 95% CI [.43, .77]).

Uncertainty There is no main effect of information uncertainty (Full Secrecy: N=99, M=5.03, 95% CI [4.74, 5.32]; Partial Secrecy: N=294, M=5.14, 95% CI [4.99, 5.28]; Risk: N=302, M=4.96, 95% CI [4.80. 5.12]; Transparent: N=305, M=4.98 [4.81,

5.14]) on willingness to accept. This is expected because the effect of this manipulation is contingent on the other manipulations of inequity and level of pay.

Hypothesis testing

Table 4 summarizes the disaggregated mean scores for willingness to accept across all the 20 conditions. First, we seek to replicate the test for H2 that states willingness to accept an allocation increases in the presence of a peer who is known to be receiving an equal allocation, compared to the case where the allocation to the peer is secret. We conducted paired-sample t-tests to compare participants' reported willingness to accept across the two uncertainty conditions of *Full Secrecy* and *Transparent* offers, for *Equal offers.* The dependent variable is *Willingness to accept*. For *Low* absolute offer amounts, we found that participants in *Transparent* (Condition 4: N=51, M=5.47, 95% CI [5.19, 5.75]) reported a higher willingness to accept than participants in *Full Secrecy* (Condition 1: N=51, M=4.53, 95% CI [4.11, 4.95]; $p < .00$, 95% CI [.45, 1.44]). Similar to the findings in Experiment 2, at the *High* absolute offer amount of $3.00, there were no differences in reported willingness to accept between participants in *Full Secrecy* (Condition 13: N=48, M=5.56, 95% CI [5.20, 5.92]) and participants in *Transparent* (Condition 16: N=51, M=5.76, 95% CI [5.52, 6.01]; p=.35). These results replicate our previous findings from Experiment 2, which found that transparency and equality of offers increased willingness to accept relative to secret offers, but only when the offer amount is low.

At *High level of pay* to self across *equal offers*, there is no difference across the four different conditions of uncertainty (*Full Secrecy* condition 13: N=48, M=5.56, 95% CI [5.20, 5.92]; *Partial Secrecy* condition 14: N=49, M=5.76, 95% CI [5.44, 6.07]; *Risk* condition 15: N=49, M=5.82, 95% CI [5.54, 6.09]; *Transparent* condition 16: N=51,

M=5.76, 95% CI [5.52, 6.01]). This is expected as equity considerations appear to be less salient at high absolute offer levels and participants are inclined to accept offers in general (Ho and Su, 2009).

Additional Analysis

Degree of uncertainty

We investigated the impact of intermediate levels of uncertainty (i.e. *Partial Secrecy* and *Risk*) on willingness to accept for *Equal offers* at high and low levels of pay. At *Low* level of pay, we find that there is no statistically significant difference in reported willingness to accept between participants in the *Risk* condition (condition 3: N=51, M=5.41, 95% CI [5.11, 5.72]), where participants know the mean and variance of offers to peers, and participants in the *Transparent* condition (condition 4: N=51, M=5.47, 95% CI [5319, 5.75]; p = .77, 95% CI [-0.35, 0.47]). Similarly, there is no statistically significant difference in reported willingness to accept between participants in *Partial Secrecy* condition (condition 2: N=49, M=4.80, 95% CI [4.45, 5.14]) and participants in *Full Secrecy* condition (condition 1: N=51, M=4.53, 95% CI [4.11, 4.95]; p = .33, 95% CI [-.27, .80]. However, reported willingness to accept by participants in *Partial Secrecy* (condition 2) is lower than those of participants in *Transparency* condition (Condition 4: N=51, M=5.47, 95% CI [5.19, 5.75]; p = .00, 95% CI [.24, 1.11]). This lends confidence that considering only the extreme points of uncertainty (Full Secrecy and Transparency) as we had done in Experiments 1 and 2 does not lead to misleading conclusions.

Disadvantageous Inequity

At low levels of pay and when participants received lower offers than peers (disadvantageous inequity), we find that participants in *Transparent* condition (condition

12: N= 50, M=3.88, 95% CI [3.43, 4.33]) reported lower willingness to accept than participants in *Full Secrecy* condition (condition 1: N=51, M=4.53, 95% CI [4.11, 4.95]; p = .04, 95% CI [-1.26, -.04]). Similarly, participants in the *Risk* condition (condition 11: N=51, M=3.88, 95% CI [3.47, 4.29]) also reported lower willingness to accept than participants in *Full Secrecy* condition (p = .03, 95% CI [-1.22, -.07]). There were no differences in reported willingness to accept between participants in *Partial Secrecy* condition (condition 10: N=49, M=4.96, 95% CI [4.65, 5.27]) and participants in *Full Secrecy* condition (p=.10).

At high absolute levels of offers to self, when participants received lower offers than peers (disadvantageous inequity), participants in *Transparent* condition (condition 24: N=50, M=4.66, 95% CI [4.26, 5.06]) reported lower willingness to accept than participants in *Full Secrecy* condition (condition 13: N=48, M=5.56, 95% CI [5.20, 5.92]; p = .00, 95% CI [.37, 1.43]). Similarly, participants in *Risk* condition (condition 23: N=51, M=4.39, 95% CI [3.99, 4.79]) reported lower willingness to accept than participants in *Full Secrecy* condition (p = .00, 95% CI [.64, 1.70]). There was no difference in reported willingness to accept between participants in *Partial Secrecy* condition (condition 22: N=48, M=5.21, 95% CI [4.82, 5.60]) and those in *Full Secrecy* condition. These results confirm prior theory that visible inequality can lower willingness to accept.

Advantageous inequity Next, we compared the results across situations where participants received higher offers than peer (advantageous inequity). There were no differences between the conditions at low levels of pay (*Partial Secrecy* condition 6: N=48, M=4.77, 95% CI [4.42, 5.13], *Risk* condition 7: N=52, M=4.88, 95% CI [4.52, 5.24], *Transparent* condition 8: N=51, M=4.65, 95% CI [4.20, 5.09], *Full Secrecy* condition 1).

We run the same tests at high absolute levels of offers to self in situations where participants received higher offers than peers (advantageous inequity). There were no differences between the reported willingness to accept among participants in conditions with varying levels of uncertainty (*Transparent* condition 20: N=52, M=5.40, 95% CI [4.99, 5.82]; *Risk* condition 19: N=48, M=5.44, 95% CI [5.03, 8.84]; *Partial Secrecy* condition 18: N=51, M=5.31, 95% CI [4.96, 5.67]) and the *Full Secrecy* condition (condition 13). Received theory indicates that the effects of advantageous inequity should be weaker than those of disadvantageous inequity (Fehr & Schmidt, 1999; Fershtman et al, 2012), and our results confirm that.

Mediation testing

To test the mechanism of EDS by determining whether fairness mediates the effect of uncertainty on willingness to accept, we conducted a bootstrapped indirect effect analysis in STATA for Conditions 1 (*Full Secrecy-Low-Equal*) and 4 (*Transparent-Low-Equal*). We set uncertainty as a binary variable, where 1=full secrecy and 0=transparent. Uncertainty negatively predicts willingness to accept (B= -.94, SE=.25, p<.01, 95% CI [.45, 1.44]) and perceived fairness (B=-1.84, SE=.26, p<.01, 95% CI [1.33, 2.36]), while perceived fairness was a positive predictor of willingness to accept (B=.30, SE=.09, p<.01, 95% CI [.12, .48]). However, with perceived fairness added as a predictor, the effect of uncertainty on willingness to accept was no longer statistically significant (B= -.38, SE=.29, p=.19, 95% CI [-.96, .20]. The indirect effect of uncertainty on willingness to accept through perceived fairness was significant, *indirect effect* = -.56, *SE* = .22, 95% CI = [-.98, -.14] (see Figure 3). This provides evidence that the effect of uncertainty on willingness to accept is mediated by perceptions of fairness, thus suggesting that

participants perceived less fairness when offers were secret, which consequently reduced their willingness to accept.

<Insert Figure 3 About Here>

<Insert Table 7 About Here>

General Discussion

We find robust evidence to suggest that the mere presence of a peer, without any additional information regarding allocations to that peer, is sufficient to trigger concerns about inequity and inflate perceptions of what one deserves (i.e. EDS), relative to situations in which no peer is present (Hypothesis 1). Our explicit comparison of the minimum acceptable offers participants report, with random assignment into the ultimatum games and paired ultimatum games offers the most persuasive evidence to date that implicit peer comparison influences considerations of the equity of offers made to oneself. Our results show that secrecy may not protect organizations from the adverse consequences of such comparison.

Transparency differs from secrecy in two ways – a) transparency reveals what others get and b) whether what others get is higher or lower than what the self has received. Secrecy reveals neither, and yet produces a systematic escalation in the perception of one's own deservingness because of the asymmetry in utility from receiving more versus less than a peer. This may occur with or without an upward bias in estimating what others are receiving, with an upward bias further strengthening the effect. Thus, uncertainty that accompanies pay secrecy can impose costs on the organization in the form of escalating beliefs of deservingness.

The implication of our analysis is a new boundary condition on when secrecy should be applied: *as long as the perception of what is a fair allocation for self, when peers receive offers secretly, is smaller than the actual offer to peers.* Transparency in such a situation would only escalate perceptions of what is a fair offer to self even further, to the disadvantage of the offeror. To illustrate this, suppose a hierarchical superior has two subordinates, ego and alter. The superior wants to pay alter an amount of 100. When the offer to alter is unknown to ego, EDS may occur and lead ego to come to expect an amount X. If X<100, then the designer should maintain secrecy and pay ego and alter X and 100 respectively. However, if X>100, then the designer is better off paying both ego and alter 100 and disclose the payments made to ego and alter to each other, since 200< X+100. In practice, transparency can be achieved by sharing information about pay ranges or the pay distribution, and these can reduce the costs imposed by EDS otherwise.

We also offer some thoughts on how to calibrate EDS. In an additional scenario study using the paired ultimatum game (PUG), we found that under secrecy, elicited minimum acceptable offers (MAOs) are approximately equal to MAOs under transparency where peers are offered $3 out of $5 (see Supplementary Study 3 in supplementary materials for more information). Specifically, participants indicated a MAO of M=2.51 when offer to peer was secret, which is almost equivalent to what participants indicated (M=2.68) when they knew that an offer of $3 out of $5 was made to a peer. However, when participants knew that offers to peer was lower ($1.50 out of $5, $.01 out of $5), their reported MAO was much lower (M=1.90, M=1.61 respectively). Consequently, in this experiment, if the offer to peers is in fact lower than approximately 60% ($3 out of $5) of the available sum of money, then keeping that offer secret is harmful to the offeror's

interest. Making the equivalent offer to peers transparent will reduce the minimum acceptable amount from participants. Conversely, at the highest offer level of approximately 90% of the pot ($4.50 out of $5.00), unsurprisingly, participants reported higher MAOs than those participants who did not know the offers peer. Such an approach to calibration may help determine the threshold (60% in this example) below which offers to peers should be public.

When allocations to peers are unknown, the escalation of deservingness perceptions among subordinates may also force superiors to adopt compromise options. From the perspective of superiors, EDS among subordinates may manifest as an implicit cartel that forms without communication, with all members of that cartel ratcheting up their perceptions of what is a fair allocation to self, thus increasing the cost to the organization. In fact, if there is a constraint on resources leading to subordinates demanding more than what they think a peer will demand, then a publicly declared equal allocation to all subordinates might help the organization to resist inflationary pressure. This is a possible explanation for the widely reported phenomenon of corporate socialism, that is, of the equal allocation of resources to divisions by multidivisional corporations (Rajan, Servaes & Zingales, 2000).

Our results also suggest the intriguing possibility that inevitable comparisons with peers can be used to the advantage of the organization (Hypothesis 2). We found that transparent allocations to peers not only mitigate the inflation of perceptions of what a fair allocation to oneself is relative to the situation in which these allocations are secret, but that transparent and equitable offers actually deflate perceptions of what a fair allocation to self is (Experiments 2 & 3). Indeed, numerous studies on UG suggest that offers less

than 20% are overwhelmingly rejected (Camerer, 2003), whereas we find that even such offers are highly likely to be accepted if a peer is transparently seen to receive the same. Our study is the first to directly test and provide evidence for this surprising but inescapable corollary to the premise that individuals derive at least some utility from equal offers to peers independent of the utility they derive from the material properties of the offer itself. Decreasing the variance of offers to subordinates may thus enable a superior to also reduce the mean value of those offers.

In other words, satisfying peer-related equity concerns in a visible manner (and doing so for the correct set of relevant peers) may actually allow a manager to get away with more inequitable behavior toward a subordinate, relative to a situation in which there is no peer. The implication is that an effective organizational design may be the clustering of employees who will be paid the same amount, not only to lower the costs of envy (Nickerson & Zenger, 2008) but also to allow the organization to pay them less in aggregate. More generally, our results suggest that organizations must consider the trade-off between the benefits of optimal but unequal allocations versus the benefits of transparent and equal allocations rather than automatically assume that secrecy resolves the fairness concerns created by unequal allocations (also see Card et al., 2012).

Taken together, the observations of this paper suggest that equity and transparency may be complements from the perspective of the organization. The value of making transparent offers to subordinates and their peers increases when those offers are equitable (and decreases when they are inequitable). Conversely, the value of making equitable offers to subordinates increases when those offers are transparent, whereas opaque offers, even when equitable, are likely to lead to an escalation of deservingness under secrecy

(EDS). Conversely, when the variance in pay is sufficiently large so that transparency increases the wage bill for the firm far more through pressures towards equality than the costs of secrecy we have indicated, then clearly secrecy is to be preferred (failing which wage compression may be necessary; see Nickerson and Zenger, 2008).

Even for a given position with the same set of job responsibilities, organizational members seldom receive identical levels of compensation. This is due to heterogeneity in ability and expected performance, which may result in inequality that nonetheless appears as inequity to recipients (Larkin et al, 2012; Lee and Puranam, 2017). From an organizational designer's perspective, if significant inequity in pay is unavoidable then it is best to keep that difference secret. However, when pay differences are small, the secrecy may be counterproductive as all agents escalate their expectations of what the others are being paid upwards, which may be higher than the actual pay differences. Furthermore, when pay levels are uniformly 'high' in an organization, transparency or secrecy do not matter. Given that pay is unlikely to be uniformly high, organizational designers need to pay attention to the levels of inequality when making a choice between secrecy and disclosure.

Limitations and Future Directions

Our studies focused directly on manipulating the absence and presence of a peer, and the secrecy versus transparency of offer amounts to peers. One major limitation of our studies in extrapolating to salary situations at the workplace is that we did not account for effort or performance. Visible effort and relative performance are vital components influencing equity considerations in organizations for any given degree of inequality, and

we abstracted away from these to a setting where inequality is the same as inequity. Relatedly, we have not incorporated individual heterogeneity in ability that may influence perceptions of what is a fair allocation to oneself and peers. Translating the inisghts from our research to the field will require a careful consideration of these complications.

Mismatches in perceptions of what is a fair offer to self can take time to adjust (Experiment 1). It may be tempting to draw the conclusion that five identical interactions (the number it took to push the MAOs closer to UG in Experiment 1) suffice for such adjustment to take place, and therefore that the peer presence-induced ratcheting up of perceptions of what is a fair allocation to self may be a transient phenomenon. However, that conclusion would be premature. In the experiment, these interactions were five of the ten that participants knew would occur. In practice, the number of interactions is not known in advance, and they are in any case unlikely to be identical. Rather, our results suggest that there is a tendency to ratchet up perceptions of what is a fair offer to oneself through EDS, though learning through repeated interactions may help to curb this inflation. In this paper, we did not investigate the effects of repeated interactions leading to learning. Future studies could consider repeated interactions and integrate a learning model with the EDS mechanism. Without a significant digression into learning models, it would be hard to do justice to the phenomenon of "learning what is fair".

Conclusion

Much of organizational life occurs in the shadow of hierarchy and in the presence of peers. This implies that considerations of equity arise in both vertical and lateral directions. For a variety of reasons, it has been argued that rewards to other subordinates be kept a secret by a hierarchical superior, lest transparency harms the social cohesion

within an organization by revealing inequality. In this paper, we argue and find support for a mechanism that causes an escalation of perceptions of deservingness of an allocation to self (EDS) under secrecy and thus demands a more careful consideration of the conditions under which secrecy is a good policy. An important corollary of EDS is that when rewards to peers are transparent and seen to be equitable relative to what one is receiving, then lower rewards may be palatable to all than was the case when the rewards to peers were kept secret. The EDS mechanism not only suggests further theoretical and empirical research but also informs organization design thinking in terms of how to create reference groups through grouping.

References

Adams, J. S. (1965) Inequity in social exchange. *Advances in Experimental Social Psychology, 2*, 267-299.

Agarwal, R., Anand, J., Bercovitz, J., & Croson, R. (2012). Spillovers across organizational architectures: The role of prior resource allocation and communication in post-acquisition coordination outcomes. *Strategic Management Journal, 33*(6), 710-733.

Bamberger, P., & Belogolovsky, E. (2010). The impact of pay secrecy on individual task performance. *Personnel Psychology, 63*(4), 965-996.

Bamberger, P., & Belogolovsky, E. (2017). The dark side of transparency: How and when pay administration practices affect employee helping. *Journal of Applied Psychology, 102*(4), 658-671.

Bahry, D. L., & Wilson, R. K. (2006). Confusion or fairness in the field? Rejections in the ultimatum game under the strategy method. *Journal of Economic Behavior & Organization*, *60*(1), 37-54.

Belogolovsky, E., & Bamberger, P. (2014) Signalling in secret: Pay for performance and the incentive and sorting effects of pay secrecy. *Academy of Management Journal, 57*(6), 1706-1733.

Brandts, J., & Charness, G. (2011). The strategy versus the direct-response method: a first survey of experimental comparisons. *Experimental Economics, 14*(3), 375-398.

Burton, R. M., & Obel, B. (1988). Opportunism, incentives, and the M-form hypothesis: A laboratory study. *Journal of Economic Behavior & Organization*, *10*(1), 99-119.

Camerer, C. (2003) *Behavioral game theory: Experiments in strategic interaction*. Princeton University Press.

Card, D., Mas, A., Moretti, E., & Saez, E. (2012). Inequality at work: The effect of peer salaries on job satisfaction. *American Economic Review, 102*(6), 2981-3003.

Colella, A., Paetzold, R. L., Zardkoohi, A., & Wesson, M. J. (2007). Exposing pay secrecy. *Academy of Management Review, 32*(1), 55-71.

Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ, 2.

Fehr, E. & Schmidt, K. M. (1999) A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics, 114*(3), 817-868.

Fershtman, C., Gneezy, U., & List, J. A. (2012) Equity aversion: Social norms and the desire to be ahead. *American Economics Journal: Microeconomics, 4*(4), 131-144.

Festinger, L. (1954) A theory of social comparison processes. *Human Relations, 7*(2), 117-140.

Fliessbach, K., Phillipps, C. B., Trautner, P., Schnabel, M., Elger, C. E., Falk, A., & Weber, B. (2012). Neural responses to advantageous and disadvantageous inequity. *Frontiers in human neuroscience*, *6*, 165.

Gartenberg, C., & Wulf, J. (2017). Pay harmony? Social comparison and performance compensation in multibusiness firms. *Organization Science*, *28*(1), 39-55.

Gely R, Bierman L (2003) Pay secrecy/confidentiality rules and the National Labor Relations Act. *University of Pennsylvania Journal of Labor and Employment Law*, *6*, 121-156.

Guetzkow, H., & Simon, H. A. (1955). The impact of certain communication nets upon organization and performance in task-oriented groups. *Management science, 1*(3-4), 233-250.

Haran, U., & Ritov, I. (2014) Know who you're up against: Counterpart identifiability enhances competitive behavior. Journal of Experimental Social Psychology, *54*, 115-121.

Ho, T. H., & Su, X. (2009) Peer-induced fairness in games. *The American Economic Review*, *99*(5), 2022-2049.

John, L. K., Loewenstein, G., & Rick, S. I. (2014). Cheating more for less: Upward social comparisons motivate the poorly compensated to cheat. *Organizational Behavior and Human Decision Processes*, *123*(2), 101-109.

Lanaj, K., Hollenbeck, J. R., Ilgen, D. R., Barnes, C. M., & Harmon, S. J. (2013). The double-edged sword of decentralized planning in multiteam systems. *Academy of Management Journal*, *56*(3), 735-757.

Larkin, I., Pierce, L., & Gino, F. (2012). The psychological costs of pay-for-performance: Implications for the strategic compensation of employees. *Strategic Management Journal*, *33*(10), 1194-1214.

Lawler, E. E. (1965). Managers 'Perceptions of their Subordinates' Pay and of Their Superiors' Pay. *Personnel Psychology*, *18*(4), 413-422.

Lee, S., & Puranam, P. (2017). Incentive Redesign and Collaboration in Organizations: Evidence from a Natural Experiment. *Strategic Management Journal*, *38*(12), 2333–2352.

Malhotra, D., & Murnighan, J. K. (2002). The effects of contracts on interpersonal trust. *Administrative Science Quarterly*, *47*(3), 534-559.

Martin, J. (1982). The fairness of earnings differentials: An experimental study of the perceptions of blue-collar workers. *The Journal of Human Resources*, *17*(1), 110-122.

Mitzkewitz, M., & Nagel, R. (1993). Experimental results on ultimatum games with incomplete information. *International Journal of Game Theory*, *22*(2), 171-198.

Moore, D. A., & Healy, P. J. (2008). The trouble with overconfidence. *Psychological review*, *115*(2), 502.

Nickerson, J. A., & Zenger, T. R. (2008). Envy, comparison costs, and the economic theory of the firm. *Strategic Management Journal*, *29*(13), 1429-1449.

Oosterbeek, H., Sloof, R., & Van De Kuilen, G. (2004). Cultural differences in ultimatum game experiments: Evidence from a meta-analysis. *Experimental economics*, *7*(2), 171-188.

Pillutla, M. M., & Murnighan, J. K. (1996). Unfairness, anger, and spite: Emotional rejections of ultimatum offers. *Organizational Behavior and Human Decision Processes*, *68*(3), 208-224.

Rajan, R., Servaes, H., & Zingales, L. (2000). The cost of diversity: The diversification discount and inefficient investment. *The Journal of Finance*, *55*(1), 35-80.

Raveendran, M., Puranam, P., & Warglien, M. (2015). Object salience in the division of labor: Experimental evidence. *Management Science*, *62*(7), 2110-2128.

Reitzig, M., & Maciejovsky, B. (2015). Corporate hierarchy and vertical information flow inside the firm—a behavioral view. *Strategic Management Journal*, *36*(13), 1979-1999.

Sanfey, A. G., Rilling, J. K., Aronson, J. A., Nystrom, L. E., & Cohen, J. D. (2003). The neural basis of economic decision-making in the ultimatum game. *Science*, *300*(5626), 1755-1758.

Solnick, S. J., & Schweitzer, M. E. (1999). The influence of physical attractiveness and gender on ultimatum game decisions. *Organizational Behavior and Human Decision Processes*, *79*(3), 199-215.

Tremblay, M., & Chênevert, D. (2008). Influence of compensation strategies in Canadian technology-intensive firms on organizational and human resources performance. *Group & Organization Management*, *33*(3), 269-302.

Tricomi, E., Rangel, A., Camerer, C. F., & O'Doherty, J. P. (2010). Neural evidence for inequality-averse social preferences. *Nature*, *463*(7284), 1089-1092.

Wang, C. S., Sivanathan, N., Narayanan, J., Ganegoda, D. B., Bauer, M., Bodenhausen, G. V., & Murnighan, K. (2011). Retribution and emotional regulation: The effects of time delay in angry economic interactions. *Organizational Behavior and Human Decision Processes*, *116*(1), 46-54.

Zenger, T. R. (1994). Explaining organizational diseconomies of scale in R&D: Agency problems and the allocation of engineering talent, ideas, and effort by firm size. *Management science*, *40*(6), 708-729.

Table 1: Roadmap of Experimental Approaches

Study	Method	DV	Purpose
Experiment 1	10 round (paired) ultimatum game	Strategy Method: MAO	Investigate effect of knowledge of presence of peer on MAO
Experiment 2	Job offer scenario	Willingness to accept job offer	Investigate effect of transparency on willingness to accept equal offers to peers
Experiment 3	1 shot (paired) ultimatum game	Willingness to accept offer	Investigate effect of transparency on willingness to accept offers to peers at varying levels of inequity and uncertainty
Supplementary Study 1 - Scenario Calibration Study	1 shot (paired) ultimatum game	Strategy Method: MAO	Replicate findings of Experiment 1 on different sample (Investigate effect of knowledge of presence of peer on MAO)
Supplementary Study 2 - PUG Scenario Study	(Paired) Ultimatum Game; each participant shown four offers in different order: $0.01, $1.50, $3.00, $4.50 out of $5 pot	Accept / Reject Offer	Investigate effect of transparency on acceptance levels of equal offers to peers
Supplementary Study 3	(Paired) Ultimatum Game; each participant informed that offeror made an offer of ($0.01/$1.50/$3.00/$4.50 out of $5 pot) to peer	Strategy Method: MAO	Investigate effect of transparency of offer to peer on MAO

Table 2: Experiment 1 Results. MAO across rounds with respondent1 and respondent2 pooled (Amounts in INR)

Condition	Mean MAO with 95% CI	Difference in mean MAO	95% CI of Difference in mean MAO	p-value
Round 1				
PUG Aware (a)	309 [260, 358]			
PUG Unaware (b)	188 [140, 235]			
UG (c)	203 [141, 264]			
(a)-(b)		122	[55, 188]	.00
(a)-(c)		106	[29, 183]	.01
(b)-(c)		-15	[-91, 61]	.69
Round 1-5				
PUG Aware (a)	253 [231, 276]			
PUG Unaware (b)	188 [167, 208]			
UG (c)	191 [168, 213]			
(a)-(b)		65	[35, 96]	.00
(a)-(c)		63	[31, 94]	.00
(b)-(c)		-3	[-33, 27]	.86
Round 6-10				
PUG Aware (a)	211 [187, 235]			
PUG Unaware (b)	183 [162, 204]			
UG (c)	185 [163, 207]			
(a)-(b)		28	[-4, 60]	.09
(a)-(c)		26	[-6, 58]	.12
(b)-(c)		-2	[-32, 28]	.90
Round 10				
PUG Aware (a)	208 [151, 266]			
PUG Unaware (b)	185 [162, 204]			
UG (c)	171 [117, 225]			
(a)-(b)		23	[-53, 99]	.54
(a)-(c)		37	[-39, 115]	.33
(b)-(c)		14	[-59, 87]	.70

Table 3: Experiment 2 Results. Mean scores of Likelihood of Acceptance across Conditions and Offer Levels

	PUG Secrecy	PUG Transparency	*Difference*
$2,000 Salary Offer	*M* = 2.58, [2.19, 2.98]	*M* = 3.25, [2.85, 3.65]	Δ = 0.67, *p* = 0.02, [0.12, 1.21]
$2,300 Salary Offer	*M* = 3.32, [2.92, 3.71]	*M* = 3.57, [3.15, 3.99]	Δ = 0.25, *p* = .37, [-0.31, 0.81]
Combined	*M* = 2.93, [2.65, 3.22]	*M* = 3.40, [3.12, 3.68])	Δ = 0.47, *p* = .02, [0.07, 0.86]

95% Confidence Intervals are in parentheses

Table 4: Experiment 3 Conditions. Summary of experimental conditions and with Mean scores of Willingness to Accept.

Condition	Uncertainty	Level of Pay to Self	Inequity	N	Mean	SD	Variance
1	Full Secrecy	Low	Equal	51	4.53	1.49	2.21
2	Partial Secrecy	Low	Equal	49	4.80	1.19	1.42
3	Risk	Low	Equal	51	5.41	1.08	1.17
4	Transparent	Low	Equal	51	5.47	0.99	0.97
5	*Full Secrecy*	*Low*	*Advantageous Inequity*	-	-	-	-
6	Partial Secrecy	Low	Advantageous Inequity	48	4.77	1.22	1.50
7	Risk	Low	Advantageous Inequity	52	4.88	1.29	1.67
8	Transparent	Low	Advantageous Inequity	51	4.65	1.59	2.51
9	*Full Secrecy*	*Low*	*Disadvantageous Inequity*	-	-	-	-
10	Partial Secrecy	Low	Disadvantageous Inequity	49	4.96	1.08	1.16
11	Risk	Low	Disadvantageous Inequity	51	3.88	1.45	2.11
12	Transparent	Low	Disadvantageous Inequity	50	3.88	1.60	2.56
13	Full Secrecy	High	Equal	48	5.56	1.24	1.53
14	Partial Secrecy	High	Equal	49	5.76	1.09	1.19
15	Risk	High	Equal	49	5.82	0.95	0.90
16	Transparent	High	Equal	51	5.76	0.89	0.78
17	*Full Secrecy*	*High*	*Advantageous Inequity*	-	-	-	-
18	Partial Secrecy	High	Advantageous Inequity	51	5.31	1.27	1.62
19	Risk	High	Advantageous Inequity	48	5.44	1.40	1.95
20	Transparent	High	Advantageous Inequity	52	5.40	1.49	2.21
21	*Full Secrecy*	*High*	*Disadvantageous Inequity*	-	-	-	-
22	Partial Secrecy	High	Disadvantageous Inequity	48	5.21	1.35	1.83
23	Risk	High	Disadvantageous Inequity	51	4.39	1.42	2.00
24	Transparent	High	Disadvantageous Inequity	50	4.66	1.41	1.98

Table 5: Experiment 3 Manipulation Checks. Mean scores of Perceived Uncertainty and Perceived Inequity of Offers.

Condition	N	Mean	SD	Variance
Uncertainty (1=none at all to 5=a great deal)				
Full Secrecy	99	3.59 [3.36, 3.81]	1.13	1.29
Partial Secrecy	294	3.09 [2.95, 3.22]	1.19	1.41
Risk	302	2.58 [2.48, 2.68]	0.87	0.76
Transparent	305	2.35 [2.24, 2.46]	1.00	1.00
Inequity (1=greatly lower to 7=greatly higher)				
Equal	300	4.18 [4.10, 4.27]	0.73	0.53
Advantageous Inequity	302	3.54 [3.38, 3.71]	1.45	2.09
Disadvantageous Inequity	299	4.92 [4.78, 5.07]	1.27	1.62

Table 6: Experiment 3 Results. Mean scores of Willingness to Accept across Manipulations.

Manipulations	N	Mean	SD	Variance
Uncertainty				
Full Secrecy	99	5.03 [4.74, 5.32]	1.46	2.13
Partial Secrecy	294	5.14 [4.99, 5.28]	1.24	1.54
Risk	302	4.96 [4.80, 5.12]	1.43	2.05
Transparent	305	4.98 [4.81, 5.14]	1.49	2.21
Level of Pay				
High	497	5.33 [5.21, 5.45]	1.33	1.78
Low	503	4.72 [4.60, 4.85]	1.40	1.96
Inequity				
Equal	300	5.50 [5.38, 5.63]	1.08	1.17
Advantageous Inequity	302	5.08 [4.92, 5.24]	1.41	1.98
Disadvantageous Inequity	299	4.49 [4.32, 4.66]	1.47	2.16

Table 7: Experiment 3 Results. Mean scores of Willingness to Accept across Conditions

Condition	Uncertainty	Level of Pay to Self	Inequity	Mean	95% CI of Difference in mean	p-value
1	Full Secrecy	Low	Equal	4.53 [4.11, 4.95]		
2	Partial Secrecy	Low	Equal	4.80 [4.46, 5.13]		
3	Risk	Low	Equal	5.41 [5.11, 5.71]		
4	Transparent	Low	Equal	5.47 [5.20, 5.74]		
	4 – 1 (Test of H2)				[.45, 1.44]	.00
	4 – 2				[.24, 1.11]	.00
	4 – 3				[-.35, .47]	.77

Figure 1: Experimental Paradigm of UG and PUG

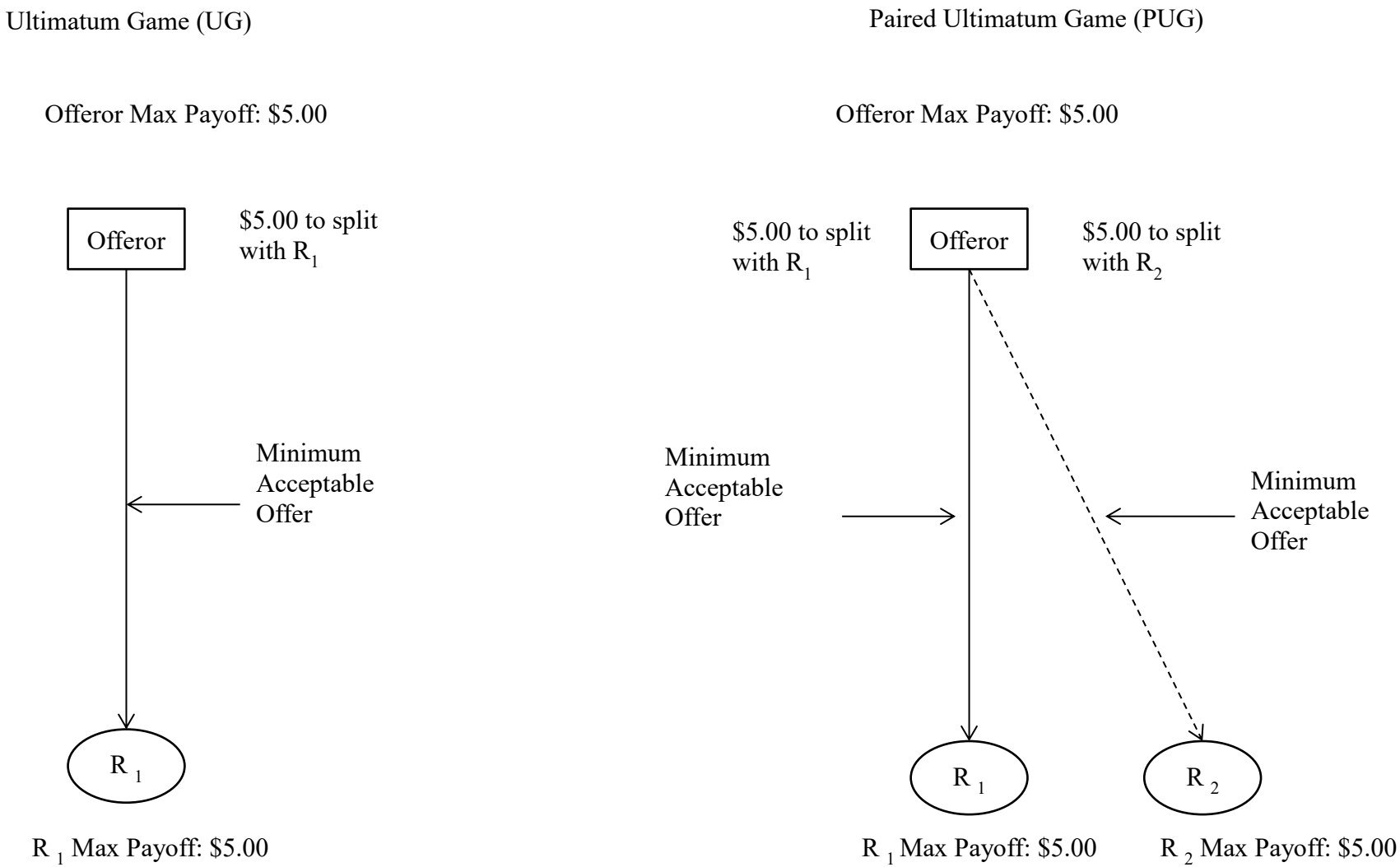


Figure 2: Experiment 1 Mean MAO across Conditions

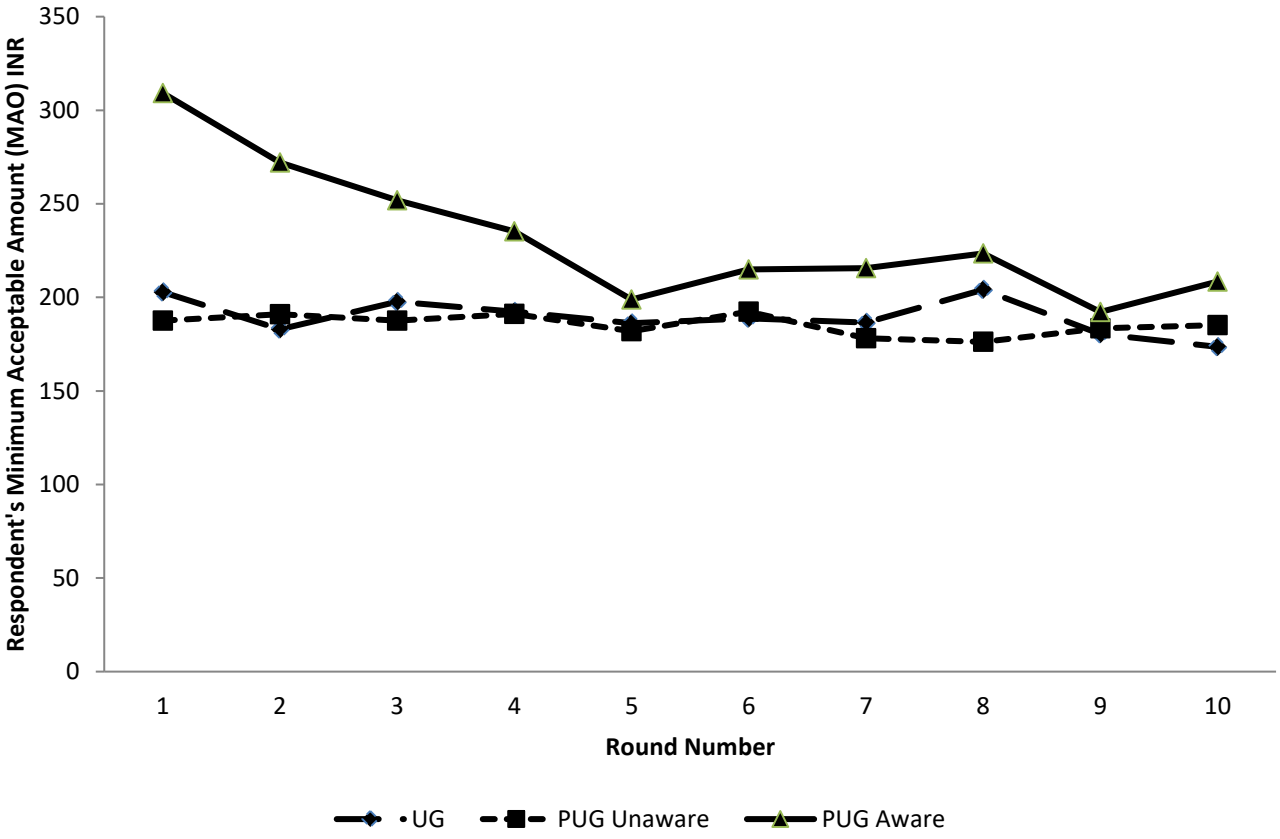
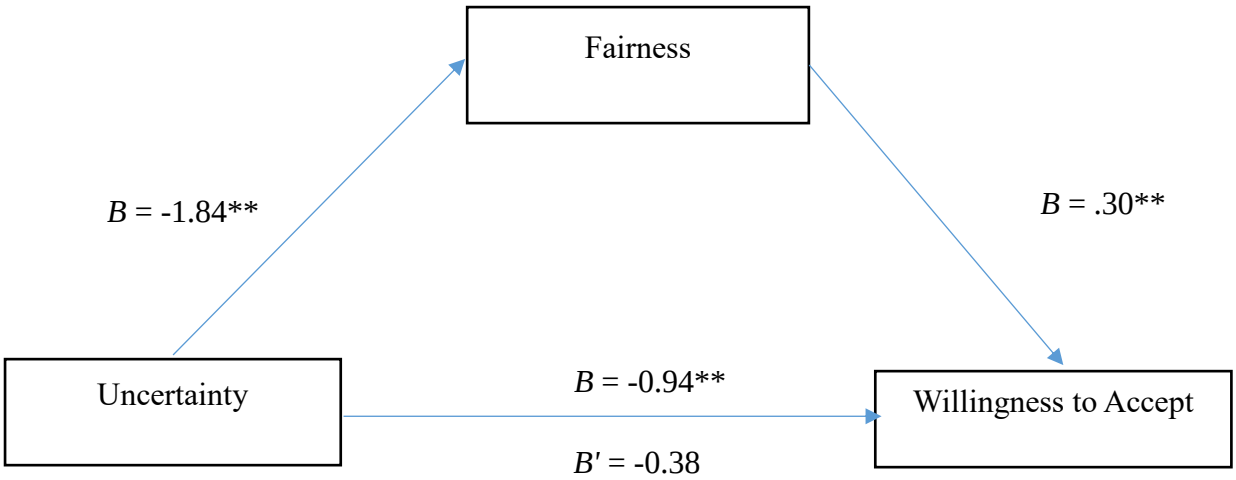


Figure 3. Illustration of the mediation model identified in Experiment 3.



Note: † $p < .10$, * $p < .05$, and ** $p < .01$ (two-tailed).

Uncertainty 0 = transparent, 1 = full secrecy