Increased Transparency in Procurement: The Role of Peer Effects

(Authors' names blinded for peer review)

Motivated by recent initiatives to increase transparency in procurement, we study the effects of disclosing information about previous purchases in a setting where an organization delegates its purchasing decisions to its employees. When employees can use their own discretion—which may be influenced by personal preferences—to select a supplier, the incentives of the employees and the organization may be misaligned. Disclosing information about previous purchasing decisions made by other employees can reduce or exacerbate this misalignment, as peer effects may come into play. To understand the effects of transparency, we introduce a theoretical model that compares employees' actions in two settings: one where employees cannot observe each other's choices and one where they can observe the decision previously made by a peer before making their own. Two behavioral considerations are central to our model: that employees are heterogeneous in their reciprocity towards their employer, and that they experience peer effects in the form of income inequality aversion towards their peer. As a result, our model predicts the existence of *negative spillovers* as a reciprocal employee is more likely to choose the expensive supplier (which gives him a personal reward) when he observes that a peer did so. A laboratory experiment confirms the existence of negative spillovers and the main behavioral mechanisms described in our model. A surprising result not predicted by our theory, is that employees whose decisions are observed by their peers are less likely to choose the expensive supplier than the employees in the no transparency case. We show that observed employees' preferences for compliance with the social norm of "appropriate purchasing behavior" explain our data well.

Key words: behavioral operations, delegation, transparency, procurement, peer effects, laboratory experiments.

1. Introduction

As part of recent initiatives to increase operational transparency, several organizations have launched online platforms to make information related to procurement transactions visible to various parties within the organization. For example, the government of Buenos Aires, Argentina, launched in 2017 a new platform, BuenosAiresCompra, that allows government employees to search and buy products and services from a set of preselected suppliers and to observe the past purchases of other government employees, among other features. ProZorro, an open public procurement platform launched by the government of Ukraine in 2014, goes even further and, under the motto "*Everyone can see everything*," discloses public procurement data, including the list of all potential suppliers with their bids, the decisions of the evaluation committee, contracts, and all qualification/certification documents to the general public. Similar initiatives have been adopted by the governments of Chile (ChileCompra), the UK (ContractsFinder), the state of California (CaleProcure), and other governments and private companies through third-party platforms such as OpenGov and Procurify. As opposed to ProZorro, most of these platforms provide only aggregate information to the public and, as in BuenosAiresCompra, individual decisions are observable only to employees within the organization.

In general, the transactions recorded by these platforms can be broadly classified into two types. The first type comprises the purchases of products and services that are central to the operation of the organization (e.g., the purchase of meals by a school district). As such, these purchases are the responsibility of procurement teams that must follow well-specified purchasing protocols. The second type comprises those purchases that, instead of being carried out by specialized procurement teams, are *delegated* to individual employees who will ultimately be the ones using these products and services. Examples of the latter include employees booking their own air tickets and hotels for business travel purposes, or choosing which work computer to buy. While employees still need to follow some purchasing guidelines, they are typically allowed much more freedom in selecting products and suppliers. This freedom can be somewhat problematic as the incentives of employees and the organization are not always fully aligned: while organizations typically care about price and quality, employees' preferences may be influenced by personal considerations. For example, employees might prefer to choose airlines for which they obtain reward points for personal use, ignoring lower-priced alternatives. This can be concerning for organizations because, even though individually delegated purchases generally involve small expenses, they can add up to large amounts. For instance, in 2014 the US government spent \$17.1 billion through the Government Purchase Card Program, which allows public agencies to pay for small purchases.[1]

Disclosing information about others' purchasing decisions can reduce or exacerbate this misalignment, as social comparisons and peer effects may come into play. Moreover, mechanisms to mitigate the misalignment are typically unavailable—individuals' needs are idiosyncratic and purchases are usually small, making punishment and monitoring unfeasible—and therefore understanding the impact of increased transparency on purchasing decisions is particularly important in this setting.

The goal of this paper is to study, both theoretically and experimentally, the impact of increased transparency on delegated purchasing behavior. Our contribution is threefold. First, we introduce a theoretical model incorporating employees' social preferences in the presence of transparency into

[1] Source: SBTDC, September 2, 2015. http://www.sbtdc.org/2015/09/what-is-the-government-purchase-card/.

the employees' utility, and derive testable hypotheses. Second, we design a procurement game to test the predictions of our model and to analyze the main drivers leading to changes in behavior. Finally, based on our results, we provide concrete managerial insights for organizations seeking to understand the potential consequences of increased transparency on their procurement costs.

More precisely, we introduce a stylized model of an organization consisting of a director and two employees, whose wages are identical and determined by the director. The organization needs to purchase two identical items and the director delegates the supplier choice to the employees: each of the employees must choose one of two suppliers to provide an item, which will be paid by the organization, and their decisions can be neither overruled nor punished by the director. Purchasing from the expensive supplier provides an extra personal benefit for the employees (such as purchasing a flight from a preferred airline) but also results in a higher procurement cost for the organization. This model captures the main features of the real-world settings described above and, at the same time, it is simple enough to allow us to squarely focus on studying the impact of transparency on employees' purchasing decisions, both theoretically and experimentally.

In particular, to understand the effect of transparency, we compare the employees' actions in two settings: one where employees make their decisions simultaneously and cannot observe each other's choices (baseline) and one where they make their decisions sequentially and the second employee can observe the first employee's supplier choice before making his own (peer). We assume that, besides the motivation to maximize monetary payoffs, two behavioral factors drive employees' decisions. First, we assume that (some) employees have reciprocal preferences towards the employer such that the employees are willing to forgo the personal benefit and choose the cheaper supplier if they perceive their employer is treating them kindly. Second, employees are subject to peer effects, which we model as income inequality aversion towards their peer's payoff. In line with previous literature, we assume that the latter is only present among employees who can observe their peer's decisions.

We show that, in both the baseline and peer settings, the probability that an employee chooses the expensive supplier is decreasing in the wage offered by the director, in the price difference between suppliers, and in how much the employee cares about reciprocity. Our main theoretical contribution is to show the existence of a *negative spillover* price-difference region for reciprocal employees, i.e., if the price difference between the suppliers falls in that region, a reciprocal employee is more likely to choose the expensive supplier (relative to the baseline) if he observes that his peer did so. This effect, results from the interaction of two behavioral considerations: the heterogeneity in employees' reciprocity towards the employer, and the aversion to disadvantageous income inequality relative to the peer. Moreover, our model predicts the absence of positive spillovers as observing that a peer chose the cheapest option does not affect employees' behavior, regardless of their reciprocity type.

To test these predictions we introduce a new game, the *procurement game*, that replicates the setting in our theoretical model. Our experimental design consists of a baseline treatment, where both employees choose a supplier simultaneously, and a peer treatment, in which employees make their decisions sequentially. The main experimental finding is that increasing transparency has a heterogeneous effect on buyers. In line with our theoretical results, we find evidence of negative spillover effects on reciprocal employees and no evidence of positive spillover effects. These results suggest that increasing transparency negatively affects reciprocal employees who observe their peers' decisions. Besides confirming the existence of negative spillover effects, which have previously been uncovered experimentally in related settings (see Section 2 for a detailed discussion), our theoretical model and experimental design allow us to identify the heterogeneity in reciprocity towards the employer as a key behavioral mechanism leading to this effect.

Moreover, we analyze how a buyer's behavior changes when he is being observed by a peer. The effects on observed employees have been mostly overlooked by the previous literature on peer effects, which mainly focuses on the effects on observers. We find evidence that employees who are observed are less likely to choose the expensive option. This result is particularly significant among non-reciprocal employees, suggesting that reciprocity is not the main mechanism driving their behavior. We propose an alternative explanation based on preferences for compliance with the *social norm*, i.e., the collective agreement about the appropriateness of choosing the expensive supplier. To test it, we conduct two social norm elicitation treatments to measure the appropriateness of choosing the expensive supplier in the baseline and peer settings respectively. We find that it is less appropriate to choose the expensive supplier when employees are observed by others, and that the differences between the elicited social norms are consistent with the differences in purchasing behavior. These results suggest that a model where observed employees seek to comply with social norms better explains their purchasing behavior.

We conduct two additional treatments to examine the effects of transparency when the two conditions we isolated in the peer treatment overlap, such that an employee observes a peer's decision before making his own, *and* is also himself observed by a peer. These treatments confirm that the two main effects that we identified—negative spillovers associated with observing that a peer chose the expensive supplier and positive effects associated with being observed by a peer—are still present when an employee both observes and is observed.

Our results provide useful managerial insights that can be applied when designing procurement platforms that increase transparency. In particular, firms' internal communication policies should emphasize that employees' decisions will be observed by their peers: this would help reduce overspending by non-reciprocal employees which in turn would mitigate the negative spillovers on reciprocal employees, leading to lower procurement costs. In addition, our results show that overspending is perceived to be less appropriate when an employee's decision will be observed by other employees. This should also be exploited by the organization to reduce procurement costs: as employees comply, to a certain level, with what is perceived as socially appropriate, organizations should make communication efforts that reinforce what is perceived as appropriate spending behavior in an attempt to increase compliance with the social norm.

Finally, while our experiment captures decision making in a procurement setting, we believe our findings and the behavioral mechanisms we identify (and, consequently, the managerial implications we derive) can more broadly explain the effects of increased transparency in related settings.

The remainder of this paper is organized as follows. In Section 2 we discuss the related literature. In Section 3 we present the theoretical model. Section 4 describes the experimental design and the hypotheses derived from our model, and Section 5 presents the main results. Section 6 provides a discussion. Finally, Section 7 describes the managerial implications of this research and concludes.

2. Related Literature

Our paper lies at the intersection of several streams of literature. First, it contributes to a growing literature studying the effects of transparency in operations management. So far, this literature has focused mostly on the effects of transparency on consumers' valuations for a product or service. For example, Buell and Norton (2011) show that operational transparency signaling that a service provider has exerted effort leads to a higher customer value perception. Buell et al. (2017) find similar positive effects of transparency when customers observe operational processes and employees can observe customers. Kraft et al. (2018) show that increased transparency through greater supply chain visibility increases consumers' valuations for a firm's social responsibility practices. Our paper shifts the focus towards the effects of transparency regarding employees' procurement decisions on the behavior of those same employees and their peers, and provides insights into how transparency can be most effectively implemented in this setting.

Our paper is also related to the literature studying the impact of human behavior on the design of procurement policies; see Elmaghraby and Katok (2017) for a comprehensive overview. Several papers focus on comparing the outcomes of alternative mechanisms (Engelbrecht-Wiggans and Katok 2006, Katok and Kwasnica 2008, Wan and Beil 2009, Wan et al. 2012, Tunca et al. 2014, Chaturvedi et al. 2016, among others) and on analyzing the behavioral factors affecting bidders' decisions (Kwasnica and Katok 2007, Davis et al. 2011). In particular, Elmaghraby et al. (2012) and Haruvy and Katok (2013) identify adverse effects of increased information transparency in suppliers' bidding behavior. Elmaghraby et al. (2012) find that rank-based feedback leads to lower prices than full price feedback. Haruvy and Katok (2013) find that bidders act more aggressively under a sealed-bid first-price format than under open-bid dynamic auctions. While suppliers' monetary payoffs directly depend on other suppliers' bids, our focus is on the increased visibility of employees' decisions, where their choices do not affect each other's monetary payoffs.

Our paper studies a procurement setting where an organization delegates the supplier choice to its employees. This resembles the traditional delegation setting introduced in the seminal paper by Aghion and Tirole (1997). Recent papers have studied behavioral aspects of delegation in different settings. Charness et al. (2012) conduct an experiment where an employer can decide either to choose an employee's wage or to delegate this choice to the employee and show that both the employer's and the employee's earnings are larger under delegation. Hamman et al. (2010) find that delegation may also be used to avoid taking direct responsibility for selfish or unethical behavior. Unlike these papers, we do not seek to study whether a decision should be delegated or not. Rather, we contribute to this literature by studying a setting where the choice of delegating has already been made (and, as under A-formal authority in Aghion and Tirole 1997, employees' decisions cannot be overruled or punished by the director), and focus on understanding how increasing transparency affects the procurement outcome.

Evidence of peer effects has been found in various related settings. The closest papers study peer effects in a three-person gift-exchange game, where an employer first chooses a wage for each of two workers, who then individually choose—either simultaneously or sequentially—a costly effort level that benefits the employer and has no monetary effect on the coworker.[2] Gächter and Thöni (2010) and Gächter et al. (2012) find that reciprocal preferences towards the employer play an important role in explaining employees' behavior, and that higher wages are associated with higher effort. These papers focus on employees' responses to unequal treatment from the employer, and find that effort comparisons are present when the employer pays equal and generous wages to both employees. Instead, we focus squarely on the peer effects resulting from increased transparency of the procurement decision and only allow for equal wages. Gächter et al. (2013) and Thöni and Gächter (2015) identify spillover effects when one worker can observe the other worker's effort before choosing his own. The former find a positive correlation between the decisions of employees making their choices sequentially, and shows that the second worker's behavior is better explained by income inequality aversion towards the peer (Fehr and Schmidt 1999) than by preferences for compliance with social norms. The latter find that agents follow a low-performing but not a high-performing peer. This asymmetry is also identified by Dimant (2019), who shows that unethical behavior is more contagious than ethical behavior in a two-stage dictator game where subjects can

[2] The original gift-exchange game, introduced by (Fehr et al. 1993), consists of one employer and one employee.

donate to or take away money from charity. In the operations management literature, Ho et al. (2014) study peer effects when two retailers interact with the same supplier and find that, due to the retailers' peer-induced and distributional fairness (Ho and Su 2009), the second retailer has a higher wholesale price, makes a lower profit, and has a lower share of the total supply chain profit than the first retailer. We make three important contributions to this literature. First, we show that the negative spillover effects are a robust result, which also arises in our procurement game. Second, our experimental design allows us to test the mechanisms leading to this result by identifying that the negative spillovers affect primarily reciprocal employees. Third, we show the existence of "positive effects" on employees who are observed by their peers, a result that has been mostly overlooked in previous literature,[3] and analyze the behavioral drivers leading to it.

Finally, our paper is also broadly related to the behavioral operations management literature studying the effects of social preferences in supply chain management and procurement (Croson et al. 2013). This stream of literature has established that factors such as fairness (Haitao Cui et al. 2007, Loch and Wu 2008, Katok and Pavlov 2013), trust and trustworthiness (Özer et al. 2011, Özer et al. 2014, Özer and Zheng 2017, Spiliotopoulou et al. 2016, Beer et al. 2018), and long-term relational concerns (Davis and Hyndman 2017) are important for understanding how firms make decisions in procurement and how they relate with their suppliers. While most of these papers focus on firm-level decisions, our focus is on employee-level decisions and in particular on how employees affect each other's decisions when transparency is introduced.

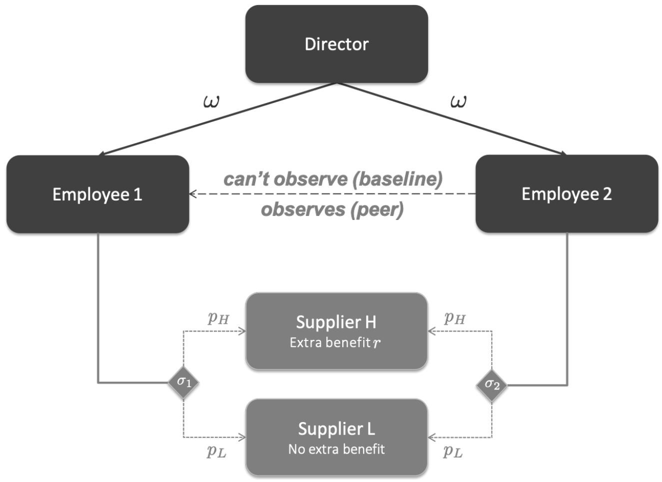
3. Model

We consider an organization comprised of three agents: a director (D) and two employees (E_1 and E_2). The organization needs to purchase two items and the director delegates this task to the employees, such that each employee is in charge of buying one item. The employees can purchase the item from one of two suppliers, supplier H and supplier L (S_H and S_L), who offer identical items at prices p_H and p_L, respectively. For simplicity, p_L is fixed and $p_H = p_L + \Delta$, where Δ is a random variable uniformly distributed in $\left[0, \bar{\delta}\right]$. That is, supplier H is at least as expensive as supplier L, and the realized price difference δ is randomly determined.[4] These prices are exogenously given, i.e., suppliers are non-strategic and/or employees have negligible market power, as in the motivating examples. Finally, employees obtain a personal reward $r > 0$ when purchasing from S_H that is commonly known. This reward can represent the mileage obtained from choosing the preferred airline, the extra utility of choosing a preferred brand, and so on.

[3] Mittone and Ploner (2011) study a five-person trust game, with one sender and four receivers, who are paired and make their choices sequentially. They find evidence of higher returns in receivers who move first, but only when the investment is high.

[4] When clear from the context we abuse notation and use δ for both the random price difference Δ and its realization.

Figure 1 The Procurement Game



Note: In Stage 1 the director chooses a wage that is equal for both employees. In Stage 2 the employees observe the wage chosen by the director and the realized price difference between suppliers, and make their decision. In the baseline model employees make their decisions simultaneously. In the peer model employees make their decisions sequentially, with E_1 choosing first and E_2 observing E_1's choice before making his own.

The interactions between the director and the employees are described in terms of a two-stage *procurement game* as follows. In the first stage, the director chooses a wage $\omega \in [\underline{\omega}, \infty)$ that is the same for both employees. The director chooses the wage knowing only the distribution of the price difference but not its realization. Her goal is to minimize the total procurement cost, given by the sum of the employees' wages and the prices of the suppliers selected by the employees. In the second stage, and after observing the wage chosen by the director and the realized prices p_H and p_L, each employee chooses a supplier. Employees' decisions can be neither overruled nor punished by the director. The game is illustrated in Figure 1.

In the absence of social preferences (i.e., when all agents maximize their own monetary payoff), this game has a unique equilibrium: both employees always choose supplier H, and the director chooses a wage $\omega = \underline{\omega}$. However, previous work has found evidence that agents not only care about their monetary payoff, but also incorporate social considerations in their utility function (e.g. Rabin 1993, Charness and Rabin 2002, Fehr and Schmidt 1999, Bolton and Ockenfels 2000). We focus on the interplay of two such considerations: (1) reciprocity towards the director, which reflects the desire to reward kind actions (high wage) and punish hostile ones (low wage); and (2) distributional preferences towards the peer, which we model as income inequality aversion.[5] In

[5] One could also consider including distributional fairness towards the director. However, since employees' actions follow the director's wage decision, we expect the employees' social preferences to be primarily driven by their perception of how kind the employer's action was. Indeed Ho and Su 2009 show that, in ultimatum games played sequentially by a leader and two followers, peer-induced fairness between the followers is significantly stronger than the followers' distributional fairness towards the leader. Consistent with this result, we focus on employees' reciprocity rather than employees' distributional fairness towards their employer.

the next subsections we consider two variants of the model. We start with a *baseline model* where employees cannot observe each other's decisions. Later, we consider a *peer model*, where employees make their decisions sequentially, starting with E_1 and followed by E_2, and E_2 can observe E_1's supplier choice before making his own decision.

3.1. Baseline Model

In the baseline model, both employees choose a supplier simultaneously. As employees have no information about each other's payoff, we assume that they have no distributional preferences towards their peer and that they have only reciprocity towards the director in their utility function.

We consider employees who are heterogeneous in their sensitivity to reciprocity, and denote employee i's sensitivity to reciprocity by γ_i. We assume that employees can be classified into two types, i.e., $\gamma_i \in \{\gamma_L, \gamma_H\}$ with $0 \leq \gamma_L \leq \gamma_H$. In addition, we let $\gamma_i = \gamma_H$ with probability q, and let $\gamma_i = \gamma_L$ with probability $1-q$, and assume that this distribution is commonly known. We focus on the special case where $\gamma_L = 0$ and $\gamma_H = \gamma > 0$, and say that employee i is *reciprocal* if $\gamma_i = \gamma$ and is *non-reciprocal* otherwise. This is consistent with previous work (see Englmaier and Leider 2012 and Beer et al. 2018).[6]

The strategy for employee $i \in \{1,2\}$ can be described by a function $\sigma_i : [\underline{\omega}, \infty) \times \left[0, \bar{\delta}\right] \times \{0, \gamma\} \to \{S_H, S_L\}$ where $\sigma_i(\omega, \delta, \gamma_i)$ represents the supplier chosen by employee i given wage ω, price difference δ, and its reciprocity coefficient[7] γ_i. When there is no risk of confusion, we sometimes omit the arguments and simply denote by σ_i the decision made by employee i.

For a given wage, price difference, and strategy, we model the utility of employee i as the sum of three terms as follows:

$$u_i(\omega, \delta, \gamma_i, \sigma_i) = \omega + r \cdot \mathbb{1}_{\{\sigma_i = S_H\}} + \gamma_i \cdot R_\rho(\omega, \delta, \sigma_i),$$

where the first two terms represent the monetary payoff (the wage and the reward if the expensive supplier is chosen), and the last term captures the additional utility from reciprocity. We model the latter as the product of the employee's sensitivity to reciprocity, γ_i, and a function R_ρ that depends on the employee's belief about how kind the director is (how the received wage compares to a reference wage) and the employee's kindness towards the director. For simplicity we assume that all employees have the same reference wage, which we denote by ρ. Formally, the function $R_\rho : [\underline{\omega}, \infty) \times \left[0, \bar{\delta}\right] \times \{S_H, S_L\} \to \mathbb{R}$ is defined as

$$R_\rho(\omega, \delta, \sigma_i) = \underbrace{(\omega - \rho)}_{\substack{:=\lambda_\rho(\omega) \\ director's\ kindness}} \cdot \underbrace{\frac{\delta}{2}\left(\mathbb{1}_{\{\sigma_i = S_L\}} - \mathbb{1}_{\{\sigma_i = S_H\}}\right)}_{\substack{:=\kappa_i(\delta, \sigma_i) \\ employee's\ reciprocation}}. \tag{1}$$

[6] As we shall see in Section 5, the assumption $\gamma_L = 0$ is consistent with our own experimental results.

[7] We restrict our attention to pure symmetric strategies, and in the case of indifference we assume that the employees choose supplier H and the director chooses the lowest wage.

The first term, $\lambda_\rho(\omega)$, captures the employee's belief about how generous the wage offered by the director is. We extend Dufwenberg and Kirchsteiger (2000) and assume that E_i's assessment of the director's kindness (or unkindness) is proportional to the difference between the wage received and the reference wage ρ, i.e. $\lambda_\rho(\omega) = \omega - \rho$. That is, the wage offered by the director is perceived as (un)kind if it is (below) above the reference wage ρ. The second term, $\kappa_i(\delta, \sigma_i)$, captures the employee's kindness towards the director. We again follow Dufwenberg and Kirchsteiger (2000) and assume that $\kappa_i(\delta, \sigma_i) = \frac{\delta}{2} \cdot (\mathbb{1}_{\{\sigma_i = S_L\}} - \mathbb{1}_{\{\sigma_i = S_H\}})$; i.e., employee i is kind if $\sigma_i = S_L$ (unkind if $\sigma_i = S_H$), and the magnitude of E_i's (un)kindness is equal to the average impact of his decision on the director's payoff, which is equal to $\delta/2$ (that is, $-\delta$ if $\sigma_i = S_H$ and 0 if $\sigma_i = S_L$).

Notice that, when $\omega > \rho$, the probability of choosing S_H is non-increasing in ω and δ as

$$\begin{aligned} \mathrm{P}\left(\sigma_i = S_H \mid \omega, \delta\right) &= \mathrm{P}\left(u_i(\omega, \delta, \gamma_i, S_H) > u_i(\omega, \delta, \gamma_i, S_L)\right) \\ &= \mathrm{P}\left(r + \gamma_i \cdot \left[R_\rho(\omega, \delta, \gamma_i, S_H) - R_\rho(\omega, \delta, \gamma_i, S_L)\right] > 0\right), \end{aligned} \tag{2}$$

is non-increasing in both ω and δ. This captures the fact that it is more costly to be unkind when the director offers a high wage or when the employee's decision has a higher impact on the director's payoff. By contrast, if $\omega < \rho$ then $R_\rho(\omega, \delta, S_H) - R_\rho(\omega, \delta, S_L)$ is non-negative and non-decreasing in both ω and δ, so the employees will always choose the expensive supplier.

The goal of the director is to choose a wage ω that minimizes her expected cost, defined as

$$c_D(\omega) = 2\omega + \mathbb{E}_{\delta, \gamma_1, \gamma_2}\left[p_{\sigma_1(\omega, \delta, \gamma_1)} + p_{\sigma_2(\omega, \delta, \gamma_2)}\right], \tag{3}$$

the expected sum of the prices of the suppliers chosen by the employees, choices that depend on the realized price difference and the reciprocity coefficients, both of which are unknown to the director at the time she chooses a wage.

Proposition 1 characterizes the equilibrium in the baseline model.

Proposition 1. *For a given wage ω and price difference δ, employee i's optimal strategy function can be characterized depending on his reciprocity type as follows:*

$$\sigma_i(\omega, \delta, 0) = S_H, \qquad \textit{and} \qquad \sigma_i(\omega, \delta, \gamma) = \begin{cases} S_H \ \textit{if}\ \lambda_\rho(\omega) \le 0 \\ S_H \ \textit{if}\ \lambda_\rho(\omega) > 0 \ \textit{and}\ \delta \le \frac{r}{\gamma \lambda_\rho(\omega)} \\ S_L \ \textit{if}\ \lambda_\rho(\omega) > 0 \ \textit{and}\ \delta > \frac{r}{\gamma \lambda_\rho(\omega)}. \end{cases} \tag{4}$$

The director's optimal wage ω_B^* is given by:

$$\omega_B^* = \begin{cases} \rho + \psi & \textit{if}\ r < q\gamma\bar{\delta}^2,\ 2(\rho - \underline{\omega}) < q\bar{\delta} - 3\psi \\ \underline{\omega} & \textit{otherwise.} \end{cases}, \quad \textit{where} \quad \psi = (q/\delta)^{\frac{1}{3}} \times (r/\gamma)^{\frac{2}{3}}. \tag{5}$$

The proof can be found in Appendix A. Intuitively, if an employee is non-reciprocal (i.e., $\gamma_i = 0$), he always chooses supplier H regardless of the wage and the price difference. By contrast, reciprocal employees (i.e. those for which $\gamma_i > 0$) always choose supplier H if the wage is below the reference wage; if the wage is above the reference wage, they employ a threshold strategy: they select supplier H for low price differences ($\delta \le \frac{r}{\gamma \lambda_\rho(\omega)}$) and supplier L otherwise. Based on the model primitives and on the employees' responses, the director will either choose to pay the minimum wage or she will incentivize pro-social behavior to achieve a lower procurement cost by offering $\omega_B^* = \rho + \psi$.

3.2. Peer Model

Consider now the case where E_2 observes E_1's decision before making his own. In this context we refer to E_1 and E_2 as the *observed* and the *observer* employees, respectively. As E_2 can perfectly observe E_1's monetary payoff, we assume that he incorporates distributional preferences in his utility, which becomes

$$u_2(\omega,\delta,\gamma_i,\sigma_2) = \pi_2 + \underbrace{\gamma_2 \cdot R_\rho(\omega,\delta,\sigma_2)}_{\text{reciprocity}} + \underbrace{(\pi_1 - \pi_2)\cdot\left(\alpha\cdot\mathbb{1}_{\{\pi_2>\pi_1\}} - \beta\cdot\mathbb{1}_{\{\pi_2<\pi_1\}}\right)}_{\text{peer-effects}}, \tag{6}$$

where α and β are non-negative constants, $R_\rho(\omega,\delta,\sigma_2)$ is defined as in Equation (1), and π_i is a shorthand for the function $\pi_i(\omega,\sigma_i) = \omega + r\cdot\mathbb{1}_{\{\sigma_i=S_H\}}$, representing the monetary payoff. As in Ho and Su (2009) and Ho et al. (2014), we assume that only employee 2 incorporates distributional concerns as he is the only one who can perfectly infer monetary payoffs. Thus, the utility functions of the director and employee 1 remain unchanged. Moreover, following Fehr and Schmidt (1999) we restrict our attention to distributional preferences for "difference aversion"; i.e., α and β reflect the strength of E_2's aversion to advantageous and disadvantageous income inequality, respectively. Previous related work on trilateral gift-exchange games finds estimates for α and β in $[0,1]$ (Gächter et al. 2013, Thöni and Gächter 2015), and so we focus our analysis on α and β in this range.

Proposition 2 characterizes the equilibrium outcome of the peer model. As employee 2 now conditions his actions on the decision of employee 1, we solve for the equilibrium using backward induction in three steps: we first solve for the strategy of employee 1, then for the strategy of employee 2 given the strategy of employee 1, and, finally, for the director's decision.

PROPOSITION 2. *Employee 1's optimal strategy σ_1 is as characterized in Proposition 1. Suppose that $\alpha,\beta\in[0,1]$. Then, given wage ω, price difference δ, and employee 1's optimal strategy σ_1, employee 2's optimal strategy can be characterized based on his reciprocity coefficient as follows:*

$$\sigma_2(\omega,\delta,0,\sigma_1) = S_H, \quad \text{and} \quad \sigma_2(\omega,\delta,\gamma,\sigma_1) = \begin{cases} S_H \ \text{if } \lambda_\rho(\omega)\le 0 \text{ or } \lambda_\rho(\omega)>0 \text{ and } \delta < \frac{r}{\gamma\lambda_\rho(\omega)}, \\ S_H \ \text{if } \lambda_\rho(\omega)>0, \delta\in\left[\frac{r}{\gamma\lambda_\rho(\omega)}, \frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right] \text{ and } \sigma_1 = S_H, \\ S_L \ \text{if } \lambda_\rho(\omega)>0, \delta\in\left[\frac{r}{\gamma\lambda_\rho(\omega)}, \frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right] \text{ and } \sigma_1 = S_L, \\ S_L \ \text{if } \lambda_\rho(\omega)>0, \delta > \frac{r\cdot(1+\beta)}{\gamma\lambda_\rho(\omega)}. \end{cases} \tag{7}$$

Finally, let ψ be defined as in Equation (5) and define

$$\xi = \left[\frac{(1+q)}{2}\right]^{\frac{1}{3}}, \quad \zeta = \left[\frac{(1+q)+(1+\beta)^2\cdot(1-q)}{2}\right]^{\frac{1}{3}}.$$

Then, the optimal wage ω_P^* is given by:

$$\omega_P^* = \begin{cases} \rho+\psi\zeta \ \text{ if } \xi\in\left(\frac{r}{\gamma\bar\delta\psi}, \frac{r(1+\beta)}{\gamma\bar\delta\psi}\right), \zeta\in\left(\frac{r(1+\beta)}{\gamma\bar\delta\psi}, \infty\right), 2(\rho-\underline{\omega}) < q\bar\delta - 3\psi\zeta,\ 3\psi(\zeta-\xi) < \frac{q(1-q)\bar\delta}{2} \\ \rho+\psi\zeta \ \text{ if } \xi\notin\left(\frac{r}{\gamma\bar\delta\psi}, \frac{r(1+\beta)}{\gamma\bar\delta\psi}\right), \zeta\in\left(\frac{r(1+\beta)}{\gamma\bar\delta\psi}, \infty\right), 2(\rho-\underline{\omega}) < q\bar\delta - 3\psi\zeta \\ \rho+\psi\xi \ \text{ if } \xi\in\left(\frac{r}{\gamma\bar\delta\psi}, \frac{r(1+\beta)}{\gamma\bar\delta\psi}\right), \zeta\in\left(\frac{r(1+\beta)}{\gamma\bar\delta\psi}, \infty\right), 2(\rho-\underline{\omega}) < \frac{q(1+q)\bar\delta}{2} - 3\psi\xi,\ 3\psi(\zeta-\xi) \ge \frac{q(1-q)\bar\delta}{2} \\ \rho+\psi\xi \ \text{ if } \xi\in\left(\frac{r}{\gamma\bar\delta\psi}, \frac{r(1+\beta)}{\gamma\bar\delta\psi}\right), \zeta\le\frac{r(1+\beta)}{\gamma\bar\delta\psi},\ 2(\rho-\underline{\omega}) < \frac{q(1+q)\bar\delta}{2} - 3\psi\xi, \\ \underline{\omega} \qquad \text{otherwise.} \end{cases} \tag{8}$$

The proof can be found in Appendix A. The equilibrium strategy for employee 1 is equal to that in the baseline model, but now employee 2 uses a different strategy. If employee 2 is non-reciprocal ($\gamma_i = 0$), he always chooses supplier H. If employee 2 is reciprocal ($\gamma_i > 0$) he always chooses supplier H if the wage is below the reference wage, and uses a threshold strategy when the wage is above the reference wage: if the price difference is below $\frac{r}{\gamma\lambda_\rho(\omega)}$, then he chooses supplier H; if the price difference is above $\frac{r\cdot(1+\beta)}{\gamma\lambda_\rho(\omega)}$, then he chooses supplier L; finally, if the price difference is in the intermediate region (i.e., $\delta \in \left[\frac{r}{\gamma\lambda_\rho(\omega)}, \frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right]$), then employee 2 mimics employee 1's choice. We refer to the latter region as the *negative spillover* region as, in this region, reciprocal employees choose supplier H when they observe their peer did so, whereas in the absence of transparency reciprocal employees always choose supplier L. Finally, and similarly to the baseline case, the director will either choose to pay the minimum wage or she will incentivize pro-social behavior to achieve a lower procurement cost by offering either $\rho + \psi\xi$ or $\rho + \psi\zeta$, depending on the model primitives.

Note that a direct consequence of $\alpha \leq 1$ is the absence of positive spillover effects when E_1 is reciprocal and E_2 is non-reciprocal. The reason is that the benefit from choosing the expensive supplier, r, outweighs the harm from the aversion to advantageous income inequality ($r\alpha$).

In Figure 2 we summarize the equilibria described in Propositions 1 and 2 in the case where both ω_B^* and ω_P^* are above ρ and $\omega_B^* \leq \omega_P^*$. Since the director knows neither the price difference δ nor the reciprocity type of each employee, the figure shows what she expects for each possible combination of γ_1 and γ_2 and each price difference. We observe that the most relevant difference between the two columns is the decision made by E_2 in the region $\left[\frac{r}{\gamma\lambda(\omega_B^*)}, \frac{r\cdot(1+\beta)}{\gamma\lambda(\omega_P^*)}\right]$ when $(\gamma_1, \gamma_2) = (0, \gamma)$ and[8] $\beta > 0$. In the baseline model E_2 chooses S_L, while in the peer model he chooses S_H. We refer to this as the *negative spillover region*, since a non-reciprocal E_1 can negatively influence a reciprocal E_2.

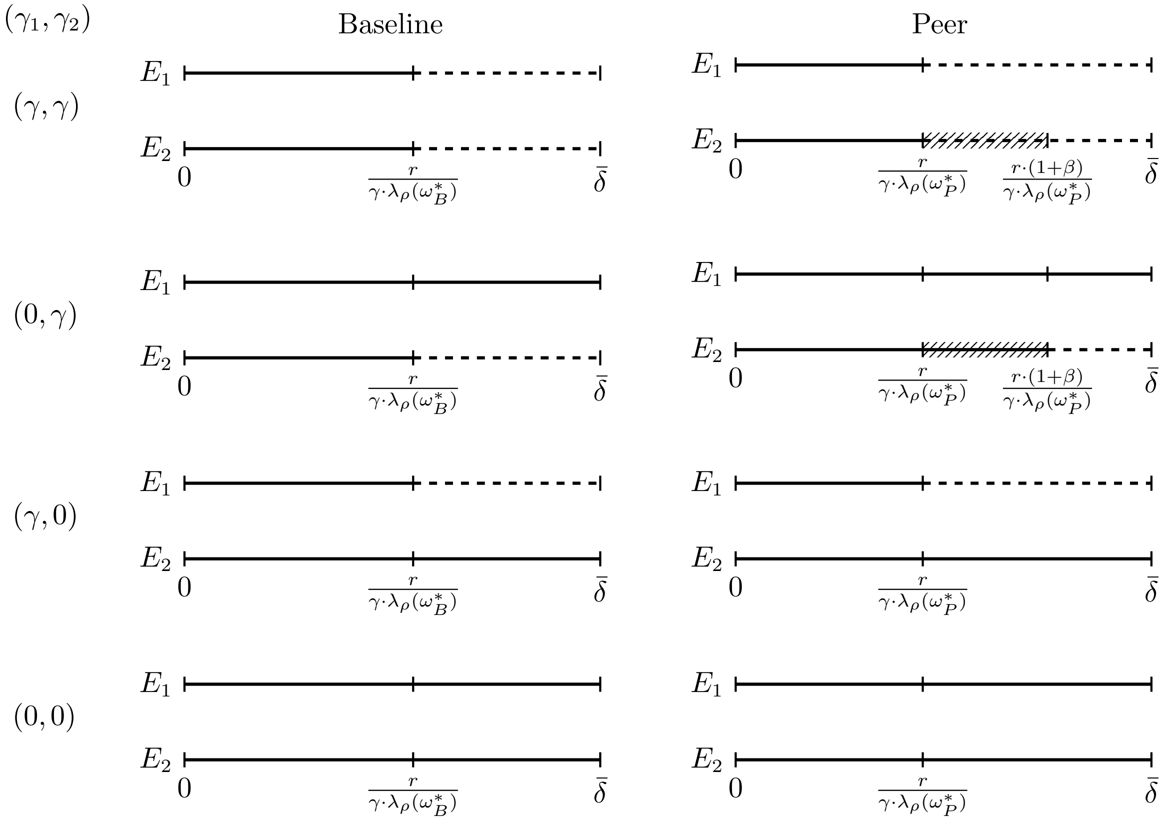
Remark 1. (The role of heterogeneity in reciprocity towards the director) The aforementioned differences disappear if $\gamma_L = \gamma_H = \gamma$, as $\omega_B^* = \omega_P^*$ and all the cases reduce to $(\gamma_1, \gamma_2) = (\gamma, \gamma)$.

4. Experimental Design

To test the predictions derived from our theoretical model, we designed a computerized laboratory experiment consisting of a *procurement game* that reproduces the game presented in the theory section. At the beginning of each session, subjects are randomly assigned to the role of director or employee, and they keep their role for the entire session. Subjects then play six rounds of the procurement game, where the sequence of events is as follows. At the beginning of each round, subjects are randomly and anonymously matched into an organization consisting of one director

[8] Considering $\beta \geq 0$ ensures that $\frac{r}{\gamma\lambda(\omega_B^*)} < \frac{r\cdot(1+\beta)}{\gamma\lambda(\omega_P^*)}$. Otherwise, if $\beta = 0$ then $\zeta = 1$ and $\omega_B^* = \omega_P^*$.

Figure 2 Equilibrium Comparison: Baseline vs. Peer



Note: The left column represents the equilibrium in the baseline model, while the right column corresponds to the equilibrium in the peer model. For each combination of (γ_1, γ_2), each sub-figure includes two lines that represent the range of possible price differences. The top line illustrates the best response of E_1, while the bottom line represents E_2's best response. The solid and dashed lines represent the regions of price differences δ where the employees select S_H and S_L respectively. Finally, the slashed area represents the region where E_2 follows E_1, i.e., chooses S_H if he observes that E_1 chose S_H, and chooses S_L if E_1 chose S_L.

and two employees (employee 1 and employee 2).[9] The random re-matching in between rounds prevents punishment or reputation effects from carrying over from one round to the next. After the matching occurs, the director chooses a wage of either 25 or 40 points that is paid to both employees. Each employee then separately chooses between supplier L, whose price is $p_L = 20$, and supplier H, whose price is[10] $p_H = p_L + \delta$. The price difference between suppliers, δ, is randomly determined and takes one of three values, 10, 25, or 40, all with equal probability. As in the theoretical model, choosing supplier H results in an additional benefit for the employees, which is set to $r = 10$ points. We elicited employees' decisions by having them follow the strategy method

[9] In the instructions we refer to the employees as "employee A" and "employee B" respectively, to avoid inducing any perceptions of hierarchy.

[10] In the experiment, suppliers H and L are labeled supplier A and B respectively.

so that they would provide a full contingency plan, i.e., a decision for each combination of wage the director might offer them $\omega \in \{25, 40\}$ and price difference that might be randomly realized $\delta \in \{10, 25, 40\}$—six decisions in total.[11] The strategy method has the advantage that it allows us to elicit subjects' complete strategies, including their choices under those scenarios that arise less frequently in the experiment. In addition, previous literature has shown that subjects' strategies do not change significantly under the strategy method relative to the direct-response method (Brandts and Charness 2011), and this especially holds in the case of gift-exchange games (Falk and Kosfeld 2006, Gächter et al. 2013), which are similar to our procurement game.

At the end of each round, a price difference δ is randomly chosen by the computer for each organization and each subject's payoff is computed. The director's payoff is

$$\pi_D = 200 - 2 \cdot \omega - p_{\sigma_1(\omega,\delta)} - p_{\sigma_2(\omega,\delta)},$$

where $p_{\sigma_i(\omega,\delta)}$ is the price of the supplier selected by E_i, $i \in \{1, 2\}$, and each employee's payoff is

$$\pi_i = 50 + \omega + 10 \cdot \mathbb{1}_{\{\sigma_i(\omega,\delta)=S_H\}}.$$

Note that, to prevent negative payoffs and associated loss aversion effects, the director starts with an initial endowment of 200 points, while each employee starts with 50 points. After each round, the director learns the realized price difference δ between the suppliers, the decisions $\sigma_1(\omega, \delta)$ and $\sigma_2(\omega, \delta)$ made by each employee (based on the wage chosen by the director and the realized price difference), and her own total profit. Similarly, the employees learn the wage chosen by the director, the realized price difference, and their own payoff in the round.

Our experimental design consists of two treatments. In the *baseline* treatment both employees choose a supplier simultaneously (without observing each other's choices), as in the theoretical model. In the *peer* treatment, the employees make their decisions sequentially, with E_1 choosing first and E_2 *observing* E_1*'s choice in each situation* (i.e., for each pair ω, δ) before making his own decision. To keep a clear distinction between the roles of observed and observer employees, subjects play either in the role of E_1 or E_2 throughout a session. At the end of the experiment, one of the six rounds of the procurement game is randomly selected for payment and subjects are paid \$0.10 per point earned in that round.

We make the following important design considerations. 1) The values of the parameters for the price difference and the extra reward are carefully chosen to capture different focal circumstances. When $\delta = 10$, choosing either supplier results in the same total surplus (recall that $r = 10$), and

[11] We also included $\delta = 0$ to check for consistency. We omit these results from the analysis because all subjects in the baseline chose the expensive supplier, as expected.

the employee faces the dilemma of benefiting himself or the director. The values of $\delta = 25$ and 40 capture settings where choosing S_H maximizes the employees' own monetary payoff but is inefficient in terms of total surplus. In addition, the reward the employee gets from choosing the expensive supplier is relatively low compared to his wage (it is at most half the wage). This is consistent with our motivating examples, where the extra benefit an employee gets from delegated procurement is not his main source of compensation. 2) The director chooses between two wages, $\omega \in \{25, 40\}$, rather than from a continuum of possible wages. We make this simplification for two reasons: first, a simple choice set for the director allows us to use the strategy method for the employees' decisions, which are our main focus. Second, both wage alternatives, 25 and 40, are significantly higher than the reward and are thus likely to be perceived by the employees as being higher than the reference (fair) wage.[12] 3) The initial endowments are chosen so that there is large asymmetry between the director's and the employees' endowments. This is intended to emulate the actual relation between a large organization and its employees.

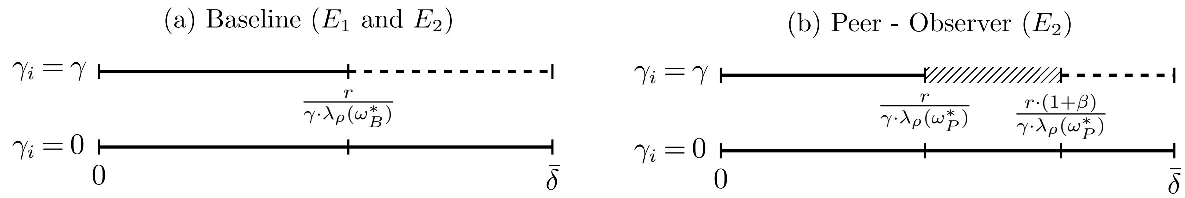
Additional Trust Game. After playing six rounds of the *procurement game*, subjects participate in an additional *trust game* (Berg et al. 1995). The trust game aims to measure preferences for trust and reciprocity. Since reciprocity is one of the main behavioral drivers in our model, we will use the outcome of this game to construct an exogenous measure of a subject's reciprocity. In this game, a sender and a receiver are initially endowed with 10 points. The sender moves first and decides how much of his endowment to send to the receiver. The amount sent is tripled by the experimenter. The receiver moves second and decides how much of the amount received to return to the sender. Following the strategy method, subjects make decisions as senders (how much to send) and as receivers (how much to return for each possible amount received, ranging from 0 to 30 in increments of 3 points). Subjects are then randomly matched and assigned a role for payment, which consists of \$0.10 per point earned. Only subjects who are assigned the role of employee in the procurement game participate in the trust game.

4.1. Hypotheses

Based on the predictions of the theoretical model, we derive the following hypotheses for the baseline and peer treatments. First, we expect reciprocal employees to be less likely to choose the expensive supplier compared to non-reciprocal employees, both in the baseline and peer treatments. The theory predicts that, while non-reciprocal employees choose the expensive supplier regardless

[12] The conjecture that both wage alternatives, 25 and 40, are (at least to some extent) perceived as "fair" is later confirmed by our experimental results. Recall that if $\omega = 25$ was not perceived as fair, our model of reciprocity predicts that all employees would choose S_H, regardless of the price difference between suppliers. On the contrary, we observe heterogeneity in employees' decisions when the wage is 25, with some of them choosing S_H (particularly when the price difference between suppliers is high).

Figure 3 Best Response: Baseline vs. Observer in Peer



Note: Figures 3a and 3b show the best-response function of employees in the baseline model (E_1 and E_2) and of observers (E_2) in the peer model respectively. Each figure includes two lines that represent the range of possible price differences. The top line illustrates the best response for reciprocal employees ($\gamma_i = \gamma$), while the bottom line corresponds to non-reciprocal employees ($\gamma_i = 0$). The solid and dashed areas represent the regions of price differences δ where the employees always select S_H and S_L respectively. The slashed area represents the region where E_2 follows E_1, i.e. chooses S_H if he observes that E_1 chose S_H, and chooses S_L if E_1 chose S_L.

of the wage and the price difference between suppliers, reciprocal employees are less likely to choose the expensive supplier as the wage and price difference increase. Therefore, we distinguish between reciprocal and non-reciprocal employees, based on the exogenous measure of reciprocity elicited in the trust game. We expect that the difference between reciprocal and non-reciprocal employees should be higher when the wage and the price difference are high.

HYPOTHESIS 1 **(Effect of Reciprocity)**. *Reciprocal employees are less likely to choose S_H than non-reciprocal employees. The difference between reciprocal and non-reciprocal employees is higher when the wage and the price difference between suppliers are high.*

Our theoretical model also predicts changes in employees' behavior when transparency is introduced (peer treatment). We first consider the effects of transparency on employees who *observe* a peer's decision before making their own decision. The theory predicts the existence of negative spillovers, by which E_2 is more likely to choose S_H when he observes that E_1 chose S_H. Furthermore, our model specifies the behavioral mechanisms leading to this result. Figure 3 shows the best-response functions of E_1 and E_2 in the baseline (Figure 3a) and of E_2 in the peer treatment (Figure 3b), where the top lines correspond to reciprocal employees and the bottom lines correspond to non-reciprocal employees. The model predicts that a reciprocal E_2 in the peer treatment behaves differently depending on what he observes. Specifically, E_2 mimics E_1's decision when the price difference is between $\frac{r}{\gamma \cdot \lambda_\rho(w_P^*)}$ and $\frac{r(1+\beta)}{\gamma \cdot \lambda_\rho(w_P^*)}$ (slashed region in the top line of Figure 3b). Thus, we expect that a reciprocal E_2 in the peer treatment is more likely to choose the expensive supplier if he observes that the peer chose S_H than if he observes that the peer chose S_L. In addition, since in the slashed region a reciprocal E_2 in the peer treatment mimics the decision of E_1, the region where a reciprocal E_2 chooses S_H if he observes that the peer chose S_H is larger than the region where a reciprocal employee in the baseline chooses S_H. Therefore, we expect that the probability of choosing S_H is higher for a reciprocal employee who observes that his peer chose S_H than for a reciprocal employee in the baseline.[13] Hypothesis 2 summarizes these predictions.

Hypothesis 2 **(Peer Effects on Observer Employees)**. *Observing that a peer chose S_H results in negative spillovers on a reciprocal E_2:*

(a) The probability of choosing S_H is higher for a reciprocal employee that observes that his peer chose S_H than for a reciprocal employee that observes that his peer chose S_L.

(b) The probability of choosing S_H is higher for a reciprocal employee that observes that his peer chose S_H in the peer treatment than for a reciprocal employee in the baseline.

Our theory predicts two additional results related to observer employees. First, an *absence of positive spillovers* on reciprocal employees; that is, a reciprocal E2 is not more likely to choose S_L when he observes that his peer did so compared to the baseline treatment. Second, an *absence of peer effects on non-reciprocal employees*—that is, a non-reciprocal E_2 who observes that his peer chose S_H is equally likely to choose S_H as a non-reciprocal E_2 who observes that his peer chose S_L (as shown by the bottom lines in Figure 3).

The final hypothesis focuses on the behavior of *observed* employees. The theoretical model predicts that there will be no peer effects on observed employees, as E_1's behavior remains unchanged in the peer treatment relative to the baseline.

Hypothesis 3 **(Absence of Peer Effects on Observed Employees)**. *E_1 in the peer treatment is equally likely to choose S_H as an employee in the baseline treatment.*

5. Experimental Results

The experiment was conducted using z-Tree (Fischbacher 2007) at a public university in the Midwest of the USA, between September and November of 2017.[14] Average payoffs were \$15 (including a \$5 show-up fee) and each session lasted approximately one hour. In total, 165 students participated in the experiment, and no subject participated in more than one session.[15] Of these students, 48 participated in four sessions of the baseline treatment and 117 in ten sessions of the peer treatment.

[13] This should especially hold when the observer's income inequality aversion, β, is sufficiently high, as this increases the length of the interval where the negative spillovers occur.

[14] Subjects were undergraduate students. Average age was 21.98, 57.27% were female and 42.73% were male, and 17.27% were economics or business majors and 82.73% were other majors.

[15] Subjects were recruited using the online recruiting system ORSEE (Greiner 2004).

5.1. Preliminaries and General Results

As described in Section 4, we used the strategy method to elicit employees' decisions for each wage $\omega \in \{25, 40\}$ and for each price difference $\delta \in \{10, 25, 40\}$. Considering all the possible combinations of these parameters we obtain six situations, which we order lexicographically by wage and later by price difference.[16] We denote by $\sigma_{ist} \in \{S_H, S_L\}$ the decision made by employee i in situation s in round t, and we record it as a binary variable y_{ist} such that[17]

$$y_{ist} = \begin{cases} 1 \text{ if } \sigma_{ist} = S_H \\ 0 \text{ if } \sigma_{ist} = S_L. \end{cases}$$

For some of the analysis (indicated in the corresponding cases), we use the subject-level average decision (sometimes in a particular role or condition), $\bar{y}_{is}$, as an estimator of the overall probability that subject i chooses the expensive supplier in situation s.

Appendix C describes the general results, which we next summarize. Since the game in the baseline treatment is symmetric, we expect to find no differences in a subject's behavior in the roles of E_1 and E_2. This result is confirmed by the tests in Table 20 for all situations. Since there are no significant differences, for the rest of the analysis we pool the data from E_1 and E_2 in the baseline treatment. In the peer treatment, the probability of choosing the expensive supplier (S_H) is different depending on the role played (Table 21). More specifically, we find that E_2 is more likely to choose S_H compared to E_1, and these differences are significant in all cases where $\delta \geq 25$. Given these differences, in the peer treatment we analyze separately the behavior of employees who are *observed* (E_1) from those who are *observers* (E_2).

When we analyze the frequency of choosing the expensive supplier, S_H, aggregated at the subject level, we find that the probability of choosing the expensive supplier is decreasing in the wage offered by the director and in the price difference between suppliers, in both treatments (Appendix C). In the baseline treatment, the effect of wage is significant under all price differences, and the effect of price difference is significant, both when the wage is 25 and 40. In the peer treatment the probability of choosing S_H is decreasing in ω (statistically significant for observers and observed separately when $\delta = 25$ and marginally significant for observers when $\delta = 40$) and in price difference for both wages, for observed and observers separately.

In the next subsections we test our hypotheses, organizing the results as follows: Section 5.2 focuses on the effect of reciprocity, while Sections 5.3 and 5.4 examine the effect of transparency on *observer* and *observed* employees, respectively.

[16] That is, situations 1 to 3 consider a wage of 25 and an increasing price difference, and situations 4 to 6 consider a wage of 40 and an increasing price difference.

[17] At no risk of confusion we will sometimes omit the subindices s and t.

5.2. Effect of Reciprocity

The predictions derived from the theoretical model rely on the assumption that employees are heterogeneous in their reciprocity towards the director. Specifically, we assume that employees are either reciprocal ($\gamma_i = \gamma > 0$) or non-reciprocal ($\gamma_i = 0$). As stated in Hypothesis 1, we expect that reciprocal employees are less likely to choose the expensive supplier compared to non-reciprocal employees. This should especially hold for high wages and price differences, as non-reciprocal employees are expected to choose S_H regardless of the wage and price difference, while reciprocal employees choose S_L if the wage and the price difference are sufficiently high.

To test how reciprocity affects subjects' behavior in the *procurement game*, we elicit subjects' individual level of intrinsic reciprocity with an additional *trust game* that participants play at the end of the session.[18] Based on their decisions in this game, we create a measure of reciprocity for each subject by taking the difference between the maximum and the minimum of the amount returned (as in Beer et al. 2018).[19] The metric of reciprocity ranges between 0 and 30 and its distribution (presented in Figure 6 in Appendix B) confirms that there is high heterogeneity among subjects. We then characterize subjects as non-reciprocal if their reciprocity is within the lowest 30th percentile[20] (less than or equal to 8) and as reciprocal otherwise.

Table 1 presents the probability of choosing the expensive supplier (aggregated at the subject level, $\bar{y}_{is}$) for reciprocal and non-reciprocal employees separately. The table suggests that non-reciprocal employees are more likely to choose S_H than reciprocal employees in all conditions (that is, employees in the baseline treatment, and observers and observed employees in the peer treatment), providing support for Hypothesis 1. In addition, as predicted by Hypothesis 1, the differences between reciprocal and non-reciprocal employees are increasing in wage and price difference. In particular, these differences are significant when the price difference is high ($\delta = 40$), when the wage is high ($\omega = 40$) and the price difference intermediate ($\delta = 25$), and for observer employees in the peer treatment whenever the price difference is intermediate ($\delta = 25$).

We confirm the previous results with regressions in Table 9 in Appendix B. The table shows the results of panel probit models with subject random effects for each wage and price difference considering an employee's choice (i.e., y_{ist}) as a dependent variable, and as independent variable a binary variable that takes value 1 if subjects are reciprocal and 0 otherwise. Unless otherwise stated,

[18] Since subjects play the *procurement game* before the *trust game*, we check that the behavior in the second game is not affected by the treatment or by the role played in the first game. We find no significant differences in either the amount sent or the amount returned for each amount received depending on subjects' condition: baseline, observed, and observer (see Table 8 in Appendix B).

[19] The minimum amount returned is measured considering all possible amounts sent, excluding 0.

[20] The percentile for the cutoff is chosen based on the distribution of the metric of reciprocity presented in Figure 6 in Appendix B. The results remain qualitatively unchanged if the cutoff is set at the 10th or 25th percentile.

Table 1 Comparison Between Reciprocal and Non-Reciprocal Employees by Condition

		Probability of choosing S_H					
		$\omega = 25$			$\omega = 40$		
		$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Baseline	Reciprocal	0.89 (0.25)	0.61 (0.39)	0.39 (0.43)	0.73 (0.37)	0.34 (0.41)	0.27 (0.36)
	Non-Reciprocal	0.97 (0.11)	0.87 (0.27)	0.80 (0.35)	0.95 (0.16)	0.87 (0.20)	0.73 (0.42)
	Difference (p-value)	0.403	0.061	**0.015**	0.054	**0.001**	**0.009**
Observed	Reciprocal	0.79 (0.32)	0.55 (0.36)	0.25 (0.32)	0.75 (0.37)	0.32 (0.31)	0.19 (0.24)
	Non-Reciprocal	0.85 (0.25)	0.74 (0.30)	0.62 (0.39)	0.83 (0.22)	0.61 (0.40)	0.56 (0.38)
	Difference (p-value)	0.665	0.104	**0.004**	0.899	**0.030**	**0.003**
Observer	Reciprocal	0.88 (0.18)	0.72 (0.26)	0.53 (0.36)	0.79 (0.30)	0.56 (0.35)	0.46 (0.38)
	Non-Reciprocal	0.95 (0.11)	0.93 (0.16)	0.88 (0.26)	0.95 (0.11)	0.85 (0.21)	0.83 (0.26)
	Difference (p-value)	0.235	**0.008**	**0.003**	0.096	**0.017**	**0.005**

Note: Standard errors reported in parentheses. We report the p-values of Wilcoxon rank-sum tests comparing reciprocal and non-reciprocal employees for each condition. Bold values represent significant differences at the 5% level.

all regressions have errors clustered at the session level and control for round and demographics.[21] Panels 1, 2, and 3 present the results separately for employees in the baseline treatment, observed employees in the peer treatment, and observer employees in the peer treatment. We find that the coefficients are negative for most conditions, confirming the hypothesis that reciprocal subjects are less likely to choose the expensive supplier. In addition, we observe that the result is significant in all situations among subjects in the baseline treatment, while it is significant when the price differences are high (i.e., $\delta \geq 25$) among observed and observer employees in the peer treatment.

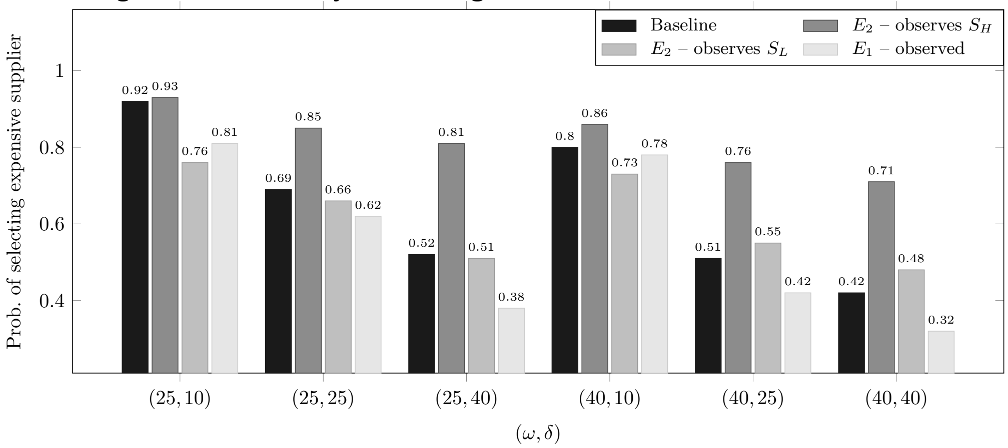
5.3. Spillover Effects

Hypothesis 2 predicts that observing that a peer chose S_H results in negative spillovers on a reciprocal E_2. To test this, we divide observers (E_2 in the peer treatment) into two subconditions: *observes H*, for those who observe that their peer chose supplier H; and *observes L*, for those who observe that their peer chose supplier L. Note that subjects in the role of E_2 (which is fixed throughout a session) may in some rounds observe that E_1 chose S_H and in other rounds observe that E_1 chose S_L. Therefore, for each E_2 in the peer treatment we compute the probability of choosing S_H when they observed that E_1 chose S_H and S_L separately, by taking the average of their decisions in all the rounds where they played in each of these two conditions respectively.

Figure 4 shows the estimated probability of choosing S_H for each pair (ω, δ) and condition ("baseline" and, in the peer treatment, "observes H," "observes L," and "observed"). In this section we focus on the analysis of the first three; the analysis of observed employees (E_1) in the peer

[21] Demographic controls include age, gender, race, income, and major.

Figure 4 Probability of Choosing S_H across Treatments and Conditions



treatment is presented in Section 5.4. The figure suggests that the probability of choosing S_H is higher for an employee who observes that the peer chose S_H than for an employee who observes that the peer chose S_L or for an employee in the baseline treatment, providing a first indication of the existence of negative spillovers on observer employees. Appendix D presents an analysis of how the probability of choosing S_H in each of these four conditions changes as rounds in a session elapse. Overall, we observe that the frequency of choosing S_H slightly increases with the rounds of play; however, in most conditions a steep increase occurs between rounds 1 and 2 and then remains relatively stable from round 2 onwards. In order to formally test the behavioral drivers derived from the theoretical model—the presence of negative spillovers on reciprocal observer employees (Hypotheses 2a and 2b)—we next examine separately the behavior of *reciprocal* and *non-reciprocal* observer employees in the peer treatment.

Hypothesis 2a predicts that a reciprocal employee who observes that his peer chose S_H is more likely to choose S_H than a reciprocal employee who observes that his peer chose S_L. Panel 1 in Table 2 pools data of all reciprocal observers in the peer treatment. The coefficients of the dummy variable "Observes H" are positive and significant for all wages and price differences, confirming that reciprocal employees are more likely to choose S_H if they observe that their peer chose S_H than if they observe that their peer chose S_L. This result provides support for Hypothesis 2a.

Hypothesis 2b predicts that a reciprocal employee who observes that his peer chose S_H is more likely to choose S_H than a reciprocal employee in the baseline treatment. Panel 2 in Table 2 presents the results of panel probit regressions with subject random effects, pooling the data of reciprocal employees in the baseline treatment and of reciprocal employees (E_2) in the peer treatment who observe that their peer chose S_H. For each situation (ω, δ), the dependent variable is the decision made by the employee in each round, y_{ist}, and the independent variable is a dummy that takes value 1 if the employee observes that S_H was chosen, and 0 if the employee is in the baseline treatment.

Table 2 Social Spillovers — Reciprocal Employees

Panel 1: Reciprocal — Observes H vs. Observes L

	Probability of choosing S_H					
	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Observes H	0.566***	0.481*	0.846***	0.728**	0.576**	0.998***
	(0.117)	(0.280)	(0.319)	(0.327)	(0.293)	(0.318)
Constant	1.339	1.025	-0.061	1.931	1.120	1.178
	(0.911)	(0.664)	(1.113)	(1.450)	(0.787)	(1.067)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	174	174	174	174	174	174

Panel 2: Reciprocal — Baseline vs. Observes H

	Probability of choosing S_H					
	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Observes H	-0.134	0.765	2.175**	0.582	1.626*	1.530**
	(0.525)	(0.521)	(0.980)	(0.405)	(0.833)	(0.662)
Constant	2.069	0.817	-0.832	1.308	-1.000	0.103
	(1.323)	(0.861)	(1.984)	(1.691)	(1.437)	(1.231)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	271	228	191	268	197	172

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. Panel 1 pools data from reciprocal employees who are observers in the peer treatment. Panel 2 pools data from reciprocal employees in the baseline and reciprocal employees who observe that their peer chose S_H in the peer treatment. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Note that the number of observations differ by situation as the frequency with which E_2 observes that his peer chose S_H changes with the wage and the price difference. We find that the coefficient of the dummy variable "Observes H" is positive and significant when $(\omega, \delta) \in \{(25, 40), (40, 40)\}$ and marginally significant when $(\omega, \delta) = (40, 25)$, implying that the probability of choosing the expensive supplier after observing that the peer did so is significantly higher compared to the baseline, and that this holds particularly when the price difference is high. Hence, we conclude that Hypothesis 2b is supported by our data.

We test two additional predictions on observer employees derived from our theoretical model. First, we test the absence of positive spillovers on reciprocal employees. Table 10 in Appendix B pools data from reciprocal employees in the baseline treatment and reciprocal E_2 in the peer treatment who observe that the peer chose S_L. We find that the difference between these two conditions is not significant under any wage and price difference, confirming the absence of positive spillovers on reciprocal observer employees. Second, we test the absence of peer effects on non-reciprocal employees. The regressions in Table 11 in Appendix B pool data from non-reciprocal employees in the baseline and non-reciprocal E_2 in the peer treatment who observe S_H (Panel 1) and S_L (Panel 2). We find that among non-reciprocal employees, observing that the peer chose S_H results in a higher probability of choosing S_H in only one situation, while observing that the peer chose S_L does not result in a significant difference in the frequency of choosing S_H in any situation. These results confirm the absence of effects on non-reciprocal employees, for the most part.

Overall, the results in this section confirm that Hypothesis 2 is well supported by the experimental results, and that the underlying behavioral mechanisms obtained from the theoretical model explain the data well.[22]

[22] In Appendix D.2 we explore whether the behavior of E_2 in the peer treatment is affected by past observations of a peer. We find that E_2 primarily care about what they observe in the current round (over what they observed in previous rounds), suggesting that the peer effects arising in the current round are a more salient driver of behavior.

Table 3 Effect on Observed Employees

	Probability of choosing S_H					
	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Observed	-1.684***	-0.750**	-1.287*	-0.585	-0.413	-0.367
	(0.493)	(0.379)	(0.750)	(0.637)	(0.404)	(0.428)
Constant	0.208	-0.856	-1.990	-0.549	-1.988**	-1.993*
	(0.740)	(0.647)	(1.446)	(0.720)	(0.911)	(1.119)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	426	426	426	426	426	426

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. The table pools data from employees in the baseline and observed employees in the peer treatment. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

5.4. Effects on Employees Who Are Observed by a Peer

Hypothesis 3 predicts no differences between employees in the baseline and observed employees in the peer treatment. However, as shown in Table 3, we find that the coefficient of the dummy variable "Observed," which is equal to 1 if the employee is observed in the peer treatment and 0 if the employee is in the baseline, is negative and significant when $\omega = 25$ for all δ. Furthermore, Figures 7a and 7b in Appendix D show a parallel downward shift in the frequency of choosing the expensive supplier for E_1 in the peer treatment relative to the baseline as rounds in a session elapse, suggesting that the positive effect on observed employees remains steady over rounds. This implies that, when the wage is low, observed employees in the peer treatment are less likely to choose the expensive supplier compared to the employees in the baseline.

One possible explanation of this result is that observed employees anticipate the negative spillovers associated with the decision of choosing the expensive supplier; i.e., an observed employee choosing the expensive supplier generates the "extra punishment" for the director of increasing the probability that the employee who observes his action will choose the expensive supplier as well. This concern for inflicting a double punishment on the director should be higher among reciprocal employees who were offered a high wage. To test whether this explains the difference between observed employees in the peer treatment and employees in the baseline treatment, in Table 4 we report the results of interacting the dummy variable "Observed" with the employees' reciprocity. If the differences in the probability of choosing S_H between observed employees in the peer treatment and employees in the baseline are driven mainly by reciprocal preferences, we would expect the differences in behavior to be significant among reciprocal employees (and to be particularly salient when the wage is high). However, we observe that the difference among reciprocal employees is only significant when $(\omega, \delta) = (25, 10)$. By contrast, the lower probability of an observed employee choosing S_H relative to the peer is significant in all situations where $\delta < 40$ among non-reciprocal employees. This suggests that non-reciprocal employees that are observed by a peer are significantly

Table 4 Effect on Observed Employees — Reciprocity

	Probability of choosing S_H					
	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Baseline × Recip	-2.208***	-2.111***	-3.905***	-3.166***	-3.005***	-2.383***
	(0.432)	(0.482)	(0.929)	(0.526)	(0.544)	(0.638)
Observed × Recip	-3.671***	-2.564***	-4.744***	-3.293***	-2.908***	-2.630***
	(0.766)	(0.524)	(1.114)	(0.662)	(0.402)	(0.559)
Observed × Non-Recip	-2.987***	-1.595**	-2.249*	-2.820***	-1.457***	-0.707
	(0.809)	(0.711)	(1.273)	(0.784)	(0.558)	(0.678)
Constant	1.261*	0.196	0.004	1.219	-0.341	-0.751
	(0.765)	(0.723)	(1.101)	(0.755)	(0.632)	(1.045)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	426	426	426	426	426	426
	Tests (p-value)					
(1) Baseline = Observed | Recip	**0.008**	0.200	0.133	0.834	0.855	0.611
(2) Baseline = Observed | Non-Recip	**0.000**	**0.050**	0.155	**0.001**	**0.018**	0.595

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. The table pools data from employees in the baseline and observed employees in the peer treatment. Bold values represent significant differences at the 5% level. We adjust p-values using the Holm method (Holm 1979) for multiple-hypothesis testing. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

less likely to choose the expensive supplier compared to non-reciprocal employees in the baseline (tests 1 and 2 in Table 4).

Overall, our results show that there are significant differences in behavior between employees in the baseline and those employees whose decisions are observed in the peer treatment. This is especially true when the wage is low and employees are non-reciprocal, suggesting that the result is not driven by reciprocal employees' concern to avoid inflicting a double punishment on the director.

5.4.1. Alternative Model: Compliance with the Social Norm In this section we explore an alternative explanation of the difference in the behavior of non-reciprocal observed employees in the peer treatment relative to the no-transparency baseline case. We consider that observed employees may be less likely to choose the expensive supplier due to a desire to comply with *social norms*—defined as collective agreements about the appropriateness of different behaviors or actions (Fehr and Gächter 2000, Krupka and Weber 2013). In particular, we focus on *injunctive norms*, which are defined as what one "ought" to do, rather than *descriptive norms*, which are customs or actions that people regularly take (Krupka et al. 2016). Previous literature has explored the role of preferences for compliance with the social norm of appropriate behavior in settings related to ours, with a focus on its effect on the behavior on an *observer* of a peer's action (Gächter et al. 2013, Gächter et al. 2017). Building on this literature, we study whether a preference for compliance with the social norm provides a plausible explanation of the behavior of an *observed* employee. In particular, we conjecture that the appropriateness of choosing the expensive supplier changes when transparency is introduced. Note that the social norm of appropriate behavior is highly dependent on the context (Gächter et al. 2017). If transparency affects the social norm (i.e., choosing the expensive supplier is perceived as less appropriate when an employees is observed by a peer), a model that incorporates an observed employee's preference for compliance with the social norm of appropriate behavior could explain why observed employees in the peer treatment are less likely to choose the expensive supplier compared to the baseline. In addition, while one could conjecture that the social norm may incorporate reciprocal considerations (i.e., it is less appropriate to choose the expensive supplier when the wage and the price difference are high), the social norm should be empirically elicited as this may not necessarily be the case. In fact a social norm that (at least to some extent) deviates from reciprocity may explain why the difference in the behavior of observed employees is mostly present among non-reciprocal employees.

Model. We consider non-reciprocal employees' preference for compliance with the social norm as follows. Let $N : [\underline{\omega}, \infty) \times \left[0, \bar{\delta}\right] \times \{S_H, S_L\} \rightarrow \mathbb{R}_+$ be a function such that $N(\omega, \delta, \sigma_i)$ represents the perceived social appropriateness of choosing supplier σ_i when the wage is ω and the price difference is δ. Then, the utility of employee i is

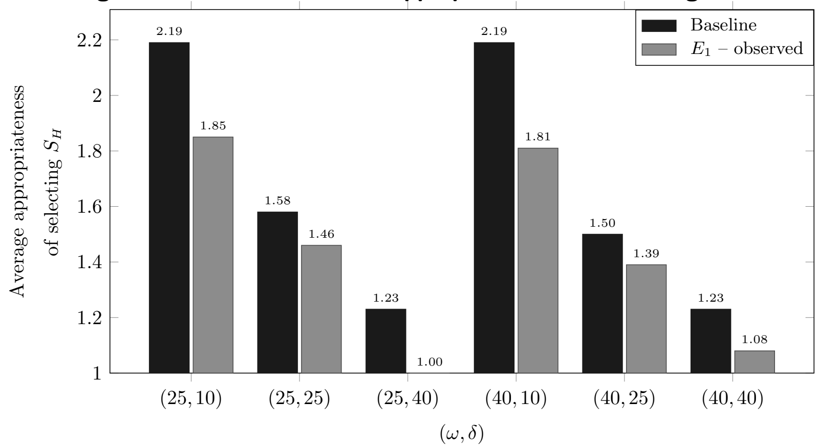
$$u_i(\omega, \delta, \sigma_i) = \omega + r \cdot \mathbb{1}_{\{\sigma_i = S_H\}} + \varphi_i \cdot N(\omega, \delta, \sigma_i), \tag{9}$$

where φ_i represents employee i's preference for complying with the social norm. Note that this utility function is the same for employees in the baseline and for those who are observed in the peer model. However, we conjecture that the social appropriateness of choosing the expensive supplier changes when transparency is introduced. Specifically, we expect that it is less appropriate for an employee to choose the expensive supplier if his decision is observed by a peer. To test this, the social norm needs to be *empirically derived* under each of these settings.

HYPOTHESIS 4 **(Effect of Transparency on the Social Norm)**. *The social appropriateness of choosing S_H is lower when the employee's decision is observed by a peer than when there is no observability of employees' actions (baseline treatment).*

Social Norm Elicitation. To test Hypothesis 4, we design two incentivized norm elicitation treatments. In the first treatment, subjects are given a description of the setting of the procurement game baseline treatment, and in the second treatment, they are given a description of the setting of the procurement game peer treatment. After the setting is described, participants evaluate how socially appropriate it is to choose the expensive supplier for each situation $(\omega, \delta) \in \{25, 40\} \times \{10, 25, 40\}$, rating it as "very socially inappropriate," "somewhat socially inappropriate,"

Figure 5 Social Norm — Appropriateness of Choosing S_H



"somewhat socially appropriate," or "very socially appropriate."[23] For analysis, we later translate these answers into an appropriateness scale ranging from 1 to 4, corresponding to each of the four ratings, respectively.

To avoid experimenter demand effects, we use a between-subject design (subjects who participate in one norm elicitation treatment do not participate in the other) and we use the neutral labels "Employee A" and "Employee B," as in the original procurement game.

We incentivize the norm elicitation treatments following the procedure in Krupka and Weber (2013), by offering participants an extra \$10 (in addition to the \$5 show-up fee) if their rating in a randomly selected situation coincides with the mode among all participants' ratings in the session. This coordination game incentivizes participants to respond what they perceive is the most socially accepted answer rather than what they personally believe is most appropriate.

Results. A total of 52 students participated in the norm elicitation treatments; 26 of them participated in the *baseline norm elicitation* treatment, and 26 in the *peer norm elicitation* treatment. The number of subjects in each session was between 4 and 8, and each session lasted approximately 30 minutes.

Figure 5 shows the average social appropriateness of choosing supplier H for an employee in the baseline norm elicitation treatment and for the observed employee in the peer norm elicitation treatment. First, we observe that the appropriateness is decreasing in the price difference (Kruskal–Wallis test; $p < 0.001$ for all wages and conditions considered), but it does not vary significantly with wage (Wilcoxon signed-rank test; $p > 0.113$ for all prices and for both baseline and "observed"). This suggests, that the price difference between suppliers has higher influence than

[23] For completeness we also elicited the social norm when the employee observes that another employee previously chose supplier H or supplier L. In addition, we also elicited the social appropriateness of choosing supplier L. The results are consistent with the results of the procurement game.

Table 5 Procurement Game vs. Social Norm — Observed Employees

		Probability of choosing S_H					
		$\omega = 25$			$\omega = 40$		
		$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Procurement Game	Observed	-1.684*** (0.493)	-0.750** (0.379)	-1.287* (0.750)	-0.585 (0.637)	-0.413 (0.404)	-0.367 (0.428)
	Observations	426	426	426	426	426	426
		Appropriateness of choosing S_H					
Social Norm	Observed	-0.689* (0.360)	-0.240*** (0.090)	-4.762*** (0.393)	-0.576*** (0.195)	-0.247 (0.182)	-0.151 (0.476)
	Observations	52	52	52	52	52	52

Note: The top panel shows the results from the *procurement game* previously reported in Table 3. The bottom panel corresponds to the norm elicitation treatments, and reports the estimates of ordered probit regressions with errors clustered at the session level reported in parentheses. The dependent variable is the social appropriateness of choosing S_H (in a scale from 1 to 4). The independent variable is a dummy that takes value 1 when subjects evaluate the appropriateness of observed employees' decisions in the peer norm elicitation, and 0 when subjects evaluate the appropriateness of employees' decisions in the baseline norm elicitation. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

the wage on the changes in the appropriateness of choosing the expensive supplier. Second, we observe that the social appropriateness of choosing S_H is significantly lower for employees who are "observed" in the peer treatment than it is for employees in the baseline. The bottom panel in Table 5 reports the estimates of an ordered probit model regressing subjects' ratings of the appropriateness of choosing S_H on the dummy variable "Observed."[24] We find that choosing the expensive supplier is significantly less appropriate for an observed employee when the wage and the price difference are low (the coefficient is significant for $(\omega, \delta) \in \{(25, 25), (25, 40), (40, 10)\}$ and marginally when $(\omega, \delta) \in (25, 10)$). The top panel in Table 5 presents a result from the procurement game previously reported in Table 3. It shows panel probit regressions of the decision variable y_{ist} on a dummy variable "Observed." Comparing the results in the top and bottom panels of the table we find that, whenever observed employees are significantly less likely to choose S_H than employees in the baseline (procurement game), it is significantly less appropriate to do so (norm elicitation treatments). Tables 13 and 14 in Appendix B compare the changes in behavior in the procurement game with the changes in the social norm *separately for non-reciprocal and reciprocal employees*, respectively. For non-reciprocal employees we confirm that whenever observed employees are significantly less likely to choose S_H than employees in the baseline, it is significantly less appropriate to do so. On the contrary, for reciprocal employees, the difference in behavior in the procurement game is only significant in one situation, which does not coincide with the significant changes in

[24] Table 12 in Appendix B reports the estimates of OLS models. The results are qualitatively equivalent to those obtained with the ordered probit models, but their significance is weaker because no subject rates choosing supplier H as "very socially appropriate" and, therefore, we effectively have only three categories.

the social norm. The fact that the situations where there are significant differences in the purchasing decisions of non-reciprocal employees coincide with the situations where there are significant differences in the appropriateness of choosing S_H suggests that preferences for compliance with the social norm provide a more compelling explanation of the differences in behavior between observed employees in the peer treatment and those in the baseline.

5.5. Weak and Strong Overlap of Effects

Our previous results suggest that two effects arise from increased transparency. The first is a positive spillover effect by which observed employees are less likely to choose the expensive supplier, which is more salient among non-reciprocal employees. The second is a negative spillover effect by which observer employees become more likely to choose the expensive supplier when they observe that their peer did so, which affects mostly reciprocal employees. Isolating these effects was possible because our peer treatment was designed so that a subject could either be observed by a peer or observe a peer's decision, but not both. We now turn to study the behavior of an employee who is both an observer of a peer's action and observed by a peer. To do so, we conduct two new treatments, described next.

In the first treatment, two employees make their decisions sequentially with E_1 choosing first and E_2 observing E_1's choice before making his own decision, as in the peer treatment. After E_2 has made a decision, E_1 observes E_2's choice but cannot update his own decision. The roles remain fixed and subjects are randomly re-matched into new organizations for the following round. Thus, in this treatment, E_1 is not only an observed employee but he is also a "weak" observer: his decision in round two and onward may be influenced by his previous observation of E_2. However, this observation is of a peer he is no longer paired with (and within an organization he is no longer part of) at the time of his next decision. Similarly, E_2 is not only an observer but he is also "weakly" observed, as he is observed by a peer who does not make a new purchasing decision within the same organization. We denote this treatment *Weak Overlap of Effects* (WOE). Note that this treatment also allows E_1 to learn about his peers' decisions as rounds in a session elapse, whereas an E_1 in the peer treatment received no feedback about the decisions of other subjects in the session.

In the second treatment we consider an organization consisting of a director and three employees, E_1, E_2, and E_3. Employees make their decisions sequentially, with E_1 choosing first, E_2 choosing second after observing E_1's decision, and E_3 choosing last after observing E_2's decision.[25] Subjects keep their role and are randomly re-matched for the following round. Note that E_2 in this

[25] To provide a cleaner comparison with the peer treatment, we allow for E_3 to observe E_2's decision but not E_1's, keeping constant that each employee observes and/or is observed by at most *one* peer.

treatment is both a "strong" observer and "strongly" observed: he observes E_1 who has made a purchasing decision within the same organization, and is observed by E_3 who will subsequently make a purchasing decision within the same organization. Therefore, we denote this treatment *Strong Overlap of Effects* (SOE).

5.5.1. Hypotheses To test the weak overlap of effects, we first compare the decisions of E_1 in the peer treatment and E_1 in the WOE treatment. In both cases, E_1 is observed but in the WOE treatment he is also a "weak" observer. Based on our previous results, we conjecture that E_1 in the WOE treatment who in the previous round observed that his peer chose the expensive supplier is more likely to choose S_H than E_1 in the peer treatment, and that these "weak" negative spillovers across rounds will be more prominent among reciprocal employees. We next compare the decisions of E_2 in the peer treatment with those of E_2 in the WOE treatment. Both employees are observers, but E_2 in the WOE treatment is also "weakly" observed. Thus, by our previous findings, we expect E_2 in the WOE treatment to be less likely to choose S_H than E_2 in the peer treatment, and this effect to be more salient among non-reciprocal employees.

HYPOTHESIS 5 **(Weak Overlap of Effects)**.

(a) E_1 in the WOE treatment who observes that the last E_2 he was paired with chose S_H is more likely to choose S_H than E_1 in the peer treatment. The difference is larger among reciprocal employees.

(b) E_2 in the WOE treatment is less likely to choose S_H than E_2 in the peer treatment. The difference is larger among non-reciprocal employees.

To study the strong overlap of effects, we first compare the decisions of E_2 in the SOE treatment who observed that E_1 chose S_H with E_1 in the peer treatment. Both employees are "strongly" observed by a peer (the former by E_3 and the latter by E_2) but E_2 in the SOE treatment is also a "strong" observer who observed that E_1 chose S_H. Based on our previous results, we expect that the former will choose S_H more frequently than the latter, and that this should hold particularly among reciprocal employees. We next compare E_2 in the SOE treatment with E_2 in the peer treatment. Both employees are "strong" observers, but E_2 in the SOE treatment is also being strongly observed (by E_3), which we expect will make him less likely to choose S_H. We expect this to hold particularly among non-reciprocal employees.

HYPOTHESIS 6 **(Strong Overlap of Effects)**.

(a) E_2 in the SOE treatment who observed that E_1 chose S_H is more likely choose S_H than E_1 in the peer treatment. The difference is larger among reciprocal employees.

(b) E_2 in the SOE treatment is less likely to choose S_H than E_2 in the peer treatment. The difference is larger among non-reciprocal employees.

Table 6 E1 Peer vs. E1 WOE

	Probability of choosing S_H					
	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Peer × Recip	-0.598	-0.550	-1.612**	0.046	-1.200***	-1.616***
	(0.364)	(0.370)	(0.644)	(0.471)	(0.314)	(0.465)
Observed H × Recip	0.076	0.363	-0.750	0.515	-0.776*	-1.085**
	(0.289)	(0.437)	(0.622)	(0.485)	(0.416)	(0.438)
Observed H × Non-Recip	1.164**	0.890**	0.753**	0.685***	0.614	0.332
	(0.496)	(0.398)	(0.376)	(0.249)	(0.399)	(0.406)
Observed L × Recip	-	0.872	-1.082*	-0.306	-1.913***	-2.667***
	-	(0.635)	(0.553)	(0.703)	(0.552)	(0.508)
Observed L × Non-Recip	-	-0.443	-0.410	0.400	-0.623*	-0.409*
	-	(0.610)	(0.375)	(0.790)	(0.330)	(0.233)
Constant	-0.957	-0.773	-1.023	0.296	-1.461	-1.165
	(0.687)	(0.895)	(1.319)	(1.037)	(0.991)	(1.086)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	449	456	456	445	456	456
	Tests (p-value)					
(1) Peer vs. Observed H | Recip	0.170	**0.018**	**0.019**	0.471	0.212	0.110
(2) Peer vs. Observed H | Non-Recip	0.056	0.077	0.135	**0.024**	0.124	0.414
(3) Peer vs. Observed L | Recip	0.101	0.061	0.148	1.000	0.177	**0.001**
(4) Peer vs. Observed L | Non-Recip	-	0.468	0.274	0.613	0.176	0.158

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. The table pools data for E_1 in the peer and WOE treatments. Bold values represent significant differences at the 5% level. We adjust p-values using the Holm method (Holm 1979) for multiple hypothesis testing. We control for round and demographics. Missing values for Observed L×Non-Recip and Observed L×Recip are due to perfect separation (these variables perfectly predict that S_H is chosen). Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

5.5.2. Results We conducted the new treatments between February and April of 2019 at the same university and with the same subject pool as the original treatments. A total of 111 subjects participated in the WOE treatment and 136 subjects participated in the SOE treatment.

Hypothesis 5a predicts that E_1 in the WOE treatment who in the previous round observed that E_2 chose S_H is more likely to choose S_H than E_1 in the peer treatment, and that the difference is more prominent among reciprocal employees. In Table 6 we compare the probability of choosing the expensive supplier for E_1 in the peer treatment and for E_1 in the WOE treatment who in the previous round observed that E_2 chose S_H or S_L, distinguishing between reciprocal and non-reciprocal employees. Note that for the situation $(\omega, \delta) = (25, 10)$ we drop the cell corresponding to the case where E_2 observed S_L, due to lack of enough observations for each reciprocity type. We find that, among reciprocal employees, E_1 in the WOE treatment who observed that E_2 in the previous round chose S_H are more likely to choose S_H compared to E_1 in the peer treatment (this holds directionally for all situations and is significant in two of them; see test 1 in Table 6). Moreover, these differences are also present among non-reciprocal employees, but only in one situation (test 2).

Hypothesis 5b predicts that E_2 in the WOE treatment is less likely to choose S_H than E_2 in the peer treatment, and that the difference is more prominent among non-reciprocal employees.

Based on our previous results, we test this by conditioning on what E_2 observed. Panel 1 in Table 15 (Appendix B) compares the purchasing decisions of E_2 who observes that E_1 chose S_H in the peer and WOE treatments, interacted with their reciprocity. We observe no significant differences between E_2 who observed S_H in the peer and WOE treatments, for either reciprocal or non-reciprocal employees (panel 1, tests 1 and 2, respectively). Similarly, we find no significant differences (except in one situation) between E_2 who observed that their peer chose S_L across the peer and WOE treatments, for either reciprocal or non-reciprocal employees (panel 2 in Table 15, tests 1 and 2, respectively). Together, these results suggest that there are no positive effects of being "weakly" observed by a peer who will not make a decision in the current round, indicating that Hypothesis 5b is not supported.

Table 7 Peer vs. E2 SOE — Observes H

	Probability of choosing S_H											
	Panel 1: E_1 Peer vs. E_2 SOE						Panel 2: E_2 Peer vs. E_2 SOE					
	$\omega = 25$			$\omega = 40$			$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Peer × Recip	-0.579*	-0.777**	-1.936**	-0.493	-1.255***	-1.592***	-0.863**	-1.242***	-2.049***	-1.305**	-1.734***	-1.337**
	(0.337)	(0.317)	(0.809)	(0.374)	(0.478)	(0.398)	(0.339)	(0.270)	(0.764)	(0.632)	(0.457)	(0.590)
SOE × Recip	0.611	0.305	0.297	-0.382	-0.322	-0.305	-0.675	-1.266***	-2.037***	-1.499**	-2.118***	-1.520***
	(0.480)	(0.415)	(0.852)	(0.420)	(0.726)	(0.564)	(0.420)	(0.403)	(0.669)	(0.748)	(0.463)	(0.460)
SOE × Non-Recip	2.622***	0.962*	0.809	0.864	0.611	-0.178	-0.109	-0.705	-1.604***	-0.619	-1.209***	-1.383***
	(0.500)	(0.537)	(0.775)	(0.689)	(0.782)	(0.508)	(0.496)	(0.431)	(0.558)	(0.731)	(0.463)	(0.416)
Constant	-1.545**	-1.093	-0.933	0.141	-0.481	-0.183	1.758***	1.831***	2.963**	3.835***	3.198***	3.043**
	(0.717)	(0.690)	(1.188)	(0.720)	(1.077)	(1.030)	(0.464)	(0.669)	(1.174)	(1.153)	(0.973)	(1.552)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	421	392	355	389	336	312	376	302	210	338	201	154
	Tests (p-value)											
(1) Peer vs. SOE | Recip	**0.034**	**0.002**	**0.002**	0.832	0.121	**0.011**	1.000	0.929	0.986	0.662	0.419	0.738
(2) Peer vs. SOE | Non-Recip	**0.000**	0.073	0.297	0.421	0.435	0.725	0.825	0.203	**0.008**	0.794	**0.018**	**0.002**

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. Panel 1 pools data from E_1 in the peer treatment and E_2 who observe S_H in the SOE treatment. Panel 2 pools data from E_2 who observe S_H in the peer treatment and E_2 who observe S_H in the SOE treatment. Bold values represent significant differences at the 5% level. We adjust p-values using the Holm method (Holm 1979) for multiple-hypothesis testing. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

We next analyze the case of a strong overlap of effects. Hypothesis 6a predicts that E_2 in the SOE treatment who observed that E_1 chose S_H (and is observed by E_3) is more likely to choose S_H than E_1 in the peer treatment (who is observed but not an observer). Panel 1 in Table 7 presents the decisions of E_1 in the peer treatment and E_2 who observed that E_1 chose the expensive supplier in the SOE treatment, separating between reciprocal and non-reciprocal employees. The tests at the bottom of the table confirm that observed employees are more likely to choose the expensive supplier when they observe that a peer chose S_H, as predicted by Hypothesis 6a. Furthermore, this effect is more salient among reciprocal employees (significant in four situations) than among non-reciprocal employees (significant in one situation).[26] These results suggest that the positive effects of being observed are diminished by the negative spillovers associated with observing that a peer chose the expensive supplier, providing support for Hypothesis 6a.

Hypothesis 6b predicts that the negative spillovers on observers may be attenuated when employees are also observed by a peer. To obtain a cleaner comparison, we test this by conditioning on what E_2 observed. Panel 2 in Table 7 compares the decisions of E_2 who observes that E_1 chose S_H in the peer and SOE treatments, distinguishing between reciprocal and non-reciprocal employees. We find that E_2 in the SOE treatment (who are observed by E_3) are significantly less likely to choose the expensive supplier than E_2 in the peer treatment (who are not observed by a peer). In addition, this effect is only present among non-reciprocal employees (significant in three situations), consistent with our previous results. Table 17 in Appendix B shows that the positive effects of being observed by E_3 are also significant in two situations when we compare E_2 who observe that E_1 chose S_L in the SOE and in the peer treatments. Both these results provide support for Hypothesis 6b.

Overall, these two additional treatments allow us to extend the scope of our findings in the previous subsection. First, these treatments suggest that the negative spillovers associated with observing that a peer chose the expensive supplier also affect employees who are themselves observed. Second, the positive effects associated with being observed by a peer are also present in employees who observe that a peer chose the expensive supplier. This is particularly true in the case with *strong* overlap of effects. In addition, we find that the main behavioral mechanisms we identified in the peer treatment—that negative spillovers affect primarily reciprocal employees, and the positive effects from being observed affect non-reciprocal employees—are still present when an employee both observes and is obseved.

6. Discussion

The experimental results largely confirm the main prediction derived from our theoretical model: the existence of negative spillover effects, by which reciprocal employees are more likely to choose the expensive supplier after observing that their peer did so. Our results also confirm the underlying mechanisms leading to this effect: the heterogeneity in employees' preferences for reciprocity and the employees' aversion to disadvantageous income inequality. Our additional treatments also suggest that negative spillovers are present even when employees are (weak or strong) observers. We also find support for the theoretical prediction that increased transparency does not induce positive

[26] Table 16 in Appendix B compares E_2 in the SOE treatment who observe that E_1 chose S_L with E_1 in the peer treatment and confirms the absence of positive spillovers in this case.

spillovers; i.e., employees are not more likely to choose the cheaper supplier after observing that their peer did so.

In addition, the experimental results show that transparency has positive effects on employees whose decisions are observed by a peer, by which they are significantly less likely to choose the expensive supplier than the employees in the baseline. These effects appear to be consistent with a preference for compliance with the social norm, a result that is not anticipated by the theory and that has been mostly overlooked in previous literature on peer effects in related three-person gift exchange and trust games.[27] Furthermore, being observed by a peer also mitigates the negative spillovers arising from observing that a peer chose the expensive option in larger organizations, as shown by the analysis of the SOE treatment.[28]

Finally, while the theoretical model predicts that, as a result of the negative spillovers, the average procurement cost per employee should be higher in the peer treatment than in the baseline (Corollary 1 in Appendix A), the experimental results show no significant differences in the average cost per employee between the two treatments ($c_B = 60.208$ vs. $c_P = 61.314$; Wilcoxon rank-sum test; $p = 0.335$). This mismatch is due to the fact that our theory does not account for the positive effects of transparency on observed employees: while negative spillover effects work in the direction of increasing the procurement cost, the effects on observed employees work in the opposite direction and contribute to reducing it. In fact, when comparing the overall probability that an employee will choose the expensive supplier in the baseline and peer treatments (we look at the average across E_1 and E_2 in each treatment) we find that there is no significant difference, except in one situation where this probability is lower in the peer treatment; see Table 19 in Appendix B. Consistent with this observation, the experimental results show that the average wage is not significantly different across baseline and peer treatments ($w_B = 28.125$ vs. $\omega_P = 28.269$; Wilcoxon rank-sum test; $p = 0.915$).

We are also interested in understanding how the average procurement cost changes in organizations where the same employees can observe and be observed. We first compare the overall probability that an employee will choose the expensive supplier in the peer, WOE, and SOE treatments (we look at the average across E_1 and E_2 in the peer and WOE treatments, and across E_1,

[27] Mittone and Ploner (2011) analyze peer-pressure effects on the first follower in a trust game. They find that peer pressure has a positive effect on reciprocity, but this effect is significant for the highest investment level only.

[28] To examine whether the positive effect on observed employees is consistent with preferences for compliance with the social norm, we conducted a norm elicitation treatment corresponding to the SOE setting. Twenty-three subjects participated in the social norm elicitation treatment, which was conducted in the same university with the same subject pool and the same recruiting protocol as the previous treatments. While we do not find evidence that E_2's behavior is consistent with the corresponding social norm, we do find that the higher frequency of choosing the expensive supplier of E_1 in the SOE treatment relative to E_1 in the peer treatment is consistent with the social norm: it is more appropriate for E_1 to choose the expensive supplier in the SOE treatment relative to the peer treatment, particularly in the situation where this behavior is observed (Table 18 in Appendix B). This suggests that a preference for compliance with the social norm is a robust result among E_1 (who are observed but not observers).

E_2, and E_3 in the SOE treatment). We observe that both treatments with overlap of effects lead to a higher frequency of choosing S_H, and the difference is significant when the wage is low; see Table 19 in Appendix B. However, we find no significant differences in the average wage between the peer treatment and the WOE and SOE treatments. Moreover, the difference in the average cost between the peer and SOE treatments is not significant and, while there is a significant difference in the average cost between the peer and WOE treatments, the latter is higher by only 3.8%.

7. Conclusions

Motivated by recent initiatives to increase transparency in procurement, we study the effects of disclosing information about previous purchases in a setting where an organization delegates its purchasing decisions to its employees. We develop a theoretical model that captures the main dynamics of delegated procurement and makes two behavioral considerations: that employees are heterogeneous in their reciprocity towards the employer and that they are averse to disadvantageous income inequality relative to their peer. We show the existence of a price region where increased transparency leads to negative spillovers on reciprocal employees, who in the absence of peer effects would have chosen the cheaper supplier to benefit their employer. Our model also predicts an absence of positive spillovers on reciprocal employees, and a lack of peer effects on employees who are observed by their peer.

We design a laboratory experiment to test these predictions and to shed light on the behavioral mechanisms driving decisions. To this end, we introduce a new game, the procurement game, that captures the setting analyzed in the theory. Our experimental results confirm the existence of negative spillovers on reciprocal employees, by which they are more likely to choose the expensive supplier after observing that their peer did so. Consistent with the theory, we also find that there are no positive spillovers; i.e., employees who observe that their peer chose the cheapest option are not more likely to do so than in the case with no transparency.

A result that is not predicted by our model is that employees whose decision will be observed by their peer are less likely to choose the expensive supplier. These effects are especially significant among non-reciprocal employees and when the wage is low, suggesting that reciprocity is not the main mechanism driving this behavior. We propose an alternative explanation based on employees' desire to comply with the social norm by taking the action that is socially perceived as most appropriate. To test this, we conduct two additional norm elicitation treatments to evaluate the appropriateness of choosing the expensive supplier in the context of our experimental setting, with and without transparency. We find that choosing the expensive supplier is less appropriate when employees' decisions are observed by a peer than in the no-transparency baseline, and that these differences in the social norm are consistent with the differences in purchasing behavior between employees in the baseline and those who are observed in the peer treatment. This result suggests that a model that incorporates the desire to comply with social norms provides a plausible explanation for the behavior of observed employees.

Finally, our additional treatments confirm that the two main effects that we identified (negative spillovers associated with observing that a peer chose the expensive supplier and positive effects associated with being observed by a peer) are still present when an employee both observes and is observed.

7.1. Managerial Implications

Our results provide valuable insights for organizations seeking to implement transparency initiatives in their procurement processes, and suggest some concrete recommendations to be incorporated when designing such procurement platforms.

First, we find that increased transparency affects employees' purchasing behavior: observing overspending negatively affects reciprocal employees and being observed by a peer positively affects non-reciprocal employees. Hence, firms' internal communication policies should emphasize that employees' decisions will be observed: this would help reduce overspending by non-reciprocal employees which in turn would mitigate the negative spillovers on reciprocal employees, leading to lower procurement costs. A second effect of increased transparency we identify is the change in the perceived appropriateness of choosing the expensive supplier. In particular, overspending is perceived to be less appropriate when an employee's decision will be observed by other employees. Our results also show that observed employees comply, to certain extent, with what is perceived as socially appropriate. Therefore, organizations should make communication efforts that reinforce what is perceived as appropriate spending behavior in an attempt to increase compliance with the social norm and to reduce procurement costs.

We believe that a great opportunity for future research will be to test the aforementioned ideas in a field experiment setting. For instance, in line with what we just described, two concrete suggestions arise. First, it would interesting to implement an intervention where employees are reminded of the fact that other employees will observe their decisions later on. Second, it would be interesting to elicit the perceived appropriateness of choosing the expensive suppliers, and make that visible to employees when they make their choices. This intervention would be in line with previous literature which has shown that communication that makes the social norm salient can be effective in influencing behavior in settings such as alcohol and cigarette use, energy consumption, and pro-environmental behavior (Reid et al. 2010, Schultz et al. 2007, and Cialdini et al. 2006). In addition, in public procurement settings, it would be of interest to study what is the impact of purchasing decisions being observed not only by peers but also by citizens.

Finally, while our experiment captures decision making in a procurement setting, we believe our findings can more broadly translate to the effects of increased transparency in other settings. As discussed in the literature review, our results are consistent with previous findings in other principal-agent problems (e.g., in gift-exchange games). Therefore, the behavioral mechanisms we identify and the consequent managerial implications could apply to those settings as well.

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Appendix A: Proofs

A.1. Proof of Proposition 1

Recall that the utility of employee $i \in \{1,2\}$ in the baseline model is given by

$$u_i(\omega,\delta,\gamma_i,\sigma_i) = \omega + r \cdot \mathbb{1}_{\{\sigma_i = S_H\}} + \gamma_i \cdot R_\rho(\omega,\delta,\sigma_i).$$

Suppose first that employee i is non-reciprocal, i.e. $\gamma_i = 0$. Then, as $r > 0$, it is optimal for employee i to always choose supplier A, regardless of the received wage and the realized price difference.

Next, suppose that $\gamma_i = \gamma$. If the wage offered is below the reference wage, then it is optimal for employee i to select supplier A regardless of the realized price difference, as $\lambda_\rho(\omega) < 0$ and therefore $R_\rho(\omega,\delta,S_H) \geq 0$. In contrast, if ω is above the reference wage, we have $\lambda_\rho(\omega) > 0$ and the utility of choosing S_H is $\omega + r - \gamma\lambda_\rho(\omega)\frac{\delta}{2}$, whereas the utility of choosing S_L is $\omega + \gamma\lambda_\rho(\omega)\frac{\delta}{2}$. Hence, it is optimal for employee i with $\gamma_i = \gamma$ to choose supplier A if and only if $\delta \leq \frac{r}{\gamma\lambda_\rho(\omega)}$.

We thus conclude that the optimal strategy for the employees is:

$$\sigma_i(\omega,\delta,0) = S_H, \qquad \text{and} \qquad \sigma_i(\omega,\delta,\gamma) = \begin{cases} S_H & \text{if } \lambda_\rho(\omega) \leq 0 \\ S_H & \text{if } \lambda_\rho(\omega) > 0 \text{ and } \delta \leq \frac{r}{\gamma\lambda_\rho(\omega)} \\ S_L & \text{if } \lambda_\rho(\omega) > 0 \text{ and } \delta > \frac{r}{\gamma\lambda_\rho(\omega)} \end{cases}. \tag{10}$$

Anticipating the employees' behavior, the director will choose a wage in order to minimize her cost function given by (3). We consider two cases:

1. If $\omega \in \left[\underline{\omega}, \rho + \frac{r}{\gamma\bar{\delta}}\right]$, then all reciprocal employees will choose supplier A regardless of the price difference, as $\bar{\delta} \leq \frac{r}{\gamma\lambda_\rho(\omega)}$ for any wage in this interval. As non-reciprocal employees always choose supplier A (regardless of the wage and price difference), the cost of the director will be:

$$c_D^B(\omega) = 2\omega + 2p_L + 2\mathbb{E}_\delta\left[\delta\right] = 2\omega + 2p_L + \bar{\delta},$$

   where for the second equality we use the fact that δ is uniformly distributed in $[0,\bar{\delta}]$.

2. If $\omega \in \left(\rho + \frac{r}{\gamma\bar{\delta}}, \infty\right)$, then whether an employee will choose supplier A or not depends on his reciprocity type and the realized price difference. In this case, using the fact that the utility of employee i is independent of the type and strategy of the other employee, we have that:

$$\begin{aligned} c_D^B(\omega) &= 2\omega + 2p_L + \sum_{i=1}^{2}\mathbb{E}_{\delta,\gamma_i}\left[\mathbb{1}_{\{\sigma_i = S_H|\omega,\delta,\gamma_i\}}\delta\right] \\ &= 2\omega + 2p_L + 2\Big((1-q)\mathbb{E}_\delta\left[\mathbb{1}_{\{\sigma_i = S_H|\omega,\delta,\gamma_i=0\}}\delta\right] + q\mathbb{E}_\delta\left[\mathbb{1}_{\{\sigma_i = S_H|\omega,\delta,\gamma_i=\gamma\}}\delta\right]\Big) \\ &= 2\omega + 2p_L + 2(1-q)\frac{\bar{\delta}}{2} + 2q\int_0^{\frac{r}{\gamma\lambda_\rho(\omega)}}\frac{\delta}{\bar{\delta}}d\delta \\ &= 2\omega + 2p_L + (1-q)\bar{\delta} + \frac{q}{\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 \end{aligned}$$

   where the first equality is obtained by noting that both employees are ex-ante symmetrical, the second one by conditioning on the reciprocity type of the employee, and the third equality follows by replacing the strategies of the employees in the indicator by those in (10).

We therefore conclude that the cost of the director is given by the following piecewise function:

$$c_D^B(\omega) = \begin{cases} 2\omega + 2p_L + \bar{\delta} & \text{if } \omega \in \left[\underline{\omega}, \rho + \frac{r}{\gamma\bar{\delta}}\right] \\ 2\omega + 2p_L + (1-q)\bar{\delta} + \frac{q}{\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 & \text{if } \omega \in \left(\rho + \frac{r}{\gamma\bar{\delta}}, \infty\right) \end{cases}. \tag{11}$$

It is easy to check that $c_D^B(\omega)$ is convex in $\left[\rho + \frac{r}{\gamma\bar{\delta}}, \infty\right)$ and that it is increasing for ω big enough, so it has a unique minimizer in this range.

Let ω_B^* be the optimal wage for the director. Given that the director's cost is a piece-wise function, with one of the pieces being linear and the other convex, to find the optimal wage we can optimize over the two pieces separately and compare these costs.

As the cost function is linear and increasing in $\left[\underline{\omega}, \rho + \frac{r}{\gamma\bar{\delta}}\right]$, it follows that, in this range, the cost function is minimized at $\underline{\omega}$.

Let $\hat{\omega}$ be the minimizer of the cost function in $\left[\rho + \frac{r}{\gamma\bar{\delta}}, \infty\right)$. Note that

$$(c_D^B)'(\omega) = \frac{\partial c_D^B(\omega)}{\partial\omega} = 2 - \frac{2q}{\bar{\delta}} \cdot \frac{1}{\lambda_\rho(\omega)^3} \cdot \left[\frac{r}{\gamma}\right]^2 = 2 - \frac{2q}{\bar{\delta}} \cdot \frac{1}{(\omega-\rho)^3} \cdot \left[\frac{r}{\gamma}\right]^2.$$

When $(c_D^B)'\left(\rho + \frac{r}{\gamma\bar{\delta}}\right) \geq 0$ (which happens if and only if $r \geq q\gamma\bar{\delta}^2$), it follows by convexity that $\hat{\omega} = \rho + \frac{r}{\gamma\bar{\delta}}$. It can be easily verified that $c_D^B(\hat{\omega}) > c_D^B(\underline{\omega})$. Otherwise, $\hat{\omega}$ must satisfy the first order conditions and thus:

$$\hat{\omega} = \rho + \left[\frac{q}{\bar{\delta}}\right]^{\frac{1}{3}} \cdot \left[\frac{r}{\gamma}\right]^{\frac{2}{3}} = \rho + \psi$$

Therefore, for ω_B^* to be in $(\underline{\omega}, \infty)$ it must be the case that $r < q\gamma\bar{\delta}^2$ and $c_D^B(\hat{\omega}) < c_D^B(\underline{\omega})$, which holds only if $2(\rho - \underline{\omega}) < q\bar{\delta} - 3\psi$. Thus,

$$\omega_B^* = \begin{cases} \rho + \psi & \text{if } r < q\gamma\bar{\delta}^2,\ 2(\rho - \underline{\omega}) < q\bar{\delta} - 3\psi \\ \underline{\omega} & \text{if } otherwise \end{cases},$$

as desired. □

A.2. Proof of Proposition 2

As employee 1's utility only depends on his reciprocity towards the director and does not depend on employee 2's decision, it is direct that his optimal strategy is the same as in the baseline model (without transparency), so it is given by (4).

On the other hand, employee 2 incorporates distributional preferences as he is able to infer employee 1's payoff from his decisions. Noticing that

$$(\pi_i - \pi_j) = \begin{cases} r & \text{if } \sigma_i = S_H,\ \sigma_j = S_L \\ 0 & \text{if } \sigma_i = \sigma_j \\ -r & \text{if } \sigma_i = S_L,\ \sigma_j = S_H \end{cases}$$

the utility of employee 2 in Equation (6) can be re-written as:

$$u_2(\omega, \delta, \gamma_2, \sigma_1, \sigma_2) = \omega + \gamma_2 \cdot R_\rho(\omega, \delta, \sigma_2) + \mathbb{1}_{\{\sigma_2 = S_H\}} \cdot r \cdot [(1-\alpha) + (\alpha+\beta) \cdot \mathbb{1}_{\{\sigma_1 = S_H\}}] - \beta \cdot r \cdot \mathbb{1}_{\{\sigma_1 = S_H\}} \tag{12}$$

Suppose first that $\gamma_2 = 0$. Then, as $r > 0$ and $\alpha \leq 1$, the benefit from choosing supplier A (equal to r) is always greater than or equal to the disutility resulting from the aversion to advantageous income inequality (equal to $\alpha \cdot r$), so it is optimal for employee 2 to choose supplier A for all combinations of wage and price difference, regardless of employee 1's decision.

Next, suppose that $\gamma_2 = \gamma$. If the wage offered is below the reference wage, then $R_\rho(\omega, \delta, S_H) \geq 0$ and employee 1 chooses S_H, so it is optimal for employee 2 to always choose the expensive supplier.

In contrast, if ω is above the reference wage (and thus $\lambda_\rho(\omega) > 0$), the decision of employee 2 depends on the decision made by employee 1. In particular, if $\sigma_1 = S_H$, the utility that employee 2 gets from choosing S_H is $\omega + r - \gamma\lambda_\rho(\omega)\frac{\delta}{2}$, while his utility from choosing S_L is $\omega + \gamma\lambda_\rho(\omega)\frac{\delta}{2} - \beta r$. Hence, it is optimal for employee 2 to choose supplier A if and only if $\delta \leq \frac{r(1+\beta)}{\gamma \cdot \lambda_\rho(\omega)}$. On the other hand, if $\sigma_1 = S_L$, the utility that employee 2 gets from choosing S_H is $\omega + r - \gamma\lambda_\rho(\omega)\frac{\delta}{2} - \alpha r$, whereas his utility from choosing S_L is $\omega + \gamma\lambda_\rho(\omega)\frac{\delta}{2}$, so it is optimal for him to choose S_H if and only if $\delta \leq \frac{r(1-\alpha)}{\gamma \cdot \lambda_\rho(\omega)}$. Combining these cases, the optimal strategy of employee 2 becomes

$$\sigma_2(\omega, \delta, 0, \sigma_1) = S_H, \quad \text{and} \quad \sigma_2(\omega, \delta, \gamma, \sigma_1) = \begin{cases} S_H \text{ if } \lambda_\rho(\omega) \leq 0 \text{ or } \lambda_\rho(\omega) > 0 \text{ and } \delta < \frac{r}{\gamma\lambda_\rho(\omega)}, \\ S_H \text{ if } \lambda_\rho(\omega) > 0 \text{ and } \delta \in \left[\frac{r}{\gamma\lambda_\rho(\omega)}, \frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right] \text{ and } \sigma_1 = S_H, \\ S_L \text{ if } \lambda_\rho(\omega) > 0 \text{ and } \delta \in \left[\frac{r}{\gamma\lambda_\rho(\omega)}, \frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right] \text{ and } \sigma_1 = S_L, \\ S_L \text{ if } \lambda_\rho(\omega) > 0 \text{ and } \delta > \frac{r \cdot (1+\beta)}{\gamma\lambda_\rho(\omega)}, \end{cases} \tag{13}$$

As in the baseline model, the director anticipates the behavior of the employees and chooses a wage to minimize her expected cost, which is given by:

$$\begin{aligned} c_D^P(\omega) &= 2\omega + 2p_L + \mathbb{E}_{\delta,\gamma_1,\gamma_2}\left[\left(\mathbb{1}_{\{\sigma_1 = S_H|\omega,\delta,\gamma_1\}} + \mathbb{1}_{\{\sigma_2 = S_H|\omega,\delta,\gamma_2,\sigma_1\}}\right)\delta\right] \\ &= 2\omega + 2p_L + (1-q)^2\mathbb{E}_\delta\left[\left(\mathbb{1}_{\{\sigma_1 = S_H|\omega,\delta,\gamma_1=0\}} + \mathbb{1}_{\{\sigma_2 = S_H|\omega,\delta,\gamma_2=0,\sigma_1\}}\right)\delta\right] \\ &+ q(1-q)\mathbb{E}_\delta\left[\left(\mathbb{1}_{\{\sigma_1 = S_H|\omega,\delta,\gamma_1=0\}} + \mathbb{1}_{\{\sigma_2 = S_H|\omega,\delta,\gamma_2=\gamma,\sigma_1\}}\right)\delta\right] \\ &+ q(1-q)\mathbb{E}_\delta\left[\left(\mathbb{1}_{\{\sigma_1 = S_H|\omega,\delta,\gamma_1=\gamma\}} + \mathbb{1}_{\{\sigma_2 = S_H|\omega,\delta,\gamma_2=0,\sigma_1\}}\right)\delta\right] \\ &+ q^2\mathbb{E}_\delta\left[\left(\mathbb{1}_{\{\sigma_1 = S_H|\omega,\delta,\gamma_1=\gamma\}} + \mathbb{1}_{\{\sigma_2 = S_H|\omega,\delta,\gamma_2=\gamma,\sigma_1\}}\right)\delta\right] \end{aligned} \tag{14}$$

We consider three cases:

1. If $\omega \in \left[\underline{\omega}, \rho + \frac{r}{\gamma\bar{\delta}}\right]$, then both employees will always choose supplier A regardless of the price difference, as $\alpha \leq 1$ and $\bar{\delta} \leq \frac{r}{\gamma\lambda_\rho(\omega)}$ for any wage in this interval. Then, similar to the baseline, the cost for the director will be:
$$c_D^P(\omega) = 2\omega + 2p_L + 2\mathbb{E}_\delta[\delta] = 2\omega + 2p_L + \bar{\delta}.$$
2. If $\omega \in \left[\rho + \frac{r}{\gamma\bar{\delta}}, \rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}\right]$, a reciprocal employee 2 will follow the decision made by employee 1 regardless of the price difference, as $\bar{\delta} \leq \frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}$ for any wage in this interval. In contrast, if employee 2 is non-reciprocal he will always choose S_H regardless of employee 1's decision (as $\alpha \leq 1$). Using these facts, the expected cost for the director in (14) can be written as
$$\begin{aligned} c_D^P(\omega) &= 2\omega + 2p_L + 2(1-q)^2\frac{\bar{\delta}}{2} + 2q(1-q)\frac{\bar{\delta}}{2} + q(1-q)\left[\int_0^{\frac{r}{\gamma\lambda_\rho(\omega)}} \frac{\delta}{\bar{\delta}} d\delta + \frac{\bar{\delta}}{2}\right] + 2q^2 \int_0^{\frac{r}{\gamma\lambda_\rho(\omega)}} \frac{\delta}{\bar{\delta}} d\delta \\ &= 2\omega + 2p_L + \bar{\delta} - \frac{q(1+q)\bar{\delta}}{2} + \frac{q(1+q)}{2\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 \end{aligned}$$
where the first equality is obtained by replacing the indicator functions in Equation (14) with the strategies of the employees.

3. If $\omega \in \left[\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}, \infty\right)$, then a reciprocal employee 2 will follow a non-reciprocal employee 1 and choose S_H if $\delta \le \frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}$, whereas he will choose the cheapest supplier if the price difference exceeds this threshold. Then, replacing the indicator functions by the employees' best responses, the expected cost in (14) becomes:

$$\begin{aligned} c_D^P(\omega) &= 2\omega + 2p_L + 2(1-q)^2\frac{\bar{\delta}}{2} + q(1-q)\left[\frac{\bar{\delta}}{2} + \int_0^{\frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}} \frac{\delta}{\bar{\delta}} d\delta\right] + q(1-q)\left[\int_0^{\frac{r}{\gamma\lambda_\rho(\omega)}} \frac{\delta}{\bar{\delta}} d\delta + \frac{\bar{\delta}}{2}\right] + 2q^2\int_0^{\frac{r}{\gamma\lambda_\rho(\omega)}} \frac{\delta}{\bar{\delta}} d\delta \\ &= 2\omega + 2p_L + (1-q)\bar{\delta} + \frac{q(1+q)}{2\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 + \frac{q(1-q)}{2\bar{\delta}}\left(\frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right)^2 \end{aligned}$$

Therefore, the expected cost of the director is given by the following piecewise function:

$$c_D^P(\omega) = \begin{cases} 2\omega + 2p_L + \bar{\delta} & \text{if } \omega \in \left[\underline{\omega}, \rho + \frac{r}{\gamma\bar{\delta}}\right] \\ 2\omega + 2p_L + \bar{\delta} - \frac{q(1+q)\bar{\delta}}{2} + \frac{q(1+q)}{2\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 & \text{if } \omega \in \left[\rho + \frac{r}{\gamma\bar{\delta}}, \rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}\right] \\ 2\omega + 2p_L + (1-q)\bar{\delta} + \frac{q(1+q)}{2\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 + \frac{q(1-q)}{2\bar{\delta}}\left(\frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right)^2 & \text{if } \omega \in \left[\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}, \infty\right) \end{cases} \quad (15)$$

Notice that if $\beta = 0$ (i.e. no aversion to disadvantageous income inequality) or $q \in \{0, 1\}$ (i.e. no heterogeneity in reciprocity), the best response function of employee 2 is the same as for employee 1, and the expected cost for the director is equivalent to that in the baseline case. Thus, from now on we focus on the case where $\beta > 0$ and $q \in (0, 1)$. Then, the cost function $c_D^P(\omega)$ is linear in $\omega \in \left[\underline{\omega}, \rho + \frac{r}{\gamma\bar{\delta}}\right]$ and convex in both $\left[\rho + \frac{r}{\gamma\bar{\delta}}, \rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}\right]$ and $\left[\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}, \infty\right)$, and it is easy to see that this function is increasing for ω large enough. Hence, $c_D^P(\omega)$ has a unique minimizer in each piece, and therefore to find the globally optimal solution it is enough to optimize over the three pieces separately and compare the resulting costs.

Let ω_1, ω_2 and ω_3 be the minimizers of $c_D^P(\omega)$ in each piece, and let ω_P^* be the optimal wage for the director. As the cost function is linear and increasing in $\left[\underline{\omega}, \rho + \frac{r}{\gamma\bar{\delta}}\right]$, it is direct that $\omega_1 = \underline{\omega}$. In addition, note that in $\left[\rho + \frac{r}{\gamma\bar{\delta}}, \rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}\right]$,

$$(c_D^P)'(\omega) = \frac{\partial c_D^P(\omega)}{\partial \omega} = 2 - \frac{q(1+q)}{\bar{\delta}} \cdot \left[\frac{r}{\gamma}\right]^2 \cdot \frac{1}{(\omega - \rho)^3}.$$

By convexity it follows that $\omega_2 = \rho + \frac{r}{\gamma\bar{\delta}}$ if $(c_D^P)'\left(\rho + \frac{r}{\gamma\bar{\delta}}\right) \ge 0$. This holds if $q\gamma\bar{\delta}^2\xi^3 \le r$, or equivalently if $\xi \le \frac{r}{\gamma\bar{\delta}\psi}$, where $\xi = \left[\frac{1+q}{2}\right]^{\frac{1}{3}}$ and $\psi = \left[\frac{q}{\bar{\delta}}\right]^{\frac{1}{3}} \cdot \left[\frac{r}{\gamma}\right]^{\frac{2}{3}}$. On the other hand, if $(c_D^P)'\left(\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}\right) \le 0$ (which happens if $q\gamma\bar{\delta}^2\left[\frac{\xi}{1+\beta}\right]^3 \ge r \Leftrightarrow \xi \ge \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}$) then it must be that $\omega_2 = \rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}$ because convexity implies that $c_D^P(\omega)$ is decreasing in this interval. Otherwise, ω_2 satisfies first order conditions, and therefore:

$$\omega_2 = \rho + \left[\frac{q}{\bar{\delta}}\right]^{\frac{1}{3}} \cdot \left[\frac{r}{\gamma}\right]^{\frac{2}{3}} \cdot \left[\frac{1+q}{2}\right]^{\frac{1}{3}} = \rho + \psi \cdot \xi.$$

Finally, for $\omega \in \left[\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}, \infty\right)$ note that

$$(c_D^P)'(\omega) = \frac{\partial c_D^P(\omega)}{\partial \omega} = 2 - \frac{q(1+q)}{\bar{\delta}} \cdot \left[\frac{r}{\gamma}\right]^2 \cdot \frac{1}{(\omega-\rho)^3} - \frac{q(1-q)}{\bar{\delta}} \cdot \left[\frac{r(1+\beta)}{\gamma}\right]^2 \cdot \frac{1}{(\omega-\rho)^3}.$$

As before, convexity implies that $\omega_3 = \rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}$ if $(c_D^P)'\left(\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}\right) \ge 0$. This holds if $q\gamma\bar{\delta}^2\left[\frac{\zeta}{1+\beta}\right]^3 \le r$, which can also be written as $\zeta \le \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}$, where $\zeta = \left[\frac{(1+q)+(1+\beta)^2\cdot(1-q)}{2}\right]^{\frac{1}{3}}$ and ψ is defined as before. Otherwise, ω_3 must satisfy first order conditions, and therefore:

$$\omega_3 = \rho + \left[\frac{q}{\bar{\delta}}\right]^{\frac{1}{3}} \cdot \left[\frac{r}{\gamma}\right]^{\frac{2}{3}} \cdot \left[\frac{(1+q)+(1+\beta)^2\cdot(1-q)}{2}\right]^{\frac{1}{3}} = \rho + \psi \cdot \zeta.$$

For ω_i to be globally optimal it must be the case that $c_D^P(\omega_i) < \min_{j\in\{1,2,3\}\setminus\{i\}}\{c_D^P(\omega_j)\}$. It is easy to check that for ω_2 to be globally optimal it must be the case that $\omega_2 = \rho + \psi\xi$ (which holds if $\xi \in \left(\frac{r}{\gamma\bar{\delta}\psi}, \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}\right)$), as $c_D^P(\underline{\omega}) = c_D^P(\omega_1) < c_D^P(\rho + \frac{r}{\gamma\bar{\delta}})$ and $c_D^P(\omega_3) \le c_D^P(\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}})$. Moreover, it must also be the case that $c_D^P(\omega_2) < c_D^P(\omega_1) = c_D^P(\underline{\omega})$, which follows if $2(\rho - \underline{\omega}) < \frac{q(1+q)\bar{\delta}}{2} - 3\psi\xi$.

Similarly, for ω_3 to be globally optimal it must be the case that $\omega_3 = \rho + \psi\zeta$ (which holds if $\zeta > \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}$), as $c_D^P(\omega_2) \le c_D^P(\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}})$. Also it must be that $c_D^P(\omega_2) < c_D^P(\omega_1) = c_D^P(\underline{\omega})$, which holds if $2(\rho - \underline{\omega}) < q\bar{\delta} - 3\psi\zeta$.

Finally, suppose that $\omega_2 = \rho + \psi\xi$ and $\omega_3 = \rho + \psi\zeta$. Then, $c_D^P(\omega_2) \le c_D^P(\omega_3)$ if and only if $3(\zeta - \xi) \ge \frac{q(1-q)\bar{\delta}}{2}$, so the optimal wage ω_P^* can be written as,

$$\omega_P^* = \begin{cases} \rho + \psi\zeta \text{ if } \xi \in \left(\frac{r}{\gamma\bar{\delta}\psi}, \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}\right), \zeta \in \left(\frac{r(1+\beta)}{\gamma\bar{\delta}\psi}, \infty\right), 2(\rho - \underline{\omega}) < q\bar{\delta} - 3\psi\zeta,\ 3\psi(\zeta - \xi) < \frac{q(1-q)\bar{\delta}}{2} \\ \rho + \psi\zeta \text{ if } \xi \notin \left(\frac{r}{\gamma\bar{\delta}\psi}, \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}\right), \zeta \in \left(\frac{r(1+\beta)}{\gamma\bar{\delta}\psi}, \infty\right), 2(\rho - \underline{\omega}) < q\bar{\delta} - 3\psi\zeta \\ \rho + \psi\xi \text{ if } \xi \in \left(\frac{r}{\gamma\bar{\delta}\psi}, \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}\right), \zeta \in \left(\frac{r(1+\beta)}{\gamma\bar{\delta}\psi}, \infty\right), 2(\rho - \underline{\omega}) < \frac{q(1+q)\bar{\delta}}{2} - 3\psi\xi,\ 3\psi(\zeta - \xi) \ge \frac{q(1-q)\bar{\delta}}{2} \\ \rho + \psi\xi \text{ if } \xi \in \left(\frac{r}{\gamma\bar{\delta}\psi}, \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}\right), \zeta \le \frac{r(1+\beta)}{\gamma\bar{\delta}\psi}, 2(\rho - \underline{\omega}) < \frac{q(1+q)\bar{\delta}}{2} - 3\psi\xi. \\ \underline{\omega} \qquad \text{if } otherwise \end{cases}$$

□

A.3. Procurement cost in the baseline and peer setting

Proposition 3 shows that if the director decides to offer a wage above the reference wage, then the expected cost in the peer model is greater than or equal to the cost in the baseline model.

PROPOSITION 3. *For any* $\omega \in [\underline{\omega}, \infty)$, $c_D^B(\omega) \le c_D^P(\omega)$.

C onsider Equations 11 and 15. If $\omega \in \left[\underline{\omega}, \rho + \frac{r}{\gamma\bar{\delta}}\right]$, then it is direct that $c_D^B(\omega) = c_D^P(\omega)$. If $\omega \in \left[\rho + \frac{r}{\gamma\bar{\delta}}, \rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}\right]$, then

$$\begin{aligned} c_D^P(\omega) - c_D^B(\omega) &= \bar{\delta} - \frac{q(1+q)\bar{\delta}}{2} + \frac{q(1+q)}{2\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 - (1-q)\bar{\delta} - \frac{q}{\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 \\ &= q\bar{\delta}\left(\frac{1-q}{2}\right) - \left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 \frac{q}{\bar{\delta}}\left(\frac{1-q}{2}\right) \\ &\ge q\bar{\delta}\left(\frac{1-q}{2}\right) - \left(\frac{r}{\gamma\lambda_\rho(\rho + \frac{r}{\gamma\bar{\delta}})}\right)^2 \frac{q}{\bar{\delta}}\left(\frac{1-q}{2}\right) \\ &= q\bar{\delta}\left(\frac{1-q}{2}\right) - \left(\frac{r}{\gamma \cdot \frac{r}{\gamma\bar{\delta}}}\right)^2 \frac{q}{\bar{\delta}}\left(\frac{1-q}{2}\right) \\ &= 0, \end{aligned} \tag{16}$$

where the inequality comes from the fact that $\lambda_\rho(\omega) = \omega - \rho$ is increasing in ω and the assumption that $\omega \in \left[\rho + \frac{r}{\gamma\bar{\delta}}, \rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}\right]$.

Finally, if $\omega \in \left[\rho + \frac{r(1+\beta)}{\gamma\bar{\delta}}, \infty\right)$,

$$\begin{aligned} c_D^P(\omega) - c_D^B(\omega) &= \frac{q(1+q)}{2\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 + \frac{q(1-q)}{2\bar{\delta}}\left(\frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right)^2 - \frac{q}{\bar{\delta}}\left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2 \\ &= \frac{q(1-q)}{2\bar{\delta}}\left[\left(\frac{r(1+\beta)}{\gamma\lambda_\rho(\omega)}\right)^2 - \left(\frac{r}{\gamma\lambda_\rho(\omega)}\right)^2\right] \\ &\ge 0, \end{aligned} \tag{17}$$

where the inequality comes from $\beta \ge 0$. □

From Proposition 3 it follows directly that $c_D^B(\omega_B^*) \leq c_D^P(\omega_P^*)$. This result is formalized in the next corollary.

Corollary 1. *Suppose that* $\alpha, \beta \in [0,1]$. *Let* ω_B^*, ω_P^* *be the optimal wages in the baseline and peer models respectively. Then,* $c_D^B(\omega_B^*) \leq c_D^P(\omega_P^*)$.

Appendix B: Additional Tables and Figures

Figure 6 Reciprocity Distribution

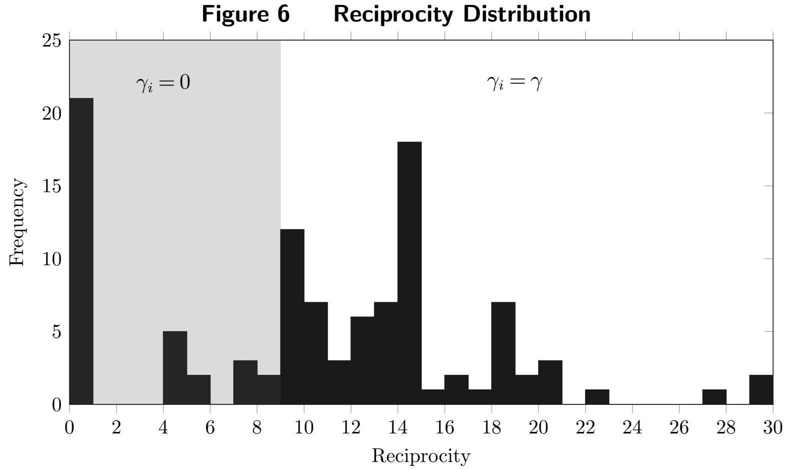


Table 8 Results Trust Game

	Amount Sent	Amount Returned 1	2	3	4	5	6	7	8	9	10
Baseline	4.50 (3.06)	0.69 (0.64)	1.81 (1.33)	2.78 (1.90)	3.91 (2.72)	4.63 (3.37)	5.50 (4.24)	6.28 (4.95)	7.34 (5.61)	8.31 (6.32)	9.97 (7.34)
Peer - E_1	5.00 (3.46)	0.85 (0.74)	1.85 (1.41)	2.79 (1.98)	3.95 (2.77)	4.85 (3.54)	5.95 (4.37)	7.08 (5.27)	8.18 (6.02)	9.33 (6.73)	11.13 (7.95)
Peer - E_2	4.72 (2.70)	0.96 (0.80)	2.21 (1.45)	3.22 (2.11)	4.21 (2.75)	5.37 (3.58)	6.82 (4.19)	7.86 (5.02)	8.87 (5.62)	9.65 (6.58)	10.64 (7.43)
		Tests (p-value)									
(1) Baseline vs. Peer - E_1	0.752	0.407	0.943	0.943	0.832	0.760	0.686	0.453	0.618	0.539	0.618
(2) Baseline vs. Peer - E_2	0.627	0.147	0.263	0.371	0.809	0.501	0.317	0.224	0.409	0.583	0.925
(3) Peer - E_1 vs. Peer - E_2	0.911	0.489	0.294	0.406	0.988	0.663	0.485	0.529	0.657	0.900	0.758

Note: Standard errors reported in parentheses. Wilcoxon rank-sum p-values reported.

Table 9 Effect of Reciprocity

	Probability of choosing S_H																	
	Panel 1: Baseline						Panel 2: Peer - Observed						Panel 3: Peer - Observer					
	$\omega=25$			$\omega=40$			$\omega=25$			$\omega=40$			$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Reciprocity	-2.506***	-2.229**	-5.570***	-3.923***	-3.754***	-2.789**	-0.703*	-0.966**	-2.136***	-0.510	-1.456***	-1.831***	-0.702	-1.648***	-2.670***	-1.532***	-1.490***	-1.954***
	(0.351)	(1.074)	(1.621)	(1.240)	(1.371)	(1.273)	(0.417)	(0.399)	(0.829)	(0.511)	(0.417)	(0.430)	(0.505)	(0.273)	(0.480)	(0.504)	(0.301)	(0.510)
Constant	5.185***	2.435**	2.614	2.300	1.471	0.159	-2.532***	-2.608***	-2.822*	-1.451	-2.443***	-1.577	2.089*	2.906***	3.010***	3.458***	2.545***	3.034***
	(1.690)	(1.052)	(1.629)	(2.131)	(1.117)	(0.992)	(0.738)	(0.797)	(1.556)	(1.214)	(0.891)	(1.024)	(1.264)	(0.670)	(0.913)	(1.226)	(0.593)	(1.063)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	168	192	192	168	192	192	234	234	234	234	234	234	234	234	234	234	234	234

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. Panel 1 pools data from employees in the baseline. Panel 2 pools data from employees who are observed in the peer treatment. Panel 3 pools data from employees who are observers in the peer treatment. Missing observations for $\delta = 10$ in Panel 1 are due to perfect separation. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 10 Reciprocal Employees — Baseline vs. Observes L

	Probability of choosing S_H											
	Panel 1: Round						Panel 2: Round and Demographics					
	$\omega=25$			$\omega=40$			$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Observes L	-1.126	0.042	0.318	-0.374	0.908	0.649	-1.524***	0.125	0.547	-0.652	0.888	0.604
	(0.729)	(0.719)	(0.742)	(0.532)	(0.604)	(0.501)	(0.590)	(0.672)	(0.678)	(0.748)	(0.686)	(0.540)
Constant	2.737***	0.068	-1.464**	0.657	-1.428***	-1.513***	3.992**	1.278	-0.914	-1.544	-0.551	-0.356
	(0.884)	(0.537)	(0.688)	(0.704)	(0.533)	(0.353)	(1.690)	(0.919)	(1.494)	(1.205)	(1.149)	(1.217)
Round	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	167	210	247	170	241	256	167	210	247	160	241	256

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. The table pools data from reciprocal employees in the baseline and reciprocal employees who observe that S_L was chosen in the peer treatment. In Panel 1 we control for round, and in Panel 2 we control for round and demographics. The missing observations for $(\omega, \delta) = (40, 10)$ in Panel 2 are due to perfect separation when including the demographic controls. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 11 Social Spillovers — Non-Reciprocal Employees

Panel 1: Non-Reciprocal — Baseline vs. Observes H

	Probability of choosing S_H					
	$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Observes H	0.110	1.726**	3.650	-0.339	0.493	1.028
	(0.856)	(0.858)	(30.23)	(0.605)	(0.393)	(1.069)
Constant	6.517*	1.171	3.577	3.166**	0.231	0.181
	(3.328)	(1.533)	(18.36)	(1.307)	(0.459)	(.)
Round	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	No	No	No	No
Observations	110	108	90	107	94	86

Panel 2: Non-Reciprocal — Baseline vs. Observes L

	Probability of choosing S_H					
	$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Observes L	-2.289*	-0.957	0.269	-0.988	-0.855	0.461
	(1.260)	(2.286)	(1.278)	(1.077)	(0.819)	(1.346)
Constant	3.499*	2.248***	1.108	3.998**	0.412	0.241
	(1.791)	(0.861)	(1.807)	(1.868)	(0.372)	(1.139)
Round	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	No	No	No	No	No	No
Observations	70	72	90	73	86	94

Panel 3: Non-Reciprocal — Baseline vs. Observes H

	Probability of choosing S_H					
	$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Observes H	-	0.224	-1.639	-5.869***	0.062	-0.224
	-	(1.226)	(21.50)	(0.068)	(0.503)	(.)
Constant	-	-3.578***	-3.953	0.571	-1.207***	-5.554
	-	(1.201)	(16.76)	(1.058)	(0.458)	(.)
Round	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Observations	-	77	67	35	88	80

Panel 4: Non-Reciprocal — Baseline vs. Observes L

	Probability of choosing S_H					
	$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Observes L	-	-	-0.936	-6.311***	-1.460**	0.402
	-	-	(1.235)	(1.382)	(0.712)	(1.682)
Constant	-	-	-3.488	0.854	-0.917	-2.049
	-	-	(3.357)	(1.823)	(0.583)	(2.889)
Round	Yes	Yes	Yes	Yes	Yes	Yes
Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Observations	-	-	65	14	74	82

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. Panels 1 and 3 pool data from non-reciprocal employees in the baseline and non-reciprocal employees that choose S_H in the peer treatment. Panels 2 and 4 pool data from non-reciprocal employees in the baseline and non-reciprocal employees that choose S_L in the peer treatment. Note that since non-reciprocal employees are only 30% of our sample, including demographic controls results in a significant drop in the number of observations due to perfect separation. Therefore, we report separately the regressions with (panels 3 and 4) and without (panels 1 and 2) demographic controls. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 12 Social Norm — Appropriateness of Choosing S_H — OLS

	$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Observed	-0.346*	-0.115*	-0.231	-0.385**	-0.115	-0.154
	(0.159)	(0.0511)	(0.155)	(0.121)	(0.113)	(0.134)
Constant	2.192***	1.577***	1.231***	2.192***	1.500***	1.231***
	(0.0975)	(0.0386)	(0.155)	(0.0628)	(0.0831)	(0.116)
Observations	52	52	52	52	52	52

Note: OLS regressions with errors clustered at the session level reported in parentheses. The dependent variable is the social appropriateness of choosing S_H (in a scale from 1 to 4). The independent variable is a dummy that takes value 1 when subjects evaluate the appropriateness of observed employees' decisions in the peer norm elicitation, and 0 when subjects evaluate the appropriateness of employees' decisions in the baseline norm elicitation. Significance reported: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 13 Procurement Game vs. Social Norm — Observed Employees (Non-Reciprocal)

		Probability of choosing S_H					
		$\omega=25$			$\omega=40$		
		$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Procurement Game	Observed	-	-1.741**	-2.655*	-1.730***	-1.452	-0.413
		-	(0.823)	(1.512)	(0.582)	(0.970)	(1.097)
	Constant	2.207***	-1.022	-2.132	1.901***	-0.832	-1.492
		(0.412)	(1.215)	(2.272)	(0.620)	(1.404)	(2.106)
	Controls	Yes	Yes	Yes	Yes	Yes	Yes
	Observations	72	132	132	132	144	144
		Appropriateness of choosing S_H					
Social Norm	Observed	-0.689*	-0.240***	-4.762***	-0.576***	-0.247	-0.151
		(0.360)	(0.090)	(0.393)	(0.195)	(0.182)	(0.476)
	Observations	52	52	52	52	52	52

Note: The top panel reports the results of panel probit regression considering as dependent variable y_{ist} (from the *procurement game*), pooling data from non-reciprocal employees in the baseline and observed conditions only. Missing observations when $\omega=25$ and $(\omega,\delta)=(40,10)$ are due to perfect separation. The bottom panel corresponds to the norm elicitation treatments, and reports the estimates of ordered probit regressions with errors clustered at the session level reported in parentheses. The dependent variable is the social appropriateness of choosing S_H (in a scale from 1 to 4). The independent variable is a dummy that takes value 1 when subjects evaluate the appropriateness of observed employees' decisions in the peer norm elicitation, and 0 when subjects evaluate the appropriateness of employees' decisions in the baseline norm elicitation. We control for round and demographics. Significance reported: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 14 Procurement Game vs. Social Norm — Observed Employees (Reciprocal)

		$\omega=25$, $\delta=10$	$\omega=25$, $\delta=25$	$\omega=25$, $\delta=40$	$\omega=40$, $\delta=10$	$\omega=40$, $\delta=25$	$\omega=40$, $\delta=40$
		Probability of choosing S_H					
Procurement Game	Observed	-1.561**	-0.283	-0.448	-0.027	0.289	-0.040
		(0.619)	(0.393)	(0.574)	(0.745)	(0.595)	(0.481)
	Constant	-1.150	-1.039	-2.422*	-3.194**	-3.139***	-2.210*
		(1.099)	(0.785)	(1.278)	(1.527)	(1.015)	(1.244)
	Controls	Yes	Yes	Yes	Yes	Yes	Yes
	Observations	282	282	282	282	282	282
		Appropriateness of choosing S_H					
Social Norm	Observed	-0.689*	-0.240***	-4.762***	-0.576***	-0.247	-0.151
		(0.360)	(0.090)	(0.393)	(0.195)	(0.182)	(0.476)
	Observations	52	52	52	52	52	52

Note: The top panel reports the results of panel probit regression considering as dependent variable y_{ist} (from the *procurement game*), pooling data from reciprocal employees in the baseline and observed conditions only. The bottom panel corresponds to the norm elicitation treatments, and reports the estimates of ordered probit regressions with errors clustered at the session level reported in parentheses. The dependent variable is the social appropriateness of choosing S_H (in a scale from 1 to 4). The independent variable is a dummy that takes value 1 when subjects evaluate the appropriateness of observed employees' decisions in the peer norm elicitation, and 0 when subjects evaluate the appropriateness of employees' decisions in the baseline norm elicitation. We control for round and demographics. Significance reported: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 15 E2 Peer vs. E2 WOE

	Probability of choosing S_H											
	Panel 1: E_2 Peer vs. E_2 WOE - Observes H						Panel 2: E_2 Peer vs. E_2 WOE - Observes L					
	$\omega=25$			$\omega=40$			$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Peer × Recip	-1.127***	-1.525***	-2.952***	-1.443**	-2.131***	-2.328**	0.417	-1.506	-2.047***	-1.504**	-0.794	-1.699***
	(0.372)	(0.227)	(1.008)	(0.563)	(0.442)	(1.113)	(0.873)	(0.998)	(0.489)	(0.726)	(0.563)	(0.511)
WOE × Recip	-0.489	-1.529***	-3.726***	-0.619	-2.479***	-3.179**	-	-1.212	-1.865***	-7.701**	-1.208**	-2.318***
	(0.406)	(0.316)	(1.126)	(0.530)	(0.399)	(1.314)	-	(1.189)	(0.650)	(3.031)	(0.602)	(0.574)
WOE × Non-Recip	-0.647	-0.818*	-0.046	-0.542	-0.600	0.113	-	0.098	-0.645	-0.868	0.614	-0.050
	(0.490)	(0.486)	(1.042)	(0.678)	(0.519)	(1.355)	-	(1.088)	(0.594)	(1.153)	(0.664)	(0.613)
Constant	2.394***	1.739***	1.785	3.447***	2.177**	3.064*	2.111*	3.757***	2.073***	1.249	1.276	2.165**
	(0.557)	(0.497)	(1.396)	(1.277)	(0.987)	(1.851)	(1.260)	(1.376)	(0.622)	(0.911)	(0.821)	(0.891)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	403	316	220	377	219	177	45	140	236	79	237	279
	Tests (p-value)											
(1) Peer vs. WOE | Recip	0.064	0.986	0.789	0.270	0.343	0.543	0.633	1.000	0.702	**0.035**	0.400	0.483
(2) Peer vs. WOE | Non-Recip	0.187	0.185	0.965	0.424	0.495	0.934	-	0.928	0.555	0.451	0.709	0.936

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. The table pools data for E_2 who observe S_H in the peer and WOE treatments. Bold values represent significant differences at the 5% level. We adjust p-values using the Holm method (Holm (1979)) for multiple hypothesis testing. We control for round and demographics. Missing values for WOE×Recip and WOE×Non-Recip in Panel 2, when $(\omega, \delta) = (25, 10)$, are due to perfect separation. Significance reported: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 16 E1 Peer vs. E2 SOE — Observes L

	Probability of choosing S_H					
	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Peer × Recip	-0.695*	-0.911***	-1.897**	-0.337	-1.365***	-1.871***
	(0.362)	(0.338)	(0.772)	(0.515)	(0.465)	(0.419)
SOE × Recip	-0.993	-0.866	-0.293	-1.839**	-1.715**	-1.699**
	(0.732)	(0.660)	(0.889)	(0.898)	(0.747)	(0.682)
SOE × Non-Recip	-	0.008	-0.135	0.074	-0.209	-0.915
	-	(0.695)	(0.734)	(1.034)	(0.691)	(0.678)
Constant	-1.930***	-1.243*	-0.161	-0.300	-0.859	-0.522
	(0.710)	(0.752)	(1.107)	(0.943)	(1.090)	(1.126)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	243	280	317	283	336	360
	Tests (p-value)					
(1) Peer vs. SOE | Recip	0.678	1.000	**0.023**	0.170	0.957	0.742
(2) Peer vs. SOE | Non-Recip	-	0.990	0.854	0.943	0.762	0.355

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. We pool data for E_1 in the peer treatment and E_2 who observe that their peer chose S_L in the SOE treatment. Bold values represent significant differences at the 5% level. We adjust p-values using the Holm method (Holm 1979) for multiple hypothesis testing. Missing values when $(\omega, \delta) = (25, 10)$ are due to perfect separation and lack of observations. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 17 E2 Peer vs. E2 SOE — Observes L

	Probability of choosing S_H					
	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Peer × Recip	-0.174	-1.173	-2.395***	-1.216	-1.007*	-1.976***
	(0.913)	(1.037)	(0.569)	(0.941)	(0.530)	(0.474)
SOE × Recip	1.213	-1.387	-1.850**	-2.201	-1.974**	-2.863***
	(1.002)	(1.145)	(0.811)	(1.456)	(0.834)	(0.641)
SOE × Non-Recip	-	-0.210	-1.672**	-0.476	-0.470	-2.022***
	-	(1.120)	(0.701)	(1.191)	(0.644)	(0.580)
Constant	3.001**	2.668**	2.788***	2.033	2.299***	2.986***
	(1.230)	(1.148)	(0.807)	(1.477)	(0.690)	(1.004)
Observations	54	136	228	96	237	284
	Tests (p-value)					
(1) Peer vs. SOE | Recip	**0.016**	1.000	0.335	0.712	0.308	0.172
(2) Peer vs. SOE | Non-Recip	-	0.851	**0.034**	0.689	0.465	**0.001**

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. We pool data for E_2 who observe that their peer chose S_L in the peer and SOE treatments. Bold values represent significant differences at the 5% level. We adjust p-values using the Holm method (Holm 1979) for multiple hypothesis testing. Missing values when $(\omega, \delta) = (25, 10)$ are due to perfect separation and lack of observations. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 18 Procurement Game vs. Social Norm — Observed Employees, E1 (Peer vs. SOE)

		Probability of choosing S_H					
		$\omega = 25$			$\omega = 40$		
		$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Procurement Game	SOE	0.440	0.641*	1.040**	-0.173	0.332	0.061
		(0.368)	(0.350)	(0.430)	(0.507)	(0.433)	(0.405)
	Constant	-0.325	-1.367**	-2.982***	-0.669	-3.117***	-3.757***
		(0.736)	(0.531)	(1.088)	(0.848)	(0.750)	(0.878)
	Controls	Yes	Yes	Yes	Yes	Yes	Yes
	Observations	438	438	438	438	438	438
		Appropriateness of choosing S_H					
Social Norm	SOE	0.958***	1.019***	5.249***	1.138***	0.378	0.581
		(0.254)	(0.206)	(0.319)	(0.305)	(0.331)	(0.436)
	Observations	49	49	49	49	49	49

Note: The top panel reports the results of panel probit regression considering as dependent variable y_{ist} (from the *procurement game*), pooling data from observed employees (E_1) in the peer and SOE treatments. The bottom panel corresponds to the norm elicitation treatments, and reports the estimates of ordered probit regressions with errors clustered at the session level reported in parentheses. The dependent variable is the social appropriateness of choosing S_H (in a scale from 1 to 4). The independent variable is a dummy that takes value 1 when subjects evaluate the appropriateness of observed employees' decisions in the SOE norm elicitation, and 0 when subjects evaluate the appropriateness of employees' decisions in the peer norm elicitation. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 19 Differences across Treatments — General Results

	Probability of choosing S_H							
	$\omega = 25$			$\omega = 40$				
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$	Avg. Wage	Avg. Cost
Baseline	0.917	0.693	0.516	0.802	0.505	0.417	28.125	60.208
	(0.216)	(0.374)	(0.443)	(0.329)	(0.433)	(0.430)	(6.124)	(11.651)
Peer	0.853	0.694	0.502	0.806	0.530	0.440	28.269	61.314
	(0.243)	(0.313)	(0.392)	(0.296)	(0.366)	(0.384)	(6.206)	(12.363)
WOE	0.964	0.809	0.646	0.874	0.577	0.484	28.529	63.660
	(0.100)	(0.270)	(0.367)	(0.224)	(0.337)	(0.377)	(6.378)	(10.870)
SOE	0.938	0.799	0.629	0.809	0.515	0.376	28.514	63.581
	(0.119)	(0.248)	(0.343)	(0.281)	(0.372)	(0.370)	(6.367)	(12.721)
	Tests (p-value)							
(1) Peer vs. Baseline	**0.042**	0.653	0.741	0.543	0.774	0.734	0.915	0.335
(2) Peer vs. WOE	**0.000**	**0.013**	**0.016**	0.193	0.399	0.404	0.748	**0.043**
(3) Peer vs. SOE	**0.017**	**0.025**	**0.033**	0.878	0.712	0.262	0.775	0.121

Note: Standard errors reported in parentheses. The first six columns consider the average probability of choosing S_H. The next column considers the average wage, and the last column considers the average cost per employee. In each case we consider the data that is aggregated at the subject level. Tests 1, 2, and 3 are Wilcoxon rank-sum tests. Bold values represent significant differences at the 5% level.

Appendix C: Effect of Wage and Price

C.1. Effect of Wage and Price

Baseline Treatment Table 20 reports the mean and standard deviation of the probability of choosing S_H aggregated at the individual level when subjects play in each role. Since the game in the baseline treatment is symmetric, we expect to find no differences in a subject's behavior in the roles of E_1 and E_2. This result is confirmed by the tests in Table 20. Since there are no significant differences, for the rest of the analysis we pool the data from E_1 and E_2 in the baseline treatment.

Table 20 shows that the probability of choosing S_H decreases as the wage, ω, and the price difference, δ, increase. The effect of wage is significant for all price differences (Wilcoxon signed-rank test, p-value ≤ 0.009) and the effect of price difference is significant, both when the wage is 25 and 40 (Wilcoxon signed-rank test p-value ≤ 0.001 when $\omega = 25$ and p-value ≤ 0.030 when $\omega = 40$ for all pairs of price differences; Kruskal-Wallis test $p \leq 0.001$).

Table 20 Baseline — Frequency of Choosing S_H by Role

	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
E_1	0.93	0.73	0.52	0.82	0.50	0.44
	(0.22)	(0.36)	(0.46)	(0.34)	(0.46)	(0.47)
E_2	0.91	0.69	0.51	0.81	0.55	0.43
	(0.23)	(0.42)	(0.47)	(0.33)	(0.46)	(0.44)
Difference (p-value)	0.622	0.449	0.629	0.703	0.276	0.863

Note: Standard errors reported in parentheses. We report the p-values of Wilcoxon signed-ranked tests for subject-level pairwise comparisons when subjects play as E_1 and E_2.

Peer Treatment Table 21 presents the subject level average of the probability of choosing S_H across the six rounds played, separately for subjects in the role of E_1 and E_2. We observe that, in the peer treatment, the probability of choosing the expensive supplier (S_H) is different depending on the role played. The last row of the table shows that subjects who play in the role of E_2 are more likely to choose S_H compared to those who play in the role of E_1, and these differences are significant in all cases where $\delta \geq 25$. Given these differences, we analyze separately the behavior of employees who are *observers* (play in the role of E_2) from those who are *observed* (play in the role of E_1).

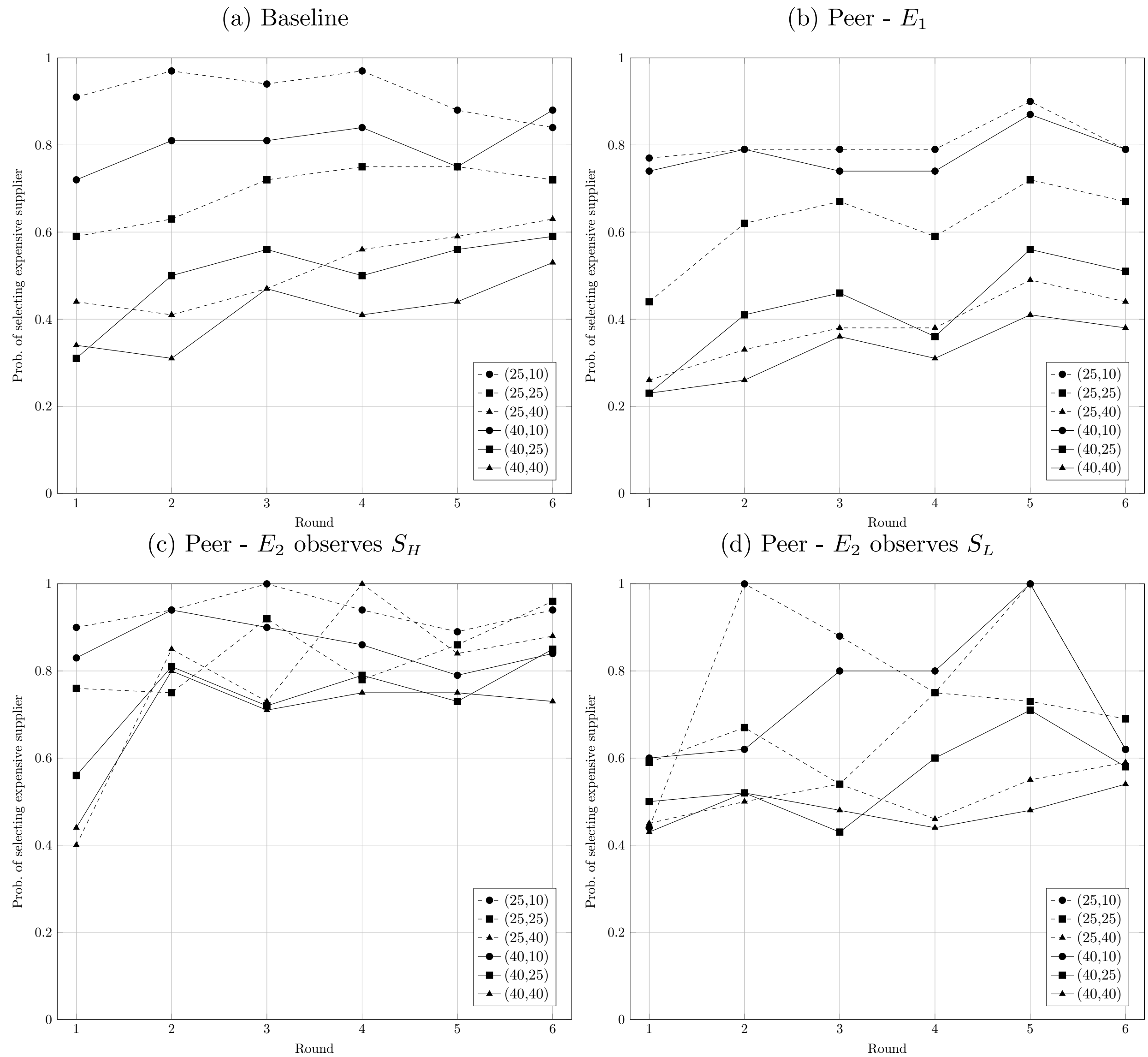
Table 21 Peer — Frequency of Choosing S_H by Role

	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
E_1	0.81	0.62	0.38	0.78	0.42	0.32
	(0.29)	(0.34)	(0.38)	(0.32)	(0.36)	(0.34)
E_2	0.90	0.77	0.62	0.83	0.64	0.56
	(0.17)	(0.26)	(0.36)	(0.27)	(0.34)	(0.39)
Difference (p-value)	0.243	**0.048**	**0.007**	0.513	**0.009**	**0.011**

Note: Standard errors reported in parentheses. We report the p-values of Wilcoxon rank-sum tests for differences between E_1 and E_2. Bold values represent significant trends at the 5% level.

Similar to what we find in the baseline, we observe that the probability of choosing S_H is decreasing in ω (statistically significant for observers and observed separately when $\delta = 25$, Wilcoxon signed-rank p-value ≤ 0.003 , and marginally significant for observers when $\delta = 40$, p-value $= 0.086$) and in price difference δ (signed-rank p-value ≤ 0.002 when $\omega = 25$ and p-value ≤ 0.024 when $\omega = 40$ for all pairs of price differences; Kruskal-Wallis test p-value ≤ 0.001 for observed and observers separately). Overall, the results indicate that the probability of choosing the expensive supplier is decreasing in wage and price difference in both treatments.

Figure 7 Probability of choosing S_H by Period and Condition



Appendix D: Dynamics of Play in the Baseline and Peer Treatments

D.1. Changes in Behavior with Rounds

We are interested in studying whether behavior changes as rounds in a session elapse. Figure 7 shows the evolution of the probability of choosing S_H among (a) employees in the baseline treatment, (b) E_1 in the peer treatment, (c) E_2 in the peer treatment who observe S_H, and (d) E_2 in the peer treatment who observe S_L. Note that employees in the baseline treatment and E_1 in the peer treatment do not learn about the population as rounds in a session elapse. On the other hand, E_2 in the peer treatment observes the decision of a different peer in each round, therefore, his later decisions may be affected by his observations of peers in earlier rounds.

We observe that there is a slight upward trend in the probability of choosing the expensive supplier both for employees in the baseline treatment and for E_1 in the peer treatment (Figures 7a and 7b), suggesting that subjects become more likely to choose the expensive supplier even in the absence of learning about the population. In addition, we observe a parallel downward shift for E_1 in the peer treatment relative to the baseline. This confirms that the positive effect on observed employees remains steady over rounds (for all combinations of wage and price difference). Figure 7c presents the dynamics of play for E_2 in the peer treatment who observes S_H. In this case there seems to be steep increase in the probability of choosing S_H from round 1 to 2, and then this probability remains relatively stable in rounds 2 onwards for all combinations of wage and price difference. Finally, Figure 7d shows the dynamics of play for E_2 who observes S_L. In this case, the probability of choosing S_H is relatively stable, with spikes for $\delta = 10$ (where the number of observations is smaller).

To formally test whether subjects' behavior presents trends across rounds, Table 22 reports the average probability of choosing S_H in each round and for each combination of wage and price difference in the four cases analyzed in Figure 7. Tests (1) and (2) at the bottom of each panel correspond to a nonparametric test for trends across ordered groups.[29] The tests show under various conditions a significant trend of increasing propensity to choose the expensive supplier as rounds elapse. Nevertheless, a large part of this trend is attributed to the learning between rounds 1 and 2—when round 1 is excluded from the analysis (test 2), the trends are no longer significant in most conditions.

In Table 23 we compare the probability of choosing S_H in rounds 1 to 3 vs. 4 to 6 for each treatment and role. We observe that in most situations the difference between the first and second half of the rounds is negative, indicating that employees are more likely to choose S_H in the last three rounds of play. Note, however, that these differences are only significant when $(\omega, \delta) = (25, 40)$ for employees in the baseline treatment and E_1 in the peer treatment. We confirm that the main results in the paper remain directionally the same if we consider only the last three rounds of play.

D.2. Cumulative Effect of Learning on Observers

We next focus on E_2 in the peer treatment, who observes the decisions of a peer in each round. We examine whether past observations affect the behavior of an E_2 in the peer treatment, separating those who in the current round observe that the peer chose S_H from those who in the current round observe that a the peer chose S_L. In Table 24, we consider rounds 2 to 6 and examine whether the probability of choosing the expensive supplier changes with the interaction between what the employees observed in the previous period (observed H or observed L) and what they observe in the current one (observes H or observes L). The tests at the bottom of the table show that there is a significant negative effect of having observed H in the previous round in only one of the six situations for employees who observe that their peer chose S_H in the current round, and there are no significant effects for employees who observe S_L in the current round. This suggests that employees mostly care about what they observe in the current round (i.e., within their current organization), and that this effect outweighs the effect of what they observed in the previous round.

[29] The nonparametric test for trend across ordered groups developed by Cuzick (1985) is an extension of the Wilcoxon rank-sum test.

Table 22 Frequency of Choosing S_H by Role and Treatment

	Panel 1: Baseline						Panel 2: Peer - E_1					
	$\omega=25$			$\omega=40$			$\omega=25$			$\omega=40$		
Round	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
1	0.91	0.59	0.44	0.72	0.31	0.34	0.77	0.44	0.26	0.74	0.23	0.23
	(0.30)	(0.50)	(0.50)	(0.46)	(0.47)	(0.48)	(0.43)	(0.50)	(0.44)	(0.44)	(0.43)	(0.43)
2	0.97	0.63	0.41	0.81	0.50	0.31	0.79	0.62	0.33	0.79	0.41	0.26
	(0.18)	(0.49)	(0.50)	(0.40)	(0.51)	(0.47)	(0.41)	(0.49)	(0.48)	(0.41)	(0.50)	(0.44)
3	0.94	0.72	0.47	0.81	0.56	0.47	0.79	0.67	0.38	0.74	0.46	0.36
	(0.25)	(0.46)	(0.51)	(0.40)	(0.50)	(0.51)	(0.41)	(0.48)	(0.49)	(0.44)	(0.51)	(0.49)
4	0.97	0.75	0.56	0.84	0.50	0.41	0.79	0.59	0.38	0.74	0.36	0.31
	(0.18)	(0.44)	(0.50)	(0.37)	(0.51)	(0.50)	(0.41)	(0.50)	(0.49)	(0.44)	(0.49)	(0.47)
5	0.88	0.75	0.59	0.75	0.56	0.44	0.90	0.72	0.49	0.87	0.56	0.41
	(0.34)	(0.44)	(0.50)	(0.44)	(0.50)	(0.50)	(0.31)	(0.46)	(0.51)	(0.34)	(0.50)	(0.50)
6	0.84	0.72	0.63	0.88	0.59	0.53	0.79	0.67	0.44	0.79	0.51	0.38
	(0.37)	(0.46)	(0.49)	(0.34)	(0.50)	(0.51)	(0.41)	(0.48)	(0.50)	(0.41)	(0.51)	(0.49)
Tests (p-value)												
(1) 1 to 6	0.17	0.13	**0.03**	0.29	**0.04**	0.09	0.41	**0.03**	**0.04**	0.38	**0.01**	0.06
(2) 2 to 6	**0.04**	0.39	**0.04**	0.77	0.50	0.14	0.60	0.53	0.22	0.54	0.22	0.20

	Panel 3: Peer - E_2 observes S_H						Panel 4: Peer - E_2 observes S_L					
	$\omega=25$			$\omega=40$			$\omega=25$			$\omega=40$		
Round	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
1	0.90	0.76	0.40	0.83	0.56	0.44	0.44	0.59	0.45	0.60	0.50	0.43
	(0.31)	(0.44)	(0.52)	(0.38)	(0.53)	(0.53)	(0.53)	(0.50)	(0.51)	(0.52)	(0.51)	(0.50)
2	0.94	0.75	0.85	0.94	0.81	0.80	1.00	0.67	0.50	0.62	0.52	0.52
	(0.25)	(0.44)	(0.38)	(0.25)	(0.40)	(0.42)	(0.00)	(0.49)	(0.51)	(0.52)	(0.51)	(0.51)
3	1.00	0.92	0.73	0.90	0.72	0.71	0.88	0.54	0.54	0.80	0.43	0.48
	(0.00)	(0.27)	(0.46)	(0.31)	(0.46)	(0.47)	(0.35)	(0.52)	(0.51)	(0.42)	(0.51)	(0.51)
4	0.94	0.78	1.00	0.86	0.79	0.75	0.75	0.75	0.46	0.80	0.60	0.44
	(0.25)	(0.42)	(0.00)	(0.35)	(0.43)	(0.45)	(0.46)	(0.45)	(0.51)	(0.42)	(0.50)	(0.51)
5	0.89	0.86	0.84	0.79	0.73	0.75	1.00	0.73	0.55	1.00	0.71	0.48
	(0.32)	(0.36)	(0.37)	(0.41)	(0.46)	(0.45)	(0.00)	(0.47)	(0.51)	(0.00)	(0.47)	(0.51)
6	0.94	0.96	0.88	0.84	0.85	0.73	0.62	0.69	0.59	0.62	0.58	0.54
	(0.25)	(0.20)	(0.33)	(0.37)	(0.37)	(0.46)	(0.52)	(0.48)	(0.50)	(0.52)	(0.51)	(0.51)
Tests (p-value)												
(1) 1 to 6	0.88	0.07	**0.01**	0.41	0.29	0.31	0.63	0.37	0.36	0.42	0.23	0.64
(2) 2 to 6	0.38	0.11	0.53	0.13	0.77	0.85	0.09	0.58	0.58	0.84	0.28	0.91

Note: Standard errors reported in parentheses. Tests 1 and 2 are NP-trend tests considering all rounds and rounds two to six, respectively. Bold values represent significant trends at the 5% level.

It is also possible that learning in a session occurs over several rounds of play. We next examine whether longer cumulative effects play a role, by examining the decisions of E_2 in the peer treatment in rounds 5 and 6—where they have experienced at least four rounds of learning. Table 25 presents a probit regression of the probability of choosing S_H on the cumulative number of times the employee has seen his peers chose S_H in the first four rounds, controlling for his observation in the current round and his own previous decisions. In particular, we create a dummy variable, observed H ($\geq K$), that is equal to 1 if the employee observed that his peers chose S_H in at least K of the first four rounds, and 0 otherwise, for $K \in \{2,3,4\}$. The tests at the bottom of the table compare the frequency of choosing S_H among employees who saw that their peers chose S_H at least K times and emploees who saw that their peers chose S_H less than K times, conditioning on what they observe in the current round. The results show that, for most situations, there are no significant differences between employees who observe that their peers chose the expensive supplier in at least K of the periods and those who observe the opposite, regardless of whether they observe S_H or S_L in the current

Table 23 Frequency of Choosing S_H by Role and Treatment — First and Second Half

		$\omega = 25$			$\omega = 40$		
		$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Baseline	Rounds 1 to 3	0.94	0.65	0.44	0.78	0.46	0.38
		(0.24)	(0.48)	(0.50)	(0.42)	(0.50)	(0.49)
	Rounds 4 to 6	0.90	0.74	0.59	0.82	0.55	0.46
		(0.31)	(0.44)	(0.49)	(0.38)	(0.50)	(0.50)
	Difference (p-value)	0.384	0.092	0.029	0.521	0.112	0.143
Peer - E_1	Rounds 1 to 3	0.79	0.57	0.32	0.76	0.37	0.28
		(0.41)	(0.50)	(0.47)	(0.43)	(0.48)	(0.45)
	Rounds 4 to 6	0.83	0.66	0.44	0.80	0.48	0.37
		(0.38)	(0.48)	(0.50)	(0.40)	(0.50)	(0.48)
	Difference (p-value)	0.219	0.174	0.037	0.168	0.097	0.248
Peer - E_2 Observes S_H	Rounds 1 to 3	0.95	0.82	0.68	0.89	0.72	0.67
		(0.23)	(0.39)	(0.47)	(0.32)	(0.45)	(0.48)
	Rounds 4 to 6	0.92	0.87	0.90	0.83	0.79	0.74
		(0.28)	(0.34)	(0.30)	(0.38)	(0.41)	(0.44)
	Difference (p-value)	0.509	0.169	0.105	0.163	0.166	0.226
Peer - E_2 Observes S_L	Rounds 1 to 3	0.76	0.6	0.49	0.68	0.49	0.48
		(0.44)	(0.49)	(0.50)	(0.48)	(0.50)	(0.50)
	Rounds 4 to 6	0.75	0.73	0.53	0.78	0.62	0.49
		(0.44)	(0.45)	(0.50)	(0.42)	(0.49)	(0.50)
	Difference (p-value)	0.699	0.550	0.944	0.367	0.241	0.716

Note: Standard errors reported in parentheses. We report the p-values of Wilcoxon signed-rank tests comparing Rounds 1 to 3 - Rounds 4 to 6: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

Table 24 Effect of Learning from Previous Round

	Probability of choosing S_H					
	$\omega = 25$			$\omega = 40$		
	$\delta = 10$	$\delta = 25$	$\delta = 40$	$\delta = 10$	$\delta = 25$	$\delta = 40$
Observed L × Observes H	-0.049	0.391	0.961*	0.533	0.823*	1.261**
	(0.531)	(0.337)	(0.531)	(0.443)	(0.491)	(0.527)
Observed H × Observes L	-0.291	-0.212	0.289	-0.360	-0.511	0.110
	(0.538)	(0.473)	(0.408)	(0.445)	(0.356)	(0.393)
Observed H × Observes H	0.828	0.883	1.992***	0.308	0.372	0.672*
	(0.669)	(0.587)	(0.572)	(0.494)	(0.468)	(0.404)
Constant	1.425*	0.765	0.562	2.639**	0.633	1.200
	(0.770)	(0.955)	(1.731)	(1.268)	(1.209)	(1.606)
Observations	135	160	195	195	195	195
	Tests (p-value)					
(1) Observed H vs. Observed L | Observes H	**0.000**	0.573	0.073	0.601	0.286	0.348
(2) Observed H vs. Observed L | Observes L	0.589	0.654	0.479	0.837	0.302	0.780

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. We consider data for E_2 in the peer treatment in rounds 2 to 6. Bold values represent significant differences at the 5% level. We adjust p-values using the Holm method (Holm 1979) for multiple hypothesis testing. Missing values when $(\omega, \delta) = (25, 10)$ and $(25, 25)$ are due to perfect separation. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

round. Overall, these results suggest that there is a weak cumulative effect over rounds and that employees are mostly affected by what they observe in the current period.

Table 25 Effect of Cumulative Learning

	Probability of choosing S_H																	
	Panel 1: $K=2$						Panel 2: $K=3$						Panel 3: $K=4$					
	$\omega=25$			$\omega=40$			$\omega=25$			$\omega=40$			$\omega=25$			$\omega=40$		
	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$	$\delta=10$	$\delta=25$	$\delta=40$
Observed H ($\geq K$)	-0.014	0.194	-0.354*	0.010	-0.005	-0.069	0.058	-0.184	0.028	0.067	0.182*	-0.014	-0.017	0.146	0.068	-0.127	0.080	0.089
× Observes L	(0.074)	(0.255)	(0.188)	(0.047)	(0.180)	(0.113)	(0.168)	(0.191)	(0.159)	(0.110)	(0.095)	(0.113)	(0.063)	(0.131)	(0.114)	(0.083)	(0.075)	(0.081)
Observed H ($< K$)	0.339*	0.310	-0.094	-0.059	0.224	0.095	-0.073	0.088	0.070	-0.242***	0.095	0.122	0.181*	0.211	-0.017	-0.038	0.231	-0.042
× Observes H	(0.180)	(0.290)	(0.137)	(0.217)	(0.150)	(0.101)	(0.107)	(0.155)	(0.126)	(0.083)	(0.097)	(0.091)	(0.100)	(0.136)	(0.138)	(0.109)	(0.174)	(0.076)
Observed H ($\geq K$)	0.067	0.288	0.054	-	-0.024	0.048	0.189	0.009	0.144	0.087	0.109	0.018	0.261***	0.200	0.197	0.062	0.152	0.226
× Observes H	(0.064)	(0.249)	(0.142)	-	(0.131)	(0.078)	(0.141)	(0.137)	(0.138)	(0.120)	(0.103)	(0.064)	(0.082)	(0.186)	(0.205)	(0.103)	(0.120)	(0.287)
Num. times	0.141**	0.058*	0.186***	0.235***	0.196***	0.224***	0.135***	0.063**	0.161***	0.241***	0.185***	0.231***	0.115**	0.052	0.160***	0.230***	0.177***	0.219***
chose S_H	(0.061)	(0.030)	(0.034)	(0.020)	(0.028)	(0.014)	(0.045)	(0.026)	(0.034)	(0.022)	(0.036)	(0.017)	(0.051)	(0.033)	(0.033)	(0.020)	(0.039)	(0.021)
Constant	1.111***	0.454	0.496	1.382***	0.607	0.720**	1.298***	0.479	0.763	1.526***	0.874***	0.739**	1.644***	0.558	0.828**	1.651***	0.951***	0.806***
	(0.381)	(0.515)	(0.498)	(0.450)	(0.415)	(0.303)	(0.497)	(0.483)	(0.488)	(0.436)	(0.330)	(0.315)	(0.464)	(0.460)	(0.397)	(0.500)	(0.333)	(0.251)
Observations	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
	Tests (p-value)																	
(1) Observes H ($\geq K$) vs ($< K$)	0.073	0.882	0.138	1.000	**0.030**	0.690	**0.018**	0.552	0.485	**0.000**	0.899	0.069	**0.000**	0.403	0.759	0.133	0.470	0.651
(2) Observes L ($\geq K$) vs ($< K$)	0.845	0.896	0.119	0.831	0.978	1.000	0.727	0.336	0.862	0.541	0.113	0.902	0.070	0.238	0.900	0.727	0.369	1.000

Note: Panel probit regressions with subject random effects. Standard errors clustered at the session level reported in parentheses. All panels consider only data for E_2 in the peer treatment in rounds 5 and 6. Panel 1 interacts a dummy variable equal to 1 if E_2 has observed a peer choosing S_H at least twice in the first 4 rounds with a dummy variable that is 1 if he observes S_H in the current round. Panel 2 interacts a dummy variable equal to 1 if E_2 has observed a peer choosing S_H at least three times in the first 4 rounds with a dummy variable that is 1 if he observes S_H in the current round. Panel 3 interacts a dummy variable equal to 1 if E_2 has observed a peer choosing S_H exactly four times in the first 4 rounds with a dummy variable that is 1 if he observes S_H in the current round. Missing values for $K = 2, (\omega, \delta) = (40, 10)$ are due to the absence of observations for observed H ($< K$) × observes L, so observed H ($\geq K$) × observes H is omitted because of collinearity. The tests report the p-values of the comparison between Observed H ($\geq K$)×Observes H vs. Observed H ($< K$)×Observes H (Test 1), and Observed H ($\geq K$)×Observes L vs. Observed H ($< K$)×Observes L (Test 2). Bold values represent significant differences at the 5% level. We adjust p-values using the Holm method (Holm 1979) for multiple hypothesis testing. We control for round and demographics. Significance reported: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.