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Incentive and Signaling Effects of Bonus Payments: An Experiment in a Company

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ABSTRACT

Economists and management scholars have argued that the scope of incentives to increase cooperation in organizations is limited as their use may signal the prevalence of free-riding among employees. This paper tests this hypothesis with an artefactual field experiment that assigns managers and employees from a large company to stylized roles within a controlled game. We exogenously vary whether managers are informed about prevailing cooperation levels among employees before they can set incentives to promote cooperation. In addition, employees matched to informed managers learn that the manager could base their incentive choice on cooperation levels. We find no evidence for the hypothesized signaling effect. Having an informed manager set the incentive does not change employees' beliefs about the cooperativeness of others. Incentives, hence, have strong positive effects on cooperative beliefs, irrespective of information. The absence of the signaling effect appears to reflect employees' perceptions of managerial intentions: incentives are interpreted not as signals of low cooperation, but as rewards for expected cooperation. A follow-up survey experiment supports this mechanism, showing that a cooperative culture affects the interpretation of managerial actions.

JEL Classification: C91, D83, D91, D01

1 | Introduction

With increasing specialization and fragmentation of tasks, cooperation of individual employees is necessary to reap the benefits of complementary skills and tasks (e.g., Dirks and Ferrin 2001; Gratton 2009). While cooperation is beneficial to the company, it may be individually rational for the employee not to cooperate. This misalignment of individual profits and collective efficiency can cause free-rider problems where individuals slack at the expense of others (e.g., Gittell 2000; Fehr 2018). Implementing monetary incentives is a prevalent strategy of companies to cope with such conflict,[1] but their effectiveness is still debated. Specifically, several studies point out that incentives can induce unintended side-effects that eventually impede their original purpose (e.g., Gneezy et al. 2011; Bowles and Polanía-Reyes 2012; Wagner et al. 2020; Ockenfels et al. 2014; Gächter et al. 2025).

One effect of particular relevance in the context of cooperation is that incentives can convey information about the typical behavior of others (e.g., Mulder et al. 2006; Sliwka 2007; Van der Weele 2012; Benabou and Tirole 2011). A manager who introduces incentives to cooperate may signal that employees would act selfishly otherwise. As a result, employees may expect less cooperative behavior from their colleagues and, in line with evidence on conditional cooperation (Fischbacher et al. 2001), cooperate less themselves.[2] Evidence from the laboratory suggests that students potentially understand the signaling value of

incentives (e.g., Galbiati et al. 2013), but evidence from outside the lab is largely missing.

Studying the signaling value of incentives within companies, however, is difficult. Incentives and information about cooperative behavior held by managers are both endogenous, and whether such information is available to managers might be unknown to employees. This study combines a unique field setting with a controlled decision environment to overcome these issues. Our artefactual field experiment (Harrison and List 2004) creates exogenous variation in information about the cooperativeness of employees held by managers when choosing tournament incentives. The measure of cooperativeness has been administered prior to our experiment in the sample population, but in a different sample, such that employees are unaware of its existence. This allows us to randomly inform employees that a measure of cooperativeness exists and that it was available when the manager decided whether to incur a cost to set the monetary incentives for the employees.

We collaborate with a large software company that relies heavily on the cooperative behavior of its employees and seeks to provide bonus incentives to encourage cooperation. To study whether bonuses work as signaling devices, we conduct a stylized experiment with managers ($n = 47$) and employees ($n = 401$) from the company. Employees face a social dilemma situation in which the dominant strategy is to free-ride on the cooperative efforts of their colleagues. Managers benefit from high cooperation levels among employees and can pay to set a monetary bonus to promote cooperation. Before they decide about the bonus, we exogenously vary whether managers are informed about prevailing cooperation levels among employees measured in a previous study (Deversi et al. 2020). At the same time, we notify those employees who will be matched with an informed manager that their manager has received information about cooperation levels before deciding whether to set the bonus.[3] It is common knowledge that setting the bonus is costly for the manager.

This design allows us to study beliefs and cooperation in three scenarios. First, we isolate the signaling effect of setting the incentive by comparing employees with information (about their informed managers) to those without information. On the basis of theoretical models by Sliwka (2007) and Van der Weele (2012), information could interact negatively with incentives, that is, if informed managers pay to introduce incentives, employees are expected to be less optimistic about others' cooperation. Second, we identify the signaling effect when incentives are not set. Employees with information should now be more optimistic than uninformed ones because they can interpret the absent incentive as a signal of high cooperation rates that requires no further action. This positive signaling effect has already been demonstrated in a laboratory principal–agent setting by Danilov and Sliwka (2017). Finally, we study the incentive effect when managers (and employees) are not informed.

Starting with the last scenario, we find that incentives have strong positive effects on cooperation absent information. In this case, incentives increase beliefs about cooperative behavior by 44% and cooperation rates by 24%. In contrast to previous evidence from the lab (Galbiati et al. 2013; Cardinaels and Yin 2015; Danilov and Sliwka 2017), we find no evidence for negative signaling effects of incentives or positive signaling of absent incentives. This indicates that employees in our setting do not take into account the potential information conveyed by the managers' incentive choices. In addition to these main effects, we examine treatment effect heterogeneity along two dimensions, lower seniority, and better understanding of the experiment. For these subgroups, we expect stronger reactions to information: lower seniority might imply a less precise prior, and hence more updating (Alfitian et al. 2023; Danilov and Sliwka 2017), and better understanding should reduce the noise in the responses. For both dimensions, we find some evidence for a *positive* signaling effect when incentives are set.

To better understand these results, we explore employees' beliefs about managers. It appears that the absence of a signaling effect is driven by the employees' interpretation of the managers' decision-making. Employees consider managers more likely to choose the costly bonus when managers expect higher levels of cooperation, that is, employees do not expect managers to maximize their own monetary benefit with the bonus choice. Instead, employees appear to interpret managers' choices to "reward" cooperation through incentive provision. To corroborate the interpretation that context matters for the interpretation of incentives, we run a survey experiment with a diverse sample of employees from the same country. We document that a cooperative context makes it more likely that a bonus payment is interpreted as a reward. This is an interesting result given that managers can actively influence both incentives and corporate culture as the broader context (Bolton et al. 2013; Hermalin 2013).

This study contributes to the literature on the interaction of incentives and social preferences (discussed below). We provide an explicit test of signaling effects in bonus payments and do so with actual managers and employees and in a setting in which previous real-life experience may matter. Our results highlight the importance of the general relationship between management and employees for the effectiveness of incentives and point to important contextual factors that render signaling and crowding out effects more or less likely to occur. This is evidence in the spirit of Gneezy et al. (2011, 199): "we believe that the discussion should not be *whether* incentives negatively affect contributions to public goods, but *when* incentives do and do not work."

2 | Related Literature

This study relates to a large literature on how monetary incentives may crowd out intrinsic motivation (see, e.g., Frey and Jegen 2001; Gneezy et al. 2011; Bruers 2024 for reviews). Specifically, it speaks to the literature in economics and management that investigates the interaction of incentives and social preferences (for a review, see Bowles and Polanía-Reyes 2012).[4] While early evidence comes from the lab, field evidence on crowding out is also accumulating, see, for example, Alfitian et al. (2023), Ashraf et al. (2020), Wagner et al. (2020), and Cassar and Meier (2021).

Incentives can crowd out social behavior for various reasons (Gneezy et al. 2011). First, incentives may change the framing of the interaction and hence the interpretation from a social to a monetary context, consistent with findings in, for example,

Bohnet et al. (2001), Fuster and Meier (2010), and Gneezy and Rustichini (2000a, 2000b). Second, incentives can provide information about the person who sets the incentive, such as selfish intentions (e.g., Fehr and Rockenbach 2003; Cassar and Meier 2021), distrust (e.g., Falk and Kosfeld 2006; Fehr and List 2004), or their knowledge about the task (e.g., Benabou and Tirole 2003; Bremzen et al. 2015; Deserranno 2019).

Third, most closely related to our study, incentives may signal principals' private information about social norms. In the experimental laboratory, Danilov and Sliwka (2017) investigate the shirking behavior of agents who work on individual tasks under either fixed or variable pay contracts. They find an increase in agents' trustworthiness when the principal is informed about past effort provision and refrains from implementing a variable pay contract. Cardinaels and Yin (2015) show that using incentive contracts to increase truthful behavior in a reporting task signals that other agents were likely to report dishonestly before. Both studies differ from our design by analyzing individual decisions in the lab rather than interactions of multiple agents. Furthermore, both studies compare fixed versus variable pay conditions, where the latter may result in worse outcomes for the agents. This is different in our setting as the incentive payment is a bonus on top of the otherwise similar compensation scheme. The focus on a positive incentive also distinguishes us from Galbiati et al. (2013), who study sanctions in a two-agent minimum effort game. They vary whether sanctions are endogenously set by an informed principal or exogenously set by the experimenter. They find that exogenous sanctions are more effective in enforcing high effort because they do not contain a negative signal.

In contrast to sanctions, evidence on signaling effects of bonuses is rare, despite the relevance of bonus payments in real-life settings. A notable exception is Alfitian et al. (2023), who implement a bonus scheme in a field experiment to reduce absenteeism at the workplace. While their study intended to measure the effects of a monetary versus a time bonus scheme, they present post-treatment survey evidence suggesting that the backfiring effect of the monetary bonus is not driven by signaling the prevalent behavior of others but rather a reduction in the internal costs of absenteeism. In contrast, our study explicitly tests for the signaling effect, holding constant other factors that may change behavior.

3 | Experimental Design

3.1 | Setting, Sample, and Source of Cooperativeness Information

We conduct this study in partnership with a large software company. In most tasks within the company—reaching from software development, consulting, and sales to service activities (e.g., human resource management)—cooperation is essential to maximize the joint production output of work teams.[5] The management of the company conducted a study to measure the prevailing levels of cooperation and to subsequently establish new policies that enhance cooperation. This study is described by Deversi et al. (2020). It entailed a one-shot, three-person, linear public goods experiment with endowments of €10 per person and a marginal per capita return of 0.5. A total of 369 employees participated. The data revealed high levels of cooperation (on average, 79% of the endowment).[6] Furthermore, about 82% of company employees were classified as conditional cooperators (based on their choices elicited via the strategy method), which emphasizes the relevance of beliefs about others' behavior for cooperation in the company. Expectations about others' cooperation behavior are high (on average 66% of the endowment), but beliefs underestimate actual cooperation rates.

TABLE 1 | Participants' characteristics.

	Managers		Employees	
	Mean	Std. dev.	Mean	Std. dev.
Female	0.40	0.50	0.33	0.47
Age	43.96	10.05	36.15	8.35
Seniority	11.73	6.97	5.08	3.89
Education				
Highschool	0.06	0.25	0.10	0.30
Bachelor	0.04	0.21	0.14	0.35
Master	0.63	0.49	0.60	0.49
PhD	0.21	0.41	0.12	0.32
Other	0.06	0.25	0.04	0.19
Performance pay				
Company	0.79	0.41	0.70	0.46
Individual	0.21	0.41	0.30	0.46
Observations	47		401	

The experiment of the current study takes place after Deversi et al. (2020), but precedes any announcement of the results to company employees.[7] This allows us to use their finding of a 79% cooperation rate as the information we provide to managers.

Table 1 presents the characteristics of the 47 managers and 401 employees who participated in our experiment. Both managers and employees are highly educated (only less than 14% have no postsecondary education). There are 19 female managers (40%) and 132 female employees (33%). Managers are on average 44 years old and have been working in the company for almost 12 years. Employees are on average 36 years old and have been working in the company for around 5 years. Furthermore, 70% of employees work under a company performance pay scheme in which bonuses depend on the company's asset market performance. The other 30% work under an individual performance scheme in which they receive bonuses based on individual target achievement.

3.2 | Experimental Game

In the experiment, three randomly and anonymously matched employees play a public goods game. Each employee receives an initial endowment of 10 tokens (1 token = €1) to be allocated between a private account and a common account. The sum of contributions to the common account is multiplied by 1.5 and then divided equally among the three group members. Therefore, each individual group member receives a share of 0.5 of the total sum of contributions. The individual payoff from the game is the sum of the tokens allocated to the private account and the share

received from the common account. The calibration and stake size are similar to those in Deversi et al. (2020), who show that employees are responsive to this level of payment.[8]

In addition, we anonymously match one manager to each group of employees. Managers earn a fixed amount of 15 tokens and a variable pay equal to 0.5 of the sum of contributions. They cannot contribute. Before employees act, managers decide whether to give up 5 of their tokens to set a monetary incentive for employees (called "Conditional Payment" in the instructions). If the incentive is chosen, the employee with the highest contribution to the common account receives an additional payment of 3 tokens.[9] If more than one participant contributes the highest amount, the 3 tokens are evenly distributed among the highest contributors. To allow for a strong signal of the incentive, we design it to be inefficient (paying 5 tokens to reward 3 tokens).[10] In practice, such inefficiencies may arise, for example, due to bureaucracy. We focus on this tournament structure because it is a policy that the upper management was interested in implementing. The idea was to introduce a monetary incentive that rewards the most cooperative employee within each team.[11] Within the company, cooperation would be measured by the number of received peer-to-peer recognition awards that can be sent within the company's intranet.

When the manager does not set the incentive, the standard social dilemma arises, that is, it is welfare-efficient for each member to contribute their whole endowment, but it is individually optimal to contribute nothing. The Nash equilibrium is for all employees to contribute 0. When the manager does set the incentive, maximum contributions are still welfare-efficient. For an individual employee, however, the optimal choice now depends on how much they expect the more generous of the other two employees to contribute. If the expected highest contribution is below 5 tokens, the best response is to contribute just enough to exceed it (i.e., the smallest whole-number contribution larger than the expectation). If the expected highest contribution is exactly 5, the employee is indifferent between free-riding and contributing 6. If the expected highest contribution is above 5, the social dilemma situation emerges again: trying to "win" the incentive is too costly, so contributing nothing is individually optimal. With the incentive, no pure strategy equilibrium exists. In a symmetric mixed-strategy Nash equilibrium, players randomize over [0, 5] tokens, that is, expected contributions are small but higher than without the incentive. Overall, the incentive raises the private return to contributing (because there is now a chance of earning the incentive), but it does not change employees' action space.

From the manager's perspective, paying for the incentive is worthwhile only if it increases total employee contributions enough to offset its cost. Since the manager gains half a token for each additional token contributed by employees, the cost of 5 tokens is recovered only if total contributions rise by at least 10 tokens. Therefore, implementing the incentive can be payoff-maximizing only when the manager expects that, without the incentive, total contributions would be below 20 tokens (i.e., 6.67 tokens per employee on average).

We use the strategy method to elicit employees' decisions conditional on the incentive choice by the manager.[12] Within a given incentive setting, we first elicit employees' contribution to the common account (*unconditional contribution*). Second, we ask for their contributions if the other group members contributed on average 0/1/2/.../10 (*conditional contributions*). For one randomly selected subject in the group, the conditional contributions are payoff-relevant, whereas for the two remaining subjects, the unconditional contribution determines the payoffs. This ensures that both unconditional and conditional contribution decisions are incentive-compatible.[13]

In addition, we elicit employees' belief about the average unconditional contribution of the other two players (*belief*), again using the strategy method. Following Gächter and Renner (2010), employees receive €5 if they hit the correct average, and €0 otherwise.[14] Finally, we ask two further questions that capture employees' beliefs about managers' incentive choice and their beliefs about managers' expectations of the contribution behavior of employees. Both questions are incentivized by providing €1.5 for a correct response. A full list of elicited variables, including additional, post-experimental survey variables, can be found in Appendix D.

3.3 | Treatments and Hypotheses

The critical feature of our experiment is the information structure. Generally, there exists uncertainty about employees' behavior in the game. We provide information on average unconditional contributions measured by Deversi et al. (2020) to managers in INFO, but not in NO INFO.[15] Prior to making the incentive choice, the managers in INFO receive the following information.

> *Tip for you as a manager: 369 employees have already made their decision to allocate the 10 tokens between the private account and the common account. There was no additional payment for these decisions in place. On average, 2.10 tokens were paid into the private account and 7.90 tokens into the common account.*

On the employee side, the instructions in INFO entailed the following statement.[16]

> *What does the manager know before making a decision? The manager received information about the average contribution decision of 369 other employees. These employees have already decided on the allocation of the 10 tokens between the private account and the common account. There was no additional payment for these decisions in place.*

Table 2 summarizes the design that creates a setting in which the manager benefits from cooperation and in which we use the INFO treatment to vary whether asymmetric information about the status quo of cooperation exists. The INFO treatment is

TABLE 2 | Treatment overview.

		Within subject	
		NO INCENTIVE	INCENTIVE
Between subject	NO INFO	205 employees and 23 managers	
	INFO	196 employees and 24 managers	

randomized between subjects. Table A1 shows that employees' observable characteristics are balanced across the Info and No Info treatments. Due to the strategy method, the outcome of the manager's incentive choice varies within employees. The design enables us to measure the beliefs and cooperation of employees under different information sets of the managers while holding incentive choices constant.

While actual contribution behavior might also be influenced by other factors, our treatment should directly affect employees' beliefs about cooperation. Beliefs about the cooperation of other employees are thus the primary focus of our analysis.[17] To derive testable predictions, we assume that employees update their beliefs in a Bayesian fashion and that they believe that managers maximize their own payoffs and set incentives to enhance cooperation.

Without additional information, employees should then be more optimistic about others' cooperativeness if the incentive is in place, as selfish employees may be steered away from free-riding and conditional cooperators will cooperate more.

Hypothesis 1. *In No Info, employees' average beliefs about others' contributions are higher in Incentive than in No Incentive.*

With informed managers in Info, the absence of incentive implies that contribution levels observed by the manager have been sufficiently high, as otherwise, it would have been worth to incur the cost of implementing the incentive.

Hypothesis 2. *With No Incentive in place, employees' average beliefs are more optimistic in Info compared with No Info.*

Conversely, observing the incentive in Info should reflect the information that contribution levels observed by the manager have been sufficiently low, such that it was worth it to incur the cost to implement the incentive.[18]

Hypothesis 3. *With an Incentive in place, employees' average beliefs are more pessimistic in Info compared with No Info.*

3.4 | Procedures

We conducted the experiment in the spring of 2019 using the software Qualtrics. We invited 1500 potential participants via email with a personalized link. Participation took place in a 2-week time period. Comprehension questions at the beginning of the experiment and a telephone hotline through which participants could ask questions during the experiment aimed at preventing misunderstandings. Full experimental instructions are presented in Appendix E.

Payout calculations and matching of managers and employees were administered ex post. While there was no feedback during the experiment, participants received payoff information afterward via a website created solely for this purpose. We asked participants to perform all experimental tasks individually, and groups were randomly allocated to avoid coalition formation. A double-blind procedure ensured the anonymity of all managers and employees. Approval from the ethics committee at the University of Munich has been granted in January 2019, and our analyses have been preregistered at the AEA RCT registry (AEARCTR-0003931).

4 | Results

4.1 | Main Effects on Beliefs

As described in our hypotheses, employees' beliefs about others' contributions are a crucial indicator of the mechanisms at work in the incentive and information conditions. Figure 1 presents the respective treatment comparisons.[19] Beliefs about others' unconditional contributions are higher when the manager selected the incentive as compared with when it was not selected (7.5 tokens vs. 5.2 tokens; Wilcoxon signed-rank tests [WSR], $p < 0.001$). This difference is also statistically significant when tested in both treatments separately (WSR, both $p < 0.001$). Yet, the information treatment has no impact on

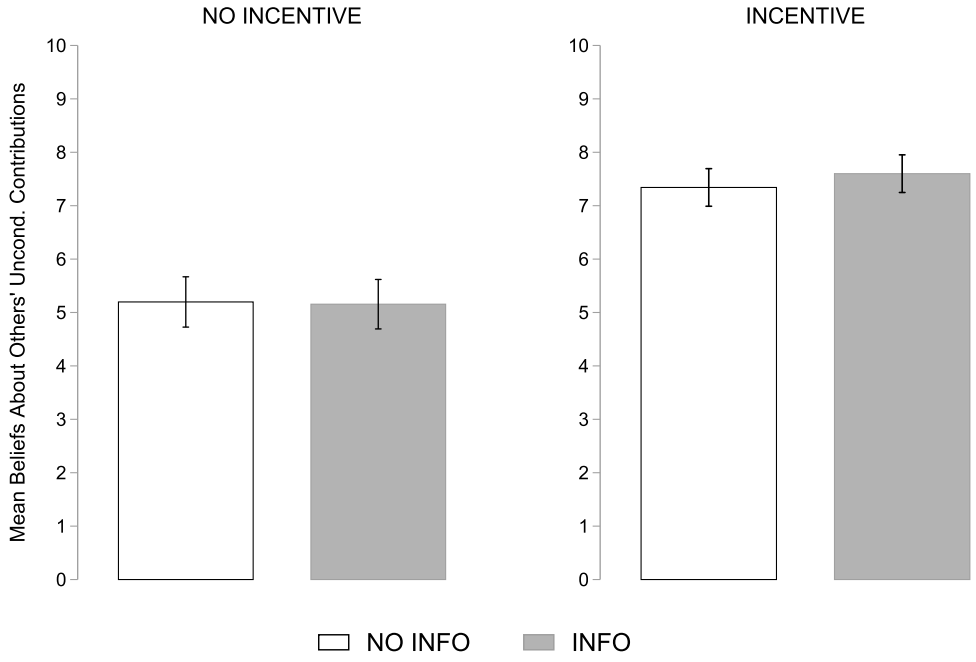

FIGURE 1 | Average treatment effects on employees' beliefs. *Notes:* Mean belief of employees about the unconditional contribution decision of the other group members and 95% confidence intervals.

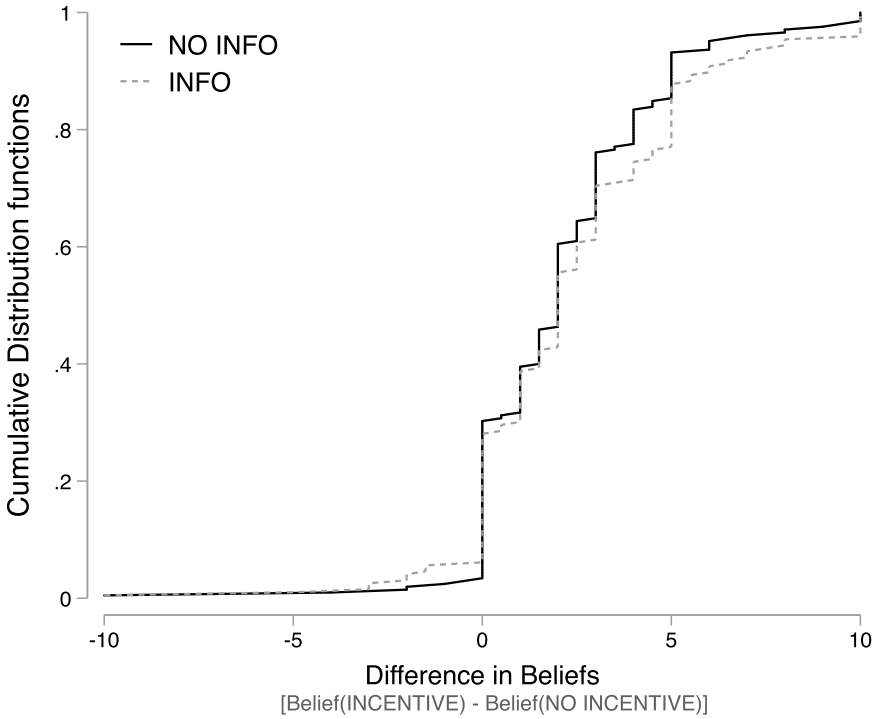

FIGURE 2 | Treatment effects on employees' belief difference. *Notes:* The graph shows the cumulative distribution functions of the difference between employees' beliefs about others' contributions with the incentive in place and without the incentive in place by treatment.

beliefs, neither under No Incentive (Mann–Whitney U test [MWU], $p = 0.906$) nor under Incentive (MWU, $p = 0.236$).[20] The individual within-subject difference in beliefs between the two incentive states is also not statistically significant from each other between Info and No Info (MWU, $p = 0.314$). This indicates that employees' beliefs were unresponsive to the information treatment. If anything, we observe a small tendency in the opposite direction of the predicted effect.

To show a more complete representation of the belief data, Figure 2 plots the cumulative distribution functions of the individual belief differences between Incentive and No Incentive. If incentive choices work as signaling devices, the difference in beliefs should be smaller in Info compared with No Info. However, we do not find an indication of this effect. Both distributions appear very similar to each other and do not clearly diverge (Kolmogorov–Smirnov test, $p = 0.402$).

The estimation results in Column (1) of Table 3 confirm the nonparametric analyses. Here, we regress beliefs on treatment dummies. The Ordinary Least Squares (OLS) regression pools all decisions in the strategy method and clusters standard errors on the participant level. While the incentive significantly increases beliefs by 44% (2.1 tokens) on average, the interaction of the information treatment and the incentive choice, as well as the information dummy alone, has only small positive and insignificant effects. The null effect of the treatment interaction is robust to controlling for a wide range of employee characteristics, including gender, age, seniority, incentive scheme, career level, and job function, as shown in Column (2).

TABLE 3 | Beliefs: Main treatment effects.

	(1)	(2)
I(Incentive)	2.144***	2.172***
	(0.174)	(0.179)
I(Info)	−0.0419	−0.0442
	(0.335)	(0.339)
I(Incentive × Info)	0.300	0.294
	(0.274)	(0.283)
Constant	5.198***	4.912***
	(0.239)	(0.494)
Controls	No	Yes
Observations	802	784
R^2	0.131	0.156

Notes: The dependent variable is beliefs about the average unconditional contributions of the group members. For each employee and dependent variable, two entries are observed: one entry under the incentive and one without the incentive. The omitted category is No Info and No Incentive. The control variables include *gender*, *seniority*, *incentive scheme*, *career level*, and *job function*. Eighteen employees are not included in the regressions using the additional controls, as some of these have not been available for those participants. Standard errors are clustered on the subject level and are shown in parentheses.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

4.2 | Statistical Power

This null effect of Info does not seem to be driven by low statistical power. In our ex ante power analysis described in the preanalysis plan, we calculated a required sample size of 368, whereas our final sample size is 402. In the ex post power calculation, given our sample size and the measured standard deviations in the belief difference between the incentive states, we would be able to detect an effect size of 30% of a standard deviation. This is exactly the effect size we aimed for and calculated with the in the ex ante power calculations. It is also smaller than detected effect sizes in, for example, Galbiati et al. (2013) or Cardinaels and Yin (2015).

The null result is surprising for two main reasons. First, in comparison to standard student subject pools, employees in our study have a high average education level, including many employees with a PhD in natural sciences. The lack of strategic sophistication is hence unlikely to explain the absence of a signaling effect.[21] In addition, stake size is not too small for employees to care: In Deversi et al. (2020), a comparable sample reacts to variations in the marginal per capita return and does not use a surprise donation option at the end of the experiment. Second, the use of the strategy method makes it *more* likely to find an effect as inference is easier: Danilov and Sliwka (2017) find a strong signaling effect using the strategy method and Cardinaels and Yin (2015, 1012) even argue that "[...] the strategy method may signal to agents that the experimenter wants them to infer information from contract choices." We hence do not believe that the treatment is too subtle.

4.3 | Treatment Effect Heterogeneity

Following Danilov and Sliwka (2017) and Alfitian et al. (2023), one may expect that employees who work at the company for only a short period of time should update their beliefs more strongly because they have a less precise prior. In Columns (1) and (2) of Table 4, we show OLS regressions for employees whose seniority is above and below the median seniority level, respectively. For less senior employees, the interaction effect of the incentive choice and the information treatment is positive and marginally significant. Less senior employees exhibit a small tendency to infer relatively high cooperation rates from managers setting the incentive. For more senior employees, the interaction is very close to zero and insignificant, and a Wald test rejects the equality of the two coefficients for high and low seniority.

Another important dimension of potential treatment effect heterogeneity is the employees' interpretation of the manager's intention when choosing the incentive.[22] We find that 21% of employees believe that their manager does not expect higher cooperation levels from setting the incentive, or even negative effects. Focusing only on employees who believe that their manager sets the incentive to increase cooperation, Columns (3) and (4) in Table 4 provide results analogous to the first two columns. Contrary to our Hypothesis 3, the positive interaction effects *increase* in magnitude compared with the full sample estimates. The signaling effect on beliefs captured by the interaction term is now statistically significant at the 5% level. These effects are robust to the inclusion of controls (Column 4). Employees infer high contribution levels from managers who select the incentive.

5 | Discussion

We explore beliefs of employees and managers to discuss potential mechanisms behind our results. In addition, we present evidence from a survey experiment with a different sample on how the organizational context affects employees' interpretation of manager behavior.

Sections 5.1 and 5.2 are exploratory in nature to better understand the results. They were not preregistered. We hence also present sharpened two-stage q values (Benjamini et al. 2006) to account for multiple testing. These q values take into account all prespecified and other tests regarding heterogeneity, as well as all tests in Sections 5.1 and 5.2. Further studies will be needed to corroborate the findings presented here.

5.1 | Employees

What reasoning do employees expect from managers? In Figure 3a, we correlate the expected likelihood of the manager setting the incentive with employees' beliefs about the manager's expectation of the unconditional contribution levels.[23] If employees perceive the managers as individual profit-

TABLE 4 | Beliefs: Treatment effect heterogeneity.

	(1)	(2)	(3)	(4)
I(Incentive)	2.329***	2.000***	2.642***	2.640***
	(0.235)†††	(0.278)†††	(0.180)†††	(0.184)†††
I(Info)	−0.654	0.454	−0.291	−0.346
	(0.486)	(0.472)	(0.340)	(0.346)
I(Incentive× Info)	0.712*	−0.0144	0.563**	0.620**
	(0.382)	(0.418)	(0.280)†	(0.289)†
Constant	4.677***	5.955***	4.559***	4.230***
	(0.662)	(1.072)	(0.251)	(0.488)
Sample	Lower Seniority	Higher Seniority	Correct Interpretation	Correct Interpretation
Controls	Yes	Yes	No	Yes
Observations	384	400	640	628
R^2	0.198	0.168	0.220	0.243

Notes: The dependent variable is beliefs about the average unconditional contributions of the group members. For each employee and dependent variable, two entries are observed: one entry under the incentive and one without the incentive. The omitted category is No Info and No Incentive. The control variables include *gender*, *seniority*, *incentive scheme*, *careerz level*, and *job function*. Standard errors are clustered on the subject level and are shown in parentheses.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.
Sharpened q values are indicated as follows: † < 0.10; †† < 0.05; ††† < 0.01.

FIGURE 3 | Employees' beliefs about managers. *Notes:* The graph presents employees' beliefs about managers with the expected likelihood of setting the incentive on the *y*-axis and second-order beliefs about (a) differences in contributions with and without the incentives and (b) contributions without the incentive on the *x*-axis. [Color figure can be viewed at wileyonlinelibrary.com]

maximizers who trade off the expected incentive effect against its costs, one would observe a positive relationship between both variables. However, we observe that employees perceive them as independent (slope parameter in No Info of −0.01, *t* test, $p = 0.993$, $q = 0.91$). The relationship turns slightly positive in Info but remains insignificant (interaction effect of 0.91, *t* test, $p = 0.450$, $q = 0.54$). Employees appear not to take into account that setting the costly incentive could fulfill a selfish purpose. This can explain the overall null result but not the observed tendency that signals crowd-in beliefs.

To analyze the latter, we correlate employees' beliefs about the likelihood of setting the incentive with their beliefs about the manager's expectation of the unconditional contribution level without the incentive in place in Figure 3b. While one would expect a downward-sloping relationship in line with payoff maximization, we find the opposite. A standard deviation increase in the belief about the manager's expectation increases the belief about the likelihood of incentive selection by 2.5% points (*t* test of the regression coefficient, $p < 0.001$, $q = 0.001$).

5.2 | Managers

While the signaling effect of incentives hinges on the beliefs of employees, we can also examine managers' behavior. We first note that managers update their beliefs when receiving information. Figure 4 shows the cumulative distribution function of the deviation between the managers' expectations and the average contribution level provided in Info. It becomes clear that managers hold heterogeneous beliefs in No Info that differ substantially from the provided average and that managers in the information condition adjust their priors accordingly. Almost 80% of managers in Info deviate not more than 1 token from the provided average value, whereas 20% hold such beliefs in No Info. Hence, we reject that beliefs in both conditions are from the same underlying distribution (MWU, $p = 0.001$, $q = 0.003$). After receiving information, managers are well calibrated: In NoIncentive/Info, managers' beliefs correspond to actual contributions in our experiment (WSR, $p = 0.48$, $q = 0.55$).[24]

Despite the belief update in Info, we do not find a statistically significant difference in managers choosing the incentive in Info versus NoInfo (Fisher's exact test, $p = 0.245$, $q = 0.39$). This is likely driven by a combination of the small sample size and the fact that the majority of managers choose the incentive: 91% in NoInfo and 75% in Info.[25] Importantly, holding beliefs according to which incentive setting would be payoff-maximizing does not make managers more likely to use the incentive: Using incentivized beliefs about contributions with and without the incentive in place, we can determine on the individual level whether a manager would maximize their payoff by setting the incentive. Setting the incentive is only payoff-maximizing if expected average contributions without the incentive are below 6.67 tokens, and the difference between expected contributions with the incentive and without the incentive is at least 3.34 tokens. We find that only eight of the 47 managers hold beliefs that make incentive setting monetarily beneficial and that these managers are not more likely to set the incentive (Fisher's exact test, $p = 1$, $q = 0.91$).

We explore other potential explanations for incentive setting, none of which appears to hold. Managers do not lack sophistication. Over 80% have a PhD or Master's degree and education is weakly *positively* correlated with incentive setting (see Column 2 of Table A3).[26] Social preferences (altruism and reciprocity) do not appear to matter, that is, managers do not seem to compensate the group member that suffers the most from free-riding (see Columns 3 and 4 of Table A3). Beliefs about contributions and expected effects of setting the incentive do not correlate with incentive setting, which speaks against strategic behavior (see Columns 5–7 of Table A3). We also note that managers do not choose randomly and hence conclude that managers actively and consciously choose the incentive.

While the sample size is too small to conclusively investigate managers' motives behind setting incentives, our preferred interpretation is in line with the cooperative culture of the company: Managers use incentives as a costly signal that they contribute as well and/or as a coordination device for conditional cooperators (see, e.g., Cooter 1998). This would be in line with the experimental literature showing that cooperative leaders are more effective in increasing cooperation (e.g., Levati et al. 2007; Güth et al. 2007; Gächter et al. 2013) and that a shared identity can facilitate cooperation (Drouvelis and Nosenzo 2013). Importantly, managers do not expect negative signaling effects from setting the incentive (see Figure A1) and this is in line with employees' beliefs and behavior.

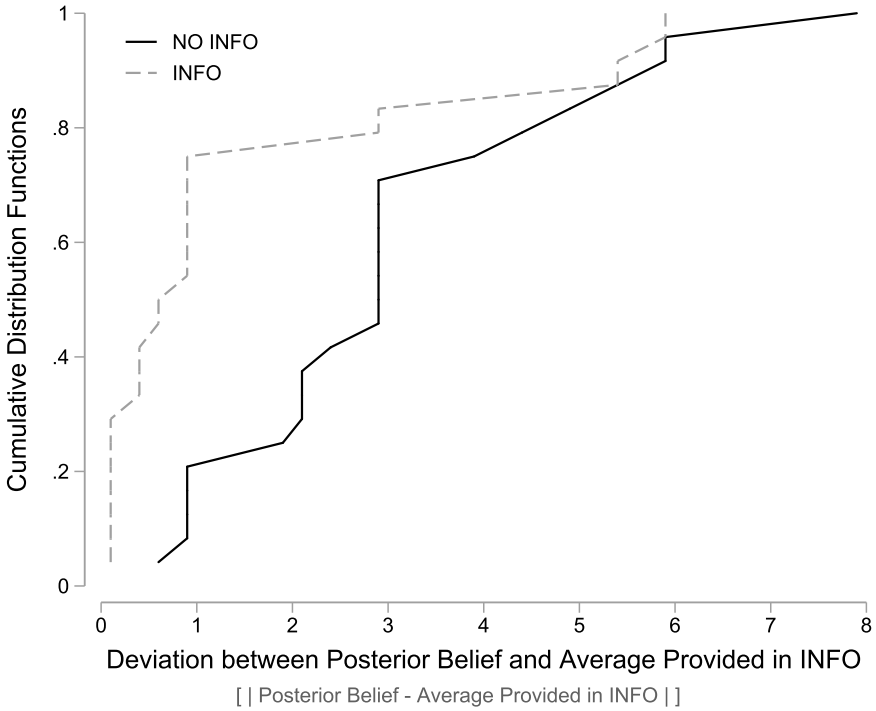

FIGURE 4 | Treatment effects on managers' posterior beliefs. *Notes:* The graph shows the cumulative distribution functions of the absolute difference between managers' posterior beliefs about employees' contributions without the incentive in place and the measured contribution rate in Deversi et al. (2020) by treatment.

Overall, it appears that the company successfully established a setting in which incentives can be used to further increase cooperation without a backlash. For our experiment, this implies that the assumption underlying Hypotheses 2 and 3 employees expect managers to maximize their monetary payoff, does not hold. As such, our results can only be interpreted as showing no evidence for a signaling effect rather than a strong test (and rejection) of negative signaling effects.

5.3 | Employees' Interpretation of Managers' Behavior

It appears that employees expect managers to reciprocally provide rewards for high expected levels of cooperation. This effect is unlikely to be driven by managers reciprocating to high benefits from the common account. Employees knew that the information provided to managers stemmed from a distinct sample of employees and that they were randomly matched to a manager only after the experiment took place. However, it could be related to a general expectation regarding managers' reciprocity that is grounded in past experiences with managers of the company. If employees think that managers provide incentives based on high expectations about cooperation among employees, incentive provision signals high contribution levels and could, in turn, explain the belief update observed in Table 3. This interpretation is in line with the cooperative culture of the company.

To corroborate this interpretation and because an additional survey within the company was not possible, we run an incentivized survey experiment with a distinct sample of employees from the same country (see Appendix C for more details).[27] In a vignette, we describe a hypothetical setting similar to our experiment where the respondent works in a large company and faces a project together with two other employees that requires unpaid overtime work for successful completion. A manager supervises the team and would benefit from a successful project. The manager cannot work on the project, but can decide to implement a policy that would compensate the team member who works the most. We ask participants whether they believe that the manager will implement the bonus payment (referring to it in the neutral term "policy"). We then define "incentive" and "reward" and ask participants about the interpretation of the policy (in randomized order).[28] To incentivize choices, respondents are paid to match the modal answer. Choices hence reflect beliefs about other employees' perceptions. The preregistered outcome of interest is the answer to the question "How likely do you think it is that the manager understands the bonus payment as a reward?," measured on a seven-point Likert scale from 1, very unlikely, to 7, very likely.

To test the hypothesis that a cooperative environment makes it more likely that a bonus payment is interpreted as a reward, we implement two between-subjects treatments that are randomized at the individual level. The treatments vary how the company culture is described at the beginning of the experiment. In Cooperative, the vignette describes the following: "The working atmosphere is very pleasant. Often, everyone works together and helps each other. It rarely happens that someone shirks work at the expense of others," whereas Uncooperative reads "The working atmosphere is not very pleasant. It is rare for everyone to work together and help each other. Often someone shirks work at the expense of others." The rest of the instructions are identical and continue with the description of the project setting. As an incentivized manipulation check, we ask to what extent employees believe that their team members work a lot on the project before we ask the questions about the manager.

We implement this survey experiment in a gender-balanced sample of 1008 employees representative in terms of age of the country's working population. Table C1 presents summary statistics and shows that characteristics of respondents are balanced across Cooperative and Uncooperative. Participants took an average of about 5 min to complete the survey.

The results show that the treatment manipulation is effective: Individuals in Cooperative expect more teamwork (t test, $p<0.001$) than respondents in Uncooperative. The main result is that in Cooperative, the bonus is more likely to be viewed as a reward than in Uncooperative (t test, $p = 0.020$). As preregistered, we also assess the robustness of the effect to the inclusion of various controls. Estimates are remarkably stable (first four columns of Table 5), which suggests that the relationship between the work culture and the interpretation of

TABLE 5 | Results from the vignette experiment.

	Full sample				Correct manipulation check			
Cooperative	**0.15** (0.06)**	**0.14** (0.06)**	**0.14** (0.06)**	**0.15** (0.06)**	**0.44*** (0.07)**	**0.42*** (0.07)**	**0.42*** (0.07)**	**0.39*** (0.07)**
Control mean	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
N	1008	1008	1008	1008	727	727	727	727
R^2	0.01	0.01	0.01	0.05	0.05	0.05	0.05	0.09
Individual controls		✓	✓	✓		✓	✓	✓
Job controls			✓	✓			✓	✓
Experience controls				✓				✓

Notes: The dependent variable is standardized and was measured on a seven-point Likert scale from 1 very unlikely to 7 very likely and is the answer to the question "How likely do you think it is that the manager understands the bonus payment as a reward?" *Cooperative* is an indicator for the treatment that describes a cooperative culture and was administered between subjects. *Individual controls* are age, gender, and education level, *Job controls* are the extent of teamwork, an indicator for fulltime work, company size, and sector, and *Experience controls* are an indicator for own bonus payments, company culture, and satisfaction. Ordinary Least Squares regressions with robust standard errors in parentheses.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

managers' behavior may be a more general phenomenon. When we focus on participants who answer the manipulation check as expected, the effects are stronger in terms of effect size and statistical significance (last four columns of Table 5).[29]

The survey experiment suggests that a culture described as cooperative makes it more likely that employees perceive the bonus payment as a reward. Hence, cooperative culture can not only change behavior (e.g., Peysakhovich and Rand 2015) but also the interpretation of others' behavior. This is consistent with the correlation in beliefs we document in our experiment (see Figure 3b), further supporting our interpretation that the cooperative culture is important in our setting. More generally, this additional experiment suggests that potential negative effects of incentives can be circumvented. In particular, if managers create a cooperative work environment, they may change the interpretation of monetary incentives (and other actions). In this regard, the different tools that managers have at their disposal—monetary incentives and leadership styles—can be complementary.

6 | Conclusion

The literature suggests that incentives designed to promote cooperation in organizations may signal that selfish behavior is prevalent. As a consequence, incentives could have limited or even counterproductive effects. We present evidence that bonus incentives in a real company setting can increase cooperation without triggering negative signaling effects. Further analyses suggest that the absence of a signaling effect in our setting relates to employees' perception of their managers' decision-making. They believe that managers do not exploit their private information about others' behavior in an opportunistic manner, but provide incentives if they expect high levels of cooperation. This might explain why some employees infer high cooperation levels from incentives set by informed managers. Our complementary vignette experiment suggests that work culture influences the perception of bonus payments.

We study whether contract choices signal social norms in a relevant field environment. According to Levitt and List (2007), it is often not possible to generalize findings from the experimental laboratory to the field because contexts differ. Actors in the field bring internalized social norms or past experiences and strategies into the game and herewith change outcomes. To shed some light on the generalizability of our results, we follow List (2020) and briefly comment on selection, attrition, naturalness, and scaling. Regarding selection, participants self-selected into the study. We invited 1500 potential participants via email with a personalized link and contacted persons could fill in the survey within a 2-week time period. Individuals who participated in Deversi et al. (2020) did not receive an invitation. The participation and completion rate is 30%. While we do not have data on the invited nonparticipants, we can compare our sample to invited and participating individuals in Deversi et al. (2020) (see Table A4). We note that our participants' tenure at the company is much shorter, but in other observable aspects, our participants seem similar to both the participants and the nonparticipants of Deversi et al. (2020). As higher seniority (in our sample) is related to smaller effects in our experiment, we do not expect results to be different in the overall population of employees (who, on average, have higher tenure).

While effects of selection may not strongly affect generalizability within the company, the type of company and specifically its culture may matter (as also suggested by the vignette experiment). Our company values cooperation and cares about its culture. It has recently included a related measure in the nonfinancial KPIs that influence the compensation of the executive board. It also actively propagates a prosocial management style, trying to establish "empathic leadership." Managers also value cooperation. In a survey conducted by the company, the median agreement of managers to "People in my team cooperate to get the job done" was 89 out of 100. This culture may contribute to employees valuing their company. According to the platform Glassdoor, on which employees rate their employers, the company has consistently ranked among the top 10 employers in the country and compares favorably to other companies of similar size.[30] We hence believe that the selection of the company matters for our results. In our setting, it appears that incentives are perceived (and used) as rewards. Our findings suggest that context and culture are not just background conditions, but determinants of how incentives are perceived and how they work. Understanding to what extent organizations can reap the positive effects of incentives while avoiding unintended side-effects by actively investing in the general relationship between managers and employees and/or by using reward rather than punishment mechanisms is a promising question for future research. In designing incentives, companies may want to invest not only in financial structures but also in the broader cultural context that determines how those structures are interpreted.

In terms of naturalness, we note that in many field studies, there exists a trade-off between using more artificial designs to discover causal mechanisms underlying the data and more natural designs that allow for bigger picture analyses. Our paper focused on one specific signal and hence relied on a stylized experimental design that abstracts away from other effects incentives may have. As such, our study is naturally limited in terms of generalizability and is not part of research that can be directly translated into policy and scaled up.

As pointed out above, we need a more nuanced understanding of the interaction of incentives and contextual factors, such as the general corporate culture, transparency about superior information on the side of the principal, or the legitimacy of principals' decision-making (Schnedler and Vadovic 2011). Companies that design incentives to promote cooperation should also take other forms of incentive effects, like framing effects or the signaling of other information held by the management (Bowles and Polanía-Reyes 2012), into account.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

[1] Examples include the introduction of manager guidelines that outline cooperative behavior as a requirement for promotion and salary increases or the provision of peer-to-peer recognition tools in which employees can confer monetary awards to cooperative colleagues. See Gratton (2009) and www.blog.bonus.ly/a-look-at-googles-peer-to-peer-bonus-system for a description of how Google and British Petroleum implement these tools.

[2] The term "conditional cooperation" describes that people cooperate if they believe that others cooperate as well. There exists ample evidence about the prevalence of conditional cooperators in various samples (e.g., Gächter 2007; Kocher et al. 2008).

[3] Note that employees are informed about the fact that managers learned about cooperation rates, but not what the cooperation rates are. We present details and explain this design choice in Section 3.3.

[4] The issue that sanctioning and reward mechanisms can reduce trust and lower expectations about others' cooperativeness has been extensively documented and discussed in sociology and psychology (e.g., Mulder et al. 2006; Chen and Pillutla 2009; Sitkin and Roth 1993; Irwin et al. 2014).

[5] The focus on cooperation is why the company was not interested in exploring punishment for noncooperation but wanted to focus on rewards-based incentives. The cooperative culture and the corresponding leadership style are also reflected in managers being more likely to be contributors than nonmanaging employees (Deversi et al. 2020). Managers appear to actively set examples for the culture they are trying to establish. Moreover, managers value cooperation: In a survey conducted by the company, the median agreement of managers to "People in my team cooperate to get the job done" was 89 out of 100.

[6] The level of cooperation is substantially higher than in lab experiments (see, e.g., the meta analysis by Zelmer 2003 that reports average contribution rates of 37.7% in linear public good games). While players in the public good game are anonymously matched and, due to the size of the company, are unlikely to be matched to their team members, all players are aware that they are playing with fellow employees. High cooperation rates may hence be explained by an in-group effect and/or the corporate culture.

[7] Both experiments are separate studies and have been designed and implemented as such. Invitations for our study were sent 2 months after the completion of Deversi et al. (2020). Participants of both studies are drawn from the same population but constitute separate and nonoverlapping samples. Respondents from both studies mainly come from one country, but spillovers are highly unlikely as the company employs more than 20,000 individuals in that country. While both studies examine cooperation, ours is explicitly designed to test the signaling effect with an experimental manipulation. The role of the manager is unique to our study. In contrast, Deversi et al. (2020) focus on the levels of cooperation, changes in cooperativeness when the returns to cooperation change, and how cooperation relates to characteristics of employees and their jobs, such as the performance pay scheme or nonmonetary rewards for cooperation they receive within the company.

[8] In their public goods game, a substantial share of participants reacted to variations in the marginal per capita return of contributions in the common account. In addition, in a surprise donation option at the end of their experiment, most participants decided to keep the final payoff for themselves rather than donate it to a charity.

[9] Note that individual contributions cannot be observed by the manager. In this regard, our design differs from studies that explicitly vary audience effects. For example, Filiz-Ozbay and Ozbay (2014) find that observability by a third party does not influence public good contributions.

[10] Note that a more asymmetric game, where only the manager benefits from employee cooperation, would likely have made potential selfish motives more salient. We implemented a game reflecting the company's reality: while cooperation clearly benefits managers, the benefits for individual team members are more diffuse or longer-term (e.g., via promotions), and ultimately uncertain.

[11] Similar relative bonus payments for cooperation have been analyzed by Irlenbusch and Ruchala (2008).

[12] We chose this within-subject variation of the presence of the incentive for two reasons. First, with the focus being on beliefs, we wanted to follow Danilov and Sliwka (2017), who also use the strategy method to elicit beliefs. Second, due to the ex post matching procedure, a "hot" choice was not feasible to implement.

[13] To address the concern that this procedure may be confusing (Burton-Chellew et al. 2016), we compare the unconditional contribution to the conditional contribution at the level that the participant indicated as their belief. For conditional cooperators, the difference between the two contribution choices should be zero. We find that the median difference for conditional cooperators is indeed zero, and the average absolute distance is smaller than 1.5.

[14] Note that payoffs from the belief elicitation are quite high relative to payments in the experimental game. While this reduces concerns about consistency effects or ex post rationalization of behavior, it might give rise to an additional coordination game in which everyone contributes zero and receives the belief incentives. To mitigate these potential effects, beliefs were elicited only after unconditional and conditional contribution decisions were made, and the belief elicitation was not announced before making contributions.

[15] Importantly, the setup, parameters and procedures of both games are the same except for the manager's bonus choice in our experiment.

[16] For employees in Info, the treatment information was mentioned three times: once in the main instruction text, once on a summary screen with the most important aspects in bullet points, and another time in the comprehension tasks section, where we asked a question on whether the manager has been informed. Note that employees in No Info are not prompted to think about prevailing cooperation levels. Else, we would have needed to explicitly state that managers were not informed about cooperation, which might have induced experimenter demand effects. We hence opted for the current design.

[17] Cooperation decisions are more complex as they not only depend on beliefs but also on cooperative types. For conditional cooperators, beliefs should correspond to actions, but this may not be true for selfish types. Further, while the negative signaling effect of incentives can be unambiguously seen in beliefs, equilibrium behavior in Incentive/Info is less straightforward. For example, inferring from the incentive that cooperation rates are low, employees might increase their contributions if the perceived likelihood of receiving the incentive is now larger.

[18] The manager's actual decision threshold might be lower, depending on managers' beliefs and reciprocity preferences of employees (see Van der Weele 2012), the upward containment is, however, unaffected by these other aspects. Hence, we expect employees to infer the positioning of the observed contribution levels relative to the upper threshold from managers' decisions, which implies that the empirical distribution of beliefs should shift.

[19] Cooperation decisions are in line with beliefs (i.e., higher beliefs lead to larger contributions) and are presented in Appendix B.

[20] Completion times show that participants in Info took longer to read and complete the experiment (MWU, $p = 0.005$), indicating that employees paid attention to the information.

[21]Table A2 tests this more formally, showing that self-assessed math skills as a proxy for strategic sophistication (e.g., Czermak et al. 2016) are not a significant dimension of treatment effect heterogeneity.

[22]The following is a post hoc test that was not preregistered.

[23]There are no significant differences in these second-order beliefs between Info and No Info (MWU, $p = 0.400$), corroborating the null result further.

[24]While managers receive information about the average past behavior of a different sample from the same population, there is no reason to expect average behavior in this experiment to differ. This finding empirically supports this assumption.

[25]Employees underestimate these numbers. On average, they believe that 63% of managers set the incentive. These beliefs do not differ between Info and NoInfo (MWU test, $p = 0.976$, $q = 0.91$).

[26]This is consistent with Drouvelis and Pearce (2023), who find that more intelligent leaders are less likely to free-ride.

[27]The design and analysis are preregistered at https://aspredicted.org/blind.php?x=CX4_784.

[28]We follow Boosey and Goerg (2020) and define rewards as ex post payments. Conversely, we define incentives as trying to induce a desired behavior in the future. Boosey and Goerg (2020) exogenously vary the timing of the bonus payment in a gift-exchange game but abstract away from corporate culture.

[29]In Cooperative, this includes all participants who indicate that contributions of their team members is at least "neither likely nor unlikely" and in Uncooperative, this includes all participants who indicate that contributions of their team members are at most "neither likely nor unlikely"). We present results from OLS regressions for the ease of interpretation. Ordered probit results are similarly robust.

[30]The overall rating of the company is 4.2 out of 5, and 85% would recommend it, compared with an average of 3.85% and 73.4% of the 10 closest companies in terms of employee numbers in the same country.

[31]We rely on the numbers of the National Statistical Institute and aggregate several age classes to the following: 18–24 (about 10% of the working population), 25–39 (about 32%), 40–49 (about 22%), 50–59 (about 27%), and 60–64 (about 9%).

[32]The ethical approval is available here https://gfew.de/ethik/MIUZziUp and the preregistration here https://aspredicted.org/blind.php?x=CX4_784.

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Appendix A

Additional Tables and Figures

See Tables A1–A4 and Figure A1.

TABLE A1 | Balance table.

	Info	No Info	*p* value
Age	36.70 (8.65)	35.57 (8.00)	0.252
Female	0.30 (0.46)	0.36 (0.48)	0.168
Seniority	4.97 (4.14)	5.19 (3.62)	0.243
Career level			
Low	0.12 (0.33)	0.14 (0.35)	0.537
Medium	0.85 (0.36)	0.84 (0.37)	0.848
High	0.03 (0.17)	0.02 (0.12)	0.345
Individual performance pay	0.28 (0.45)	0.31 (0.47)	0.441
N	201	196	

Notes: *p* values rely on two-sample Mann–Whitney *U* tests for continuous variables or on χ^2 tests for categorical variables. Career levels subsume three categories in each presented category. Job functions are not shown in the table because there are too many categories, but there are no significant differences between the treatments observable.

TABLE A2 | Treatment effect heterogeneity in beliefs by self-assessed math skills.

	(1) Belief	(2) Belief
I(Incentive)	2.106***	2.188***
	(0.242)	(0.252)
I(Info)	−0.406	0.242
	(0.434)	(0.506)
I(Incentive) × I(Info)	0.304	0.288
	(0.394)	(0.384)
Constant	4.954***	5.474***
	(0.314)	(0.366)
Sample	Below median Math skills	Above median Math skills
Observations	406	396
R^2	0.137	0.134

Notes: The dependent variable is beliefs about average unconditional contributions of the group members. For each employee and dependent variable two entries are observed: one entry under the incentive and one without the incentive. Standard errors are clustered on the subject level and are shown in parentheses.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

TABLE A3 | Correlates of incentive setting.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Info	−0.16						
	(0.11)						
Education		0.15*					
		(0.07)					
Altruism			0.01				
			(0.02)				
Reciprocity				−0.02			
				(0.03)			
Beliefs about contributions (no incentive)					−0.00		
					(0.02)		
Second-order beliefs (no incentive)						0.02	
						(0.02)	
Diff in contribution beliefs							0.02
							(0.03)
N	47	47	46	47	47	47	47

Notes: The dependent variable is a binary indicator for setting the incentive. *Info* is an indicator of the information treatment that was administered between subjects. *Education, altruism, and reciprocity* are elicited in a post-experimental survey (see also Appendix D). Marginal effects of probit regressions without control variables (to avoid overfitting) and standard errors in parentheses.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

TABLE A4 | Comparison of participant characteristics.

	Nonparticipants (1)	Participants in Deversi et al. (2020) (2)	Participants in this study (3)
Female	0.30 (0.46)	0.30 (0.46)	0.33 (0.47)
Age (years)	45.09 (8.95)	44.48 (9.31)	36.97 (8.86)
Seniority (years)	14.33 (7.34)	14.03 (7.47)	5.77 (4.76)
Team size	13.60 (3.54)	13.78 (3.48)	13.26 (3.60)
Leader	0.09 (0.29)	0.10 (0.30)	0.10 (0.31)
Career Level[a]			
Low	0.12 (0.33)	0.12 (0.33)	0.13 (0.34)
Medium	0.76 (0.43)	0.75 (0.43)	0.79 (0.41)
High	0.12 (0.33)	0.13 (0.33)	0.08 (0.27)
Individual performance pay[a]	0.26 (0.44)	0.22 (0.41)	0.29 (0.45)
N	1889	910	448 (401[a])

Notes: Columns (1) and (2) come from Table 1 in Deversi et al. (2020). Column (3) shows pooled data from employees and managers who participated in this study.
[a]Career level and individual performance pay information are only available for the employees ($N = 401$) in our sample.

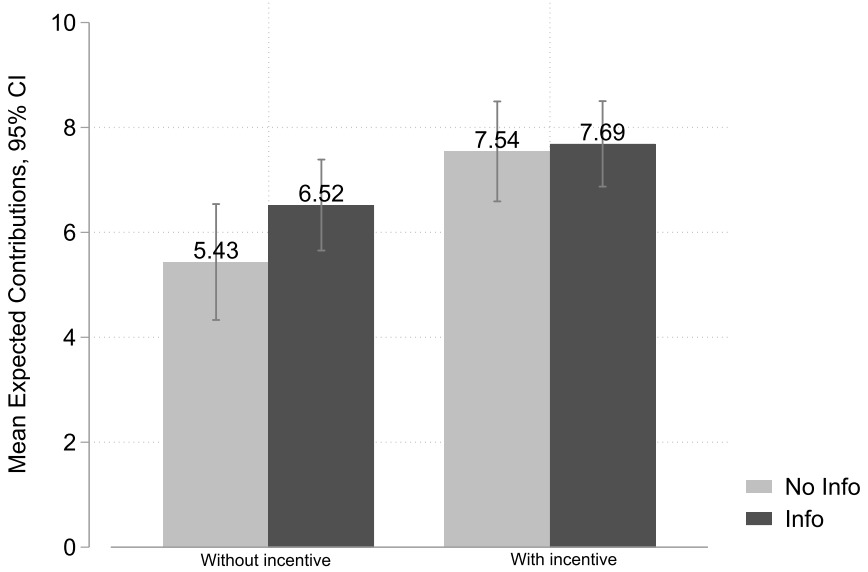

FIGURE A1 | Managers' expected contribution. CI, confidence interval.

Appendix B

Cooperation Decisions

Main Effect: Table B1 presents the unconditional contribution decisions following the logic of Table 3. Columns (1) and (2) provide estimates for the entire sample, without and with controls, respectively. In line with the beliefs, the incentive decision induces a statistically significant increase in unconditional contributions by 23% (1.5 tokens), but there is no statistically significant effect of the information treatment or the treatment interaction. As shown in Column (2), the null effect of the treatment interaction is robust to controlling for a wide range of employee characteristics, including *gender*, *age*, *seniority*, *incentive scheme*, *career level*, and *job function*.

Treatment Effect Heterogeneity: One may expect that employees with strong reciprocity preferences react more strongly to a belief update. Using data from the previous study, we observe that employees working under individual performance pay are less likely to be conditional cooperators than employees under company performance pay (MWU, $p = 0.028$). As shown in Columns (3) and (4) of Table B1, we observe that for employees in the company performance pay scheme the coefficient is positive and marginally significant, whereas for employees in the individual performance pay scheme, the coefficient of the treatment interaction is negative. Columns (5) and (6) show

conditional contributions for those who expect the managers to set incentives to increase cooperation. In line with the positive signaling effect we observe in beliefs, we see weak evidence for crowding in.

Types: We follow Thöni and Volk (2018) and classify types based on conditional contributions. *Freeriders* never contribute, whereas *unconditional cooperators* always contribute the same positive amount. *Conditional cooperators* have a weakly increasing conditional contribution schedule, and *triangle cooperators* have a weakly increasing contribution schedule up to a certain point, after which the schedule becomes weakly decreasing. Everyone who is not classified as one of these types belongs to the *other* type. Figure B1 presents the distribution by treatment. In both NoInfo and Info, the incentive reduces the fraction of free-riders (from 13% to 2% in NoInfo, and 12% to 1% in Info) and increases the fraction of others. Consistent with our main results, the type distribution is similar when comparing the information treatments.

In addition, we estimate the slope of individual contribution schedules and compare the slope parameters across treatments. We find no difference between the parameters in Info as compared with NoInfo, neither in the absence of the incentive (t test, $p = 0.27$), nor with the incentive (t test, $p = 0.32$). However, when incentives are in place, the slope is less steep. This can be explained by higher contributions induced by the incentive (see also Table B1) that flatten the contribution schedule.

TABLE B1 | Unconditional contributions: Main treatment effects and heterogeneity.

	(1)	(2)	(3)	(4)	(5)	(6)
I(Incentive)	1.346***	1.376***	1.369***	1.393***	1.580***	1.589***
	(0.216)	(0.219)	(0.278)	(0.331)	(0.238)	(0.242)
I(Info)	−0.226	−0.168	−0.176	−0.303	−0.319	−0.269
	(0.363)	(0.364)	(0.433)	(0.667)	(0.403)	(0.402)
I(Incentive × Info)	0.391	0.329	0.692*	−0.468	0.668*	0.633*
	(0.319)	(0.326)	(0.412)	(0.504)	(0.355)	(0.366)
Constant	6.744***	6.552***	6.524***	6.497***	6.379***	5.919***
	(0.248)	(0.528)	(0.573)	(1.083)	(0.277)	(0.570)
Sample	All	All	Company Pay	Individual Pay	Correct Interpretation	Correct Interpretation
Controls	No	Yes	Yes	Yes	No	Yes
Observations	802	784	552	232	640	628
R^2	0.055	0.092	0.120	0.111	0.085	0.126

Notes: The dependent variable is unconditional contributions. For each employee and dependent variable, two entries are observed: one entry under the incentive and one without the incentive. The control variables include *gender*, *seniority*, *incentive scheme*, *career level*, and *job function*. Eighteen employees are not included in the regressions using the additional controls, as some of these have not been available for those participants. Standard errors are clustered on the subject level and are shown in parentheses.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

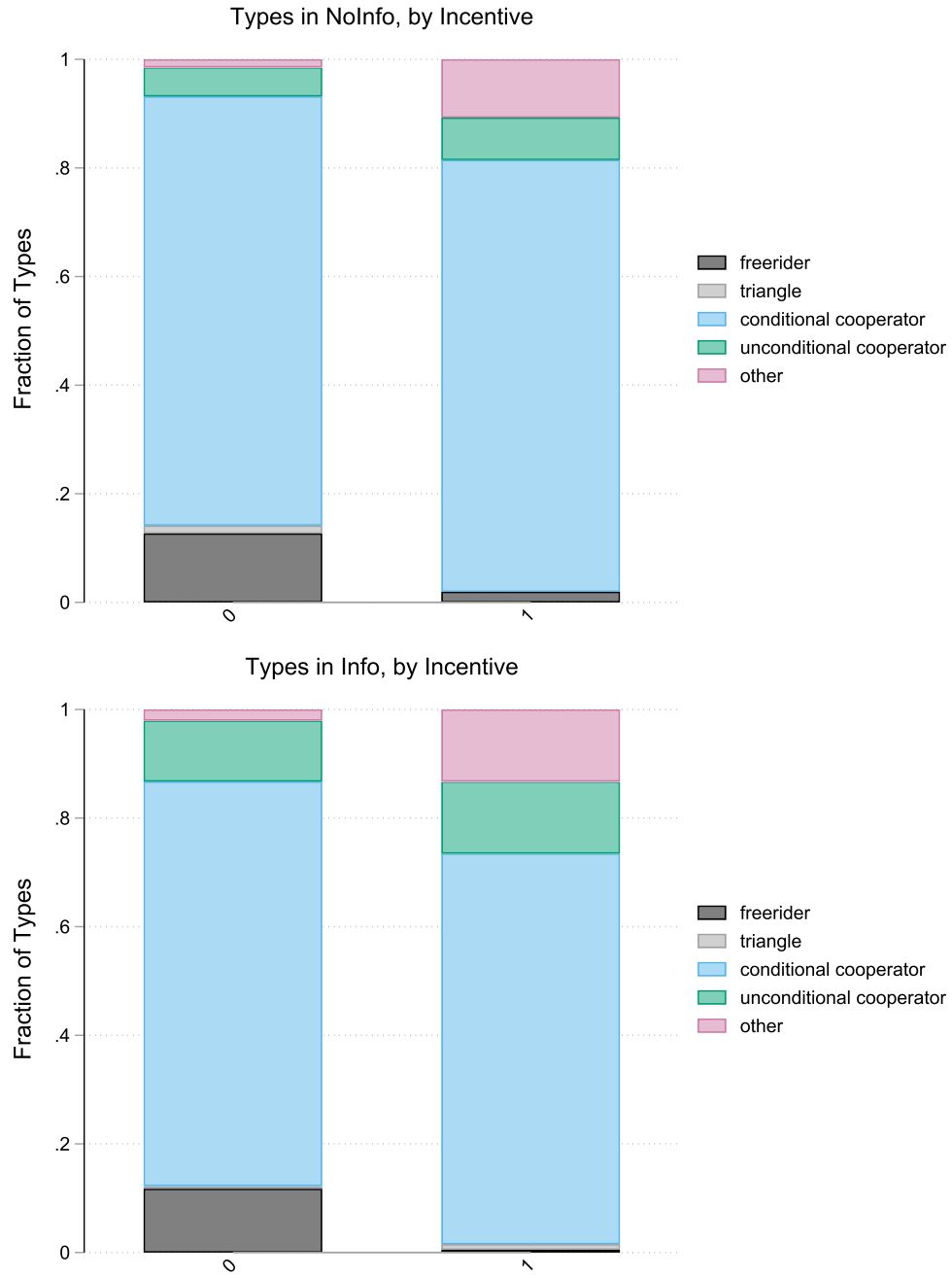

FIGURE B1 | Distribution of types. [Color figure can be viewed at wileyonlinelibrary.com]

Appendix C

Survey Experiment

Design

The survey starts with informed consent and a screener that elicits demographics related to the quotas (age and gender), the employment status (employee, self-employed, and other), and working hours (fulltime, parttime, or other). Participants need to provide consent, work as employees either fulltime or parttime to continue.

The main part is the vignette experiment and contains four incentivized questions that are each answered on a seven-point Likert scale. Before the experiment starts, participants learn that one of these four questions will be randomly selected to be payoff-relevant. For this question, their answer will be compared with the modal answer of the other participants (of the same treatment), and if the answers match, respondents will receive 2 EUR as additional payment. The experiment starts with a prime that asks participants to imagine working in a large company. In Cooperative, they read

> *The working atmosphere is very pleasant. Often, everyone works together and helps each other. It rarely happens that someone shirks work at the expense of others.*

In Uncooperative, they read

> *The working atmosphere is not very pleasant. It is rare for everyone to work together and help each other. Often someone shirks work at the expense of others.*

The rest of the instructions are identical and describe a situation in which the employee faces a project together with two other employees that requires unpaid overtime work for successful completion. The first incentivized question serves as a manipulation check and asks to what extent employees believe that their team members work a lot on the project.

A manager supervises the team and would benefit from a successful project. The manager cannot work on the project, but can decide to implement a policy that would compensate the team member who works the most. The second incentivized question asks about the likelihood of the manager setting the incentive. We then define "reward" and "incentive" following Boosey and Goerg (2020):

> *In theory, a distinction is made between incentives and rewards. An incentive is a payment that is intended to encourage greater work performance. A reward is a payment made in recognition of performance. In practice, the distinction is not always clear-cut.*

We randomly vary the ordering of the description of the two concepts between subjects. Again in random order, we then ask two further incentivized questions regarding the likelihood of the manager understanding the policy as (i) an incentive and (ii) a reward. The final question of the experiment is not incentivized and asks about the employee's likelihood of applying for an open position based on the corporate climate. This can serve as an additional check whether the prime lasted for the entire duration of the experiment.

The final part contains demographic questions about education, the frequency of teamwork, whether the employee has received a bonus payment from their current employer, the size of the company, its sector, the perceived corporate climate, and satisfaction with the current employer.

Sample, Procedures, and Manipulation Check

We worked with bilendi, a survey company, to collect responses from 1008 employees based in the same country as the company of our main experiment. We implemented quotas to ensure (i) gender balance and (ii) an age distribution that approximates the working population.[31] Table C1 presents summary statistics and shows that characteristics of respondents are balanced across Cooperative and Uncooperative. Participants took on average about 5 min to complete the survey. Ethical approval was obtained by the German Association for Experimental Economic Research, and we preregistered the study at as-predicted.org.[32]

The additional, unincentivized manipulation check shows that the prime lasted for the duration of the experiment. Respondents in Cooperative are more likely to indicate that they would apply for a job in this company (t test, $p < 0.001$); unincentivized outcome elicited after the four incentivized questions than respondents in Uncooperative.

TABLE C1 | Summary statistics.

	N	Control mean	Treatment mean	*p* value
Female	1008	0.47	0.50	0.32
18–24 years	1008	0.10	0.10	0.87
25–39 years	1008	0.36	0.33	0.33
40–49 years	1008	0.24	0.25	0.72
50–59 years	1008	0.22	0.23	0.95
60–65 years	1008	0.07	0.09	0.23
Hauptschulabschluss	1008	0.08	0.07	0.36
Realschulabschluss	1008	0.33	0.33	0.86
Abitur or equivalent	1008	0.26	0.26	0.94
Bachelor	1008	0.12	0.12	0.96
Diploma/Magister	1008	0.12	0.14	0.28
Master	1008	0.08	0.07	0.65
PhD	1008	0.01	0.01	0.77
Fulltime	1008	0.78	0.77	0.77
0–9 employees	1008	0.07	0.10	0.16
10–49 employees	1008	0.20	0.19	0.51
50–249 employees	1008	0.47	0.48	0.81
250+ employees	1008	0.25	0.24	0.56

Notes: Each variable is an indicator for a specific group that can either take the value of 1 or 0. For example, "female" is an indicator for the participant identifying as female. p values are two-sided and come from independent sample t tests. For a more conservative test, the p values are not multiple-testing adjusted.

Appendix D

Overview of Variables From the Company Setting

Company Records

Variable	Scale	Description	Details
Age	Ratio	Age of employee	
Gender	Nominal	Gender of employee	
Seniority	Ratio	Seniority of employee (in years)	
Job function	Nominal	Twelve functional areas (departments), which consist of clusters of several job families based on generic job content	Communications, development, education and training, finance, administration, human resources, information technology, marketing, sales, consulting, not assigned
Career	Ordinal	Nine career levels of employees (describe contribution based on business results, accountability, complexity, experience, and communication)	Not specified for reasons of discretion
Pay scheme	Nominal	Employees pay scheme	Either company performance pay or individual performance pay

Experiment

Variable	Scale	Description
Employees		
Contribute	Ratio	Unconditional contributions with and without the incentive
x-Contribute	Ratio	Contribution conditional on x contributed by other team members with and without the incentive
Belief contribute	Ratio	Belief about the average contribution of the other team members with and without the incentive
Manager choice	Ratio	Belief about the share of managers who select the incentive
Manager belief	Ratio	Belief about managers' expectations about unconditional contributions of employees
Managers		
Incentive choice	Binary	Decision about whether to set the incentive
Belief contribute	Ratio	Belief about the average contribution of employees with and without the incentive
Second-order belief	Ratio	Belief about employees' beliefs about contributions of others with and without the incentive

Survey

Variable	Scale	Description
Altruism	Ordinal	Social preference measure indicating the participant's tendency for altruistic behavior
Negative reciprocity	Ordinal	Social preference measure indicating the participant's tendency for negative reciprocity
Positive reciprocity	Ordinal	Social preference measure indicating the participant's tendency for positive reciprocity
Math	Ordinal	Measure of perceived math skills
Competitive attitude	Ordinal	The participants individual competitive attitude
Nationality	Nominal	The participant's nationality
Education	Nominal	The participant's education level
Children	Binary	Indicating whether the participant has children or not
Friends	Ratio	The participant's number of friends

Appendix E

Instructions for the Company Experiment

Information that is only presented in Info is highlighted in *italics*.

Managers

As a manager, you are connected to a group of three employees, which consists of anonymous participants in this study. The participants are randomly selected (Company) employees without management responsibility. The combination into groups of three occurs randomly. Your and your group's payouts depend on your and the group members' decisions. In addition, your decisions determine the payouts of up to six additional groups.

Decision-making situation of the group members

Each member of the group must decide on the use of 10 tokens each. They can put the 10 tokens into a private account, or can deposit them in whole or in part into a joint account. Any tokens that they do not deposit into the joint account are automatically added to their respective private account.

Income of the group members

The total income of a group member is the sum of income from his/her private account and his/her income from the joint account:

- *Income from the private account:* He/she earns exactly one euro for each token he/she puts in his/her private account. For example, if he/she put 4 tokens into the private account, he/she will earn exactly €4 from the private account. No one but he/she receives income from his/her private account.
- *Income from the joint account:* For each token that is added to the joint account, each group member will receive €0.5. That is, the other two group members also each receive €0.5 for each token contributed. Conversely, the contributing group member also earns money from the contributions of the other two group members to the joint account.

Your income

You, as a manager, will receive €15 for your participation. In addition to this €15, you also receive €0.50 for each token that your group members contribute to the shared account. You do not earn from the deposits of your group members into the private accounts.

Your decision

Before your group members make the contribution decisions, you decide whether or not to pay the group member with the highest contribution to the joint account an additional payment of €3 to his/her private account. In the event of a tie, the €3 will be divided among all group members with the same contribution to the joint account. If you opt for this additional payment scheme, this will cost you €5. If you decide against this, you will not incur any costs and no additional payments will be made to the group members.

What do the group members know about your decision?

Before making any decisions, all group members will be informed that you, the manager, decide on the additional payment of €3. Your group members also know that the additional payment is costly for you and that you earn from the deposits into the community account.

Tip for you as a manager

In all, 369 employees have already made their decision to allocate the 10 tokens between the private account and the common account. There was no additional payment for these decisions in place. On average, 2.10 tokens were paid into the private account and 7.90 tokens into the common account.

Summary

- All group members decide how many of the 10 tokens they deposit into their private account and how many of the 10 tokens they deposit into the joint account.
- Each group member earns one euro for the tokens in the respective private account and €0.50 for each contributed token in the joint account.
- You, as a manager, earn €0.50 for each token contributed to the joint account. You cannot contribute tokens to the community account.
- The manager knows the average contribution of 369 other (Company) employees to the joint account. There was no additional payment in place for these decisions.
- As a manager, you have to decide whether to pay the group member with the highest contribution to the joint account an additional payment of €3 to their private. The additional payment will cost you €5.
- *In decision-making situations without additional payment, 396 (Company) employees paid an average of 2.10 tokens in the private account and 7.90 tokens in the joint account.*

Comprehension Questions

Please answer the following questions to ensure that you have understood the instructions for Part I of the experiment. If you are unsure, you can return to the instructions by clicking on "Back."

Assume that none of the group members pays a contribution into the group account.

- What is the total income (private account + joint account) of a group member in tokens?
- What is your income from the group's joint account in euros?

Assume that all three group members each pay a contribution of 10 tokens into the group account.

- What is the total income (private account + joint account) of a group member in tokens?
- What is your income from the group's joint account in euros?

Assume that in a group, member A pays 0 tokens to the shared account, member B 5 tokens, and member C 10 tokens. Which member receives the additional payment of 3 tokens if the manager has selected this scheme? Member A/Member B/or Member C

Incentive Choice and Belief Elicitations

Please choose whether you want to pay the member with the highest contribution to the joint account, the additional payment of €3 to his/her private account. This additional payment will cost you €5. Yes. The additional payment is used. No. The additional payment is not used.

In addition to your earnings from your private and joint accounts, you will receive a further payout for estimating the average contribution of the other two members of your group to your joint account. Your payout will depend on how accurately you estimate the actual average contribution of your two group members. If you are exactly right, you will receive an additional €2.5 for each correct answer. If your estimate differs by 0.5 or more tokens from the actual average contribution, you will receive €0. Please enter a number from 0 to 10 (each number is allowed in steps of 0.5).

- What do you think is the average contribution of your group members' tokens to the joint account with additional payment?
- What do you think is the average contribution of your group members' tokens to the joint account without additional payment?
- What is the average expectation of the group members about the contribution of the other group members to the joint account with additional payment?
- What is the average expectation of the group members about the contribution of the other group members to the joint account without additional payment?

Employees

You are a member of a group of three, consisting of anonymous participants in this study. All participants are randomly selected employees of (Company). The combination into groups of three occurs randomly. Your group will be connected to a manager. The manager is a randomly selected (Company) manager, that is, a (Company) employee with management responsibility. The payouts for you, the other group members, and your manager in this section depend on your decisions, the decisions of the other members of your group, and the manager's decision.

Decision-making situation

Each member of the group must decide on the use of 10 tokens each. You and the other group members can put the 10 tokens into a private account, or you can deposit them in whole or in part into a joint account. Any tokens that you do not deposit into the joint account are automatically added to your private account.

Total income

Your total income is the sum of your income from your private account and your income from the joint account:

- *Income from the private account:* You earn exactly one euro for each token you put in your private account. For example, if you put 4 tokens into your private account, you will earn exactly €4 from your private account. No one but you receives income from your private account.
- *Income from the joint account:* For each token that is added to the joint account, you will receive €0.5. The other two group members also each receive €0.5 for each token you contribute. Conversely, you also earn money from the contributions of the other two group members to the joint account. For example, if the sum of all three group members' contributions to the joint account results in 30 tokens, then you and the other two group members each receive $30 \times 0.5 = €15$ from the joint account. If the three group members pay a total of 10 tokens into the joint account, you and the other two group members receive $10 \times 0.5 = €5$ each from the joint account.

Income of your manager

Your manager will receive €15 for his/her participation. In addition to this €15, he/she also receives €0.50 for each token that you and your group members contribute to the shared account. The manager does not earn from your deposits and the deposits of your group members into the private accounts.

Decision of your manager

Before you and your group members make the contribution decisions, your manager decides whether or not to pay the group member with the highest contribution to the joint account an additional payment of €3 to his/her private account. In the event of a tie, the €3 will be divided among all group members with the same contribution to the joint account. If your manager decides on the additional payment, this costs the manager €5. If he/she decides against this, the manager incurs no costs and no additional payments are made to the group members.

What does the manager know when making a decision?

The manager received information about the average contribution decision of 369 other employees. These employees have already decided on the allocation of the 10 tokens between the private account and the joint account. There was no additional payment for these decisions in place. The manager *also* knows your decision-making situation. So he/she knows how much you earn, what your decision looks like and he/she also knows that you know about his/her decision. The manager does not know how much you and your group members are contributing when taking his/her decision on the additional payment.

Your entries

As described above, you can use 10 tokens to fund your private account and the joint account. Each group member has to make two types of contribution decisions, which we will refer to below as the contribution and the contribution table. You can find a detailed description of your entries on the entry screens. When you make your decisions, you do not yet know whether the manager has selected the additional payment or not. That is why you make every decision for both scenarios - once with and once without additional payment. Since both scenarios can be relevant to your payout, you should think carefully about your decisions in both scenarios.

Summary

- All group members decide how many of the 10 tokens they deposit into their private account and how many of the 10 tokens they deposit into the joint account.
- Each group member earns one euro for the tokens in the respective private account and €0.50 for each contributed token in the joint account.
- The manager also earns €0.50 for each token contributed to the joint account. He/she cannot contribute tokens to the community account.
- *The manager knows the average contribution of 369 other (Company) employees to the joint account. There was no additional payment in place for these decisions*.
- Before you take your decisions, your manager must decide whether he/she pays the group member with the highest contribution to the joint account an additional payment of €3 to the private account or whether he/she does not pay any additional payment. The additional payment costs the manager €5.
- You do not yet know how your manager decides and make your apportionment decision in the event that he/she pays the additional payment and in the event that he/she does not pay any.

Comprehension Questions

Please answer the following questions to ensure that you have understood the instructions of the experiment. If you are unsure, you can return to the instructions by clicking on "Back." When talking about your total income, please think of the sum of the income from the private account and the joint account without the possible additional payment.

1. Assume that none of the group members (even you yourself) pays a contribution into the group account.
   - How high is your total income?
   - How high is the respective total income of the other two group members?
2. Assume that all three group members (also you yourself) each pay a contribution of 10 tokens into the group account.
   - How high is your total income?
   - How high is the respective total income of the other two group members?
3. Assume that you deposit 0 tokens into the joint account and that the other two members of your group deposit 10 tokens each.
   - How high is your total income?
   - How high is the respective total income of the other two group members?
4. Assume that you pay 10 tokens into the joint account and the other two members of your group each pay 0 tokens.
   - How high is your total income?
   - How high is the respective total income of the other two group members?

Assume that in a group, member A pays 0 tokens to the shared account, member B 5 tokens, and member C 10 tokens. Which member receives the additional payment of 3 tokens if the manager has selected this scheme? Member A/Member B/Member C

Is the additional payment scheme costly for the manager? Yes. The manager incurs costs of €5. No. The manager incurs no costs.

Is your manager informed about other (Company) employees' contributions before making a decision on the additional payment? Yes/No.

Contribution Decisions

When choosing the contribution to the joint account, you determine how many of the 10 tokens you want to deposit into the joint account. The deposit to your private account is automatically the difference between 10 tokens and your contribution to the joint account.

Please enter the amount you would like to pay into the joint account (any whole-number value between and including 0 and 10 is possible), if ...

- ... the manager has not selected the additional payment.
- ... the manager has selected the additional payment.

Now you will be asked to fill in a contribution table. In the contribution table, you should specify how many tokens you want to pay into the joint account for each possible (rounded) average contribution of the other two group members to the joint account. So, depending on how much the others contribute on average, you must define your own contribution decision. For each average contribution of the other two group members, please indicate the amount you would like to pay into the joint account (any whole-number value between and including 0 and 10 is possible; of course, you can also enter the same amount several times):

What is your contribution to the joint account if the manager has not selected the additional payment and ...

- ... the other two group members deposit an average of 0 tokens.
- ... the other two group members deposit an average of 1 token.
- ... the other two group members deposit an average of 2 tokens.
- ... the other two group members deposit an average of 3 tokens.
- ... the other two group members deposit an average of 4 tokens.
- ... the other two group members deposit an average of 5 tokens.
- ... the other two group members deposit an average of 6 tokens.
- ... the other two group members deposit an average of 7 tokens.
- ... the other two group members deposit an average of 8 tokens.
- ... the other two group members deposit an average of 9 tokens.
- ... the other two group members deposit an average of 10 tokens.

What is your contribution to the joint account if the manager has selected the additional payment and ...

- ... the other two group members deposit an average of 0 tokens.
- ... the other two group members deposit an average of 1 token.
- ... the other two group members deposit an average of 2 tokens.
- ... the other two group members deposit an average of 3 tokens.
- ... the other two group members deposit an average of 4 tokens.
- ... the other two group members deposit an average of 5 tokens.
- ... the other two group members deposit an average of 6 tokens.
- ... the other two group members deposit an average of 7 tokens.
- ... the other two group members deposit an average of 8 tokens.
- ... the other two group members deposit an average of 9 tokens.
- ... the other two group members deposit an average of 10 tokens.

Help option: The numbers in the left column are the possible (rounded) average contributions of the other two group members to the joint account. You now have to specify how many tokens you want to deposit into the joint account for each slider, provided that the others contribute the specified amount on average. You have to make an entry in each field. For example, you are to specify how much you contribute to the joint account if the other group members deposit an average of 0 tokens into the joint account; how many tokens you contribute if the others contribute an average of 1 token or 2 tokens or 3 tokens, and so on. You can enter any whole-number contribution from 0 tokens to 10 tokens in each field and, of course, the same amount several times.

Incentive Compatibility Display

Payout relevance of your decisions

After all study participants have made their decisions, one member is randomly selected in each group of 3. For the randomly selected member, only the contribution table filled in by him/her is relevant for decision-making and payout. For the other two group members who have not been selected, only the contribution is relevant for decision-making and payout. The average of the two contributions (rounded to the next whole number) then determines the relevant conditional contribution from the third member's contribution table. Of course, you do not yet know which of your contribution decisions will be randomly selected. You must therefore carefully consider both types of contribution decisions, as both can become relevant to you.

The following graphic (Figure E1) is intended to visualize the decision-making situation. For the randomly selected person on the right, the conditional contribution from the contribution table is relevant. For the other two group members, the contribution is relevant for payout.

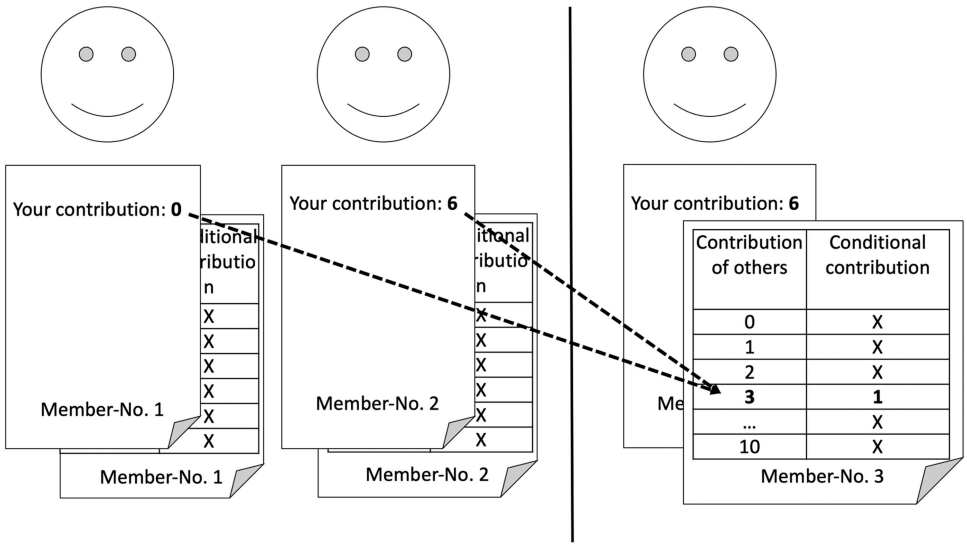

FIGURE E1 | Incentive compatibility.

Belief Elicitation

In addition to your earnings from your private and joint accounts, you will receive a further payout for estimating the average contribution of the other two members of your group to your joint account. Your payout will depend on how accurately you estimate the actual average contribution of your two group members. If you are exactly right, you will receive an additional €5. If your estimate differs by 0.5 or more tokens from the actual average contribution, you will receive €0. Please enter a number from 0 to 10 (each number is allowed in steps of 0.5).

What do you think is the average amount of tokens your two group members contribute to the joint account?

- If the manager has selected the additional payment: ...
- If the manager has not selected the additional payment: ...

What percentage of managers chooses the additional payment scheme? Please enter a number from 0% to 100% in steps of 5% points. If you are exactly right, you will receive €1.50. If your estimate is 5 percentage points or more away from the actual average value, you will receive €0.

Please enter a number from 0 to 10 for each of the next questions (any number in steps of 0.5 is allowed). If you are exactly right, you will receive €1.00 each. If your estimate is 0.5 points or more away from the actual average value, you will receive €0.

What is the average expectation of the managers about the contribution of the group members to the joint account if ...

- ... the manager has not selected the additional payment.
- ... the manager has selected the additional payment.