Social Incentives in Organizations

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Abstract

We review the evidence on social incentives, namely on how social interactions with colleagues, subordinates, bosses, customers and others, shape agents’ effort choices in organizations. We propose a two-way taxonomy based on (1) whether the social group is horizontal (peers at the same level of the hierarchy) or vertical (individuals at different levels or outside the organization) and (2) whether the agent’s effort creates externalities for the other members of her social group. We show settings in which social incentives improve productivity and settings in which they reduce it. In most cases the size of effect is around 10%, which is half the typical effect of performance pay. We also show that social incentives can interfere with financial incentives, making them ineffective or even detrimental. We conclude that social incentives are a powerful motivator that must be taken into account in the design of organizational policies and that more research is needed to understand how policies can shape the preferences that underpin these incentives.

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1 Introduction

Understanding how to motivate employees is the key challenge of every organization. The principal-agent model, a workhorse of agency theory, makes clear how this challenge can be met by offering financial incentives that align the agent’s preference for pay with the organization’s preference for performance.

Looking at organizations through the lenses of the principal-agent model, however, obscures their raison d’être which is to bring together the labor inputs of several individuals who interact with one another. The fact that these interactions shape workplace behavior has long been acknowledged by sociologists (Mayo, 1933; Barnard, 1938; Roethlisberger and Dickson, 1939; Roy, 1952) and, more recently, by economic theorists (Kandel and Lazear, 1992; Rotemberg, 1994). These interactions and the underpinning social preferences can create “social incentives”, that is they can affect the marginal benefit or cost of effort and therefore shape individuals’ motivation. They can also interact with financial incentives and shape individuals’ response to the latter.

This paper reviews the empirical evidence on social incentives in organizations and their interaction with monetary incentives. To guide our review, we develop a simple framework that allows us to organize and draw lessons from the evidence on social incentives in organizations. We begin by setting up the principal-agent model and derive the conditions under which social incentives emerge. The standard model assumes that agents’ utility is increasing in pay and decreasing in effort. To generate social incentives we need to augment preferences to include the outcomes of others within the organization (colleagues, bosses) or outside of it (clients, beneficiaries, potential hires). We follow the literature on social preferences and assume that the agent can care about others’ outcomes relative to her own, or for their own sake.

The framework illustrates how the effect of social incentives depends on the structure of social preferences, and how responses to social incentives can be used to back out the structure of preferences. The framework suggests a two way taxonomy that we use to organize our review. The two dimensions are the identity of the social group and the link between agents’ effort and the welfare of their social group. We show that in all cases the effect of social incentives on effort and the performance of the organization is ambiguous. In particular, agents with relative preferences can get discouraged if they perform worse than their comparison group, and
agents whose effort affects the welfare of their subordinate can be lead to benefit their in-group at the expense of more deserving individuals.

We also show that social incentives interact with financial incentives, sometimes making the latter ineffective or even detrimental. For instance, incentives that create inequality within the peer group might demotivate the least productive workers and further reduce their productivity. One notable exception is that financial incentives can ameliorate the targeting bias of bosses who favour their in-group at the expense of others and, by doing so, harm the organization.

The paper is organized as follows. Section 2 develops the theoretical framework, and discusses methods and scope. We focus on the analysis of personnel data and field experiments within organizations. Social incentives in other domains, for instance charitable giving or consumers’ choices, or laboratory tests of social preferences are besides the scope of this review. Section 3 reviews the evidence from contexts where the social group is made of peers, both in the case with and without effort externalities. Section 4 focuses on contexts where the peer group is vertical or outside the firm. Section 5 discusses open questions on the origin of social preferences and whether these can be shaped by the policies of the organization.

2 Theory and Methods

"How selfish soever a man may be, there are some principles in his nature, which interest him in the fortune of others and render their happiness necessary to him.” ~Adam Smith, Theory of Moral Sentiments, Book 1, Chapter 1

2.1 Theory

In the standard principal-agent model there are two actors: a principal (the organization) and an agent (the employee). The principal hires the agent to produce output, which is increasing in the effort $e$ exerted by the agent according to $f(.)$ where $f' > 0$ and $f'' < 0$. Effort entails a cost $d(e)$ for the agent, where $d' > 0$, $d'' > 0$. The moral hazard problem arises because effort is unobservable and output also depends on a shock $\epsilon$ with mean 0. Output is thus a noisy signal for effort equal to $f(e) + \epsilon$.

The model provides a stark illustration of the misalignment of interests between the organization and its employee as effort is desirable for the former but costly for the latter.

The principal offers a contract of the form $y(e) = w + bf(e)$ where $w$ is a fixed wage and $bf(e)$ is a performance bonus. The principal chooses $(w, b)$ to maximize:

$$(1 - b)f(e^*(w, b)) - w$$

where $e^*$ solves the agent’s utility maximization problem:
Thus

\[ b \frac{\partial f(e)}{\partial e} = \frac{\partial d(e)}{\partial e} \]

In this stylized world, the agent is solely motivated by performance pay, that is \( e^* = 0 \) (or the minimum feasible level) whenever \( b = 0 \). This follows from the assumption that the effort of the agent only benefits the organization, and that the agent puts no value on this.

Relaxing this assumption requires modifying the utility function of the agent \( U_i \) to capture social interactions, that is how \( i \)'s effort affects the utility of others and how the others' effort, actions or traits affect \( i \)'s own marginal return to effort. We do so by introducing a social interaction function \( S(e_i) \)

\[ U_i = w + b f(e_i) - d(e_i) + S(e_i) \]

Social interactions change the first order condition for \( i \)'s choice of effort as in:

\[ b \frac{\partial f(e_i)}{\partial e_i} + \frac{\partial S(.)}{\partial e_i} = \frac{\partial d(e_i)}{\partial e_i} \]

the second term on the left hand side captures “social incentives”, and it can be negative or positive depending on the nature of the social interaction \( S(.) \) and whether this increases or decreases the marginal benefit of effort.

This simple extension of the principal agent model suggests a taxonomy of social incentives as a function of the identity of the social group and the nature of the interaction \( S(.) \). The social group includes colleagues at different rung of the hierarchy, other social relations outside the organization (family and friends), downstream beneficiaries. \( S(.) \) can take many forms that depend on whether \( i \)'s effort affects others and on his social preferences. For instance, if \( i \)'s effort affects \( j \)'s welfare then \( S_i(.) = \sigma_i U_j(e_i) \), where \( \frac{\partial U_j}{\partial e_i} > 0 \) and \( \sigma_i > 0 \), commonly called the “social preference” parameter, measures the weight agent \( i \) puts on the utility of \( j \). The specification \( S_i(.) = \sigma_i U_j(e_i) \) also captures the case in which the good produced by the organization affects the welfare of beneficiaries outside it and \( i \) puts a positive weight on that. This mirrors Besley and Ghatak (2005) mission preferences where the agent shares the interest of the organization, in this case improving the welfare of the beneficiaries of the service. In both these examples, social interactions affect \( i \)'s effort if and \( i \) “cares” about others and his effort affects their welfare.

Social interactions can affect effort even if \( i \)'s effort does not directly affect others if social preferences are positional, that is if \( i \) cares about how his effort/pay/performance compares
to $j$’s. The literature has focussed on three classes of preferences: inequality aversion, status seeking and envy (for an overview see Sobel (2005)). Inequality aversion or conformity can be modeled as $i$’s utility decreasing in the absolute difference between him and $j$:

$$S(.) = \sigma_{ij} |y_i - y_j|, \sigma_{ij} < 0$$

In contrast, $i$ has status seeking preferences if his utility increases in the difference between him and $j$ but only if this is positive:

$$S(.) = \left\{ \begin{array}{ll}
\sigma_{ij} (y_i - y_j) & \text{with } \sigma_{ij} > 0 \\
0 & \text{if } (y_i - y_j) < 0
\end{array} \right.$$  

Whereas $i$ has envy if his utility decreases in the difference between him and $j$ but only if this difference is negative:

$$S(.) = \left\{ \begin{array}{ll}
0 & \text{if } (y_i - y_j) > 0 \\
\sigma_{ij} (y_i - y_j) & \text{with } \sigma_{ij} < 0 \text{ if } (y_i - y_j) < 0
\end{array} \right.$$  

This simple set up highlights two useful facts. First, that if social preferences are “absolute” then social incentives can arise only if there is a link or externality between $i$’s effort and $j$’s outcomes. Indeed, when $S_i(.) = \sigma_{ij} U_j \frac{\partial S}{\partial e_i} \neq 0$ only if $\frac{\partial U_j}{\partial e_i} \neq 0$. On the contrary, if preferences are relative, social incentives can arise regardless of the existence of such externalities.

Third, the effect of social incentives on the marginal benefit of effort is ambiguous. When preferences are relative its sign depends on the agent’s position relative to others. For instance, agents who are inequality averse will reduce their effort if their outcome is above the norm but increase it if they are below. When preferences are absolute, its sign depends on the sign of the externality the agent creates and the sign of the weight he puts on the welfare of others. If they are equal social incentives increase effort, if they are opposite they reduce it.

### 2.2 Methods

Our aim is to review field evidence on social incentives in organizations. We thus exclude two literatures: field evidence outside organizations- e.g. charitable donations or health seeking behavior- and evidence from the laboratory. Whilst social preferences play an important role in both these literatures, our aim is to study how social preferences shape effort and organizational performance rather than providing evidence on social preferences in general.

Research on social incentives in organizations uses three methods. The first relies on detailed personnel data from real-world organizations combined with a naturally occurring source of variation in social incentives. The second is based on collaborations between researchers and
organizations to evaluate a commonly agreed policy via experimental methods. The third has researchers set up an organization for the purpose of the experiment and hire workers for short term jobs either through university boards or online platforms.

The three methods lie at different points of the trade-off between realism and control. Realism is highest in naturally occurring data and lowest in purpose-build organizations whilst the opposite is true for control, with experiments with real-world organizations falling in between. Three dimensions of realism are particularly relevant for the study of social incentives. The first is the nature of the task: in real world organizations workers perform tasks that are appropriate for their skill level and that constitute their regular day-to-day job while in purpose-built organizations subjects, typically university students, are hired for occasional, low skilled tasks such as cataloguing books, entering data or stuffing envelopes. Performing tasks that do not require much attention might make employees more sensitive to social preferences but the fact that the job is only temporary might make them respond less. The second is the time horizon. Purpose-built organizations tend to be short-lived, employees are subject to different treatments over a short period of time and only short-run responses can be evaluated. This is relevant for social incentives because employees do not have time to establish relationships with other employees or with the employer, and thus the effect of social incentives might be underestimated. The third is that the stakes are much higher, as the employees’ responses to social incentives affect their main source of income and possibly their career in the organization. This might heighten or dampen responses depending on whether these are beneficial or costly in terms of income and career prospects.

The main advantage of creating organizations for the sole purpose of the experiment is that it allows full control: when researchers own the organization they can implement any treatment (subject to ethical constraints) and can closely match the design of the experiment to theory, which allows for a more granular study of mechanisms.

3 Social group I: peers

3.1 Settings without externalities

When the agent’s effort does directly affect the outcomes of his peers social incentives can arise only if the agent has relative preferences. Field experiments that aim to uncover these preferences rely on two sources of variation, either they create actual differences or they inform subjects of naturally occurring differences.

Breza et al. (Forthcoming) and Cohn et al. (2014) are recent examples of the first type. Breza et al. (Forthcoming) collaborate with an Indian manufacturing firm to introduce variation in pay within groups of workers who work together but without complementarities. They randomize teams to receive either the same wages for all workers or heterogeneous wages such
that each team member is paid a different wage. This allows them to identify the effect of relative pay on effort by comparing workers who receive the same absolute wage, but work with co-workers who receive different wages. Workers reduce output by 12% when their co-workers are paid more and they are also 13.5 percentage points less likely to go to work. In contrast, they find no effect when co-workers are paid less. Thus pay inequality demoralizes the weakest workers without boosting the strongest and, as such, it is unambiguously bad for the firm. Interestingly, when workers are given a plausible reason for the pay differences (the fact that they are based on baseline productivity levels) the negative impact on the lowest paid workers disappears.

Cohn et al. (2014) collaborate with a firm that hires workers for one-off sales promotions. Workers worked in groups of two performing identical individual tasks, again without complementarities. The experiment has two stages. In the first stage workers in the same group are paid the same. In the second stage the authors cut either both workers wages by 25% or just one of the two always by 25%. They find that cutting both caused a decrease in performance by 15% relative to the control group whose wages were not cut. In line with the existence of relative preferences, cutting only one group member’s wage by 25% caused a decrease in the performance of the affected workers by 34%.

Blanes i Vidal and Nossol (2011) use the second type of identification, that is they inform workers of their position in the distribution of performance and pay. They find that employees respond positively to the provision of rank information: productivity increases by 7% once the feedback policy is announced and remains at that higher level.

Taken together these papers suggest social incentives are a significant factor that shapes the choice of effort and productivity. The fact that social incentives arise in settings without externalities suggests that workers have relative preferences. Two out of the three papers find a negative effect for the workers at the bottom of the pay or performance distribution while one finds a positive effect throughout. The discrepancy might be due to the fact that workers in Breza et al. (Forthcoming) and Cohn et al. (2014) are hired for a short term job and therefore all repeated games considerations that arise in long term relationships are muted. These might undo any negative effects on pay differentials as shown in Blanes i Vidal and Nossol (2011). Comparing across contexts is of course of limited use as the time horizon is only one of the possible differences driving different responses. Understanding the conditions under which social incentives underpinned by relative preferences can benefit the organization remains an open question for future research.
3.2 Settings with externalities

The 1/N puzzle

The earliest evidence on social incentives in economics came as a by-product of economists’ interest in employee stock options (ESOPs) and profit sharing plans that became popular in the 80s. Using panel data on U.S. and Japanese firms, respectively, both Jones and Kato (1995) and Kruse (1993) show that the adoption of these plans is associated with a 4-5% increase in productivity. For comparison, most of the field and lab experiments that identify the causal impact of individual bonuses on productivity find a 20-25% increase (Bandiera et al., 2017a). The evidence is suggestive of social incentives because, in their absence, profit sharing and ESOPs should be ineffective given that each agent bears the entire cost of her effort while receiving a trivial fraction of the marginal benefit, that is 1/N where N often equals several tens of thousands. The fact that they are correlated with productivity is consistent with the assumption that agents internalize the externality, namely that the numerator is larger than 1 because they value the benefits accruing to others. The nature of the data however does not allow to establish causality.

Following on from this literature, several papers using more detailed data from individual firms uncovered a widespread use of collective/team incentives that cannot be rationalized without social incentives (Hansen, 1997; Gaynor et al., 2004; Griffith and Neely, 2009; Boning et al., 2007; Bartel et al., 2011). Hamilton et al. (2003) identify the effect of shifting from individual production and incentives to team production with team incentives using individual level personnel data from a textile factory. The standard model with selfish agents predicts that team incentives lead to free-riding and lower productivity. In contrast Hamilton et al. (2003) show that productivity increases. This is consistent with social incentives but could equally be driven by the improvement in technology associated with the shift to team production.

Social incentives in personnel data

Two papers exploit precise, high-frequency productivity data from personnel records to isolate the causal effect of social incentives on productivity. Like many of the earlier studies, Bandiera et al. (2005) analyze a setting where the incentive scheme generate an externality between workers but in this case the externality is negative. Their setting is a farm where workers pick fruit in a field with about 40 other workers and their pay equals a piece rate times the quantity of fruit picked (quality adjusted). The piece rate is “relative”, namely it is set by dividing a fixed wage by the average productivity of workers in that field and that day. This scheme creates a negative externality because by exerting effort a worker increases average productivity and lowers the piece rate for everyone in the field. To identify social incentives Bandiera et al. (2005) collaborated with senior management to replace the relative scheme with a standard piece rate
set independently of workers productivity. This allows them to identify social incentives by comparing the productivity of the same workers under the two schemes. Without social incentives, the difference should be nil, because workers do not internalize the effect of their effort on others and thus take the piece rate as fixed in both cases. In contrast Bandiera et al. (2005) find that the productivity of the average worker is 50% higher under the absolute scheme, suggesting that workers were withholding effort when this damaged their colleagues. To quantify the effect of social incentives, Bandiera et al. (2005) calibrate the social preference parameter \( \sigma \) for each worker. They find that \( \sigma > 0 \) for 98% of the workers and that the average worker weighs his colleagues’ pay 2/3 of his own. This implies that while social incentives affect effort choices, they are not strong enough for workers to reach the Pareto optimum.

Mas and Moretti (2009) analyze a setting where workers’ effort generates a positive externality on their colleagues, this time through the production function rather than through the pay scheme. Their setting is a supermarket chain where workers operate cash tills, receive fixed wages and their utility decreases as more customers form a queue at their till. Workers who take on more customers benefit their colleagues because they shorten their queues. Supermarkets stagger the change of shifts to ensure that a large number of tills stay open. This generates groups that differ in innate ability, which Mas and Moretti (2009) exploit to identify the effect of increasing colleagues’ ability on worker’s productivity. They find that the arrival of a fast worker increase the effort of other workers on the same shift by 1 percent. This cannot be explained without some form of social incentive. If workers chose their effort without taking into account the externality on others, the size of the externality should not matter. The fact that workers speed up when the externality they impose on their colleagues is larger (because faster workers would attract more customers, other things equal) suggest that they must internalize the externality to some extent.

**Implications for performance and personnel policies.**

The theoretical framework makes clear that social incentives increase effort and benefit the organization when the externality is positive. While none of the studies compares the behavior of the same workers with different types of externalities, the cross-study comparison is consistent with the theoretical prediction.

Positive externalities are much more common, and all but one of the studies reviewed above examine settings with positive externalities either through the pay scheme (Jones and Kato, 1995; Kruse, 1993; Knez and Simester, 2001), the production function (Mas and Moretti, 2009) or both (Hamilton et al., 2003). In all these cases, the fact that workers internalize the positive externality at least to some extent leads to more effort and higher performance for the organization. The only study with a negative externality (Bandiera et al., 2005) provides a useful falsification test as workers internalize the externality by reducing effort and this reduces
aggregate performance.

These results have implications for the choice of incentive schemes and other personnel policies, by highlighting that their effectiveness depends on the extent to which they leverage social incentives. Bandiera et al. (2005) use their estimates to calibrate the scheme that maximizes profits and show that team pay would lead to 30% higher effort at the same cost to the principal, and this is entirely due to social incentives because there are no complementarities in production.

Implications for social preferences

Besides identifying social incentives, these findings can be used to make inference on the nature of the social preferences that underpin them.

In a case study of profit sharing at Continental Airlines, Knez and Simester (2001) argue that the relevant in-group is the team of workers at the same airport, and that the introduction of a profit sharing scheme improved performance because workers internalized the effect on the pay of their immediate colleagues in the same airport.

Bandiera et al. (2005) collect data on friendship networks among workers. They find that when the pay scheme generates a negative externality, the average worker slows down by 21% if all his friends work on the same field relative to when none of his friends are there. In contrast, the presence of friends has no effect when the pay scheme does not generate an externality. The fact that the extent to which workers internalize the externality depends on the size of the in-group indicates that social preferences are stronger for the members of the in-group. Mas and Moretti (2009) define the in-group on the basis of familiarity, measured by the frequency with which workers work on the same shift. They find that the effects only materialize when familiarity is high, which, again, is consistent with heterogeneous preferences.

Both sets of results are consistent with different motives for social preferences. Workers might have "pure altruism" and care about the welfare of their colleagues, or helping others might give warm glow. Otherwise, they might be selfish but able to sustain cooperation through repeated interaction. Both Mas and Moretti (2009) and Bandiera et al. (2005) exploit variation in visibility to disentangle these alternatives. Bandiera et al. (2005) observe the same workers picking fruit that grows in short plants and fruit that grows in tall shrubs. The cash tills in Mas and Moretti (2009) face sideways so workers can see those in front of them but can only be seen by those behind. Both Bandiera et al. (2005) and Mas and Moretti (2009) find that workers internalize the externality only when their colleagues can see them. This rules out pure altruism and warm glow because visibility does not affect the externality. It is consistent with impure altruism based on reputation concerns and also with the ability to sustain cooperation through repeated interactions. It is important to not that, however, these findings do not imply that visibility is a necessary condition for cooperation. In both the settings analyzed
by Bandiera et al. (2005) and Mas and Moretti (2009), the effect of visibility is identified using within worker variation, so that each worker is exposed to both cases with and without visibility and only cooperates in the former. If there were no visibility at all, it is possible that workers would find ways to monitor each other and cooperate nonetheless.

4 Social group II: bosses and subordinates

4.1 Vertical social groups: bottom-up

The core assumption of the principal agent model is that agents do not internalize the welfare of the organization unless they are paid to do so. This might fail if the agent has social preferences. The literature has focussed on two violations of this assumption: that the agent has reciprocal altruism towards the employer as in models of gift exchange or if he derives utility from fulfilling the mission of the organization. Contrary to the literature on social preferences among peers, there has been no attempt to test whether relative comparisons across the hierarchy affect effort.

Gift Exchange

A well established theoretical literature starting from Akerlof (1982) models the employer-employee relationship as a gift exchange where the employers “buys” the employees’ goodwill by offering good conditions and the latter reciprocate by providing high effort.

The theory of gift exchange has been subject to several tests in the laboratory but field evidence remains slim, especially in organizations that exist independently of the research. Gneezy and List (2006), DellaVigna and Pope (Forthcoming), and DellaVigna et al. (2016) set up their own organizations to test the relevance of gift exchange on the field. They hire workers for tasks ranging from fundraising to stuffing envelopes and generate exogenous variation in wages by randomly offering some workers more than originally agreed. Of the three, only Gneezy and List (2006) find an effect but this turns out to be only temporary.

It is key to note that, however, these ad-hoc organizations are short-lived so that employers and employees do not have the time to establish a reciprocal agreement or to develop social preferences as a consequence of many acts of good will as postulated by Akerlof (1982). We need evidence from long term employment relationships to establish whether this is indeed the case.

Identity and Mission

In an influential line of work, Akerlof and Kranton (2010) highlight the motivating power of identity and show how many commonly used management practices can be ascribed to the
organization’s desire to make the employees belong and therefore care about the success of the organization.

Whilst identity is created once an individual joins an organization in Akerlof and Kranton (2010), in Besley and Ghatak (2005) it emerges as an equilibrium of the matching process between individuals and organizations, as individuals who care about a given mission sort into organizations that pursue that mission.

To provide evidence on “mission incentives”, researchers have followed two strategies. The first consists in setting up an organization for the purpose of the experiment and randomly vary whether workers are offered jobs with a “mission”, typically by changing the identity of the employer from a for profit organization to a charity or NGO. The evidence suggests that social incentives motivate workers, that is workers exert more effort when this benefits a mission they care about (Tonin and Vlassopoulos, 2010, 2015; DellaVigna and Pope, Forthcoming).

The second strategy relies on the collaboration between researchers real world organizations that have a social mission. In this case the nature of the job is fixed but researchers can test whether agents who care more about the mission, exert more effort. For instance, Ashraf et al. (2014) study the motivation and performance of agents hired by a public health organization to sell condoms in Lusaka, Zambia. They measure how much each agent cares about the mission through a lab game and then show that this experimental measure of social preferences is strongly correlated to sales performance.

**Implications for performance and personnel policies.**

Social incentives unambiguously increase effort and the performance of the organization when the employees care about the mission. However, the implications for the effectiveness of financial incentives are not clear-cut. An hypothesis that has received considerable attention in the social science is that the two motives are substitutes, so that financial incentives reduce or “crowd-out” the effect of social incentives. In contrast to the large theoretical and experimental literature (see Bowles and Polania-Reyes, 2012), tests of crowding out in organizations are rare. An exception is Ashraf et al. (2014) who randomly allocate agents to incentive treatments and test whether the effect of these interacts with the agents’ social preferences, measured as described above. Ashraf et al. (2014) find evidence of “crowding in”, that is both financial and non-financial rewards are more effective for agents with stronger social preferences.

Three recent papers test for crowding-out on the extensive margin, that is whether offering financial incentives attracts agents with weaker social preferences. Dal Bó et al. (2013) and Ashraf et al. (2016) randomize the offer of incentives when recruiting civil servants in Mexico and health workers in Zambia, respectively. In both cases the evidence indicates that stronger incentives attract higher quality applicants without displacing social preferences. Deserranno (2017) employs a similar design to hire NGO workers for a job that consists of two tasks: basic
goods sales (soap, oil etc) and health promotion. She finds that stronger financial incentives signal that the sales component is more important and thus attract agents who are more interested in this component and have weaker social preferences.  

4.2 Vertical social groups: top-down

The study of social incentives of individuals at higher levels of the hierarchy towards individuals at lower levels raises the key issue of effort allocation. Indeed, in most cases, agents at the top need to allocate effort or other resources to agents below them and social preferences can affect the allocation in addition to affecting the level. In the appendix we model the level and allocation choice of a manager who manages two workers of different ability and for whom he has different social preferences. The model makes clear that social incentives have an effort boost effect that is always positive, caring about at least one worker makes the manager work harder, and a targeting effect that can be negative if social incentives increase the effort devoted to the worker who is socially connected to the manager at the expense of the more able worker.

The model also makes clear that financial incentives that give the manager a stake in the performance of the organization can ameliorate the negative effects of social incentives.

Three recent papers study whether social incentives affect the behavior of agents who can benefit others within the organization either via the allocation of effort or other resources. The three papers all exploit natural variation in group composition that allows them to observe the same agent when he belongs to the in-group of the agent doing the allocation and when he does not.

Bandiera et al. (2009) study how managers allocate effort across workers in a fruit farm. In their setting, managerial effort makes workers more productive and, as workers are paid piece rates, increases their pay. To identify the effect of social connections they exploit the fact that the same worker is observed working with different managers. They find strong evidence that social incentives are at play: workers’ productivity and pay are 9% higher on days when the worker is managed by a manager she is socially connected to, relative to days when she is managed by someone she is not connected to.

Hjort (2014) analyses social incentives in a flower packing firm in Kenya, where employees belong to rival ethnic groups. Employees work in teams of three where an upstream manager needs to allocate flowers to one of two downstream workers. As in Bandiera et al. (2009), targeting implies higher pay and social incentives are identified off naturally occurring differences in group composition from day to day. Hjort (2014) finds that when downstream workers have different ethnicity, those who share the same ethnicity as the upstream worker earn 24% more.

Xu (2017) studies how the Secretary of State of the British Empire allocated colonies to gov-

1 The fact that with incomplete information incentives can act as signals also explains many instances of crowding-out in laboratory experiments (see Bowles and Polania-Reyes, 2012).
ernors. Salary and amenities vary considerably across colonies and they are positively corre-
lated so that some colonies are strictly preferable to others. These colonies also yield larger
revenues and there is thus a complementarity between the governor’s skill and the colony’s
revenue potential. Xu (2017) finds that social incentives affect allocation: a given governor gets
a more profitable/desirable colony when he is connected to the Secretary of State in charge in
that year.

The three papers find evidence that social incentives shape the allocation of effort and re-
sources in three very different contexts. In all three cases social incentives are underpinned by
partial altruism, as subordinates are favored when they belong to the in-group of the agent in
charge of allocating resources.

**Implications for performance and personnel policies.**

The outstanding question is whether this form of social incentives are good for the organiza-
tion. The theoretical framework makes clear that the answer depends on the balance of three
factors, that is social incentives (i) increase effort towards the in-group, (ii) increases the effec-
tiveness of effort targeted to the in-group and (iii) decrease effort towards the out-group. The
aggregate effect is positive if the first two dominate the third.

To provide evidence, Bandiera et al. (2009) engineer an exogenous change in managerial
incentives that gives managers a bigger stake in the success of the firm by offering them a
bonus based on the productivity of the managed workers. The theoretical framework makes
precise how changes in incentive power \( b \) can be used to sign the effect of social incentives on
the performance of the organization. The intuition is that an increase in \( b \) aligns the interest
of the manager with the organization, thus if devoting more effort to worker 1 is beneficial
to the organization as a whole, increasing \( b \) will increase that effort and vice versa. Bandiera
et al. (2009) find that when managers are offered steeper incentives they reallocate effort from
their socially connected workers to high ability workers, which indicates that their original
allocation did not maximize the firms’ productivity.

Hjort (2014) exploits the fact that he observes teams made entirely of the same ethnicity and
teams made of different ethnicity. Since social incentives are at play only in the latter, he can
identify their effect by comparing the average productivity of ethnically heterogeneous groups
to that of ethnically heterogeneous groups. He finds that the latter are 8% slower, suggesting
that social incentives reduce productivity. The fact that the difference disappears when the firm
changes the incentive scheme so that the upstream worker cannot help his friends downstream
suggests that it was driven by social incentives rather than difference in unobservables between
heterogeneous and homogeneous groups.

Xu (2017) collects measures of colonies’ performance to test whether being connected to the
Secretary makes governors more productive. Since the goal of the governor was to maximize
revenues for the Crown, Xu (2017) collects data on revenues which reveal that governors raise less revenues when connected to the Secretary of State, therefore ruling out that appointments driven by social incentives benefitted the organization. To corroborate this interpretation, Xu (2017) also shows that when allocation rights are shifted from the Secretary to an independent commission, social connections to the Secretary play no role, and the matching between colonies and governors becomes more assortative, that is more effective governors are assigned to better colonies.

Taken together these three papers show that social incentives distort the allocation of effort and this damages productivity. Yet, these are settings in which the tasks workers undertake are relatively simple and thus the benefits of social connections in terms of better communication or enforcement are likely to be small. In settings where these are more relevant the allocative effect of social connections on managerial effort might be beneficial. We present some such evidence below.

5 Social Groups Outside the Organization

5.1 Potential new hires

Besides affecting the welfare of colleagues within the same organization, agent’s effort also affect individuals outside the organization, which includes potential new hires, customers and downstream beneficiaries.

One of the main channels through which employees’ effort affects the welfare of agents outside the organization is through hiring and referrals. The effect of social incentives on hiring and referrals is ambiguous for similar reasons as stated above. When individuals’ preferences display limited altruism, social incentives lead them to hire or refer members of their in-group. Social incentives might be beneficial for the organization if the agent has better information about his in-group or more effective tools to solve the moral hazard problem, but they might be detrimental if they crowd-out a more deserving/ productive out group.

Giuliano et al. (2009) use personnel data from a large U.S. retail firm, to test whether the race of the hiring manager affects the racial composition of new hires. Exploiting manager changes at several stores, they find that managers tend to hire workers of their same race. The main cleavage is between black and non-black, that is black managers are more likely to hire black workers while non-black (white, hispanic and asian) managers are more likely to hire non-black workers. Whilst this is consistent of social incentives underpinned by limited altruism towards a racial in-group, Giuliano et al. (2009) cannot test whether this is beneficial for the firm.

A closely related context is that of job referrals. To test whether social incentives shape referrals, Beaman and Magruder (2012) create short-term jobs in a laboratory in the field in
Kolkata, India and ask their employees to refer others. The relevant in-group in this setting is the extended family, and indeed Beaman and Magruder (2012) find that employees often refer relatives. To test whether social incentives benefit the firm, Beaman and Magruder (2012) vary the power of financial incentives: some employees are randomly offered a flat finders’ fee while others are paid a fee that is positively linked to the performance of the referral. Like Bandiera et al. (2009), strengthening financial incentives aligns the interests of the referee to that of the firm. Beaman and Magruder (2012) find that this leads employees to refer co-workers rather than family members, and that the former perform better. The findings thus suggest that social incentives distort the choice of referrals from high ability workers to family members, and that high powered financial incentives counteract this. This, however, is a setting in which, aside from the financial incentives, the employee who makes the referral does not work with them in the long run, so, by definition, the fact that in-group members might be better able to address the moral hazard problem plays no role here.

We are not aware of any study that tests directly whether the effect of social incentives on referrals benefits the organization but two recent papers show that referred workers are more profitable for the firm than workers hired without referrals, even when the referrers are not offered financial incentives and thus, presumably, their choices are shaped by social incentives. The first is Burks et al. (2015), who use personnel data from nine large firms in three sectors: call centers, trucking and high-tech. They find that compared to non-referred workers, referees workers are more profitable because they are less likely to drop-out and hence they reduce turnover and affiliated costs. The second is Pallais and Sands (2016), who set up a series of field experiments in an on-line labor market to identify the individual channels through which social incentives can benefit the firm. They hire workers on and on-line platform and invite them to provide referrals without offering any reward. They find evidence that employees hired through referrals are of better quality (referrals contain information about the workers’ quality that is not otherwise observable by the employee) and that referred workers performed substantially better when paired with their own referrers.

The evidence suggests that the effect of social incentives goes beyond the borders of the firm as it shapes its hiring policy. There is evidence of limited altruism, as hiring managers and referrers seem to prefer members of their in-group. However, while there is evidence that workers hired through referrals are more productive, we have no direct evidence that this is due to social incentives. What we do know, from one experiment, is that financial incentives that reward the referrer for the productivity of the referred make her refer more productive workers at the expense of family members. More research is needed given the importance of referrals in the job market: In the U.S., one in two jobs are found through referrals (Burks et al., 2015) and the rate is likely to be higher in poorer countries where labor markets are thinner.
5.2 Customers

Besides affecting hiring decisions and therefore the welfare of potential hires, agents in organizations directly affect the welfare of the customers or, in the case of service delivery, beneficiaries. Because of time or stock constraints, agents might favor those in their in-group. This can be beneficial to the organization if, as before, members of the same group can better solve problems deriving from asymmetric information. It can be detrimental if the out-group has a higher willingness to pay or a greater need for the service.

Leonard et al. (2010) use data from 800 outlets of the same US retail chain to test whether the race match between the salesforce and customer base affects sale. In principle, sales representatives might devote more time to customers of their same race but also customers might be more likely to buy from someone of their same race. Using variation of salesforce composition in the same store overtime, Leonard et al. (2010) find very modest effects.

Fisman et al. (2017) use data on individual loans issued by over 4,000 employees of large Indian State Bank over six years. Fisman et al. (2017) exploit the Bank’s rotation policy to test whether loan officers give out more loans when they work in branches whose customers belong to the same religion/ caste group. They find strong evidence of social incentives: the total amount of new loans to borrowers in a religion/ caste group increases by 6.5% when the officer assigned to the branch belongs to the same group. In-group officers also increase the number of new loan recipients by 5.7% and the probability that a member of the group receives any credit by 2.5%. To test whether social incentives benefit the organization, Fisman et al. (2017) track the performance of loans during and after the term of the loan officer. They find that both improve, suggesting that targeting the in-group improves both selection and moral hazard.

The difference in the effect of social incentives in retail and banking is consistent with our simple framework. In retail, adverse selection and moral hazard are irrelevant and there is no constraint on the quantity of goods that can be sold. Thus there is no underpinning for social incentives are there are no benefits or costs to target the in-group. The opposite is true for banking. The comparison between the two sectors thus illustrates that social incentives affects the allocation of goods and services when there is an advantage to the agent or the beneficiaries.

5.3 Beneficiaries

Social incentives can play an important role in the allocation of public services, especially in low income country where delivery is typically delegated to local agents who are embedded in a network of social relationships.

Bandiera et al. (2017a) study how social incentives affects the choices of agents who deliver agricultural extension services (training and improved seeds) in Uganda. The aim of these services is to improve the productivity of the poorest and least productive farmers. To study social
incentives, Bandiera et al. (2017a) collaborate with the implementing NGO to randomly select one out of two eligible candidates for the role of delivery, thus generating random variation in the in-group membership of the farmers.\(^2\)

Bandiera et al. (2017a) find strong evidence that social incentives lead to a redistribution of resources from the out-group to the in-group: as expected, agents put a positive weight on the welfare of their in-group. To investigate what drives social preferences in this context, Bandiera et al. (2017a) tests the hypothesis that conflict generates parochial altruism, namely it increases altruism towards the in-group while at the same time increasing discrimination towards the out-group (Bauer et al., 2016). They show that delivery agents favour their in-group only in villages with political cleavages. In the same villages they discriminate against the out group. This distorts the allocation of services from poor farmers to farmers connected to the delivery agent regardless of their wealth level. Calibration of a simple model reveals that this behavior is consistent with negative altruism or “spite” towards the out-group.

6 Discussion

The study of social relations in the workplace has produced a wealth of evidence that social preferences, whether in structural or reduced form, underpin social incentives, and how these shape the agents’ choice of effort and the performance of the organizations. The studies we review, summarized in Table 1, suggest that social incentives are a key determinant of employee motivation and that they can be used to the benefit of the organization. Three patterns emerge clearly from Table 1. First is that the effect of social incentives on productivity is large. Most studies find effects between 7% and 16%. To put these numbers in context, it is useful to note that financial incentives typically increase productivity by 20% in a wide range of settings (Bandiera et al. (2017b)).

Second, that the effect of social incentives can be positive or negative overall but within cell of our taxonomy one sign generally prevails. In particular, when the social group is made of peers social incentives tend to reduce productivity through positional preferences unless individual effort generates a positive externality for other members of the group (Table 1A). When the social group is vertical, the sign of social incentives depends on whether the externality is excludable, namely whether the agent can target her effort to some and exclude others. When she cannot, social incentives typically increase productivity (Table 1B). When she can, then she might target her ingroup at the expense of a more deserving outgroup, thereby reducing

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\(^2\)Compared to the within agent variation used in all other studies, this design allows to quantify the redistributive effect of social incentives by comparing farmers connected to the winning candidate to those connected to the losing candidate. This comparison is not informative with observational data because connected and non-connected agents differ on unobservables that are likely to be correlated with the outcome of interest. The experimental design overcomes this obstacle by creating a valid counterfactual for connected agents in the absence of connections.
aggregate performance (Tables 1C and 1D).

The third fact is that the evidence suggests that social and financial incentives interact, both positively and negatively, depending on the type of social preferences underpinning social incentives. For instance, when social incentives push the agent to target her ingroup at the expense of a more deserving outgroup, financial incentives can increase the cost of doing so and therefore reduce the net benefit as we found in Bandiera et al. (2009).

To make further progress on social incentives we need more evidence on the root causes of social preferences. Comparing across studies we see that, for instance, envy is more likely to be found in short term anonymous workplaces whereas cooperation seems to prevail in longer term work relationships. Whether cooperation subsequently benefits the organization depends on whether individuals can cooperate with some at the expense of others.

All the evidence is consistent with social incentives stemming from structural parameters of the utility function or the equilibrium outcome of a repeated game among selfish agents, which results in heuristics that look like social preferences in reduced form. Both cases lead to the conclusion that social interactions in the workplace lead to social incentives that shape effort and performance. One piece of evidence that is missing is how employees respond to inequality between layers of the hierarchy. One of the most striking patterns in organizations is the exponential growth of the CEO-worker pay ratio, which, in the US, has increased more than tenfold over the last fifty years; from about 20 in the 60s to over 300 in 2015. Yet, little is known if this has an impact on workers’ productivity through social incentives.

At the core, what is missing is an understanding of how social preferences, in structural or reduced form, are formed and whether they can be shaped by policy. There is some evidence the preferences are somewhat malleable. For instance the favoritism towards employees of the same ethnicity documented by Hjort (2014) became much stronger following contested elections and the violence that followed. Along the same lines, Bandiera et al. (2017a) find that favoritism towards socially connected agents only emerges if there are political cleavages.

Research on the determinants of social preferences is in its infancy. One possibility is that preferences are state-dependent, so the same person can display different preferences in different settings. Laboratory experiments provide considerable support to this idea, starting with Andreoni (95) pathbreaking finding that individuals behaved very differently in the same public good game depending on how this was framed. Whether this holds outside the lab and whether organizations can design policies to leverage social preference, as suggested in Ashraf and Bandiera (2017), is a fruitful avenue for future research.
References


Oriana Bandiera, Greg Fischer, Andrea Prat, and Erina Ytsma. Do women respond less to performance pay? Building evidence from multiple experiments. (11724), January 2017b.


7 Appendix: Top-Down Social Groups and the Allocation Problem

The aim of this section is to set up a simple framework to study the two consequences of social incentives when an agent has social preferences towards her subordinates - or individuals outside the organization - and needs to allocate resources between them. The framework illustrates that social incentives can boost effort but also distort its allocation.

The production function

We set up the simplest possible model that captures the key mechanisms through which social incentives affect productivity. To do so we need a minimum of three agents and a flexible production function that captures both cases of targeting and non-targeting.

The three agents are indexed 0, 1, 2. For simplicity we assume that Agent 0 is not directly involved in production, rather she chooses effort $h_i$ to devote to agent $i=\{1, 2\}$. Agents 1 and 2 could be at another layer of the hierarchy, so that the organization has one agent at the top, the “manager”, and two employees in the bottom rung, but the intuition behind the results also applies to agents at the same level of the hierarchy. Agents 1 and 2 could also be outside the organization, such as potential new hires or customers.

Again, for simplicity, we do not model the choice of effort of agents 1 and 2. Rather we assume they produce output according to $y_i(a_i, H_i)$ where $a_i$ is an innate trait that determines the value of output to the organization such as ability, for instance. We assume $y_a > 0$. $H_i$ is the level of input agent $i$ gets from agent 0, and $y_H > 0$. $H_i$ is a function of the effort agent 0 targets to each agent, that is $H_i = h_i + sh_j$, where $s \in [0, 1]$ measures the fraction of effort targeted to $j$ that affects $i$.

The spillover parameter $s$ is the first of the two key parameters of the model. When $s = 0$ agent 0 can fully target, that is she can direct her effort to $i$ or $j$ without affecting the other. This captures cases such as when a manager teaches a worker a new technique that increases his productivity without spilling over on his colleagues.

When $s = 1$, agent 0 cannot target and all agents benefit (or suffer) equally. This captures cases such as when agents are paid a bonus based on team productivity, as the effort each team member exerts directly increases the pay of all her colleagues on the team, regardless of whether she (or they) wants or not.

Finally, to create a trade-off in the targeting choice of agent 0, we assume that $a$ and $H$ are strategic complements, that is the marginal effect of $H$ is increasing in $a$ ($yaH > 0$).
Contracts and preferences

Agent 0 is paid a bonus \( b \) on total output \( \sum_{i=1}^{2} y_i(a_i, H_i) \). The welfare of agents 1 and 2 is increasing in their individual output, for instance because they are paid piece rates or because higher output increases their chances of promotion. For simplicity, we assume that \( U_i = y_i(a_i, H_i) \) for \( i = 1, 2 \).

Next we specify social preferences. We assume that agent 0 puts a utility weight \( \sigma_i \) on the output of agent \( i \). \( \sigma \) captures social preferences in reduced form, these might stem from pure altruism, warm glow, the ability to sustain cooperation but also spite and hatred. To model partiality of social preferences we set \( \sigma_1 = \sigma, \sigma_2 = g\sigma \), where \( g \in [-\infty, 1] \) is the second key parameter of our framework. \( g = 1 \) implies that preferences are impartial, that is agent 0 cares equally about all the people whose welfare she can affect. We assume that her effort affects those individuals’ welfare equally. \( g = 0 \) implies she cares about one of the agents (in this case, agent 1) only. This captures the idea of limited altruism, a la Tabellini (2008). Finally, \( g < 0 \) implies that she cares about one and spites the other, as in parochial altruism, a la Choi and Bowles (2007) and groupiness a la Kranton et al. (2016).

Finally, we assume that effort entails disutility \( d(h_i, h_j) \), increasing and convex in both arguments. For analytical convenience we solve the problem for \( d(H) = d(h_1 + h_2) \) but qualitative results are robust to alternative forms of the cost function.

Solution

Agent 0 chooses \( h_1, h_2 \) to maximize

\[
b \sum_{i=1}^{2} y_i(a_i, h_i + sh_j) + \sigma_i y_i(a_i, h_i + sh_j) - d(h_1 + h_2)
\]

This yields the FOCs

\[
(b + \sigma)y_{1H_1} + s(b + g\sigma)y_{2H_1} - d_{h_1} = 0 \tag{1}
\]

\[
(b + g\sigma)y_{2H_2} + s(b + \sigma)y_{1H_2} - d_{h_2} = 0 \tag{2}
\]

To assess the impact of social incentives, it is useful to compare 1 and 2 to their equivalent under the standard assumption of selfish agents, that is for \( \sigma = 0 \). These are

\[
by_{1H_1} + sby_{2H_1} - d_{h_1} = 0 \tag{3}
\]
by $H_2 + sby_1H_2 - d_{H_2} = 0$ (4)

Note that in either case, the solution to 1 and 2 (and 3 and 4) is always at a corner. Given that the marginal cost of 1 extra unit of effort devoted to each agent is the same, when $s < 1$ agent 0 targets effort only to agent 1 if the marginal benefit of doing so exceeds the marginal benefit of targeting agent 2. When agent 0 has no social preferences or homogeneous social preferences the condition boils down to $y_{1H} > y_{2H}$, which, given the assumption of strategic complementarity requires $a_1 > a_2$.

The effect of social incentives on effort

Social incentives affect both the level and the allocation of effort. The comparison of 1 and 2 to 3 and 4, reveals that social incentives affect the marginal benefit of effort much alike monetary incentives as the first and second terms are augmented by $\sigma$ and $g\sigma$, respectively. Thus if effort increases productivity ($y_{1H} > 0$) social incentives give a boost to the marginal benefit and raise effort overall.

Second, social incentives affect the allocation of effort if $s < 1$, that is when agent 0 can target her effort to one or the other agent, and if $g < 1$ that is agent 0 has stronger social preferences for one agent. When agent 0 has no social preferences or homogeneous social preferences she targets agent 1 iff $y_{1H} > y_{2H}$, which, given the assumption of strategic complementarity requires $a_1 > a_2$. When agent 0 has heterogeneous social preferences the condition is $y_{1H} > \frac{b+g\sigma}{b+\sigma}y_{2H}$, where $\frac{b+g\sigma}{b+\sigma} < 1$. This implies that there is a value of $a$, denote it by $\hat{a}$, such that for $\hat{a} < a_1 < a_2$ we have $\frac{b+g\sigma}{b+\sigma}y_{2H} < y_{1H} < y_{2H}$ and social incentives distort the allocation of effort towards the less productive but better connected agent.

Figure 1 summarizes these patterns. The figure is divided into 4 cells that account for the 4 possible combinations of $g$ and $s$. Panel A reports the first order conditions under each parameter combination while panel B report the sign of the level and allocation effects as well as their net effect. Two points are of note. First, misallocation only arises if agent 0 can target her effort and she wants to do so, that is when $s < 1$ and $g < 1$. This is the only case in which the effect of social incentives is ambiguous because the positive level effect is counteracted by the negative allocation effect. Second, when effort cannot be targeted or preferences are heterogeneous social incentives increase effort as long as this benefits agents 1 and 2. Intuitively, if effort hurts them and agent 0 puts a positive weight on their utility, she can only help by exerting less effort.
A. First order conditions

<table>
<thead>
<tr>
<th>s=1</th>
<th>g&lt;1 heterogeneous SP</th>
<th>g=1 homogeneous SP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Good</td>
<td>((b+\sigma)y_{1H} + (b+g\sigma)y_{2H} - d_n = 0)</td>
<td>((b+\sigma)y_{1H} + y_{2H} - d_n = 0)</td>
</tr>
<tr>
<td>Private Good</td>
<td>((b+\sigma)y_{1H} + s(b+g\sigma)y_{2H} - d_n = 0)</td>
<td>((b+\sigma)y_{1H} + s(b+\sigma)y_{2H} - d_n = 0)</td>
</tr>
</tbody>
</table>

B. Predictions

<table>
<thead>
<tr>
<th>dy/dH</th>
<th>(s&gt;0, g&lt;1) – heterogeneous SP</th>
<th>(s&gt;0, g=1) – homogeneous SP</th>
</tr>
</thead>
</table>
| s=1  | • Effort boost (+)  
| | • Misallocation (0)  
| +    | • Effort drop (-)  
| | • Misallocation (0)  
| -    | • Effort drop (-)  
| | • Misallocation (0)  
| s<1  | • Effort boost (+)  
| | • Misallocation (-)  
| +    | \(s<1\), can target effort  
| | \(g<1\), prefers one agent  
| s<1  | • Effort boost (+)  
| | • Misallocation (0)  
| +    | \(s<1\), can target effort  
| | \(g=1\), cares equally  

30
<table>
<thead>
<tr>
<th>Reference</th>
<th>Organization</th>
<th>Principal + time horizon</th>
<th>Study details</th>
<th>Findings</th>
<th>Implications for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breza et al, 2017</td>
<td>Manufacturing firm, India</td>
<td>Researchers: 35 days</td>
<td>Seasonal workers, hired daily, Three team-members</td>
<td>Randomise workers into equal pay teams (3 wage levels) and unequal pay teams</td>
<td>Workers with lower relative pay are less likely to show up for work and conditional on working they are 12% slower. Workers with higher pay are unaffected. Effect disappears when pay differentials are justified. Envy Negative Incentives that create “unfair” inequality can demotivate low productivity workers</td>
</tr>
<tr>
<td>Cohn et al, 2014</td>
<td>Sale agency, Germany</td>
<td>Researchers: 4 days</td>
<td>Individuals hired for a one-off sale promotion, Two team-members</td>
<td>Randomise workers between three groups: no pay cut, uniform pay cut, uneven pay cut. Uniform pay cut reduces both workers productivity by 15%, uneven pay cut reduces the productivity of the affected worker by 34%, thus envy reduces productivity by 15%</td>
<td>Envy Negative See above</td>
</tr>
<tr>
<td>Blanes i Vidal &amp; Nossol, 2011</td>
<td>Retail and wholesale organization, Germany</td>
<td>Organisation: 3 years</td>
<td>Full-time warehouse workers, None</td>
<td>Natural variation in feedback policy on productivity and pay rank</td>
<td>Workers increase productivity by 7% as soon as the feedback policy is announced, the increase is sustained for at least 3 months. Rat race/status seeking Positive Incentives that create competition among peers can increase productivity</td>
</tr>
<tr>
<td>Bandera et al, 2005</td>
<td>Fruit farm, UK</td>
<td>Organisation: 3.5 months</td>
<td>Seasonal workers, hired daily over 4 months, About 40 pickers on the same field, Negative under the relative incentive regime, None under the piece rate regime. Natural variation in group composition + experimental variation in incentive scheme</td>
<td>Worker productivity is 50% lower under relative incentives relative to piece rates, and even lower if group contains several friends. Altruism/cooperation Negative Incentives that create negative externalities backfire if agents internalise the externalities</td>
<td></td>
</tr>
<tr>
<td>Mas and Moretti, 2009</td>
<td>Supermarket chain, US</td>
<td>Organisation: 2 years per store</td>
<td>Cashiers paid hourly by number of shifts, About 7 cashiers on duty per 10 minute interval, Positive: faster cashiers shorten the queues at their colleagues' tills. Natural variation in group composition by ability and familiarity</td>
<td>Worker productivity is 1% higher when a worker with above average productivity enters the shift, relative to a below average worker. Effect is 6-7% when worker already on duty is more familiar with entering cashier. Altruism/cooperation Positive Incentives that create positive externalities on teammembers might be more effective than individual incentives</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Study details</td>
<td>Findings</td>
<td>Social preferences</td>
<td>Performance</td>
<td>Financial incentives</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>DellaVigna et al., 2016</td>
<td>Randomise order of choice session: 2nd session randomise between 4 gift schemes: constant charity donation; positive or negative monetary, and influence.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
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<td>None</td>
</tr>
<tr>
<td></td>
<td>Productivity increases by 13% with lump-sum donation, relative to no donation.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Randomised 3 pay schemes at 2nd session: no change, baseline pay plus donation, or performance-based donation to charity.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Productivity increases by 13% with lump-sum donation, relative to no donation.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Randomised 4 pay schemes: constant pay over sessions, positive or negative monetary, and influence.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Productivity increases by 13% with lump-sum donation, relative to no donation.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Randomised into 2 treatments that span varying piece rates (4 treatments in total).</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Productivity increases by 13% with lump-sum donation, relative to no donation.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Randomised into 4 treatments: no treatments, large financial incentives, large non-financial reward (status), large non-financial reward (opportunity)</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Productivity increases by 13% with lump-sum donation, relative to no donation.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
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<td></td>
<td>Randomised into 2 treatments: positive or negative monetary, and influence.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
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<td></td>
<td>Productivity increases by 13% with lump-sum donation, relative to no donation.</td>
<td>Preferences for the social mission, positive changes in financial incentives.</td>
<td>Positive</td>
<td>None</td>
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<tr>
<td></td>
<td>Randomised into 4 treatments: no treatments, large financial incentives, large non-financial reward (status), large non-financial reward (opportunity)</td>
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<td>Preferences for the social mission, positive changes in financial incentives.</td>
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<td>Productivity increases by 13% with lump-sum donation, relative to no donation.</td>
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<td>Randomised into 2 treatments: positive or negative monetary, and influence.</td>
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The effect of both the financial and non-financial incentives are stronger for those pro-socially motivated actors.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Organization</th>
<th>Study details</th>
<th>Findings</th>
<th>Implications for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandiera et al.,</td>
<td>Fruit farm, UK</td>
<td>About 20 other pickers on same field and manager, who may be neighbor of or same nationality as worker</td>
<td>Natural variation in days with in-group manager due to rotation policy; experimentally vary manager pay between fixed wage and performance-based pay. When managers receive fixed wage, workers are 9% more productive on days when they are connected relative to days when they are not. Effect disappears when managers are paid performance bonuses, as they reallocate effort to high ability unconnected workers.</td>
<td>Latroism towards in-group</td>
</tr>
<tr>
<td>2009</td>
<td>Organisation; 4 months</td>
<td>Seasonal fruit pickers hired for 1 season (about 100 days)</td>
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<tr>
<td>Hjort, 2014</td>
<td>Flower packaging plant, Kenya</td>
<td>Three team members, who may be co-ethnic with worker</td>
<td>Natural variation in ethnic composition of teams due to rotation policy; also exploits exogenous political conflict due to election and change in pay scheme to piece rate for team output. Relative to homogenous teams, output is 0% lower when upstream worker is not co-ethnic with downstream workers; in horizontally mixed teams, output of non co-ethnic worker is 10% lower but output of co-ethnic worker is 7% higher. Political conflict decreased output of mixed teams by 4%-7%. Team pay post-conflict increased output in horizontally mixed teams by 4%.</td>
<td>Altruism towards in-group &amp; spite towards outgroup</td>
</tr>
<tr>
<td></td>
<td>Organisation; 2 years</td>
<td>Residential flower packagers</td>
<td></td>
<td></td>
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<tr>
<td>Xu, 2017</td>
<td>Colonial Office of the British</td>
<td>Secretary of state, who may share schooling or family with Governor</td>
<td>Electoral turnover in Secretary of State creates variation in social connections of sitting governors; law passed during study period limited discretionary appointments. During period when patronage is allowed, a well-connected Governor in a given position generates 4% less annual revenue, and spends 9% less on tax collection and 11% less on public works; he receives 10% higher salary, driven by transfers to higher paid governorships. These effects disappear after law preventing patronage is passed.</td>
<td>Altruism towards in-group</td>
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<td>Empire, UK</td>
<td>Secretary of state; about 110 years</td>
<td>Governors appointed to lead colonies</td>
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<td>Reference</td>
<td>Organization</td>
<td>Principal + time horizon</td>
<td>Agents</td>
<td>Social group</td>
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<tr>
<td>Giuliano et al., 2009</td>
<td>Retail chain, US</td>
<td>Organization; 30 months</td>
<td>New hires for entry level part-time sales positions</td>
<td>Manager, who may be same race/ethnicity as worker</td>
</tr>
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<td>Bauman and Magruder, 2012</td>
<td>Lab, India</td>
<td>Researcher; 2 days</td>
<td>Individuals hired for one day of lab task; may return with a referral who does same task</td>
<td>Participant and his referral</td>
</tr>
<tr>
<td>Palais and Sands, 2016</td>
<td>Online labor market, Philippines</td>
<td>Researcher; 5-6 days per experiment</td>
<td>Individuals hired for short-term lab tasks</td>
<td>Participant and his referral or partner</td>
</tr>
<tr>
<td>Buirks et al., 2015</td>
<td>Call centers, Tech firm, US</td>
<td>Organisation; 4-5 years</td>
<td>Applicants and new hires for full-time jobs</td>
<td>None</td>
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<tr>
<td>Leonard et al., 2010</td>
<td>Retail chain, US</td>
<td>Organization; 30 months</td>
<td>Part-time sales employees</td>
<td>Customer base, which may be predominantly same ethnicity/race as worker</td>
</tr>
<tr>
<td>Fisman et al., 2017</td>
<td>State-owned bank, India</td>
<td>Organisation; 5 years</td>
<td>Borrowers</td>
<td>Branch officers, who may be of same religion or caste as borrower</td>
</tr>
<tr>
<td>Bendor et al., 2017</td>
<td>BRAC, Uganda</td>
<td>Organisation</td>
<td>Delivery agents of an agricultural extension program (seeds and training)</td>
<td>Connected farmers in the village</td>
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