Motivating Whistleblowers*

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Abstract

Law-breaking activities within an organization benefiting the firm at the expense of the general public are widespread but difficult to uncover, making whistleblowing by employees highly desirable. We employ a novel laboratory experiment to investigate if and how monetary incentives and expectations of social approval or disapproval, and their interactions, affect the decision to blow the whistle. Experimental results show that: i) financial rewards significantly increase the likelihood of whistleblowing and do not substantially crowd out non-monetary motivations activated by expectations of social judgment; and ii) public scrutiny and social judgment decrease (increase) whistleblowing when the public is unaware (aware) of the negative externalities generated by fraud, suggesting that whistleblowers are highly responsive to expectations of social approval or disapproval. Our findings suggest that whistleblowers on corporate fraud should be financially rewarded and their identity should be shielded from public/media scrutiny. We also find evidence of an interesting relationship between political orientation and social judgment: while left-leaning subjects react to the possibility of receiving social approval or disapproval as expected, right-leaning people are unaffected by it.

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1 Introduction

Corporate fraud is widespread around the world. A recent survey of over 6000 organizations across 115 countries (2016 Global Crime Survey)[1] shows that one in three organizations, both worldwide and in the US, experienced fraud in the past 24 months, prevalently in the form of asset misappropriation, cybercrime, corruption, as well as procurement and accounting fraud. About 35% of the surveyed firms reported fraud-related losses exceeding $100,000, and 14% of firms reported losses above $1 million.[2] Dyck, Morse and Zingales (2013) estimated that between 1996 and 2004, about 15% of large[3] publicly traded US corporations engaged in fraud. The estimated expected annual cost of fraud for these firms amounts to a staggering $380 billion.

Due to their informational advantage, by blowing the whistle employees could potentially play a crucial role in uncovering illegal behavior and initiating internal or external investigations. However, while particular cases of whistleblowing have garnered the attention of the popular press in recent years, from the Enron scandal to the Snowden and Wikileaks-related cases, whistleblowing by employees is actually uncommon. Dyck, Morse and Zingales (2010) analyze 216 securities class action lawsuits filed against large US corporations and find that only about 18% of them were brought forward by an employee. Given the high costs associated with blowing the whistle – ranging from coworkers' disapproval and ostracism to lack of career advancement, job loss and outright harassment (e.g., Miceli and Near, 1994; Rothschild and Miethe, 1999) – this rarity is unsurprising.[4] Psychological costs caused by conflicting moral norms – loyalty toward the firm on the one hand, and fairness or justice concerns on the other – may also make employees reluctant to report wrongdoing taking place within their organization (Waytz, Dungan and Young, 2013). Fear of media scrutiny or public disapproval might further reduce employees' willingness to blow the whistle. Alternatively, if the expectation is of public approval, media or public scrutiny might actually increase whistleblowing, a possibility we discuss below.

In this paper, we experimentally investigate the effectiveness of different policies that might motivate individuals to report illegal activities taking place within an organization. We focus on both monetary and non-monetary incentives. In particular, we ask whether whistleblowers should be financially rewarded and whether they should be shielded from media scrutiny and social judgment. Moreover, we ask whether different sectors or different kinds of fraud require different policies, depending on whether the social costs generated by fraud are or are not visible and salient to the public – consider Medicare fraud versus insider trading – as suggested by recent legal theory (e.g., Engstrom, 2014b).

The issue of associating monetary incentives to whistleblowing is the topic of a controversial debate, which has intensified following the 2007-2009 Great financial crisis. On the one hand, in 2010 the US enacted the Dodd-Frank Act that, among other things, allowed whistleblowers to receive financial bounties for bringing information to the Securities and Exchange Commission (SEC) or the Commodity Futures Trading Commission (CFTC).[5] On the other hand, across the Atlantic, regulatory agencies re-

[1] https://www.pwc.com/gx/en/economic-crime-survey/pdf/GlobalEconomicCrimeSurvey2016.pdf

[2] Taking into account that most cases of fraud go undetected and that firms self-selecting into a global crime survey are likely to be "cleaner" than those selecting out, the above numbers undoubtedly underestimate the current state of the corporate world.

[3] "Large" is defined by having assets exceeding $750 million.

[4] Many of these forms of retaliation – including, for example, lack of promotion – are sufficiently opaque to escape whistleblower protection laws, and the Ethics Resource Center (2014) reports a steady increase across time in the percentage of whistleblowers facing retaliation.

[5] The US is a pioneer in the enactment on laws and provisions that protect and reward whistleblowers. In 1986, the US strengthened provision of the False Claims Act (FCA), originally passed by Congress in 1863 and signed by President Abraham Lincoln to fight government fraud, allowing among other things for the qui tam, or whistleblower, provisions. It allows any individual or non-governmental organization to file an FCA lawsuit on behalf of the US Government and, if

main strongly opposed to financially rewarding whistleblowers,[6] even though US agencies consider them a great success[7] and the available empirical research (Dyck, Morse, and Zingales, 2010) suggests that they are indeed effective motivators of whistleblowing.[8]

The issue of protecting corporate whistleblowers from media scrutiny and social judgment has not yet been discussed by law-makers or the media, but we think it is an important one to address scientifically, given its potential impact on individuals' willingness to report illegal acts.[9] In fact, a vast theoretical and experimental literature has shown that individuals' behavior is highly responsive to the possibility of social observability and judgment (e.g., Andreoni and Bernheim, 2009; Andreoni and Petrie, 2004; Ariely et al., 2009; Benabou and Tirole, 2006; Carpenter and Myer, 2010; Gerber et al., 2008; Linardi and McConnell, 2011; Xiao and Houser, 2011), therefore suggesting that public scrutiny is likely to have a significant effect on whistleblowing. However, should we expect this effect to be positive or negative? The answer may depend on how whistleblowers expect to be perceived by the public: will they be seen as snitches or as heroes? This may depend on how salient the social costs of manager malfeasance are to the public. For instance, in 1971 economist Daniel Ellsberg leaked the Pentagon papers concerning US involvement in Vietnam. He is widely viewed as a hero, which may be in part due to the salience of the (literal, physical) public harm associated with this controversial war. Public opinion is much more divided on Edward Snowden, who is seen by few as a hero and by many as a traitor. Perhaps not coincidentally, the public harm revealed by Snowden is more diffuse, distant and difficult to quantify.

An additional factor that may affect how whistleblowers are (or expect to be) perceived by the public is the presence of financial rewards. If whistleblowers get remunerated for their reporting, this may change (their expectations of) the public judgment of the morality of their actions, turning them from *heroes* to *greedy snitches*. In other words, financial rewards may crowd out non-monetary motivations driven by expectations of social approval (Benabou and Tirole, 2006); therefore, the impact of financial rewards on whistleblowing may be lower in the presence of social judgment. Studying how financial rewards and expectations of social approval or disapproval interact in incentivizing (or decentivizing) whistleblowing is therefore important and is one of the primary aims of our study.

In order to identify the impact of financial rewards and social judgment, and their interaction, on whistleblowing in a controlled setting where we can carefully measure individuals' willingness to report corporate wrongdoing, we employ a novel framed laboratory experiment that simulates the relationships between employees and managers within a firm. In our basic set-up, managers have the chance to engage in law-breaking behavior to benefit themselves and their employees at the expense of other subjects

successful, to obtain up to 30% of recoveries plus fines. Another early whistleblower reward scheme targeting tax evasion is the one run by the IRS, which was substantially strengthened in 2006.

[6] In the UK, for example, the two main financial market watchdogs – the Bank of England's Prudential Supervision Authority and the Financial Conduct Authorities – gave a joint, strongly negative response in 2014 to a request for opinion from the financial market committee of the UK parliament on the possibility of rewarding whistleblowers, even arguing, incorrectly, that: "There is as yet no empirical evidence of incentives leading to an increase in the number or quality of disclosures received by the regulators."

[7] The SEC reported in 2015 that they received 4000 tips from whistleblowers, an increase of 30% from 2012, with steady growth since 2011 probably resulting from increased awareness of the law. According to the IRS, their whistleblower program has helped to recover $3 billion since 2007, with $343 million recovered in 2013 and $310 million in 2014 (IRS, 2015).

[8] Dyck, Morse, and Zingales (2010) calculated that in sectors where the False Claim Act does not allow employees to obtain a financial reward, corporate fraud is unveiled by employees in 14% of the cases, while this percentage more than doubles (to 41%) when the False Claim Act can be applied, a highly significant difference. A series of articles published in top law journals (Engstrom, 2012, 2013, 2014a) also show empirically that several concerns about distortions linked to the False Claim Act are not justified in the light of the available evidence.

[9] There do not seem to be clear and unanimous directives on whether the identity of whistleblowers should be safeguarded from the media and, more generally, the public. For instance, in the US, the investigations conducted by the Security and Exchange Commission (SEC) protect the identity of whistleblowers, whereas investigations conducted under the False Claim Act expose whistleblowers by requiring them to file a court case.

playing the role of members of the public. Employees, who are not victims but rather beneficiaries of the manager's illicit behavior, are given the option of blowing the whistle on their manager. Whistleblowing leads to the automatic imposition of a monetary penalty on the manager. Across treatments, we manipulate the presence of both financial rewards for, and social judgment of, whistleblowers. In particular, in some treatments whistleblowing entails a net cost to the employee, while in other treatments whistleblowing engenders a net financial gain. To test whether non-monetary motives such as aversion to social disapproval or desire for social approval play a role in whistleblowing, in some treatments potential whistleblowers are informed that participants assigned the role of member of the public are allowed to send costless judgmental messages – in the form of smiley or frowny faces – to employees who choose to blow the whistle. To induce variation in employees' expectations of positive or negative public judgment, we also manipulate across treatments whether members of the public are aware of the costs imposed on them by manager malfeasance. This variation also allows us to investigate whether financial rewards and social judgment, and their interaction, have a different impact on whistleblowing, and therefore are differently desirable or undesirable, when applied to different kinds of fraud or different industries.

Our results provide strong support for whistleblower rewards: overall, employees are significantly more likely to blow the whistle when doing so entails a personal financial gain. Our findings on how social judgment affects whistleblowing confirm our expectations. When the public is made aware of the costs imposed on them by manager misbehavior, the possibility of social judgment increases the likelihood of whistleblowing. The opposite is true when the public does not know about the extent to which they have been personally harmed by corporate fraud. Together, these patterns are consistent with whistleblowers having an aversion to social disapproval and with the idea that the visibility of the social costs of fraud affects whistleblowers' expectations of how they will be judged by the public. Contrary to the crowding-out hypothesis, we do not find that financial rewards are less effective when whistleblowers are subject to social judgment. We also find that whistleblowers are not judged more negatively if they receive monetary compensation for their reporting.

As an interesting ancillary result, we find that political orientation significantly affects individuals' responsiveness to incentives: while both right-leaning and left-leaning subjects respond to financial incentives, only left-leaning participants seem to be concerned about social approval or disapproval and therefore behave differently in the presence or absence of public judgment. In order to test the robustness of this findings we replicated the experiment at a university characterized by a prevalently right-leaning subject pool, as opposed to the prevalently left-leaning student sample that participated in the original experiment. The results confirm the existence of the identified relationship between political orientation and responsiveness to social observability and judgment.

Overall, our investigation provides novel and important insights for the design and implementation of whistleblowing policies. Our findings suggest that financially rewarding whistleblowers is broadly effective and therefore generally desirable; that protecting whistleblowers from public judgment is desirable in industries where the social costs of corporate misbehavior are less transparent or salient to the general public; and that financial rewards are not less effective when whistleblowers are exposed to social judgment.

The remainder of the paper is organized as follows. Section 2 reviews the literature on whistleblowing. Section 3 describes the experiment and presents our hypotheses. Section 4 reports our empirical findings and Section 5 concludes.

2 Literature Review

While there exist a number of theoretical economic analyses of whistleblowing (Spagnolo, 2004; Aubert et al., 2006; Friebel and Guriev, 2012; and Felli and Hortala-Vallve, 2016), empirical studies are rare and typically suffer from fundamental measurement and identification challenges, as only illegal behavior that has been uncovered and only whistles that have been blown can be observed. Consequently, existing studies focus on either the infringements that have been discovered (e.g., Dyck et al., 2010) or use scenario-based survey data (e.g., Feldman and Lobel, 2010). Measurement and identification issues have led to a recent surge of experimental studies on whistleblowing. Laboratory experiments are particularly valuable, as they allow researchers to directly observe both wrongdoing and whistleblowing, and to measure responsiveness to changes in incentives in a controlled environment.

One of the first whistleblowers experiments is by Reuben and Stephenson (2013), who examine individuals' willingness to report team members after observing them cheat while knowing that blowing the whistle would cause the whole group to be penalized. More recently, Carpenter et al. (2017) experimentally investigate peer reporting within a firm and find that sharing profits with employees may effectively incentivize individuals to blow the whistle against shirking co-workers.

Bartuli et al. (2016) study whistleblowing in an experimental context that is closer to ours, i.e. a setting where: i) the potential whistleblower is an employee that benefits from the wrongdoing of the manager; ii) such wrongdoing generates losses to a third party; and iii) blowing the whistle is costly. However, while we are interested in testing policies aimed at incentivizing whistleblowing, Bartuli et al. (2016) aim to identify personality traits that are more likely to lead to whistleblowing.[10] Similarly, Waytz et al. (2013) use survey questions to investigate the relationship between propensity to blow the whistle and a specific individual trait: the subjective valuation of fairness/justice over loyalty.

The experimental study most closely related to ours is by Schmolke and Utikal (2016), who investigate whistleblowing in a neutrally framed environment where one subject may increase his payoff at the cost of increasing inequality among other players who can then report this behavior to a third subject, the potential whistleblower. Blowing the whistle leads to punishment and redistribution of payoffs to restore initial conditions. The authors study the effects of rewards for, versus fines for not, blowing the whistle and find that even modest monetary rewards increase the probability of whistleblowing. While the experiment has other interesting treatments,[11] it does not investigate the role that expectations of social approval or disapproval may play in the whistleblowing decision, and how they may interact with financial incentives.

More tangentially related to our study is the well-developed literature on whistleblowing in the context of illegal cartel formation among firms. Apesteguia, Dufwenberg and Selten (2007) were the first to study leniency and rewards to whistleblowers in an experiment on illegal cartel formation in the context of static Bertrand competition. Their results suggest that rewarding whistleblowers increases the likelihood of whistleblowing without reducing market prices. In a repeated game version of an analogous experiment, Bigoni et al. (2012) find that offering a monetary reward to the first whistleblower leads to high reporting rates that strongly deter cartel formation as predicted by theory (Spagnolo 2004, 2008). A number of other experimental studies focus on the effectiveness of leniency policies providing amnesty or

[10] They find that employees who are more altruistic and more concerned about ethical issues are more likely to blow the whistle. For survey-based studies of personality and whistleblowing, see also Miceli and Near (1992, 1994) and Feldman and Lobel (2010).

[11] They manipulate whether and how the reporting subject and the enforcing authority are positively or negatively affected by the first subject's decision.

asymmetric legal treatment to accomplice-witnesses that blow the whistle against collusion without the use of monetary rewards, including Hamaguchi et al. (2009), Hinloopen and Soetevent (2008), Bigoni et al. (2015), and Cotten and Santore (2016).

Somewhat less directly related to our study is another growing strand of experimental literature that investigates whistleblowing in the context of corrupt transactions between public officials and citizens/firms. For instance, Abbink and Wu (2017) simulate both one-shot and repeated transactions between firms and public officials where firms can obtain illegal services through the payment of a bribe. They find that whistleblower amnesty and monetary rewards strongly deter illegal transactions in a one-shot setting, but that deterrence is limited in repeated relationships. Abbink et al. (2014), Buckenmaieret et al. (2017), Schikora (2011) and Serra (2012) find similar results with amnesty alone. Breuer (2013) studies the effects of financial rewards for whistleblowers in a laboratory experiment on tax evasion and finds a strong positive effect of rewards on subjects' willingness to blow the whistle on the tax declaration of another subject and little evidence of crowding out of non-monetary motivations.

In sum, the existing literature – whether it simulates a firm environment, illegal cartel formation or corrupt transactions – has mainly focused on the effect of financial rewards and/or amnesty on the propensity to report wrongdoing, or on the deterrence effects of whistleblowing on wrongdoing. While we also investigate the effect of financial rewards on whistleblowing, our main contribution to the literature is threefold. First and foremost, we examine how non-monetary motivations in the form of expectations of public approval or disapproval affect the propensity to blow the whistle against somebody that is in a position of power and whose law-breaking benefited the potential whistleblower. This is a largely unexplored question. In fact, while there is a growing literature on how social observability and judgment affect behavior (e.g., Andreoni and Bernheim, 2009; Andreoni and Petrie, 2004; Ariely et al., 2009; Benabou and Tirole, 2006; Gerber et al., 2008; Linardi and McConnell, 2011; Salmon and Serra, 2017; Xiao and Houser, 2011; see also the overview provided by Bursztyn and Jensen, forthcoming), to the best of our knowledge there are no studies investigating the relationship between whistleblowing and public judgment. This is an important relationship, as the results of our analysis have the potential to inform policy about whether and in what contexts protecting whistleblowers from public scrutiny is desirable. Second, we ask whether different kinds of wrongdoing, possibly taking place in different industries, require different kinds of policies. In particular, we differentiate between cases of fraud generating negative externalities to society that are easily visible to the public and cases of fraud involving social costs that are less transparent or salient to the public, and consider whether the effects of financial and non-financial incentives differ across these contexts. Finally, our study sheds light on whether financial rewards may be less effective if whistleblowers are exposed to public/media scrutiny, i.e., whether they may induce the public to view whistleblowers more as *snitches* than as *heroes*.

3 The Experiment

3.1 Design

At the beginning of the experiment, participants are randomly assigned either the role of "member of a firm" or the role of "member of the public." Each firm is made of three subjects, and while multiple firms participate in each session, firms operate independently from each other. In other words, there is no interaction between firms and the payoffs of each firm member are determined solely by the actions that take place within their firm. There are 6 participants playing as members of the public, i.e., double

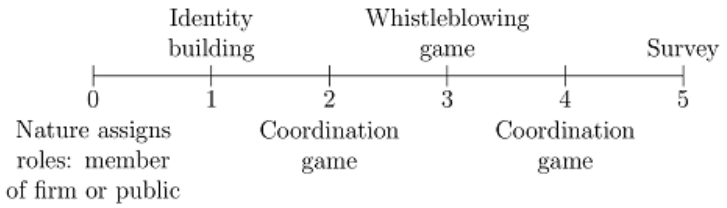


Figure 1: The stages of the experiment

the number of the members of any given firm. This is to recreate in the lab the standard case where the "society" that may be negatively affected by corporate fraud is larger than the firm engaging in it.

The experiment consists of four stages, only one of which is randomly chosen for payment at the end of the experimental session. Figure 1 displays the experimental stages.

Since loyalty to the firm and to one's manager is an important feature of work within organizations and a potential obstacle to the decision to report wrongdoing (Waytz et al., 2013), stage one was designed to induce a sense of identity and social cohesion among each firm's members. In this stage, the three members of each firm engage in a series of team-building tasks with interdependent payoffs to create a sense of "shared fate," a feature which has been shown to induce a common identity (Ashforth and Mael, 1989). The first task is the Kandinsky and Klee painting elicitation module first developed in Tajfel et al. (1971), in which subjects view a series of paintings and guess whether each of them is a Klee or a Kandinsky. Each individual gets credit if at least one member of the firm guesses correctly. The second task consists of a series of addition problems. As before, each member of the firm earns money for each problem that at least one member of the firm solves correctly. The third task involves a series of multiplication problems, each of which involves multiplying two two-digit numbers. Individual payoffs are determined as in the previous team-building tasks. The members of the public engage in the same three tasks but their payoffs are determined exclusively by their own performance. At the end of each task, firm members are informed of their own performance and the overall firm performance, which generates their earnings. Members of the public are informed only of their own performance.

Stage two consists of a one-shot minimum-effort coordination game aimed at measuring the within-firm cohesion ideally resulting from stage one. Each member of a firm plays the game with the other two members, while each member of the public plays the game with two other members of the public. Participants choose a level of effort between 110 and 170, with their payoffs being determined by the difference between the minimum effort chosen in the group and their own effort multiplied by 0.75. Subjects are not informed of the outcome of this game and the resulting earnings until the end of the experimental session.

In stage three, participants play the Whistleblowing Game. Subjects retain the role of either member of the firm or member of the public. Within each firm, one participant is randomly chosen to be the "manager" and the remaining two participants are assigned the role of "employees."[12] By having two

[12] We chose the role allocation to be done randomly rather than based on individual performance in stage one as we wanted to have enough variation in CEOs' decisions to break the law. Since such a decision is likely to be correlated with CEO's ability, role allocation by merit would have likely resulted in low frequency of law breaking.

employees of identical status and a manager, we aim to simulate most organizational set-ups where multiple individuals have the same tasks and respond to the same high-ranked supervisor or manager.[13]

The employees engage in a real-effort task consisting of adding two-digit numbers, as in task two of stage one of the experiment. Each correct answer generates private earnings at a piece rate of 2 ECU and also contributes to a firm fund at a piece rate of 1 ECU.[14] There are a total of 12 problems per employee, resulting in maximum private earnings of 24 ECU per employee and a maximum firm fund of, also, 24 ECU. The firm fund is later distributed back to the manager (one half of the fund) and the employees (one fourth each).

The manager gets a fixed wage of 24 ECU and has the chance to double the firm's fund by engaging in a more difficult real-effort task (multiplying two-digit numbers, as in task three of stage one of the experiment) and answering at least eight of the 12 problems correctly. Alternatively, the manager can augment the fund by "breaking the law." The manager is informed that breaking the law generates money for the firm but causes a monetary loss of 2 ECU to each of the six members of the public. Our payoff configuration implies that, as in real organizations, the manager always makes more money than the employees,[15] and his or her performance, whether through legal or illegal practices, may add significant value to the firm and therefore benefit the employees.

As before, members of the public are only involved in individual decision-making. They have an initial endowment of 14 ECU and, like the employees, they engage in a real-effort task consisting of adding two-digit numbers. The task generates 2 ECU for each correct answer. However, their final earnings also depend on the rule-breaking choice of the managers of the firms in the session, since each manager's wrongdoing causes a loss of 2 ECU to each member of the public.

Note that the decision to break the law would be socially efficient only if the manager were not able to augment the fund by successfully completing the multiplication task and if the firm fund were larger than 12 ECU. If the employees jointly generate a firm fund of 12 ECU, law-breaking behavior by a low-ability manager would generate a firm surplus of 12 ECU while also generating a societal loss of 12 ECU. A high-ability manager's decision to break the law is always socially inefficient. This is because a high-ability manager would always be able to solve the multiplication task correctly, thus generating the firm surplus without any negative externalities on society. In order to keep the manager's decision to break the law comparable across firms and independent of efficiency concerns, we do not reveal the size of the firm fund to the manager before eliciting his or her decision to break the law.

We measure employees' willingness to blow the whistle by using the strategy elicitation method. We ask each employee within a firm whether they would blow the whistle if they found out that their manager broke the law. Blowing the whistle requires the employee to pay a monetary cost of 5 ECU and imposes a monetary penalty of 14 ECU on a law-breaking manager. Our use of the strategy method allows us to record each employee's willingness to report his or her manager wrongdoing irrespective of whether the manager actually breaks the law. Had reporting been directly elicited, each employee's whistleblowing decision would have been conditional on the actual occurrence of law-breaking, compromising comparability across employees and resulting in fewer data points.[16] We compute final earnings within a firm

[13] We also aimed to reduce each employee's competitive feelings and inequality aversion toward the manager. Moreover, having two rather than one employee per firm doubles the number of (potential) whistleblower observations per session.

[14] Experimental currency units (ECU) were exchanged for dollars at the end of the experiment at the rate of 2 ECU per \$1, as described below.

[15] Note that the manager's wage equals the private earnings of the employee if the employee is highly productive, i.e. he or she solves all 12 problems correctly. Even in this case, the manager ends up with higher earnings, since he or she receives half of the firm fund versus the one-fourth received by the employee.

[16] Whether and to what extent the strategy elicitation affects observed behavior is the subject of ongoing debate. While

by randomly choosing one of the two employees in the firm and implementing the stated whistleblowing decision conditional on the matched manager's behavior. With this design choice, we purposely abstract from the potential presence of collective action problems in the decision to blow the whistle and from the need to control for subject behavior and expectations in such a strategic situation. These aspects have been analyzed in other contexts (see, e.g., Bigoni et al. 2012, 2015) and would have increased complexity and noise in the measuring of the effects we are interested in here.

Stage four concludes the remunerated portion of the experiment with a minimum-effort coordination game identical to the game subjects played in stage two. The purpose of this game is to identify the effects of the decisions made in the whistleblowing game – i.e., the manager's law-breaking decision and the employees' reporting decisions – on firm cohesion.

After participating in the experiment, subjects fill out a survey. As part of the survey, all subjects are presented with four actual whistleblowing cases that differ both in the extent to which the negative externalities caused by the illegal behavior are visible to the public and in the presence of financial rewards for whistleblowers. The four cases are the Snowden case, the Enron case, the UBS case and the Tenet case.[17] We chose these cases because the visibility of negative externalities varies substantially across the cases, as do the financial incentives for the whistleblowers involved. Through the survey we also measure political orientation by asking subjects to place themselves on a political spectrum of 0 to 10, where higher numbers correspond to more right-leaning preferences.

3.2 Treatments

We employ three treatment variations by manipulating the presence of financial rewards for whistleblowers, whether whistleblowers are exposed to social judgment, and whether the members of the public are aware of the negative externalities that the manager's illegal actions generate on them.

1. *Reward* vs. *No Reward*: In the No Reward condition, whistleblowing employees bear a cost of 5 ECU, while in the Reward condition an employee that blows the whistle against his or her manager also receives a financial reward of 10 ECU (i.e., whistleblowing results in a net financial gain of 5 ECU for the employee). All participants in the game. i.e., managers, employees and members of the public, are made aware of the cost associated with whistleblowing as well as the financial reward (in the Reward treatment).

2. *Social Judgment* vs. *No Social Judgment*: Under Social Judgment, members of the public are given the chance to send messages of approval or disapproval to whistleblowers. These messages take the form of a smiley face, a frowny face or a neutral face. Each member of the public can also choose to send no message at all to whistleblowers. Sending a message comes at no cost to the member of the public and does not lead to any monetary reward or penalty for the whistleblower. Crucially, employees are also informed, before they make their reporting decision, that each member of the public will be able to send one of these messages to an employee who chooses to blow the whistle.

the evidence is mixed, a recent survey of the experimental literature by Brandts and Charness (2011) found no cases of treatment effects generated when using the strategy method not observed when employing the direct-response method.

[17] For information on the Snowden case, see: https://www.nytimes.com/2014/01/02/opinion/edward-snowden-whistle-blower.html?_r=0. For the Enron case, see: http://news.bbc.co.uk/2/hi/business/5335214.stm. For the UBS case, see: http://www.wsj.com/articles/SB10000872396390444017504577645412614237708. For information on the Tenet case, see: http://www.corporatecrimereporter.com/news/200/tenet-healthcare-to-pay-514-million-gets-non-prosecution-agreement-two-units-with-no-assets-to-plead-guilty.

	Invisible Externalities		Visible Externalities		Total	
Treatments	Sessions	Subjects	Sessions	Subjects	Sessions	Subjects
No Rewards & No Judgment	2	33	2	36	4	69
No Rewards & Social Judgment	2	36	2	39	4	75
Rewards & No Judgment	3	60	2	36	5	96
Rewards & Social Judgment	2	36	3	48	5	84
Total	9	165	9	159	18	324

Table 1: Summary of experimental sessions and treatments.

By contrast, in the No Social Judgment treatment, the public is informed of whistleblowing but cannot send messages of any kind to the whistleblower.

3. *Visible* vs. *Invisible Externalities*: Under Visible Externalities, the members of the public are made aware of the monetary losses they suffer (or could suffer) due to each manager's illegal actions. In other words, they are informed about the exact payoff configuration resulting from the game, i.e., they know that, in addition of their initial endowment, they earn 2 ECU for each problem they solve correctly, and they lose 2 ECU for each manager that engages in law-breaking. In contrast, under Invisible Externalities the members of the public are informed that managers of firms can engage in wrongdoing, and they are told whether they did or did not, but they do not know that such wrongdoing affects their own earnings negatively. We achieve this by not disclosing to members of the public exactly how much they could earn from each correctly solved problem while they engage in the task. We tell them that they will earn money for the task and will be informed how much they made at the end. Members of firms are aware of the fact that the members of the public do (under Visible Externalities) or do not (under Invisible Externalities) know about the monetary losses that they may suffer due to managers' law-breaking behavior.

The interactions between our three treatment manipulations generate eight experimental conditions, as shown in Table 1.

3.3 Implementation

We conducted 18 sessions involving 324 participants at the University of California, Santa Barbara's Experimental and Behavioral Economics laboratory (EBEL), as shown in Table 1. Each subject participated in only one session and one treatment. In each session, 6 subjects were randomly assigned the role of members of the public (MPs) and between 6 and 18 subjects were randomly assigned the role of members of a firm, for a total of between 2 and 6 firms per session. Members of each firm made decisions independently from all the other firms participating in a session.

In referring to subject roles, the experimental environment and available actions, we used the same contextual labels we used in Section 2.1 when describing the game. We chose to implement a framed experiment because, as recently discussed in Alekseev, Charness and Gneezy (2016), psychological and social factors may play a significant role in individuals' decisions to engage in and report on unlawful behavior and, in such situations, framing may help subjects more fully understand the decision-making context.[18]

[18] Framing effects have been found in a large set of pro-social games, including public goods games (Andreoni, 1995;

The experiment consisted of four stages plus a questionnaire. Subjects were presented with the instructions for each stage on their computer screen immediately before that stage began. Only one randomly selected stage of the experiment was used for actual payments. Experimental earnings were converted from ECUs to dollars at the exchange rate of $1 for 2 ECU. The experiment was programmed in z-Tree (Fischbacher, 2007) and subjects were recruited among pre-registered UCSB students using ORSEE (Greiner, 2015). In order to guarantee anonymity, at the beginning of each session subjects were randomly assigned an identification number, which they kept for the duration of the experiment. At no point during the experiment did we ask subjects to reveal their names and, although actual names were used during the payment process for accounting purposes, we informed subjects that we would not register their names and therefore would not be able to link them to the choices made in the experiment. Each session lasted between 60 and 90 minutes, with average earnings of $29 per subject (including a $10 show-up fee).

3.4 Predictions

In order to generate our predictions, we need to make assumptions on employees' motives for blowing the whistle. Recall that reporting wrongdoing is costly. Therefore, under the assumption that individuals are motivated purely by monetary incentives, we should see no whistleblowing in the absence of financial rewards, irrespective of the other treatment manipulations. Our first prediction follows.

Prediction 1 *Prediction 1: If individuals are purely money maximizers, financial rewards will increase the likelihood that an employee will blow the whistle. The effectiveness of financial rewards will be the same across the social judgment and visibility treatments.*

A slightly weaker assumption is that while individuals still care only about monetary incentives, they care about both their own and others' earnings. In these purely distributional social preferences models (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Charness and Rabin, 2002), predictions will vary by model when considering actions or contexts that change any individual's earnings. However, for contextual changes that leave all individuals' earnings unchanged, all of these models predict no change in behavior. Since the earnings consequences of whistleblowing for all parties are the same irrespective of whether negative externalities are visible to the public or whether whistleblowers are subject to public scrutiny, we have a second prediction.

Prediction 2 *: If individuals exhibit purely distributional social preferences, conditional on the presence or absence of rewards, whistleblowing propensity will be the same in the No Social Judgment treatments as in the Social Judgment treatments, and the same in the Visible Externalities as in the Invisible Externalities treatments.*

The act of whistleblowing itself does have distributional consequences in our experiment—it reduces the most highly remunerated individual's earnings (the manager) while either increasing (Rewards) or decreasing (No Rewards) the whistleblowing employee's earnings. We are unable to make clear ex ante

Cookson 2000; Rege and Telle 2004; among the others) and dictator games (Eckel and Grossman, 1996; Brañas-Garza, 2007). For a recent study of how frames significantly affect first- and second-order beliefs, see Dufwenberg, Gächter, and Hennig-Schmidt (2011). Alekseev, Charness and Gneezy (2016) provide a recent review of experiments employing either abstract or meaningful frames to present the decision-making setting to the experimental subjects. Their general finding is that "evocative language either does not affect behavior or affects it in a desirable way by evoking the desired emotional response."

predictions about how these distributional consequences will affect the prevalence of whistleblowing, however, even in the case of simple inequality aversion (Fehr and Schmidt, 1999) because our payoff parameters allow whistleblowing to either increase or decrease inequality depending on employee performance and the presence of whistleblower rewards.[19]

Additional predictions are generated if we allow individuals' behavior to reflect an endogenous mix of monetary incentives and non-pecuniary motivations linked to expectations of social approval or disapproval. Our experimental treatments manipulate factors which we believe will affect how whistleblowing is perceived by members of the public, and use this variation to make predictions. In particular, we assume that the public is more likely to perceive whistleblowing as a pro-social act when it is aware of the harm associated with manager misbehavior. Intuitively, when members of the public are aware that they are being harmed by the firm, they are more likely to want the manager to be punished and, consequently, to socially reward the whistleblower for triggering such punishment. If, instead, the public does not feel directly affected by the manager's wrongdoing, it is possible that it will perceive the whistleblower as somebody who decided to run afoul of the widespread moral norm of group loyalty[20] and commit an anti-social act, leading to social disapproval. In other words, the visibility of the negative externalities to the public is likely to affect whistleblowers' beliefs about how they will be perceived and judged by the public if they do blow the whistle, i.e., as heroes if the externalities are visible and as snitches if they are not visible. These assumptions lead to our third prediction.

Prediction 3 *: If individuals have a preference for social approval or an aversion to social disapproval, allowing for social judgment will increase whistleblowing in our Visible Externalities treatments relative to our Invisible Externalities treatments.*

Next, we consider an interaction between monetary incentives and responsiveness to social judgment. If the desire to be viewed positively by the public factors heavily into an individual's decision to blow the whistle, then adding monetary incentives may backfire and "crowd out" that decision. This is because adding financial rewards may affect the public's perception of the motives behind whistleblowing and, consequently, change the way whistleblowers are judged by the public. Either more or less whistleblowing is possible after offering financial incentives—the net effect depends on the relative weights individuals place on (increased) monetary incentives versus (reduced) non-pecuniary incentives linked to social approval—so we have no prediction overall. However, one might expect the magnitude of the reduction in non-pecuniary incentives to be larger when whistleblowing was originally a stronger signal of intrinsic pro-sociality. In our context, this corresponds to the negative externalities of fraud being visible to the public. This leads to our last prediction.

[19] To see this, consider the situation where both employees perform as well as possible and suppose distributional social preferences incorporate only the individual employee's and the manager's earnings. Before whistleblowing, the employee's earnings would be (12 problems) X (2 ECU) + (1/4) X (24 ECU) = 30 ECU, while the manager's earnings would be 24 ECU + (1/2) X (24 ECU) = 36 ECU, so inequality would be 6 ECU in favor of the manager. In the *Rewards* treatment, if the manager breaks the law an employee who blows the whistle would end up with earnings of 35 ECU while the manager would earn 36 ECU – 14 ECU = 22 ECU post-penalty. Consequently, whistleblowing would *increase* inequality from 6 ECU in favor of the manager to 12 ECU in favor of the employee. In the *No Rewards* treatment, whistleblowing puts the employee ahead by 3 ECU (25 ECU vs. 22 ECU) instead of behind by 6 ECU. Since rewards would therefore increase the employee's earnings and inequality conditional on whistleblowing, commonly stipulated distributional preferences such as inequality aversion would tend to reduce the effectiveness of financial rewards.

[20] In our discussion, we are abstracting from the concerns that individuals may have about the social judgment that they would receive from their fellow firm members. A plausible assumption is that employees prefer to appear loyal to fellow firm members while also wanting to appear pro-social to members of the public, especially if they are subject to public judgment. When the negative externalities caused by fraud are visible to the public, loyalty toward firm members and preferences for social approval from members of the public pull employees in different directions. When the negative externalities are invisible to the public, both motivations steer employees away from blowing the whistle.

Prediction 4 *: If individuals value social approval and negative externalities are visible to the public, then financial incentives may be less effective at eliciting additional whistleblowing when whistleblowers are subject to social judgment than when they are shielded from it.*

Finally, we expect individuals' political orientation to impact both whistleblowing and social judgment of whistleblowers, although we do not have clear predictions on the sign of the impact. We hypothesize that the left-leaning respondents, by being more concerned about social justice issues (Demel et al., 2016, and Fisman et al., 2016), may be more likely to be whistleblowers out of concern for the members of the public suffering the social costs of corporate fraud. However, it could also be the case that the right-leaning subjects, by being more concerned with rule of law and law-breaking (Skitka and Tetlock, 1993; Graham et al., 2012) would be more likely to blow the whistle in order to punish such violations.

4 Results

We start by assessing the extent to which we were able to create social ties between members of the same firm in the stage one's tasks that preceded the whistleblowing game. As a measure of the resulting within-firm cohesion, we use the minimum effort chosen by members of a firm in the coordination game in stage two that followed our team-building tasks. A comparison of the average minimum effort chosen by members of a firm and the average minimum effort chosen by members of the public, who did not engage in team-building tasks,[21] provides strong evidence of induced firm cohesion. The minimum effort chosen within firms is significantly higher than the minimum effort chosen by members of the public (123.94 vs. 119.21; two-sided t-test p-value of 0.0003).[22] This finding suggests that we were successful in generating social cohesion and, possibly, in-group loyalty among members of a firm.

In what follows, we present and discuss the core results of the paper: the effects of our treatments on employees' willingness to blow the whistle against their manager (Section 4.1). We then present our findings with respect to the public's approval or disapproval of whistleblowers under the different treatments (Section 4.2). We conclude by describing managers' law-breaking behavior across treatments (Section 4.3).

4.1 The decision to blow the whistle

Overall, about 33% of employees decided to blow the whistle against their law-breaking managers. There is considerable variation across treatments, with the percentage of whistleblowers ranging from 6% to 61%, as shown in Figure 2 and Table 2. Since the Visible Externalities and the Invisible Externalities treatments simulate different types of illegal actions or different industries where the damages generated by fraud to the public are either more or less difficult to identify, we present the results obtained under the two settings separately.

[21] As explained in Section 3.1, during the team-building stage of the experiment (stage one) members of the public engaged in the same tasks as the members of a firm, but their payoffs were determined solely by their individual performance in these tasks.

[22] In the game, each member of a three-person group had to choose an effort level in the [110, 170] range, with payoffs being determined by: [minimum effort in the group – 0.75*(own effort)].

	No Rewards & No Judgment	No Rewards & Social Judgment	Rewards & No Judgment	Rewards & Social Judgment
Invisble Externalities	21.43%	6.25%	60.71%	31.25%
H_0: No Judgment = Judgment	p-value =0.222 (0.249) if Rewards=0		p-value = 0.060 (0.058) if Rewards=1	
H_0: Reward = No Reward	p-value = 0.016 (0.018) if Judgment=0		p-value = 0.070 (0.086) if Judgment=1	
Visible Externalities	25.00%	22.22%	18.75%	55.00%
H_0: No Judgment = Judgment	p-value = 0.849 (0.583) if Rewards=0		p-value = 0.027 (0.029) if Rewards=1	
H_0: Reward = No Reward	p-value = 0.669 (0.550) if Judgment=0		p-value = 0.039 (0.041) if Judgment=1	

Note: P-values are generated by Chi-square tests. P-values from Fisher exact tests in parentheses.

Table 2: Whistleblowing under different treatments

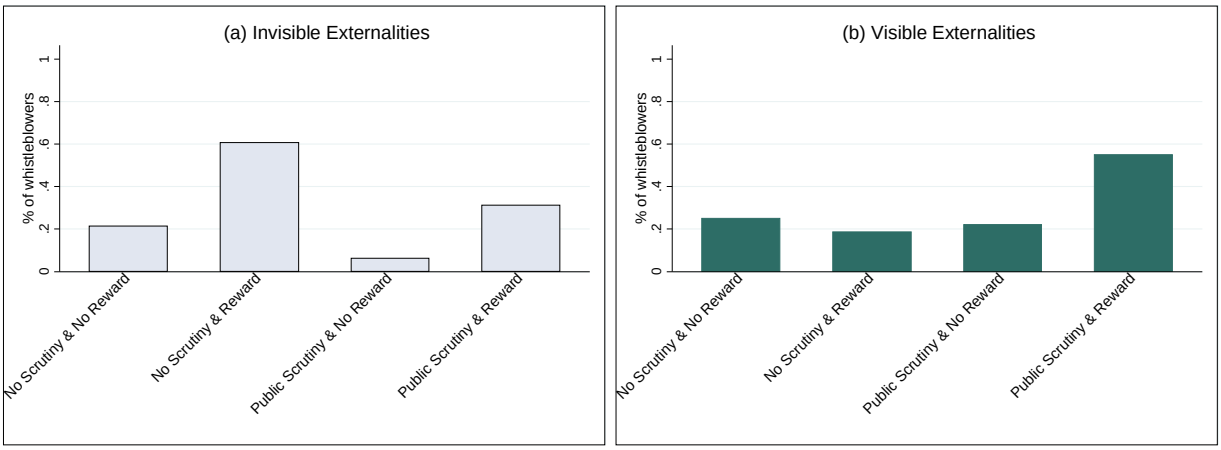


Figure 2: The effect of rewards and social judgment on whistleblowing

A number of important results emerge from Figure 2 and Table 2. First, the presence of financial rewards seems to generally and substantially increase the prevalence of whistleblowing. This holds both when whistleblowers are subject to social judgment and when they are not. The sole exception, to which we return towards the end of this section, is that financial rewards are ineffective when the externalities caused by fraud are visible to the public and whistleblowers are shielded from social approval or disapproval. These observations lead to our first result.

Result 1 *: We can reject the notion that employees are purely money maximizers, as whistleblowing is prevalent even when financially costly and it varies substantially with contextual variables having no direct earnings consequences.*

Our first result implies that we are justified in our desire to take into account non-pecuniary motivations when setting policies with regard to whistleblowing. The simplest widely used models of such motivations among economists are purely distributional preferences models. However, this simple class of models apparently cannot capture important features of whistleblowers' motivations as, contradicting our second prediction, there is clear and substantial variation in behavior across treatments where whistleblowing has identical distributional consequences (e.g., comparing the No Judgment, Reward, Invisible treatment to Social Judgment, Reward, Invisible). This leads to our second result.

Result 2 *: We can also reject the idea that whistleblowers have purely distributional social preferences, as there is significant variation in whistleblowing propensity across treatments in which whistleblowing yields identical earnings distributions.*

Considering non-monetary, non-distributional motivations, a plausible conjecture is that a preference for social approval and/or an aversion to social disapproval factor heavily into pro-social behaviors like whistleblowing. If individuals care about social approval, then as explained above in Prediction 3, we would expect public scrutiny to have a different effect on whistleblowing depending on the visibility to the public of the costs imposed on them by manager malfeasance. In particular, when negative externalities are visible to the public, the possibility of social judgment, through expectations of social approval, should generally increase employees' willingness to blow the whistle, whereas when negative externalities are not visible to the public, social judgment should generally decrease whistleblowing, possibly because whistleblowers expect to receive messages of social disapproval. The observed behavior is mostly consistent with this pattern, as is discernible from Figure 2 and Table 2 by considering all pairwise comparisons of the forms (–, –, No Judgment) and (–, –, Social Judgment). The lone exception, which we discuss at the end of this section, occurs when negative externalities are visible to the public but there are no whistleblower rewards.

Result 3 *: Our data are largely consistent with Prediction 3. When the public is made aware of the costs imposed on them by manager malfeasance, the possibility of social judgment tends to increase whistleblowing while, when these negative externalities are not visible, it tends to decrease whistleblowing.*

In other words, Result 3 suggests that individuals in our experiment directly value social (dis)approval and expect social approval to be more likely when the public realizes manager malfeasance directly harms them, and social disapproval to be more likely when whistleblowing is more likely to be interpreted as an anti-social act (disloyalty toward the firm).

Moving beyond simple pairwise comparisons, in Table 3 we report marginal effects from a probit model estimate where the dependent variable is a dummy equal to 1 if the employee is willing to blow the whistle and 0 otherwise. In the first two columns, we split our data by the visibility of negative externalities for clarity, as behavior was substantially different across this dimension. In column 3, we pool our data across all treatments and include interaction terms between the Reward and Social Judgment treatment dummies and the Visible Externality dummy. In column 4, we additionally include a set of control variables that include demographics (age and gender), whether the subject is an economics major and the number of firms in the session. In order to proxy for employees' loyalty to the firm, our set of controls also includes the ratio between firm performance and own performance in stage one of the experiment and the effort level chosen in the minimum effort game of stage two. The former variable captures the extent to which each employee may feel "indebted" to the other firm members for the earnings accumulated during the team-building stage, while the latter variable is a measure of firm cohesion, plausibly capturing trust and cooperation among firm members. Finally, we include a measure of political orientation generated by our post-experiment survey. We asked subjects where they would place themselves on the left-right spectrum, using a scale from 0 to 10, with higher numbers indicating more right-leaning preferences. The average response among subjects in the role of employees was 3.625 (3.80 in the full UCSB sample), indicating a moderately left-leaning sample. We employ a dummy for left-leaning, which takes the value of 1 if the respondent answered 0, 1, 2, 3 or 4. This dummy is equal

	Dep. Variable:				
	Dummy equal to 1 if employee is willing to blow the whistle, 0 otherwise				
	Invisible Ext.	Visible Ext.	All	All	All
Rewards	0.34***	0.15	0.35***	0.34***	0.29***
	(0.000)	(0.111)	(0.000)	(0.000)	(0.001)
Social Judgment	-0.26***	0.17*	-0.26***	-0.23**	-0.29*
	(0.000)	(0.070)	(0.000)	(0.014)	(0.078)
Visible Externalities			-0.07	-0.02	0.08
			(0.575)	(0.890)	(0.306)
Visible x Reward			-0.20*	-0.20*	-0.34***
			(0.079)	(0.089)	(0.000)
Visible x Social Judgment			0.46***	0.41***	0.22
			(0.000)	(0.003)	(0.224)
Social Judgment x Reward					0.11
					(0.541)
Judgment x Reward x Visible					0.39*
					(0.366)
Controls	No	No	No	Yes	Yes
Observations	74	70	144	144	144

Note: We report marginal effects. Controls are: age, gender, economics major, left-leaning political preferences, number of firms in the session, ratio between firm performance and own performance in team building task, and effort chosen in minimum effort task. In column 5, the number of firms in the session and being an economics major are significant at the 90 percent confident level, with a positive and a negative sign, respectively. Robust standard errors are clustered at the session level. p-values, in parentheses; *** p<0.01, * * p<0.05, * p<0.1.

Table 3: Treatment effects

to 1 for 56% of our participants.[23] In the final column, for completeness we include a triple interaction term involving all of our treatment dummies.

The second pattern that becomes more apparent in Table 3 is that rewards have a substantial and statistically significant main effect. In all estimates except for column 2, the marginal effect of financial rewards is to increase the prevalence of whistleblowing by about 30 percentage points when the negative externalities of fraud are not visible to the public. Even when the externalities are visible to the public (column 2), the estimated marginal effect is positive and large in magnitude, albeit non-significant (p-value=0.11). This is confirmed by the estimates in columns 3 to 5. In particular, column 5 confirm that rewards are effective under invisible externalities and absent social judgment (first row), and no less effective in the presence of social judgment (row 6). Moreover, the combination of rewards with social judgment and visibility of negative externalities caused by fraud further increase the likelihood of whistleblowing (row 7).

Result 4 *: Financial rewards generally substantially increase whistleblowing.*

From Table 3 we can also reconfirm our impression of how the visibility of public harm interacts with social judgment to affect whistleblowing. In particular, either by considering Visible and Invisible treatments separately (columns 1 and 2) or by pooling the data and inspecting the estimated interactions between treatments, we can see that the possibility of social judgment substantially and significantly decreases whistleblowing when the public is unaware of the costs imposed on them by manager malfeasance.

[23] We employ the dummy rather than the continuous political orientation variable to permit comparability with analysis in a later section, where we split our sample by political orientation and analyze whistleblowing by right- and left-leaning participants separately.

When these externalities are clear to the public, on the other hand, the possibility of social judgment increases whistleblowing substantially and, typically, significantly. All together, Table 3 (re)confirms that our data support Prediction 3.

Next, we consider our fourth prediction, that, overall, there should be a weaker relationship between rewards and whistleblowing when the act is subject to social judgment compared to when it is not. Evidence in support of Prediction 4 would be a negative and significant interaction between the treatment dummies Social Judgment and Reward, as this would indicate that social judgment reduces the effectiveness of financial rewards. Since this estimated interaction (column 5) is positive, substantial in magnitude, but non-significant, our data provide little support for this effect. Moreover, the positive and significant coefficient of the triple interaction between Public, Reward and Externalities suggests that, contrary to Prediction 4, crowding out of non-pecuniary motivations linked to expectations of social approval does not occur when the externalities are visible to the public either; on the contrary, financial rewards seem to be even more effective when the public is aware of the costs generated by firm fraud, and whistleblowers are subject to social judgment.

Result 5 *: Social judgment does not weaken the effect of financial rewards, i.e., we find no evidence of crowding-out of non-pecuniary motivations linked to expectations of social (dis)approval.*

Interestingly, however, we do find evidence for a different type of crowding out. The negative and (sometimes marginally) significant interaction between Visible Externalities and Reward suggests that, absent social judgment, rewards are less effective in industries or cases of fraud where the public feels that it is directly affected by managers' law-breaking behavior. This pattern is also apparent in Figure 2, when comparing the first two bars in the left panel to the same two bars in the right panel: rewards strongly increase whistleblowing when whistleblowing is not subject to social judgment in the invisible externalities case, but have little effect when externalities are visible. Thus, even in the absence of social judgment, externality visibility alters the effect of financial rewards. Since we did not design our experiment to focus on this type of crowding out, we can only speculate about the underlying mechanism. One possibility is that individuals' *intrinsic* motivations associated with whistleblowing are higher when the externalities are visible to the public; in this case, the introduction of financial rewards, absent public scrutiny, crowds out these motivations, resulting in an overall null effect of rewards. Another possibility is that the moral environment is more complex than we have been assuming and that, for example, whistleblowers learn about their own motivations through their actions – they "self-signal", in the terminology of Benabou and Tirole (2006). In this setting, when the whistleblower knows that the public is not aware of the costs imposed on them, blowing the whistle simply expresses a preference for justice or fairness – punishing the manager for bad behavior. When the whistleblower knows the public is aware of the harm imposed on them, motivations become more difficult to disentangle and, in particular, the "choosing sides" aspect – i.e., empathizing more with the public than with the in-group (firm) – becomes more salient. Abstaining from whistleblowing would then become a self-signal about loyalty to the firm, made stronger by forgoing financial rewards, so that we would expect the patterns observed in the data.

4.2 Firm Cohesion and the Interaction between Political Orientation and Public Scrutiny

To conclude our analysis of whistleblowing, we now assess the effects that manager law-breaking and employee whistleblowing may have on firm cohesion, and we explore the relationship between propensity

	Dep. Variable: Dummy equal to 1 if employee is willing to blow the whistle, 0 otherwise			
	Right-leaning	Left-leaning	Right-leaning	Left-leaning
	(1)	(2)	(3)	(4)
Rewards	0.26	0.36***	0.28*	0.28**
	(0.244)	(0.000)	(0.087)	(0.021)
Social Judgment	-0.24	-0.93***	-0.22	-0.93***
	(0.331)	(0.000)	(0.290)	(0.000)
Visible Externalities	0.09	0.03	0.40	0.09
	(0.737)	(0.625)	(0.279)	(0.251)
Visible x Reward	-0.40	-0.27***	-0.48*	-0.23**
	(0.174)	(0.001)	(0.052)	(0.038)
Visible x Social Judgment	0.41	0.98***	-0.01	0.98***
	(0.208)	(0.000)	(0.988)	(0.000)
Social Judgment x Reward	0.16	0.93	0.23	0.98
	(0.562)	(.)	(0.330)	(.)
Judgment x Reward x Visible	0.07	-0.28***	0.40	-0.21***
	(0.863)	(0.000)	(0.425)	(0.010)
Controls	No	No	Yes	Yes
Observations	63	81	63	81

We report marginal effects. Controls are: age, gender, economics major, left-leaning political preferences, number of firms in the session, ratio between firm performance and own performance in team building task, and effort chosen chosen in minimum effort task. In column 4, the number of firms in the session and being an economics major are significant at the 90 percent confident level, with a positive and anegative sign, respectively. Robust standard errors are clustered at the session level. p-values, in parentheses; *** p<0.01, * * p<0.05, * p<0.1.

Table 4: Political Orientation and Response to Treatments

to blow the whistle, social judgment and political orientation. To pursue the first objective, we assess changes in within-firm behavior in the minimum effort games played before and after the whistleblowing game. The before-after comparison shows a significant decline in the minimum effort observed within firms (123.94 vs. 121.72, with a two-sided t test p-value of 0.0075). In contrast, no significant change is observed among members of the public (119.21 vs. 119.11, with p-value equal to 0.9132). A closer look at the data shows that rule-breaking managers significantly increase their chosen effort in the stage four coordination game, while whistleblowers tend to reduce their effort (albeit not significantly). However, the low rate of actual occurrence of whistleblowing[24] makes it impossible to investigate the consequences of whistleblowing on the relationships between members of a firm.[25]

As discussed in Section 2.2, in our post-experiment survey we also collected data about our participants' political orientation. In columns 4 and 5 of Table 3, we controlled for political orientation and found no significant effects on the propensity to blow the whistle. Since the mechanisms through which political views determine whistleblowing may vary with our experimental treatments, in Table 4 we report marginal effects from multiple separate probit models in which we look at right-leaning and left-leaning subjects separately. In columns 3 and 4 we add the same set of controls employed in Table 3 except, of course, for the left-leaning dummy.

[24] Recall that whistleblowing and punishment of the manager occur only if the manager breaks the law and if the employee randomly chosen (with a .5 chance) to determine payoffs had stated his or her willingness to blow the whistle. In practice, this occurred only in 3 out of 72 cases/firms.

[25] Note that firm members were not informed about co-workers' *willingness* to blow the whistle. As in real-life organizations, information about whistleblowing was available only if whistleblowing actually occurred.

	Invisible Externalities		Visible Externalities		Total	
Treatments	Sessions	Subjects	Sessions	Subjects	Sessions	Subjects
Rewards & No Judgment	2	42	2	42	4	84
Rewards & Social Judgment	2	33	2	36	4	69
Total	4	75	4	78	8	153

Table 5: SMU Sessions and Treatments

The estimated marginal effects suggest that motivations to blow the whistle vary with political orientation conditional on social judgment. In particular, right-leaning subjects seem to respond only to monetary incentives. The behavior of left-leaning individuals, on the other hand, reflects the results highlighted in Section 4.1, i.e., the fact that the possibility of social judgment affects the propensity to blow the whistle positively if the negative externalities of fraud are visible to the public and negatively if they are not. This suggests that left-leaning individuals are more concerned about social approval and, at the same time, expect the public to generally disapprove of whistleblowing when it is unaware of the negative externalities associated with law-breaking behavior, and approve of whistleblowing when such externalities are known.

Our finding concerning the differential impact of public scrutiny on left-leaning and right-leaning populations was unexpected, and suggests that our general results might be influenced by the relatively high number of left-leaning subjects in our student sample. We therefore searched for validation using a different sample of students characterized by predominantly right-leaning political views. We conducted a subset of our treatments at Southern Methodist University in Dallas, Texas. Since financial rewards had the same effect on the behavior of right- and left-leaning individuals in the UCSB sample, we only conducted treatments where financial rewards were present. As a result, at SMU we implemented a 2 by 2 design, varying the possibility of social judgment and the visibility of externalities only (as shown in Table 5). We conducted 2 sessions per treatment, with between 3 and 5 firms per session, involving a total of 153 SMU students.

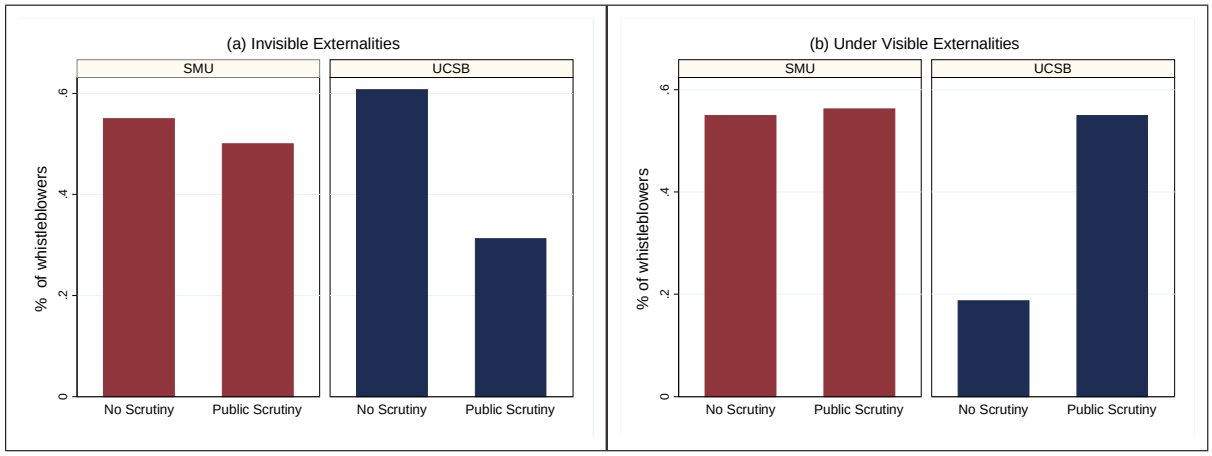


Figure 3: The effect of social judgment in a prevalently right-leaning (SMU) vs. a prevalently left-leaning (UCSB) sample

In line with our expectations, the SMU sample differs significantly from the UCSB population in terms of political orientation. Only 29% of the SMU subjects in the role of employee (33% in the

	Dep. Variable		
	Dummy equal to 1 if employee blew the whistle, 0 otherwise		
	(1)	(2)	(3)
Social Judgment	-0.05	-0.09	-0.27
	(0.175)	(0.208)	(0.290)
Visible Externalities	0.00	-0.14	-0.21
	(0.160)	(0.191)	(0.212)
Social Judgment x Visible	0.06	0.00	0.17
	(0.239)	(0.296)	(0.350)
Left-leaning		-0.29	-0.27
		(0.209)	(0.232)
Left x Social Judgment		-0.75***	-0.81***
		(0.059)	(0.053)
Left x Visible Externalities		0.39	0.51*
		(0.285)	(0.023)
Left x Judgment x Visible		0.73	0.73
		(0.053)	(0.055)
Controls	No	No	Yes
Observations	70	70	69

Note: The table reports marginal effects. Controls are: age, gender, economics major, number of firms in the session, ratio between firm performance and own performance in team building task, and effort chosen in the minimum effort task. In column 3, the ratio between firm and own performance is statistically significant (p-value<0.01) with a positive sign. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Political Orientation and Response to Treatments - SMU sample

full sample) are left-leaning, versus 56% of the UCSB employees (p=0.000). If responsiveness to social judgment depends on political orientation, we should observe that social judgment has less of an impact on whistleblowing in the SMU sample. This is clearly shown in Figure 3, which compares the responsiveness of SMU and UCSB students to social judgment under visible and invisible externalities.

Table 6 reports estimates from probit regressions on the probability of whistleblowing in the SMU sample. The small sample size prevents us from conducting the analysis separately for left-leaning and right-leaning subjects. Instead, in columns 2 and 3, we interact the social judgment and visible externality treatment dummies with our measure of political orientation. The estimates in column 1 show that in the aggregate, both social judgment and the visibility of the externalities, and their interaction, have no impact on whistleblowing. However, the estimates in columns 2 and 3 reveal that these null results are caused by the behavior of the right-leaning subjects, which constitute the majority of the sample. When interacting treatments and political orientation, we find that, as expected, social judgment does not affect the decision of right-leaning subjects to blow the whistle under both visible and invisible externalities. Left-leaning people are no more likely than right-leaning people to blow the whistle when social judgment is absent and the negative externalities are invisible to the public. They are, however, less likely to blow the whistle under social judgment when the negative externalities of fraud are invisible to the public and more likely to blow the whistle when the externalities are visible to the public. These findings confirm the results obtained for the UCSB sample. We can therefore state our sixth result:

Result 6 *: Political orientation significantly impacts the effect of social judgment on whistleblowing: right-leaning subjects respond only to monetary incentives, while left-leaning subjects respond also to the possibility of social (dis)approval.*

4.3 Social Judgment of Whistleblowers

A central hypothesis of our study is that individuals' expectations of social approval or disapproval from the general public may have a significant impact on their decision to blow the whistle against managerial wrongdoing that advanced the firm at the expense of the general public. Our finding with respect to the differential responsiveness to social judgment conditional on the visibility of the negative externalities to the public suggests that expectations of positive or negative social judgment are indeed important. In this section, we investigate the social judgment of whistleblowers under different conditions. We start by analyzing individual answers to post-experiment survey questions eliciting opinions on the social appropriateness or inappropriateness of actual whistleblowing cases. We then analyze the messages sent to whistleblowers by the members of the public in our social judgment treatments.

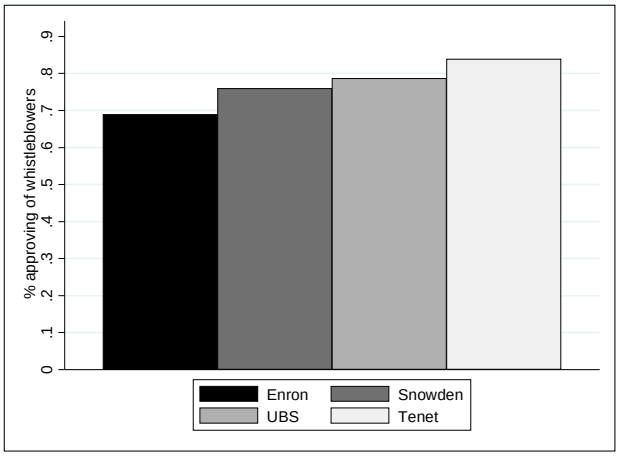


Figure 4: Social judgment of four whistleblowing cases (survey)

As part of our post-experiment survey, all study participants were presented with four actual whistleblowing cases – the Snowden case, the Enron case, the UBS case and the Tenet case – and asked to evaluate the social appropriateness of blowing the whistle in each case. As discussed in Section 2.2, we chose these cases because they vary in the visibility of the negative externalities that illegal behavior caused to the public and in the presence of financial rewards for the whistleblower. The social costs of the unlawful actions unmasked by the whistleblower are clearly visible in the Snowden (national security) and the Tenet (health care) cases, less visible in the UBS (tax evasion) case and even less visible in the Enron (earnings management) case. Moreover, financial rewards were present in the UBS and Tenet cases and not in the Enron and Snowden cases. In order to minimize ordering effects, the four cases were presented in the above order, but not one after the other. Subjects were first presented with the Snowden case and were then asked a number of unrelated questions collecting demographics and attitudinal preferences, they then saw the Enron case, followed by more unrelated questions. The UBS case came afterwards, followed by more questions before the appearance of the Tenet case. For each whistleblowing scenario, we provided a summary of the case and we asked subjects to rank the appropriateness of the whistleblower's decision.

Figure 4 reports the percentages of survey participants stating that the decision made by the whistleblower is socially acceptable. The social acceptability of whistleblowing is lowest in the Enron case and highest in the Tenet case. Pairwise comparisons between cases suggest that both the visibility of the

	No Rewards	Rewards
Invisible Externalities	58.33%	83.33%
Visible Externalities	33.33%	72.22%
H_0: Rewards = No Rewards if Visible = 0	p-value = 0.178 (0.185)	
H_0: Rewards = No Rewards if Visible = 1	p-value = 0.035 (0.042)	
H_0: Visible = Invisible Ext. if Rewards = 0	p-value = 0.219 (0.207)	
H_0: Visible = Invisible Ext. if Rewards = 1	p-value = 0.481 (0.403)	

Note: p-values generated by Chi-square tests. P-values from Fisher exact tests in parentheses.

Table 7: Percentage of members of the public sending smiley faces to whistleblowers

	Dep. Variable: Dummy equal to 1 if the MP sent a message of approval, 0 otherwise		
Rewards	0.33**	0.34**	0.42***
	(0.131)	(0.133)	(0.154)
Visible Externalities	-0.19	-0.18	-0.11
	(0.135)	(0.136)	(0.155)
Left-leaning		-0.06	-0.18
		(0.142)	(0.130)
Controls	No	No	Yes
Observations	54	54	54

Note: We report marginal effects. Controls are: age, gender, economics major, number of firms in the session, None of the controls is consistently significant across specifications. Robust standard errors in parentheses: . *** p<0.01, ** p<0.05, * p<0.1

Table 8: The decision to approve of a whistleblower

externalities and the presence of financial rewards may be responsible for the observed increase in the social acceptability of the whistleblowing act. Naturally, this is only suggestive evidence. In order to scientifically evaluate attitudes toward whistleblowers under different conditions, we analyze the messages that the members of the public sent to whistleblowers in our public scrutiny treatments.

Overall, across all treatments, 15% of members of the public decided to send no message to the whistleblowers, 63% sent a message of approval, 6% sent a message of disapproval, and the remaining 17% sent a neutral message. Table 7 reports the percentages of members of the public that sent a message of approval under the different treatment manipulations.[26] The presence of rewards leads to social approval, especially when the negative externalities caused by the managers' illegal activities are visible to the public. In contrast, the visibility of the externalities per se does not seem to affect approval of whistleblowers.

In Table 8, we conduct probit regressions on the probability to send a message of approval as opposed to a neutral message, a message of disapproval or no message. In the first column we only include our treatment dummies, in column 2 we add our political orientation dummy, and in column 3 we employ the same set of controls as in Tables 3, 4 and 6. The estimates confirm that the presence of financial rewards to the whistleblower increases the probability that the public will approve of the whistleblower. This is in line with our Result 5 and suggests that potential whistleblowers correctly anticipated that the presence of financial rewards would not negatively affect the judgment that members of the public would

[26] The table reports the UCSB data only. At SMU, a total of 24 members of the public participated in the Public Scrutiny treatment under visible or invisible externalities, always in the presence of financial rewards to the whistleblower – 12.5% did not send a message, 8% sent a message of disapproval, 37.5% sent a neutral message and 42% sent an approval message. The frequency of happy messages is higher under visible externalities (50% versus 33%), but not significantly so.

	No Rewards & No Judgment	No Rewards & Social Judgment	Rewards & No Judgment	Rewards & Social Judgment
Invisible Externalities	28.57%	12.50%	8.33%	6.67%
H_0: No Judgment = Soc. Judgment	p-value =0.438 (0.446) if Rewards=0		p-value = 0.849 (0.674) if Rewards=1	
H_0: Reward = No Reward	p-value = 0.16 (0.212) if if Judgment=0		p-value = 0.635 (0.585) if if Judgment=1	
Visible Externalities	12.50%	11.11%	0.00%	5.56%
H_0: No Judgment = Soc. Judgment	p-value = 0.929 (0.735) if Rewards=0		p-value = 0.310 (0.500) if Rewards=1	
H_0: Reward = No Reward	p-value = 0.126 (0.308) if if Judgment=0		p-value = 0.603 (0.564) if if Judgment=1	

Note: P-values are generated by Chi-square tests. P-values from Fisher exact tests in parentheses. The decline observed when the externalities are visible is also not statistically significant.

Table 9: Manager's law-breaking behavior

have of them. Contrary to our expectations, the visibility of the social cost of fraud does not significantly affect the social approval of whistleblowers.[27] Further analysis, not reported here, shows that rewards are equally conducive to approval of whistleblowers under visible and invisible externalities.

Result 7 *: Financial rewards increase the social approval of the whistleblower.*

4.4 Manager's Law-Breaking Behavior

Our experiment was primarily meant to investigate employees' decision to blow the whistle against their manager. As a consequence, our sample of managers is quite small, with a total of 72 observations. Overall, about 11% of managers decided to break the law to double the firm fund at the expense of the members of the public. The occurrence of cheating varies across treatments, as shown in Table 9. A clear pattern we see in the data is the reduction in managers' illegal behavior when there exist financial rewards for whistleblower, suggesting that the manager correctly predicts the effect of rewards on employees' willingness to report wrongdoing and that whistleblower rewards may have significant preventive/deterrent effects on corporate crime. Managers seem also less willing to break the law when the public is made aware of the negative externalities generated by fraud. However, the small sample size prevents us from finding statistically significant differences in manager behavior across treatments.

Regression analysis[28] provides evidence of the impact of the manager's skills on the probability of breaking the law. In particular, the better the manager's performance in the stage one multiplication task, the lower the probability that the manager will decide to cheat to augment the firm fund. This finding seems in line with Baloria et al. (2015), who document that the companies that lobbied against whistleblower rewards provision in the Dodd-Frank Act are precisely those that are less well run and have weaker compliance programs and poorer governance structures (e.g. less separation between Chairman and CEO). These are also the firms for which whistleblower rewards are perceived by the market to be more needed and more likely to have positive effects in terms of improving management/governance and protecting shareholders.

[27] The null effect of the visibility of the externalities caused by fraud is confirmed in the SMU sample, even though the small number of SMU observations leads us to interpret these messaging results with caution. Another noteworthy finding generated by the SMU sample is the higher likelihood of left-leaning subjects to approve of whistleblowing. About 80% of left-leaning subjects approve of whistleblowers versus 32% of right-leaning students (Fisher exact test p-value equal to 0.075).

[28] The corresponding table is not reported here but is available from the authors upon request.

5 Conclusion

Our study contributes to the policy debate and growing literature on the motivations and incentives for employees to blow the whistle on corporate fraud. Despite being splashed across the covers of popular journals in recent years, the occurrence of whistleblowing is rare and the vast majority of white-collar crime remains undetected and unpunished (Dyck et al., 2013). In this paper, we examined two policies that may motivate employees to blow the whistle on white-collar crimes: the use of financial rewards, and the protection (exposure) of whistleblowers from (to) public scrutiny and social judgment. We also examined the interaction between these two sources of whistleblowing incentives and tested whether financial rewards may crowd out non-pecuniary motivations linked to expectations of social approval. Finally, we asked whether different policies should be used for different cases of fraud or different industries, depending on whether the public feels directly affected by the negative externalities generated by the illegal activities undertaken within the organization, as discussed in the legal debate.

We employed a specially designed laboratory experiment that allowed us to observe willingness to break the law, willingness to blow the whistle on rule breaking, and public reaction to whistleblowing. Crucially, in our setting, manager wrongdoing caused financial losses to 'real' third parties, while potential whistleblowers did not take part in the illegal activities but benefited from them, and whistleblowing was costly.

We found strong evidence of the effectiveness of financial rewards on whistleblowing. We did not find evidence of the crowding out of non-pecuniary motivations driven by a preference for social approval, as financial rewards are equally effective when the whistleblower is shielded from social judgment and when he or she is not. Our findings with respect to the relationship between whistleblowing and public scrutiny show that the possibility of social judgment may act as either an incentive for or a deterrent to blowing the whistle. Social judgment acts as an incentive in cases of fraud where the public feels directly affected by the negative externalities caused by corporate fraud, and as a deterrent when the opposite holds. This suggests that, in order to maximize whistleblowing, industries and corresponding cases of fraud should be classified based on the perceived negative effects they have on the public and different policies should be adopted, either protecting or exposing whistleblowers.

Overall, our results confirm previous research on the effectiveness of financial rewards on whistleblowing and provide novel insights about the interaction between financial incentives and whistleblowers' concerns about social judgment. Even more novel is our finding of the importance of social approval or disapproval for the decision to report corporate wrongdoing. Future research could extend our analysis in multiple interesting directions. For instance, it could test whether our results apply also to "traitorous" whistleblowing, i.e., cases of fraud where the potential whistleblower took active part in the illegal activities, and whether making the punishment of the manager probabilistic rather than deterministic significantly alters employees' reporting rates and responsiveness to treatments. Another interesting extension would be to incorporate collective action problems in the decision to blow the whistle. While we believe that whistleblowing on corporate fraud does not typically have the features of a social dilemma, whistleblowing on other, more visible crimes may be a collective action problem. Indeed, if there is widespread awareness of the law-breaking actions or practices taking place within a firm, individuals' beliefs about fellow employees' reporting decisions may significantly affect willingness to blow the whistle. Finally, an unexpected, yet interesting finding of our study is the interaction between political orientation and responsiveness to social judgment. In particular, our results suggest that when deciding whether to report wrongdoing, right-leaning individuals are unaffected by the possibility of social judgment, while

left-leaning subjects are highly responsive to it. Future research should assess the robustness of this novel finding to changes in the context and the decision set.

References

Abbink, K. & K. Wu. (2017). "Reward Self-Reporting to Deter Corruption: An Experiment on Mitigating Collusive Bribery." Journal of Economic Behavior and Organization, 133: 256-272.

Abbink, K., U. Dasgupta, L. Ghanghadaran & T. Jain. (2014). "Letting the Briber Go Free: An Experiment on Mitigating Harassment Bribes." Journal of Public Economics 111: 17-28..

Alekseev, A., Charness, G., and U. Gneezy, (2016). "Experimental Methods: When and Why Contextual Instructions are Important." Journal of Economic Behavior and Organization http://dx.doi.org/10.1016/j.jebo.2016.12.0

Andreoni, J., & Bernheim, B. D., (2009). "Social image and the 50–50 norm: A theoretical and experimental analysis of audience effects." Econometrica, 77(5), 1607-1636.

Andreoni, J., & Petrie, R. (2004). "Public goods experiments without confidentiality: a glimpse into fund-raising." Journal of Public Economics, 88(7), 1605-1623.

Andreoni, J. (1995). "Warm-Glow Versus Cold-Prickle: The Effects of Positive and Negative Framing on Cooperation in Experiments." The Quarterly Journal of Economics, vol. 110, no. 1: pp. 1–21.

Apesteguia J., M. Dufwenberg and R. Selten, (2007). "Blowing the Whistle," Economic Theory, vol. 31: 143-166.

Ariely, D., Bracha, A., & Meier, S., (2009). "Doing good or doing well? Image motivation and monetary incentives in behaving prosocially." The American Economic Review, 99(1): 544-555.

Ashforth, B.E., and F. Mael (1989). "Social identity theory and the organization." Academy of management review, 14(1): 20-39.

Aubert, C., Kovacic, W., and Rey P. (2006). "The Impact of Leniency and Whistleblowing Programs on Cartels," International Journal of Industrial Organization, 24: 1241-1266.

Baloria, V. Marquardt, C. Wiedman, C. (2015). "A Lobbying Approach to Evaluating the Whistleblower Provisions of the Dodd-Frank Reform Act of 2010," unpublished working paper. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract id=1923310.

Bank of England Prudential Regulations Authority & Financial Conduct Authority. (2014). "Financial Incentives for Whistleblowers," available at: https://www.fca.org.uk/news/financial-incentives-for-whistleblowers.

Bartuli, J., Djawadi, B., Fahr, R. (2016). "Business Ethics in Organizations: An Experimental Examination of Whistleblowing and Personality," IZA Discussion Paper No.10190.

Bénabou, R., and Tirole, J. (2006). "Incentives and prosocial behavior," The American Economic Review, 96(5): 1652-1678.

Bigoni, M., Fridolfsson, S., Le Coq, C.and Spagnolo, G. (2012). "Fines, Leniency and Rewards in Antitrust," RAND Journal of Economics, 43(2): 368-390.

Bigoni, M., Fridolfsson, S., LeCoq, C., and Spagnolo, G. (2015). "Trust, Leniency and Deterrence", Journal of Law, Economics and Organization 31(4): 663-689.

Bolton, G.E., and A. Ockenfels. (2000). "ERC: A theory of equity, reciprocity, and competition." American Economic Review, 90(1): 166-193.

Branas-Garza, P. (2007). "Promoting helping behavior with framing in dictator games," Journal of Economic Psychology, Elsevier, vol. 28(4), pages 477-486.

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

Breuer, L. (2013). "Tax Compliance and Whistleblowing: The Role of Incentives," The Bonn Journal of Economics, Vol 2, No. 2: 7-44.

Buckenmaier, J., Dimant E. and L. Mittone (2017). "Experimental Evidence on Tax Evasion, Corruption and Incentives to Blow the Whistle", working paper.

Bursztyn, L., and Jensen, R. (forthcoming). "Social Image and Economic Behavior in the Field: Identifying, Understanding, and Shaping Social Pressure." Annual Review of Economics.

Carpenter, J., and Myers, C. K. (2008). "Why volunteer? Evidence on the role of altruism, image, and incentives." Journal of Public Economics 94(11): 911-920.

Carpenter, J., Robbett, A., & Akbar, P. A. (2017). "Profit Sharing and Peer Reporting." Management Science.

Carson, T., Verdu, M., and Wokutch, R. (2008). "Whistle-Blowing for Profit: An Ethical Analysis of the Federal False Claims Act", Journal of Business Ethics, Vol. 77(3): 361-376.

Charness, G., and Rabin, M. (2002). "Understanding social preferences with simple tests." The Quarterly Journal of Economics, 117(3): 817-869.

Cookson, R. (2000). "Framing effects in public goods experiments." Experimental Economics 3.1: 55-79.

Cotten S. and Santore R. (2016). "Whistleblowers, Amnesty, and Managerial Fraud: An Experimental Investigation." Unpublished manuscript.

Demel, S., Barr, A., Miller, L.and Ubeda, P.(2016). "Labour market participation, political ideology and distributive preferences" CEDEX working paper.

Dufwenberg, M., Gächter, S and Hennig-Schmidt, H. (2011). "The framing of games and the psychology of play." Games and Economic Behavior 73.2 (2011): 459-478.

Dyck, A., Morse, A. and Zingales, L. (2010). "Who Blows the Whistle on Corporate Fraud?" The Journal of Finance, 65: 2213-53.

Dyck, A., Morse, A. and Zingales, L. (2013). "How pervasive is corporate fraud?" Rotman School of Management Working Paper 2222608.

Eckel, C. and Grossman, P.J. (1996). "Altruism in anonymous dictator games." Games and Economic Behavior 16: 181.

Engstrom, D.F. (2012). "Harnessing the Private Attorney General: Evidence from Qui Tam Litigation" Columbia Law Review, 112: 1244-1325.

Engstrom, D.F. (2013). "Public Regulation of Private Enforcement: Empirical Analysis of DOJ Oversight of Qui Tam Litigation Under the False Claims Act," North-western University Law Review, 107, 1689-1756.

Engstrom, D.F. (2014a). "Private Enforcement's Pathways: Lessons from Qui Tam Litigation." Columbia Law Review, 115: 1913-2006.

Engstrom, D.F. (2014b). "Whither Whistleblowing? Bounty Regimes, Regulatory Context, and the Challenge of Optimal Design." Theoretical Inquiries L.15 605.

Ethics Resource Center, 2014. "National Business Ethics Survey of the U.S. Workforce", Available at: http://www.ethics.org/ecihome/research/nbes, accessed 31/10/2016.

Fehr, E., and K.M. Schmidt (1999). "A theory of fairness, competition, and cooperation." The quarterly journal of economics, 114(3): 817-868.

Fehr, E., & U. Fischbacher (2004). "Third-party punishment and social norms." Evolution and human behavior, 25(2): 63-87.

Fehr, E., and S. Gächter (2002). "Do Incentive Contracts Undermine Voluntary Cooperation?" Working Paper 34, Institute for Empirical Research in Economics, University of Zurich.

Fehr, E., and J.A. List (2004). "The Hidden Costs and Returns of Incentives—Trust and Trustworthiness among CEOs." Journal of the European Economic Association, 2(5): 743–71.

Feldman, Y., Lobel, O. (2010). "The Incentives Matrix: The Comparative Effectiveness of Rewards, Liabilities, Duties and Protections for Reporting Illegality", Texas Law Review, Vol 87

Felli, L. and R., Hortala-Vallve (2016). "Collusion, Blackmail and Whistle-Blowing," Quarterly Journal of Political Science, 11(3): 279-312.

Fischbacher, U. (2007). "z-Tree: Zurich toolbox for ready-made economic experiments." Experimental Economics 10.2 (2007): 171-178.

Fisman, R., Jakiela, P., and S. Kariv (2016). "Distributional Preferences and Political Behavior", working paper.

Frey, B.S., and F. Oberholzer-Gee (1997). "The cost of price incentives: An empirical analysis of motivation crowding-out." The American Economic Review 87.4 (1997): 746-755.

Friebel, G. and S. Guriev (2012). "Whistle-Blowing and Incentives in Firms," Journal of Economics & Management Strategy, 21(4): 1007-1027.

GAO-11-619 (2011). U.S. Gov't Accountability Office Report 11-619, Criminal Cartel Enforcement: Stakeholder Views on Impact of 2004 Antitrust Reform Are Mixed, but Support Whistleblower Protection, available at http://www.gao.gov/new.items/d11619.pdf.

Gerber, A. S., Green, D. P., & Larimer, C. W., (2008). "Social pressure and voter turnout: Evidence from a large-scale field experiment." American Political Science Review, 102(01): 33-48.

Gneezy, U., Meier, S., and P. Rey-Biel (2011). "When and why incentives (don't) work to modify behavior." The Journal of Economic Perspectives 25.4 (2011): 191-209.

Gneezy, U., and A. Rustichini. (2000a). "Pay Enough or Don't Pay At All." Quarterly Journal of Economics, 115(3): 791–810.

Gneezy, U., and A. Rustichini. (2000b). "A Fine Is a Price." Journal of Legal Studies, 29(1): 1–18.

Graham J, Nosek BA, Haidt J (2012). "The Moral Stereotypes of Liberals and Conservatives: Exaggeration of Differences across the Political Spectrum." PLoSONE 7(12): e50092. doi:10.1371/journal.pone.0050092

Greiner, B. (2015). "Subject pool recruitment procedures: organizing experiments with ORSEE." Journal of the Economic Science Association 1.1 (2015): 114-125.

Hamaguchi, Y., Kawagoe, T. and A. Shibata, (2009). "Group Size Effects on Cartel Formation and the Enforcement Power of Leniency Programs", International Journal of Industrial Organization 27(2), 145-165.

Heyes, A. and S. Kapur, (2009). "An Economic Model of Whistle-Blower Policy," Journal of Law, Economics, & Organization, 25(1): 157-182.

Hinloopen, J. and A. Soetevent, (2008). "Laboratory Evidence on the effectiveness of corporate leniency programs", RAND Journal of Economics, 39(2): 607-616.

IRS (2015), IRS Whistleblower Program, Fiscal Year 2015, Annual Report to the Congress.

Linardi, S., & McConnell, M. A., (2011). "No excuses for good behavior: Volunteering and the social environment." Journal of Public Economics, 95(5), 445-454.

Miceli, M. P. and Janet P. Near (1992). "Blowing the Whistle: The Organizational and Legal Implications for Companies and Employees," Lexington Books.

Miceli, M. P. and Janet P. Near (1994). "Relationship among Value Congruence, Perceived Victimization, and Retaliation against Whistle-blowers," Journal of Management 20(4), 773-794, Lexington Books.

Rege, M., and K. Telle (2004). "The impact of social approval and framing on cooperation in public good situations." Journal of Public Economics 88.7 (2004): 1625-1644.

Reuben, E., and M. Stephenson (2013). "Nobody likes a rat: On the willingness to report lies and the consequences thereof." Journal of Economic Behavior & Organization 93 (2013): 384-391.

Rothschild, J., and T. Miethe (1999). "Whistle-Blower Disclosures and Management Retaliation", Work and Occupations, 26(1): 107-128.

Salmon, T. C., & Serra, D. (2017). "Corruption, social judgment and culture: An experiment." Journal of Economic Behavior & Organization, 142: 64-78.

Schmolke, K.U. and V. Utikal (2016), "Whistleblowing: Incentives and Situational Determinants," FAU - Discussion Papers in Economics, No. 09/2016. Available at SSRN: https://ssrn.com/abstract=2820475 or http://dx.doi.org/10.2139/ssrn.2820475.

Serra, D. (2012). "Combining top-down and bottom-up accountability: evidence from a bribery experiment." Journal of Law, Economics, and Organization, 28(3), 569-587

Shikora, J. (2011). "Bringing good and bad Whistle-blowers to the Lab", Munich Discussion Paper No. 2011- 4, online: http://epub.ub.uni-muenchen.de/12161/.

Spagnolo, G., (2004). "Divide et Impera: Optimal Leniency Programs," CEPR Discussion Papers 4840.

Spagnolo, G., (2008). "Leniency and Whistleblowers in Antitrust," Ch.12 of P.Buccirossi (Ed.) Handbook of Antitrust Economics, 2008, M.I.T. Press.

Skitka, L.J., and P.E. Tetlock (1993). "Providing Public Assistance: Cognitive and Motivational Processes Underlying Liberal and Conservative Policy Preferences," Journal of Personality and Social Psychology 65: 1205-23.

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). "Social categorization and intergroup behaviour." European Journal of Social Psychology, 1(2), 149-178.

Titmuss, R.M. (1970). The Gift Relationship: From Human Blood to Social Policy (1970). Reprinted by the New Press, ISBN 1-56584-403-3 (reissued with new chapters 1997, John Ashton & Ann Oakley, LSE Books)

Waytz, A., Dungan, J., and L. Young (2013). "The whistleblower's dilemma and the fairness-loyalty tradeoff." Journal of Experimental Social Psychology, Vol. 49, pp. 1027-1033.

Xiao, E., and D. Houser (2011). "Punish in public." Journal of Public Economics, 95(7), 1006-1017.

APPENDIX
Experiment Instructions (NOT FOR PUBLICATION)

General Instructions

Thank you all for coming today. You are here to participate in an experiment. In addition to a $10 participation fee, you may earn substantially more money from today's experiment. You will be paid privately and anonymously in cash at the end of your experimental session today.

Today's experiment consists of multiple stages. Separate instructions for each stage will appear on your computer screen at the beginning of each stage. You will have the chance to earn money in each stage of the experiment except the last stage, which will be a questionnaire. Earnings during the experiment will be denominated in Experimental Currency Units, or ECU. At the end of the session one of the remunerated stages of the experiment, i.e., not the questionnaire, will be randomly selected for payment.

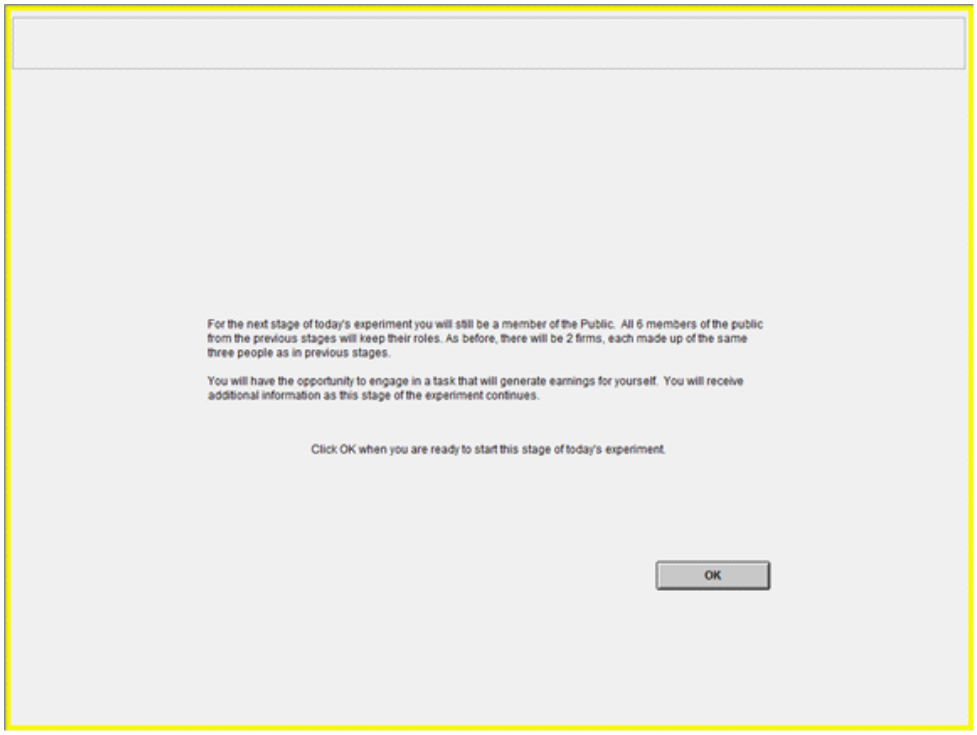
Your earnings in the randomly selected stage will be converted to dollars at the exchange rate of: 2 ECU = $1. After everybody has completed the final questionnaire, you will be paid the money you earned from the selected stage of the experiment plus your participation fee of $10. If you have any questions during the experiment, please raise your hand and wait for an experimenter to come to you. Please do not talk, exclaim or try to communicate with other participants during the experiment. Participants intentionally violating these rules may be asked to leave the experiment and may not be paid.

Please read and sign the Consent Form that you have been provided. Please raise your hand if you have any questions about any of the information on the Consent Form. We will proceed with the experiment once we have collected all signed consent forms.

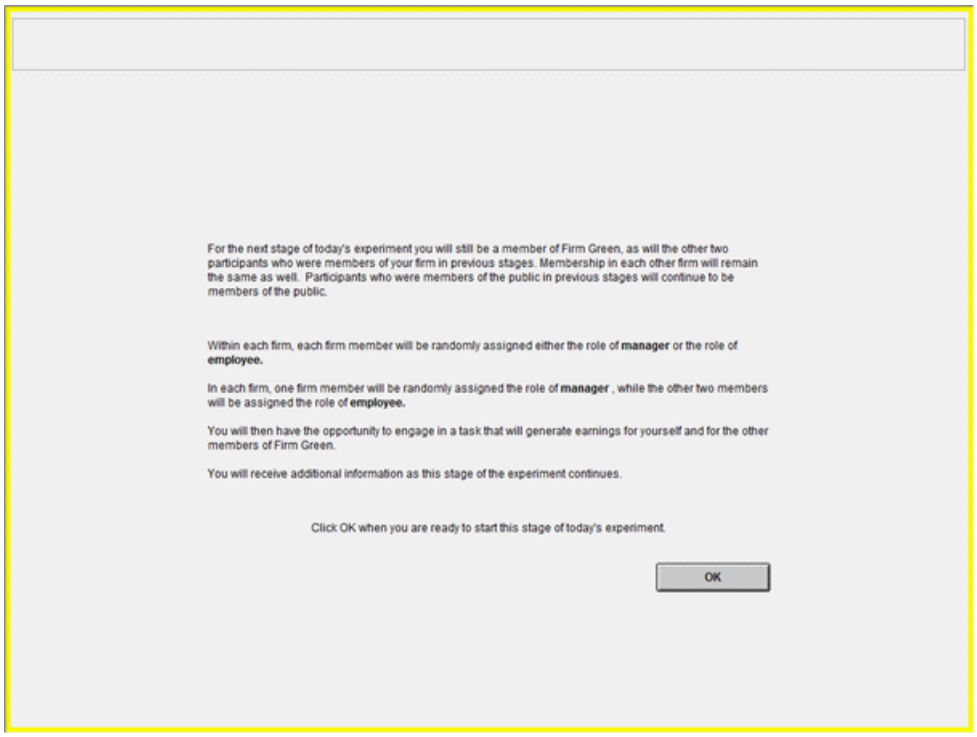
Below we attach screenshots from Stage Three of the experiment, the Whistleblowing Game.

PUBLIC SCRUTINY and VISIBLE EXTERNALITIES

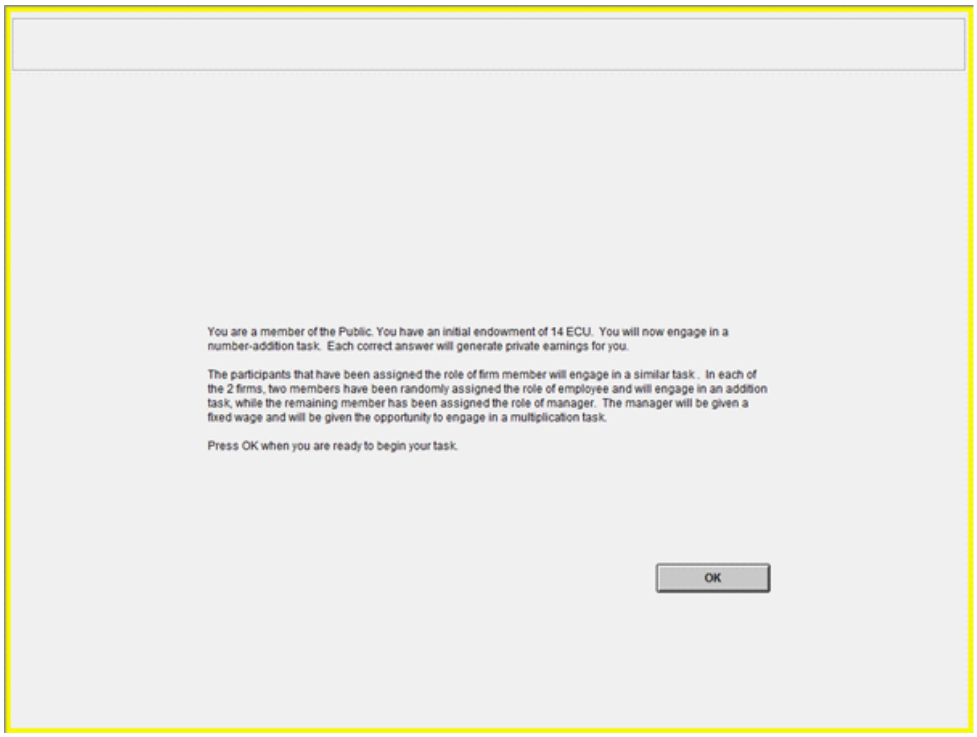
Member of the Public



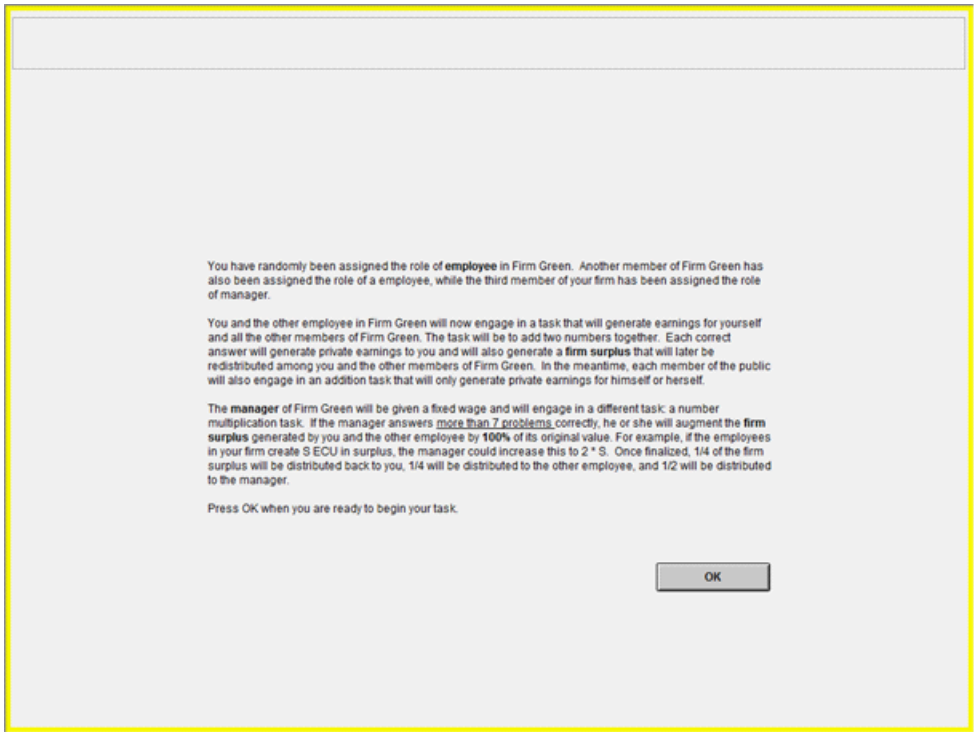
Member of a Firm



Member of the Public



Employee



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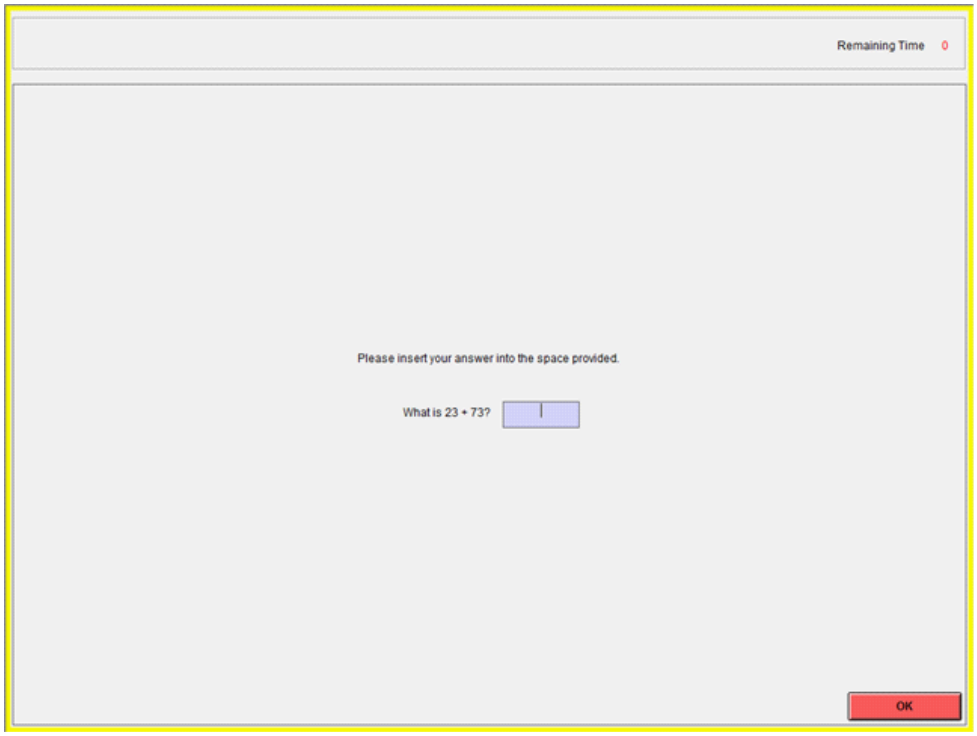
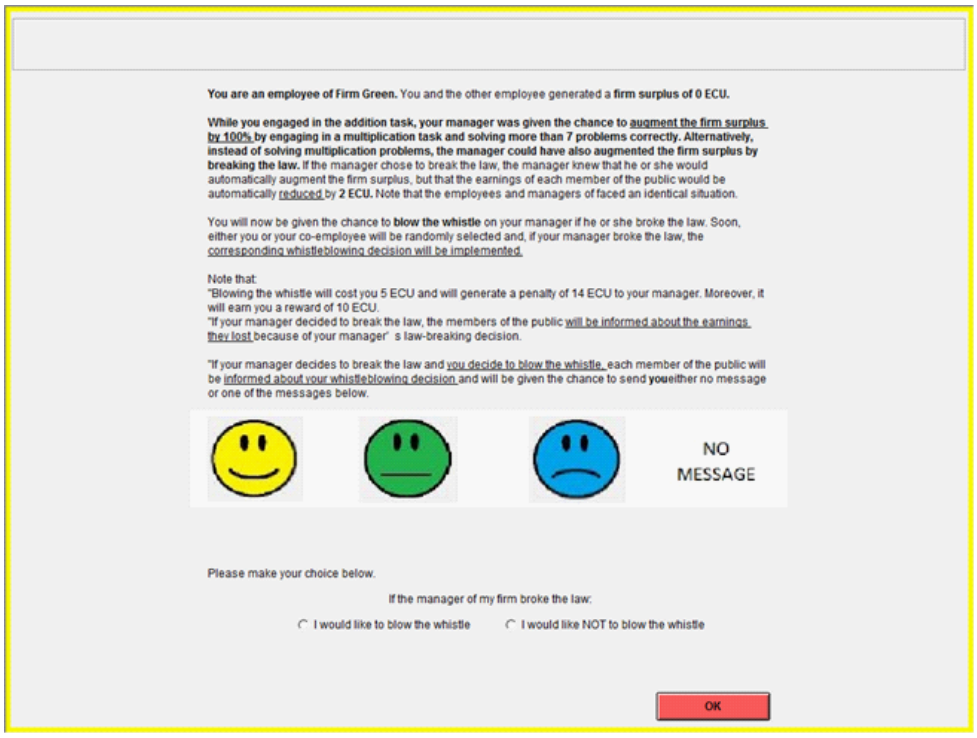


Employee



Member of the Public

Manager