



Whistleblowing: incentives and situational determinants

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Abstract

Law makers increasingly try to capitalize on individuals having acquired knowledge of corporate crimes or other misconduct by inducing them to blow the whistle. In a laboratory experiment we measure the effectiveness of incentives on the willingness to report such misconduct to a sanctioning authority. We find that fines for non-reporting insiders, rewards, and even simple commands, increase the probability of whistleblowing. We find the strongest effect for fines. Situational determinants also influence the willingness to blow the whistle: Insiders who are negatively affected by the misconduct are more likely to blow the whistle than non-affected or profiting insiders. Those (negatively affected) victims are also sensitive to the misconduct's impact on the authority sanctioning the misconduct (public authority or employer): Whistleblowing is more likely if the enforcement authority is negatively affected compared to positively or not affected.

Keywords Whistleblowing · Incentives · Situational determinants · Experiment

JEL Classification C91 · D82 · K42 · M59

1 Introduction

Every once in a while a big scandal shakes the confidence in the integrity of corporate conduct and leads to public outcry. The routine response of the political caste is to come forward with new regulation that imposes ever stricter rules of conduct which come with ever harsher sanctions in case of infringement. However, it is a truism that coming up with new prohibitions and raising sanctions are

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relatively ineffective regulatory strategies as long as the actual enforcement of the new rules does not keep pace with these measures. Effective enforcement by supervisory authorities and public prosecution, though, is often hampered by the lack of sufficient resources to gather the information necessary to reveal corporate misconduct. Facing this predicament, law makers increasingly try to capitalize on individuals having acquired knowledge of such misconduct by inducing them to blow the whistle.¹ This approach is based on the conviction that—had such individuals, typically employees of the delinquent entity, informed public authorities at an early stage—the damage done by corporate scandals like Worldcom, Parmalat (both accounting fraud), Siemens (large scale bribery), Toshiba (accounting fraud), Volkswagen (fraud on diesel emissions) or—more recently—Wirecard (accounting fraud) could have been hugely reduced if not prevented. The cases of Siemens and Volkswagen also very clearly show that corporate entities themselves have strong incentives to integrate whistleblower schemes into their internal compliance systems.

However, potential whistleblowers often hesitate to come to the fore and report to the compliance office of their corporation (internal whistleblowing) or to a public authority (external whistleblowing). This is due to the fact that whistleblowing has some properties of a public good: Whereas the whistleblower often gains little more than the satisfaction from “doing the right thing”, she envisages potentially staggering costs. Beyond direct retaliatory sanctions imposed by the employer² that may culminate in job loss, whistleblowers purportedly face blacklisting from other potential employers in the industry, ostracism from colleagues in addition to the psychological and physical costs caused by stress, public exposure and the like.³ In short, the whistleblower is highly undercompensated for her socially beneficial efforts. This public good problem may be aggravated by deeply rooted social attitudes perceiving whistleblowing as some kind of deleterious denunciation.⁴

Against this background, the legislatures around the world come up with new regulatory initiatives in order to tilt the cost–benefit calculus of the potential informant in favor of blowing the whistle. Furthermore, these initiatives may

¹ Heyes and Kapur (2008); for a global overview see Lewis (2010); for an example from European Capital Markets Law cf. Fleischer and Schmolke (2012); as to the EU Whistleblower Directive cf. Schmolke (2022).

² Spedding (2004) lists criticism, poor performance evaluations, punitive transfers and job loss as examples.

³ Alford (2001); Rapp (2007): “Potential whistleblowers face tremendous obstacles beyond direct employer retaliation. [...] Moreover, whistleblowers may fear blacklisting from future employers who suspect disloyalty, as well as social ostracism from their co-workers. Additionally, the psychological burdens associated with whistleblowing, including the effects of public criticism and a lengthy stay in litigation’s limelight, cannot be ignored.”

⁴ As to such attitudes cultivated in Central Europe, which can be explained historically see the literature and the quotes cited by Dowling Jr. (2008).

ultimately change social attitudes towards whistleblowers.⁵ At first, legislation focused on the protection of employees in the public service.⁶ Later on, lawmakers included employees of private entities into their whistleblower protection regimes. Notably, the United States enacted the Sarbanes–Oxley Act 2002 (SOX) in response to some major accounting scandals, including the abovementioned cases of Worldcom and Enron. This act contains protective measures for whistleblowers of private corporations being listed at a US stock exchange (Sec. 806 SOX).⁷ The Dodd-Frank Wall Street Reform and Consumer Protection Act 2010 (Dodd-Frank Act), being a reaction to the financial crisis 2008, further expands the whistleblower protection introduced by SOX. In October 2019 the EU followed along these lines and adopted a directive containing a comprehensive regulatory framework for the protection of whistleblowers reporting on breaches of EU law.⁸

Whistleblower protection, however, was only a side issue of the Dodd-Frank whistleblower legislation. Its main feature was the introduction of a whistleblower reward program with regard to the violation of US securities laws (Sec. 922 Dodd-Frank Act).⁹ Whistleblowers thereby became entitled to 10 to 30 percent of monetary sanctions exceeding US\$ 1,000,000 that are imposed by the Securities Exchange Commission (SEC)¹⁰ in consequence of the whistleblower's information. A similar award scheme has been introduced by the Motor Vehicle Safety Whistleblower Act 2015 which aims at fighting infractions in the auto industry. And very recently, in August 2024, the US Department of Justice launched a new Corporate Whistleblower Awards Pilot Program modelled in part after the SEC program.¹¹

Such bounty programs have a long tradition in US law dating back to 1863 when the False Claims Act came into force. In Europe on the other hand, the idea of incentivizing potential informants by monetary rewards is a rather new approach to bolster up law enforcement. The Dodd-Frank Act inspired EU legislature which adopted

⁵ Cf. with regard to the UK Public Interest Disclosure Act 1998 (PIDA) the prediction of Gobert and Punch (2000).

⁶ In the aftermath of the Watergate Scandal the United States enacted the Civil Service Reform Act 1978, which provided the first protective rules for whistleblowers in the federal public service. The Federal Whistleblower Act 1989 aimed at strengthening the protection of federal whistleblowers against employer retaliation further. For further details on the Whistleblower Protection Act 1989, see Ebersole (2011). Other countries followed this example. For an example, take the South Australia Whistleblowers Protection Act 1993.

⁷ Furthermore, such corporations were obliged to install audit committees being responsible for the oversight of the work of accounting firms employed by the corporation, which in turn had to “establish procedures for (...) the confidential, anonymous submission by employees of concerns regarding questionable accounting or auditing matters” (Sec 301 SOX). For further details on Sec 301 SOX, see Dworin (2007).

⁸ Directive (EU) 2019/1937, OJ (2019) L 305/17.

⁹ Prior to the Dodd-Frank Act the Insider Trading and Securities Enforcement Act 1988 already established a – much more limited—whistleblower bounty program for informing on insider trading. For further details, see Ebersole (2011).

¹⁰ The Securities Exchange Commission (SEC) is the Federal US authority regulation capital markets and enforcing securities law.

¹¹ For further information, cf. <https://www.justice.gov/criminal/criminal-division-corporate-whistleblower-awards-pilot-program>.

whistleblower rules in the new Market Abuse Regulation 2014 (MAR) which came into force in mid-2016.¹² These rules include the authorization of the EU Member States to “provide for financial incentives to persons who offer relevant information about potential infringements of this Regulation” (Art. 32(4) MAR). Furthermore, with regard to antitrust law enforcement whistleblower bounty schemes make inroads into Europe as well, but from a different direction.¹³ The use of such reward schemes in antitrust law enforcement originates from South Korea. The US Congress, however, refrained from reveals that the different US.¹⁴ All in all, it is safe to say that, apart from protective rules, with regard to whistleblower legislation financial reward programs are currently in the center of reform and policy debates.

While legislatures work on setting the stage for whistleblowers to become effective assistants in enforcing the law, corporations themselves strive to implement efficacious internal whistleblower routines as part of their compliance systems. Thereby, corporations get early access to information about internal misconduct as well as the opportunity to control the way such information is disclosed to the competent supervisory authorities (and the public at large).

All these initiatives and activities circle around the one crucial question: How to make potential informants, notably employees, blow the whistle? Feldman and Lobel (2010) categorized the current regulatory strategies on the table as “Protect—Command—Fine—Pay”. The “Protect” strategy refers to anti-retaliation protections, while the “Pay” strategy designates monetary incentives. In the “Fine” strategy a monetary sanction is imposed for not reporting the misconduct in question. The “Command” strategy confines itself to obliging potential informants to report the misconduct.

At first glance, one might be inclined to discard the latter two strategies without further ado, since the “Fine” strategy is seemingly only a “Pay” strategy in disguise, and the “Command” strategy apparently lacks any financial incentive to change behavior. Taking a closer look, however, reveals that the different framing¹⁵ of the “Fine” strategy may be the pivotal feature that makes its impact on potential informants differ from the “Pay” strategy. While the different framing should have no effect on rational actors, potential informants being loss averse should *ceteris paribus* be more inclined to yield to the threat of being fined than to the expectation of receiving a reward (cf. De Geest and Dari-Mattiacci 2013).

¹² Regulation (EU) No 596/2014, OJ (2014) L 173/1. In Mid-2016 the Ontario Securities Commission introduced a similar reward scheme for blowing the whistle on securities fraud, while the Quebec Securities Commission refrained from doing so because it perceived that there is “not enough evidence to show that money generated more or better tips”; cf. The Economist, Payouts for whistleblowers—Whistle while you work, July 16th 2016, p. 60.

¹³ Cf. UK Competition & Markets Authority (CMA) Informant Reward Policy (2014), and Hungarian Competition Authority (GVH), Regular questions about the cartel informant reward (2010); for further detail, see Polański (2014).

¹⁴ Cf. Sullivan et al. (2011): The Korea Fair Trade Commission (KFTC) introduced its Cartel Informant Reward Program in 2002. The adoption of similar measures was discussed in the US in 2011. But no such laws have been enacted so far.

¹⁵ The term framing does not apply in its technical sense insofar, as the end-state/size of payoff of “Fine” obviously differs from “Pay”. The decision problem is, however, identical: To abstain from whistleblowing comes with real costs (“Fine”) or opportunity costs (“Pay”), respectively.

On the other hand, there are significant drawbacks of the “Fine” strategy. If capitalizing on whistleblowers is a reaction to the lack of sufficient resources of the public authorities (or the corporate compliance department) to gather the information necessary to reveal misconduct, the imposition of a fine may be (perceived as) an empty threat. That is, while the “Pay” strategy works as a screening device to reveal private actors possessing relevant information, the “Fine” strategy may not work this way.

As to the “Command” strategy relaxing the strict assumptions of the standard model might again do the trick. There is a strand of literature suggesting that legal norms as such can shape the preferences of private actors (“preference-shaping effects of law”), thereby influencing behavior without providing further incentives via law enforcement (Sunstein 1986). Furthermore and apart from this effect, an “expressive function” is attributed to law, by which legal norms appeal to social norms. These social norms, in turn, influence behavior by means of reputational mechanisms and informal sanctions. Again, no direct legal consequences are needed to produce this effect (Sunstein 1996). Hence by relying on these effects of law and, thus, dispensing with the whole apparatus of law enforcement, the behavior of the addressees of the legal norm (here: potential informants) might be influenced in the intended way at significantly lower costs.¹⁶ Finally, with regard to internal whistleblowing similar effects may be achieved by corporations/employers via implementing a code of conduct or contractual duties that oblige potential informants to report.

There is some empirical analysis from observational data on the effects of incentivizing whistleblowers (see literature section). Unfortunately, observational data often suffers from the informational and the counterfactual problem which makes it impossible to exactly measure the effects of the whistleblower reward program and compare them to alternative incentive designs.¹⁷ By conducting a laboratory experiment, our study circumvents this problem. A typical corporate misconduct involves an increase of the wrongdoer’s profit at the expense of others (e.g. employees, shareholders, or the public). Misconduct therefore imposes inequality. In our design we capture this aspect of anti-social behavior. It also reflects all elements in the definition of whistleblowing by Jubb (1999). A player decides whether to increase his profit through misconduct. Others are affected by and learn about the misconduct and can inform the authority. The authority has the option—in case she learns about the misconduct—to punish the wrongdoer. Our focus is to measure the willingness to blow the whistle across different scenarios.

In the first of our two experiments (1 and 2), we focus on incentives to induce whistleblowing. We compare the willingness to blow the whistle in the three of the four strategies described above; that is Reward, Fine and Command. We also compare the impact of different sizes of rewards and fines on the willingness to blow the whistle. Furthermore, our experiment aims at shedding light on whether and, if so, how the willingness to report depends on the way potential informants are

¹⁶ Funk (2007): “First of all, behavior might be changed at lower costs than suggested by the classical ‘Law & Economics’ literature. Merely by passing a law (even if unenforced), citizens might adhere to it.”

¹⁷ As to these problems in general, cf. Apesteguia et al. (2007).

affected by the misconduct to be reported. This may reveal the desirability, if not necessity, for regulators and employers implementing whistleblower programs to differentiate among potential whistleblowers according to the way they are affected by the misconduct in question.¹⁸

In experiment 2 we study whether and to what extent the willingness to blow the whistle depends on whether and how the authority sanctioning the misconduct (public authority or employer/enterprise) is affected by the reported misconduct. Concededly, if the willingness to blow the whistle depends on the expected sanction imposed by the authority, this may be a 'non-issue' when it comes to external whistleblowing to public authorities. Such authorities and the agents acting on their behalf are typically unaffected by the misconduct they are tasked with punishing. However, the results of experiment 2 may shed light on the comparative effectiveness of internal whistleblowing. To illustrate this point, it suffices to recall the examples on corporate scandals mentioned at the beginning of this paper. There we see at least in some of the cases that the misconduct in question carried some utility for the corporation in the short run (while being deleterious in the long run).

Our main findings are: Financial incentives and even simple commands increase the probability of whistleblowing. Situational determinants also influence the willingness to blow the whistle: Insiders who are negatively affected by the misconduct are more likely to blow the whistle than non-affected or profiting insiders. Those (negatively affected) victims are also sensitive to the misconduct's impact on the sanctioning authority: Whistleblowing is more likely if the authority is negatively affected compared to positively or not affected.

2 Related literature

There is a huge and constantly growing body of literature on whistleblowing. This is true for economics, but also for psychology and even more so for law.¹⁹ First of all, there is some empirical analysis from observational data on the effects of incentivizing whistleblowers. Most notably, the SEC Office of the Whistleblower publishes annual reports on the developments of the Dodd-Frank Whistleblower Program. The latest report published at the end of 2023 shows that the number of tips received by the SEC grew significantly over the years (from 3,001 (2012) to 18,354 (2023)). Dworkin and Baucus (2007) and Dyck et al. (2010) analyzed actual law suits where whistleblowing was involved. Dworkin and Baucus (2007) examined 33 cases of employees whose employment was wrongfully terminated for whistleblowing. They compared the characteristics of internal and external whistleblowers and the consequences that ensue after their reporting. Dyck et al. (2010) studied 216 large scale corporate fraud cases. With regard to our experiment, their main finding is that the portion of employee whistleblowers rose significantly where US law provides high monetary rewards under the False Claims Act.

¹⁸ The way people are affected by a certain misconduct may, for example, have a significant impact on their internal motivation to blow the whistle, cf. Feldman and Lobel (2010).

¹⁹ Cf. the survey of Dasgupta and Kesharwani (2010), Lee and Chao (2018), and Nicholls et al. (2021) as well as the references given in the comparative study of Thüsing and Forst (2016).

Unfortunately, observational data often suffers from the informational and the counterfactual problem which makes it impossible to exactly measure the effects of the whistleblower reward program and compare them to alternative incentive designs. Nevertheless, it is rather difficult to nearly impossible to carry out investigations into unethical conduct in the workplace by observation.²⁰ Therefore, many research studies of whistleblowing use self-reported willingness to blow the whistle as explanatory variable (Victor et al. 1993). However, since the correlation between whistleblowing intent and actual whistleblowing seems to be rather low (cf. Mesmer-Magnus and Viswesvaran 2005), it is worthwhile to focus on revealed rather than stated willingness by means of a more objective experimental design.

Despite that, up to now the number of experimental studies on whistleblowing is comparatively limited.²¹ There are different strands of studies, each dealing with whistleblowing in a certain legal context. Breuer (2013) distinguishes between “traitorous whistleblowing” and “watchdog whistleblowing”. While the first type describes reporting misbehavior by cartel members, bribers or corrupt officials who break up conspiracies from the inside, the second one refers to whistleblowing by a third person who is not responsible for the illegal conduct, e.g. an observing bystander. Since our paper contributes to the “watchdog whistleblowing” literature, we focus on experiments on this type of whistleblowing, while leaving aside the literature on “traitorous whistleblowing”.²²

2.1 Incentives

There are several experimental laboratory studies and experimental surveys that analyze the behavior of potential whistleblowers who are bystanders and have therefore not taken part in the illegal conduct.

Feldman and Lobel (2010) contributed significantly to the research on incentivizing whistleblowers by conducting a scenario-based experimental survey. The questionnaires build on the same factual scenario putting the participant in the position of an employee who discovers fraudulent behavior of her employer. What varies is the legal environment, such as protection, high and low reward, duty, and fine. The main findings of the survey are: Participants predict higher reporting action by themselves than by others (“holier than thou effect”). The more severe the participants rate the misconduct, the more likely is their willingness to report. For participants with a high internal motivation to report the willingness to blow the whistle across the different legal environments did not vary much. However, for participants with a low internal motivation to report the willingness to blow the whistle was highest in the environments with high rewards or fines. While Feldman and Lobel (2010), therefore, have unearthed some remarkable results on whistleblowing behavior, the difference in the willingness to report among the

²⁰ Cf. also Cotten and Santore (2017).

²¹ For an overview, see also Breuer (2013).

²² For the latter type of whistleblowing, see notably Apesteguia et al. (2007); Bigoni et al. (2012); Cotten and Santore (2017); Feltoovich and Hamaguchi (2018); and, for a very recent study, Burgstaller and Pfeil (2024).

various legal environments is rather small and inconclusive with regard to the policy implications.

A laboratory experiment conducted by Breuer (2013) analyzes the effect of reward on whistleblowing behavior. Results show that in the context of tax evasion monetary rewards increase the willingness of bystanders to blow the whistle. The larger the reward, the stronger the increase in reporting turns out. Stikeleather (2016) in his laboratory experiment dealing with a corporate theft scenario also shows an increase in the whistleblowing rate if rewards are granted. He furthermore examines the correlation between the wage level and the whistleblowing rate as well as the conviction of the employee to be morally obliged to blow the whistle. He found a significantly positive correlation in both regards. The higher these latter effects (boosting the internal motivation for blowing the whistle) are, the lower the net expected economic benefit the employer gains by granting additional financial rewards for whistleblowers.

Butler et al. (2020) investigate whether and how the willingness to report corporate misconduct is driven by financial rewards and/or social judgment and whether and how these factors interact in (de)motivating whistleblowing. Furthermore, they differentiate between a scenario where the members of the public are aware that they are negatively affected by corporate misconduct and a scenario where they are not. The experiment consists of four stages where the actual whistleblowing game is played in stage three. Stages one, two and four serve the purpose to induce (stage one) and measure identity and social cohesion among the players before (stage two) and after (stage four) the whistleblowing game is played. At the beginning the roles of “manager” (one participant), “employee” (two participants) and “member of the public” (six participants) are assigned to the participants. Only the three “firm members” participate in stage one, two and four while the six “members of the public” join the whistleblowing game in stage three. This game is designed such that the “manager” decides whether to double the “firm’s fund” that is later on distributed among the “firm members” by solving at least 8 of 12 problems (real-effort task) or by “breaking the law” which causes losses to the “members of the public”. Thus, the wrongdoing results in a welfare loss where the “manager” would be able to double the firm fund anyway by solving the problems. Otherwise the welfare implications of wrongdoing depend on the contributions of the “employees” to the firm fund the size of which may be doubled by the “manager”. The “employees” may blow the whistle which is costly and comes with a considerable monetary penalty for the “manager”. Butler et al. employ three treatment variations by (1) adding a financial reward for whistleblowers, (2) exposing them to social judgment,²³ and (3) making the “members of the public” aware of the losses they incur by corporate misconduct. After having participated in the experiment the subjects filled out a survey (stage five). Differing from our experiment Butler et al. chose a framed design by using contextual labels like “manager”, “employee” or “breaking the law”. The experiment’s results show that financial rewards increase the willingness to blow the whistle regardless of whether

²³ The “members of the public” could send smileys to a whistleblower which show a friendly, indifferent or disapproving face.

the “public” is made aware of the losses incurred by corporate misconduct or not. In the former case the possibility of social judgment increases the willingness to report whereas in the latter case the willingness to report decreases.

The theoretical work of Heyes and Kapur (2008) addresses the question, what an optimal enforcement policy on whistleblowing in terms of responsiveness and the size of penalties should look like given different theories on the motivation of whistleblowers. This work complements our study insofar as it examines a follow-up question on what we are mainly interested in, namely whether and to what extent a potential whistleblower is motivated to report by different regulatory designs as well as by how she is affected by the misconduct.

To summarize, conclusive, experimental evidence on the effect of and differences between Reward, Fine or Command on whistleblowing is still missing. We endeavor to help fill this lacuna.

2.2 Situational determinants

Several studies have analyzed the effect of different situational and individual determinants on whistleblowing. A couple of studies focus on the situation of the potential whistleblower. In particular, they deal with the bystander effect that might affect willingness to blow the whistle. Evidence is mixed. While Choo et al. (2016) in a laboratory experiment and Gao et al. (2015) in an experimental survey find that the number of bystanders decreases the willingness to blow the whistle, Robinson et al. (2014), Miceli and Near (1988) and Miceli et al. (1991) find no effect or even a positive effect. Importantly, in all these bystander studies the potential informants are either just observers, and not affected by the misconduct, or the effect on the potential informant is not explicitly controlled for.

The experimental study of Choo et al. (2019), however, measures the bystander effect in relation to the motivation of the potential informants which, in turn, hinges on the proposed division of a large or small amount of money (“pot”). Their study, which is an extension of the standard ultimatum game, shows that when adding an additional insider and potential informant there is no drop in the willingness to report the actual size of the pot to the outsiders if the reporting can also be explained by self-interest of the reporting insider (“small pot” scenario). Such a drop can, however, be observed if the reporting can only be explained by altruistic motives (“large pot” scenario). In our experiment we measure the willingness to blow the whistle of potential informants who are positively, negatively or not affected by misconduct.

Few studies deal with the character of the sanctioning institution, i.e. the authority. An exception is the survey by Gao et al. (2015). They show that the willingness to blow the whistle is higher when the authority is external compared to internal. Krügel and Uhl (2023) found, in a recent experimental study, that the willingness to blow the whistle internally rose with the certainty and severity of the punishment exerted by the authority (in case of internal whistleblowing this is the organization) for the reported misconduct. While in the mild and uncertain punishment treatment the overall proportion of whistleblowing only amounted

to 5.5%, it rose in the certain and severe punishment treatment to 27%. In our experiment, we shed light on whether and how the authority is affected by the misconduct influences the willingness to report. Evidence on this question is absent in the literature, although there is evidence that punishment differs when the authority is not affected compared to being negatively affected.

3 Experimental design

We conducted two stand-alone laboratory experiments. Experiment 1 focuses on the effect of financial incentives on whistleblowing. Experiment 2 deals with the status of the punishing authority.

A typical corporate misconduct involves increasing the delinquent's profit at the expense of others (e.g. employees, shareholders, or the public). Misconduct therefore imposes inequality. We capture this aspect of anti-social behavior by letting a participant decide whether to keep a status-quo allocation (which imposes the same profit on all participants) or to switch to an unequal allocation that increases his profit. All other participants except one learn about the decision and can inform the ignorant participant who can reduce the wrongdoer's profit. The experiments were neutrally framed since we avoided all suggestive expressions. However, we interpret the selection of the unequal allocation as *Misconduct*, the transfer of information to the ignorant participant as *Whistleblowing*, and the reduction of participant A's profit as *Punishment* by the authority. We will also label the three stages of the game accordingly throughout the paper.

Stage 1: Misconduct There are five participants A-E in experiment 1 and seven participants A-G in experiment 2. All participants receive an endowment of 100 points. Participant A can decide whether to keep this status quo X or to misconduct and switch to allocation Y which affects participants differently. Y yields a higher payoff for participants A and B (and F in experiment 2), a lower payoff for participant C (and G in experiment 2), and the same payoff for participants D and E. See Table 1 for a detailed description of payoffs. Note that while total payoffs in experiment 1 are constant for X and Y, in experiment 2 total payoffs are lower in Y compared to X.

Stage 2: Whistleblowing In this stage, all participants except one learn about the decision of participant A. In Experiment 1 participant E remains ignorant, in Experiment 2 (depending on the treatment) either participant E, F, or G remains ignorant. However, the knowing participants can inform the ignorant player about A's decision (X or Y). To model psychological or other costs imposed on the whistleblower, reporting is costly. It costs 6 points. To avoid the bystander effect (e.g. to save reporting costs), all knowing participants decide whether to report, but only one knowing participant's decision is randomly selected. If this participant decided to report, he pays the reporting costs and the ignorant participant is informed about participant A's decision. If he decided not to report, he does not have to pay the reporting costs, and the ignorant participant remains uninformed.

Stage 3: Punishment If the chosen knowing participant decided to blow the whistle and therefore the ignorant participant learns about participant A's decision

(X or Y), the formerly ignorant participant assumes the role of authority, i.e. he can punish participant A by deducting points. The maximum amount of points is 100 (distribution X) or 120 (distribution Y) points, respectively. Punishment is costless.

At the end of stage 3 all participants were informed about decisions in stage 1–3.

3.1 Experiment 1: incentives for whistleblowing

To analyze the effect of incentives on whistleblowing we conducted six treatments in a between-subject design. The *No Incentives* treatment was conducted as described. We have four financial incentives treatments: In *High Reward* the randomly selected participant in stage 2 paid the reporting costs of six points and additionally received a reward of 50 points in case he reported the decision. In *Low Reward* he received 10 points for reporting. In *High Fine* the randomly selected participant in stage 2 paid the reporting costs of six points in case he reported the decision and paid a fee of 50 points in case he did not report the decision. In *Low Fine* he paid ten points. In *Command* there were no additional financial incentives, but all participants were informed in the instructions that “participants B–D are obliged to inform participant E if participant A chose allocation Y”. Table 2 supplies an overview on the treatments.

3.2 Experiment 2: status of sanctioning authority

Experiment 2 consists of three treatments, again in a between-subject design. There were no additional incentives for whistleblowing, just as in the *No Incentives* treatment above. In this experiment we varied how the authority is affected by the misconduct. In the *Not Affected* treatment the authority is not affected and remains with her endowment of 100 points. In *Positive* the authority is positively affected and receives 120 points in allocation Y. In *Negative* the authority is negatively affected and receives 60 points in allocation Y. To keep total payoffs after misconduct constant across treatments, we added two further players F and G to the experimental design of experiment 1 and varied which participant was in the role of authority. Participant E, F and G were in the role of authority in *Not Affected*, *Positive*, and *Negative*, respectively. Table 2 supplies an overview on the treatments.

3.3 Procedures

To obtain all relevant decisions, we applied the strategy method by Selten (1965). Participants decided whether to report participant A’s behavior for both allocation choices X and Y. Punishment was elicited for both allocation choices, too. For experiment 1 we conducted 19 sessions between April 2015 and July 2016. All sessions were conducted at the LERN (University of Erlangen-Nuremberg) with a total number of 505 participants (64% female). For experiment 2 we conducted

17 sessions in June 2015 with a total number of 364 participants (49% female). 5 sessions were conducted at the LERN (University of Erlangen-Nuremberg) with a total number of 140 participants (64% female). 12 sessions were conducted at the experimentTUM (TU Munich) with a total number of 224 participants (45% female). For both experiments one point translated into 0.05 euros. Experiments took about 35 min, average income of participants was 9.02 euros (\$10.01 at that point in time) including a show-up fee of 4 euros (\$4.45). The experiments were programmed with z-Tree (Fischbacher 2007). We recruited participants using the online recruiting system ORSEE (Greiner 2004). Each subject sat at a randomly assigned PC terminal and was given a copy of instructions.²⁴ To ensure common knowledge of the game, instructions were read aloud. A set of control questions was provided to ensure the understanding of the game. The experiment did not start until all subjects had answered all questions correctly. At the end of the experiment participants filled out a questionnaire including questions on gender, socio-demographics, personality traits and locus of control.

4 Results

Experiment 1 is designed to investigate the impact of reward and fine on the willingness to blow the whistle after a misconduct. Additionally, we analyze the willingness of differently affected observers. Experiment 2 adds a comparison of differently affected authorities. Unless noted otherwise, the reported test statistics refer to a two-sided Fisher's exact test.

4.1 Experiment 1: incentives for whistleblowing

We turn towards the results of the financial incentives treatments (*High & Low Reward*, *High & Low Fine*) in experiment 1 first. Table 3 gives descriptive statistics of participants' behavior, in particular participants' B-D willingness to blow the whistle. For completeness we also report the frequencies of misconduct by participant A and the amount of punishment assigned to participant A for choosing Y by participant E across treatments.

Table 3 gives two pieces of evidence that choosing allocation Y is indeed perceived as inappropriate behavior in all incentives treatments. First, the vast majority of participants A refrains from choosing Y. Second, punishment is significantly higher for allocation Y than for allocation X (Wilcoxon signed-rank test, $p < 0.01$). Table 3 also shows that even in the *No Incentives* treatment with no additional incentives, 33% of potential whistleblowers blow the whistle on average.

All five incentive treatments increase the willingness to blow the whistle on average (see Table 3). Paying whistleblowers or fining participants who refrained from blowing the whistle significantly increased whistleblowing compared to *No*

²⁴ A translation of the instructions can be found in the online appendix.

Table 1 Allocation X (status quo) and Y (misconduct), *: Participants F-G only in Experiment 2

Participant	Allocation X	Allocation Y
A	100	120
B	100	120
C	100	60
D	100	100
E	100	100
F*	100	120
G*	100	60

Incentives ($p < 0.01$ for all treatments). Furthermore, fines work better than rewards, on average.²⁵

The size of the reward or fine does not have a significant effect on the willingness to blow the whistle on average.²⁶ However, treatment effect sizes strongly differ across types. Figure 1 shows that compared to the *No Incentives* treatment, neutral and advantaged types are significantly more likely to blow the whistle when offered a *High* or *Low Reward* or threatened by a *High* or *Low Fine* (although the increase is only marginally significant for advantaged types in *Low Reward*). There is also a significant effect on disadvantaged types for *High* and *Low Reward* and *High Fine*. *Low Fine* has no effect on disadvantaged types. See Table 4.

Whereas neutral and disadvantaged players' willingness to blow the whistle does not differ across the financial incentives treatments, advantaged players' willingness is affected. For advantaged players fines work better than rewards ($p < 0.01$) and high rewards are more effective to induce whistleblowing than low rewards ($p < 0.1$). We do not find evidence that players' willingness to blow the whistle is affected by the size of the fine, though.

Whereas willingness to blow the whistle for disadvantaged players is already very high without incentives (71%) and is not strongly affected by additional incentives, willingness of neutral and advantaged players increases if there is a reward or fine and adjusts almost to the level of disadvantaged players (see Fig. 1 and Table 5): We do not find differences across types' willingness to blow the whistle when the reward is high or when there are low or high fines; in these treatments whistleblowing rates are very high for all types of potential informants (between 0.78 and 1.00). However, since the low reward has only a weak effect on advantaged players' willingness to blow the whistle, disadvantaged players and even neutral players are more likely to blow the whistle than advantaged players when the reward is low.

A—compared to financial incentives—weaker, but still significant positive impact on whistleblowing is caused by *Command*, where we find 55% of participants willing to blow the whistle (Table 3). Besides, advantaged players are significantly more likely to blow the whistle in *Command* ($p < 0.1$). For neutral and disadvantaged players the positive treatment effect of *Command* fails to be significant. In

²⁵ *High* and *Low Fine* vs. *High* and *Low Reward*: $p < .05$.

²⁶ *High Reward* vs. *Low Reward*: $p = .121$; *High Fine* vs. *Low Fine*: $p = .699$.

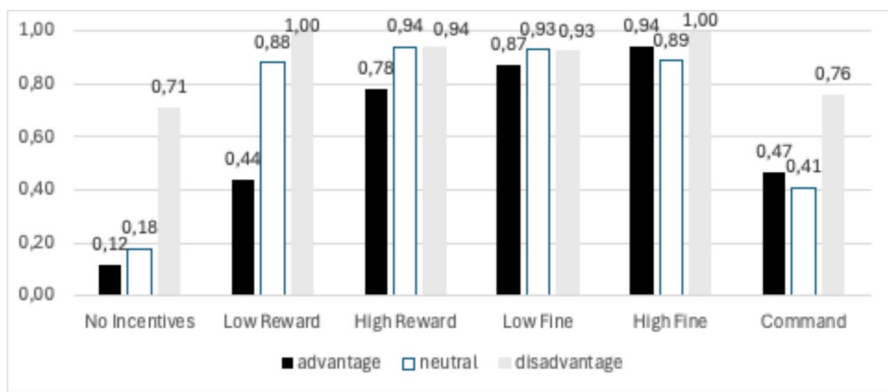
Table 2 Treatments of the experiments 1 (incentives) and 2 (authority)

	Treatment	Description	# participants	# groups
Experiment 1 (Incentives)	No Incentives		85	17
	Low Reward	Reporting the misconduct yields a reward of 10 points	80	16
	High Reward	Reporting the misconduct yields a reward of 50 points	90	18
	Low Fine	Not reporting the misconduct results in a fine of 10 points	75	15
	High Fine	Not reporting the misconduct results in a fine of 50 points	90	18
	Command	'If participant A chose Y, participants B-D are required to inform participant E.'	85	17
Experiment 2 (Authority)	Not Affected	The authority is not affected by the misconduct	119	17
	Negative	The authority is negatively affected by the misconduct	126	18
	Positive	The authority is positively affected by the misconduct	119	17

Table 3 Descriptive statistics on average behavior in experiment 1 (incentives)—elicited using the strategy method

	Frequency of misconduct	Frequency of whistleblowing after misconduct	Average punishment for misconduct (Y)
No incentives	0.06	0.33	66.41
Low reward	0.19	0.77	34.38
High reward	0.33 ^a	0.89	42.33
Low fine	0.13	0.91	58.13
High fine	0.11	0.94	55.56
Command	0.12	0.55	53.53

^aIn *High Reward* the likelihood of misconduct is significantly higher compared to *No Incentives* ($p < .1$)

**Fig. 1** Frequencies of whistleblowing across types in experiment 1 (incentives)—elicited using the strategy method**Table 4** p -values of Fisher's exact test for differences in frequencies of whistleblowing across treatments in experiment 1 (incentives)

	Low Reward vs No Incentives	High Reward vs No Incentives	Low Fine vs No Incentives	High Fine vs No Incentives
Advantage	< 0.1	< 0.01	< 0.01	< 0.01
Neutral	< 0.01	< 0.01	< 0.01	< 0.01
Disadvantage	< 0.05	< 0.1	0.178	< 0.05

Command, disadvantaged players are more likely to blow the whistle than neutral players ($p < 0.1$).

To summarize:

- There is whistleblowing even when there are no incentives.

- Compared to No Incentives, whistleblowing is more likely in Low Fine, High Fine, Low Reward, and High Reward.
- Whistleblowing is more likely in Low and High Fine than in Low and High Reward.
- Whistleblowing is more likely for disadvantaged players compared to neutral and advantaged players in No Incentives.
- Advantaged players' willingness to blow the whistle marginally increases with the size of the reward.
- Financial incentives mitigate the difference in willingness to blow the whistle between player types.
- Whistleblowing is more likely in Command compared to No Incentives.

4.2 Experiment 2: status of the sanctioning authority

Experiment 2 analyzes whether potential whistleblowers react to how the sanctioning authority is affected by the misconduct. Table 6 gives descriptive statistics of participants' behavior, in particular participants' B-D willingness to blow the whistle. For completeness we also report the frequencies of misconduct by participant A and the amount of punishment assigned to participant A for choosing Y by the authority across treatments.

As in experiment 1, whistleblowing is different from zero in all treatments. Besides, there is a higher willingness to blow the whistle for disadvantaged players compared to neutral ($p < 0.01$) or advantaged players ($p < 0.01$) in all treatments (see Fig. 2).

Table 6 shows that whistleblowing on average is in fact more likely when the authority is negatively affected compared to positively or not affected. Treatment effect sizes and significance varies across player types (see Fig. 2 and Table 7): Disadvantaged players are significantly more likely to blow the whistle when the punishment authority is negatively affected by misconduct compared to not affected or positively affected. Neutral and advantaged players also blow the whistle slightly more often when the authority is negatively affected by misconduct, but the treatment difference fails to be significant.

To summarize:

Disadvantaged players are more likely to blow the whistle when the authority is negatively affected by misconduct compared to not affected or positively affected.

5 Discussion

5.1 Incentives for whistleblowing

Although there is whistleblowing even when there are *No Incentives*, the manipulations *High Reward*, *Fine*, and *Command* significantly increase the likelihood

Table 5 *p*-values of Fisher's exact test for differences in frequencies of whistleblowing across types in experiment 1 (incentives)

	advantage vs. neutral	advantage vs. disadvantage	neutral vs. disadvantage
No incentives	1.000	0.001***	0.005**
Low reward	0.023**	0.001***	0.482
High reward	1.000	1.000	1.000
Low fine	0.338	0.338	1.000
High fine	1.000	1.000	0.486
Command	1.000	0.157	0.080*

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

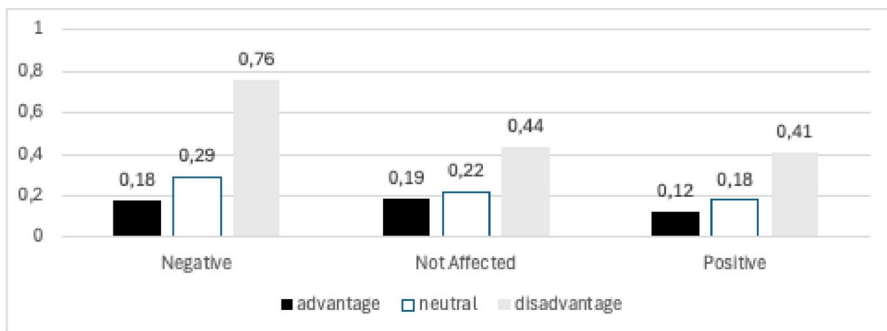
of potential informants to blow the whistle. While higher willingness to blow the whistle in the *Reward* and *Fine* treatments conforms theoretically with a behavioral model suggesting that agents are only interested in final monetary payoffs, the significant increase of whistleblowing in *Command* compared to *No incentives* does not. This result supports the theory of a preference-shaping function of law. With regard to an expressive function of law, the results are, however, not clear-cut, since the subjects of our experiment acted anonymously in a one-shot game. Thus, the appeal to social norms cannot have influenced the subjects' behavior in a direct way, that is by tying a reputational loss or other social sanction to the concrete action of non-reporting. That does not exclude an indirect influence of such social norms, inducing subjects to comply with common rules in general, because they otherwise feel shame or a loss in self-esteem (cf. Sunstein 1996). This, however, presumes that agents have already formed a preference to comply with given rules when they enter the experiment.

Furthermore, the results show clearly that *Command* is not as effective in inducing participants to blow the whistle as *Fine* or *Reward*, both of which offer monetary incentives. At first glance, one might therefore be inclined to discard the *Command* strategy from a policy perspective altogether. This would, however, be premature, since a regulator or corporation adopting a *Command* strategy to induce whistleblowing may at least raise the whistleblowing rate modestly at nearly no cost. This tilts the cost–benefit calculus of regulatory strategies to induce whistleblowing in favor of *Command*. Furthermore, in the long run *Command* strategies might have the potential to change the cultural attitudes of people towards whistleblowing, including those who are not in the position of potential whistleblowers. This, in turn, may reduce the costs of whistleblowing with regard to the threat of retaliation, ostracism and the like significantly.

In our experiment, whistleblowing is more likely in the *Fine* treatments than in the *Reward* treatments. This is in line with the results of Sutter et al. (2010) with regard to their findings on the size of the participants' contributions in the treatments, where punishment and reward institutions are imposed exogenously. An explanation of the observed difference could be loss aversion. At first sight, the higher willingness to blow the whistle in the *Fine* treatments suggests leaning on a regulatory strategy that fines/sanctions potential informants who know of the misconduct in question, but nevertheless stay silent. However, at a second glance

Table 6 Descriptive statistics on behavior in experiment 2 (authority)—elicited using the strategy method

	Frequency of misconduct	Frequency of whistleblowing after misconduct	Average punishment for misconduct (Y)
Negative	0.35	0.34	73.29
Not affected	0.33	0.30	61.94
Positive	0.33	0.26	7.71

**Fig. 2** Frequencies of whistleblowing across types in experiment 2 (authority)—elicited using the strategy method**Table 7** p -values of Fisher's exact test for differences in frequencies of whistleblowing across treatments in experiment 2 (authority)

	Advantage	Neutral	Disadvantage
Negative vs. Not Affected	1.000	0.746	0.040**
Negative vs. Positive	0.703	0.392	0.021**
Positive vs. Not Affected	0.701	0.723	0.813

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

this conclusion may be premature for the following reason: In our experiment, the probability of being “detected” is the same for participants B-D who refrain from blowing the whistle in the *Fine* and *Reward* treatments. In reality, however, regulation on incentivizing whistleblowers is typically considered where the enforcement authority (public authority or employer) lacks the information to sanction misconduct. Thus, the probability of detecting the “silent bystander” is very low. In such scenarios, therefore, reward schemes appear to be the superior regulatory option to induce an insider to share her private information about misconduct with enforcement authorities.

We do not see a strong crowding-out effect in the *Reward* treatments as described in Feldman and Lobel (2010). To the contrary, we observe an increase in the

likelihood of potential informants to blow the whistle for high and low rewards. This may be due to the fact that even in *Low Reward* the loss in intrinsic motivation is overcompensated by the utility gained through the reward. To put it differently, our results do not rule out a crowding-out effect in case the reward were set (even) lower.

We do not find a significant increase in the whistleblowing rate on average depending on the size of reward and fines. That means, that the expected utility gain from the *High Fine/Reward* in comparison to *Low Fine/Reward* is—on average—not strong enough to raise the whistleblowing rate. One reason is that whistleblowing rates are already very high in *Low Fine* and in *Low Reward* (especially for disadvantaged players) which does not leave much room for increase. Prima vista, this appears to suggest a regulation strategy that confines itself to rather modest financial incentives, at least as a first step. However, we refrain from jumping to such a conclusion, since the perception of reward and fine sizes may be highly context-dependent and subjective. Furthermore, we actually do observe a significant increase with regard to *High Reward* in comparison to *Low Reward* for the subset of advantaged participants, and it can be assumed, that a regulator also aims at effectively incentivizing such bystanders profiting from the misconduct in question.

The significance of the increase in the willingness of advantaged participants to blow the whistle in the *High Reward* treatment compared to the *Low Reward* treatment has to be seen against the backdrop of a noticeably low whistleblowing rate of this type in *Low Reward*. In light of the low probability of detecting the silent—albeit advantaged—bystander in real life (see above), we do not consider *Fine* as a superior regulatory strategy for potential informants benefiting from the misconduct in comparison to sufficiently lucrative reward schemes.

5.2 Situational determinants of whistleblowing

As to the likelihood of blowing the whistle across types, we find that whistleblowing is more likely for disadvantaged players compared to neutral and advantaged ones in *No Incentives*. As a consequence to the very high whistleblowing rate of disadvantaged players in *No Incentives*, the increase in the likelihood to blow the whistle for disadvantaged players due to additional incentives is relatively low. With regard to *Command* it even fails to be significant. From a policy perspective, these results suggest that whistleblower incentive schemes may not be necessary with regard to the victims of the misconduct in a wide range of scenarios.

This suggestion conforms with the observation that, in reality, the victim of the misconduct (=the disadvantaged party) is not the primary addressee of incentive schemes to further whistleblowing anyway. From a legal point of view this can be explained as follows: If the misconduct is not concealed from the victim (open misconduct) or the victim otherwise knows about the misconduct, he generally has sufficient incentives to (1) inform the enforcement authorities in order to stop the misconduct or make the perpetrator repair the harm done and/or (2) claim damages before the courts. If the misconduct is concealed from the victim, it does not have any private information to share with the authorities and is therefore no suitable addressee of incentives to blow the whistle. However, there is an exception to

this reasoning where the harm done to the informed party (“victim”) is not severe enough to motivate him to act. In the legal literature, the problem of private law enforcement in case of dispersed low-value damage is well-known and intensely debated. The enforcement problem may be aggravated where there is no individual claim to self-enforce. In the latter case, though, the “victim” may alternatively inform the competent public authority or the private party who has a claim in order to stop the misconduct and/or make the perpetrator repair the harm done.

However, corporations could probably still make use of the high willingness of disadvantaged employees to report in order to promote internal whistleblowing. They could do so by implementing a communication strategy that reminds employees that misconduct which harms the company may also harm them. The obvious case is where the misconduct puts the company in jeopardy and, as a consequence, may result in the employees losing their jobs. Alluding to such mediated harmful consequences may, therefore, motivate employees to report.²⁷

Having said that, whistleblower incentives primarily address neutral or advantaged insiders. We do not observe a significant difference in the willingness to blow the whistle between neutral and advantaged types in *No Incentives*. Furthermore, in this treatment the whistleblowing rates of these types are rather low. This suggests, that equality preferences of the Fehr-Schmidt kind or similar fairness preferences are rather weak for such types. In contrast, both types are highly responsive to financial incentives. As a consequence, for both neutral and advantaged players as the main targets of whistleblower regulation in real life financial incentive schemes, at least of the *Reward* kind (see explanation above) and coming along with sufficient protection from retaliation, promise to be highly effective in making them blow the whistle.

Apart from its comparatively modest impact on the willingness to blow the whistle across all player types *Command* only raises the likelihood to blow the whistle significantly for advantaged players. Thus, from a policy perspective our results suggest not to focus on a *Command* strategy as an exclusive regulatory measure, but rather to deploy it as a (nearly) costless “add-on”.

No Incentives in experiment 1 and *Not Affected* in experiment 2 differ in only one aspect. While in *Not Affected* the misconduct decreases total welfare, it does not affect total welfare in *No Incentives*. Therefore, one might expect a higher willingness to blow the whistle in *Not Affected*. However, this is not the case. Results are similar in both experiments, no player type is more willing to blow the whistle when total welfare is destroyed. If at all, we observe a tendency for disadvantaged player to be less willing to blow the whistle in this situation. One can conclude that the willingness to blow the whistle does not depend on the misconduct’s impact on total welfare. This calls the wide-spread assumption into question that the negative welfare impact of misconduct is an important driver for whistleblowers. It appears that the relationship between “moral intensity”, i.e. one’s own evaluation of the degree of the misconduct’s immorality (cf Singer et al. 1998), as a driver for whistleblowing and the negative impact of the misconduct on social welfare may not be as direct and clear-cut as assumed by parts of the literature (cf Iwasaki 2020).

²⁷ We thank an anonymous referee for this thought.

5.3 Status of sanctioning authority

Experiment 2 provides evidence that the willingness to blow the whistle at least for one type depends on how and whether the sanctioning authority is affected by the reported misconduct. More concretely, we find that unaffected bystanders and insiders for whom the misconduct carries utility are not affected by the status of authority. Their willingness to blow the whistle is rather low no matter how the authority is affected by the misconduct. For victims of the misconduct, however, we find significant differences. From disadvantaged insiders, a negatively affected authority receives information more frequently than an authority who is positively or not affected. Thus, companies or employers implementing internal whistleblowing schemes might consider to stress in their codes of conduct or elsewhere that they themselves suffer from the misconduct to be disclosed by the potential whistleblower. However, this suggestion comes with the substantial qualification that the victims of the respective misconduct are generally not the main target of a whistleblower scheme as explained above.

6 Conclusion

How to make insiders report misconduct to a sanctioning authority? In two laboratory experiments we analyzed the influence of (financial) incentives and situational frame conditions on insiders' willingness to blow the whistle. Contrary to other studies, we do not measure stated intention to blow the whistle. Our contribution is an experimental design that measures actual whistleblowing behavior in a controlled environment, and that is easily adaptable to other incentive strategies and situational determinants on the willingness to report misconduct.

Retaliation and protection against retaliation are apparent candidates for extensions. For the time being, we excluded this aspect for reasons of simplicity. Including a retaliation threat in our experimental design may at least partly offset the incentive effect of the other strategies. So far, we focused exclusively on punishment as a "remedy" for the misconduct. Another natural extension is the compensation for the losses the victims incurred because of the misconduct. Finally, with regard to the comparative whistleblowing rates of neutral and advantaged players in *Reward* and *Fine*, it would promise insightful results to add extensions with differing, rather low probabilities of detecting non-reporting participants.

In our current experimental design the misconduct was designed as anti-social behavior. There was no fraud involved. An extension that strengthens anti-social behavior with fraudulent behavior would be a straightforward amplification. Participants in our experiments were university students. On the one hand, students will eventually become employees and university misconduct is a relevant issue, too. On the other hand, conducting the experiment with potential whistleblowers on real corporate misconduct would be a promising road for future research.

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Data availability The Data is on file with authors and will be made available to reviewers and other persons with a legitimate interest.

Declarations

Conflict of interest The authors have no conflicts of interest to declare that are relevant to the content of this article.

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