The Effect of Monitoring on Teleworkers' and Office Workers' Behavior

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Abstract

Today's working environment is shaped by two megatrends: telecommuting and surveillance. While both are widespread in practice, research on how telecommuting affects employee behavior and interacts with monitoring remains scarce. In an experiment, we examine differences in effort and misreporting between teleworkers and office workers. We manipulate the presence of monitoring and focus on a setting that allows employees to reciprocate or retaliate against their employer. Consistent with our predictions, teleworkers exhibit greater effort and misreport less than office workers. A path analysis reveals that these effects are driven by reciprocity. Further, we find that monitoring leads to a greater reduction in effort and misreporting among office workers compared to teleworkers. Our study provides important implications for the design and implementation of management control systems.

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I. INTRODUCTION

Telecommuting, i.e., working at least partially away from a central workplace, has become the "new normal" in many firms – boosted particularly by the COVID-19 pandemic (Allen et al. 2015).[1] Recently, however, more and more companies have returned to or at least have articulated strong preferences for office-based work – mainly because of fears of shirking and dishonest behavior by teleworkers (Business Insider 2024a). At the same time, employee surveillance has spread in the business world (BBC 2020; Waterson 2016). Firms that have committed to telecommuting now not only apply this technology in the office but also in telecommuting environments. In this study, we first examine whether the widespread assumption that telecommuters work less and are more dishonest vis-à-vis office workers is justified. Next, we examine the effects of employee surveillance and discuss whether this practice affects office and teleworkers differently.[2]

Telecommuting and employee surveillance have become two megatrends in the workplace. Concerning the first trend, a 2022 survey reveals that 87% of U.S. employees with remote-work options work at least one day per week outside the office (McKinsey & Company 2022). Similarly, 56% of U.S. respondents express a strong preference for telework (Piacenza et al. 2022). This preference is rooted in the advantages associated with telecommuting, such as reduced commuting time, cost savings, flexibility and better work-life balance (Global Workplace Analytics 2021).

While also firms benefit from telecommuting, e.g., by less office space and estimated annual savings of $11,000 per half-time remote worker (Global Workplace Analytics 2021), many firms such as Amazon (2024) have started to require employees to return to the office. Yet, surveys document that firms' decision to offer only office-based work might be associated with high costs.

[1] We use the terms telecommuting, teleworking, working from home and remote work interchangeably.
[2] We use the terms monitoring and surveillance interchangeably.

For example, in the case of Amazon, 91% of Amazon employees are dissatisfied with the decision, and thus 72% have started looking for alternative jobs (Chen 2024). This is in line with other studies, showing that 66% of U.S. employees would quit their jobs when the remote work option is removed and about 46% reveal that they would be less willing to go the extra mile when forced to work in the office (Owl Labs 2022).

Due to the high costs of not offering the option for telecommuting, it is important to better understand employee behavior in the office vis-à-vis when telecommuting. However, research in this field provides mixed evidence. While some researchers find positive effects of telecommuting on productivity (Belanger 1999; Bloom et al. 2015; Rupietta and Beckmann 2018), others document negative (Gibbs et al. 2021; Golden et al. 2008), or even no effects at all (Gajendran and Harrison 2007).[3] Prior research speculates that these inconsistencies are driven by methodological issues, e.g., single-source data, cross-sectional designs, or self-reported variables (e.g., Allen et al. 2015). While we employ a controlled experiment that addresses many of these issues, our study differs from prior research in one important aspect: We acknowledge that employees are well aware of the fact that employers today often *have the option* to allow telecommuting, i.e., telecommuting is an employer's decision. In our experimental study, employees can directly reciprocate or retaliate against their employer for the telecommuting decision. We argue that this feature better reflects the real world and allows for unambiguous predictions.

Firms' reservations concerning telecommuting can be easily explained by the assumptions of agency theory. According to agency theory, employees will exploit the loss of control resulting from telework to maximize their utility (Ross 1973). This leads to a reduction of effort due to

[3] Another example is Kelly et al. (2024) who, in their survey, do not find any direct effect of telework on perceived productivity but an indirect effect through more hours worked. Both variables are self-reported by MTurk respondents in this study.

increased opportunity costs when not working in the office (e.g., engaging in personal activities) and increased misreporting (e.g., of working hours). In this vein, Elon Musk posted on X that everyone who disagrees with a policy of coming back to the office "should pretend to work somewhere else" (Porter 2022). According to agency theory, one option—besides incentives—to address this issue is to increase monitoring (Jensen and Meckling 1976).

Employers' desire to monitor employees is not new and had come up long before teleworking became popular. Technological advances have made employee monitoring cheaper, more accessible and more reliable, resulting in an increased usage (Alge and Hansen 2013; Ravid et al. 2020). Regarding the other workplace trend we address, a recent study finds that 49% of office workers in the U.S. are monitored at work (American Psychological Association 2023). Many of the systems used at the workplace monitor whether the employee is physically present at work, e.g., sitting at the computer or moving the mouse. Often output cannot be reliably measured and if it can, it is more attractive to use incentives instead of monitoring. Capturing physical presence means verifying that the employee is at work. In this respect, the British newspaper Daily Telegraph placed sensors beneath employees' desks using heat and motion detection to monitor whether employees sit at their desks (Waterson 2016). Similarly, the UK head office of Barclays pilot-tested a system tracking employees' computer usage in the office (BBC 2020). This was followed by a controversial initiative where the company secretly placed black boxes under employees' desks to monitor their whereabouts (Ball 2021). Another example is Canon, a global imaging solutions company, which offers workplace AI solutions combining cameras and AI video analytics (Canon 2024). These systems monitor employees in the office in real time.

During the COVID-19 pandemic, the usage of employee monitoring increased and the technology was also used to track teleworkers. Also, the demand for surveillance software rose by

108% in April 2020 compared to the previous year (Ball 2021). Consistent with this trend, employee-surveillance-software providers reported a surge in sales inquiries with increases ranging from 333% (Desk Time software) to 139% (KickIdler software) in 2020 compared to the previous year (Ball 2021; Brown 2020). Importantly, these surveillance technologies are also used for teleworkers and, e.g., make screenshots or record videos using the computer's webcam to verify whether the employee is really sitting in front of the computer. Against this backdrop, our study not only examines office workers' and teleworkers' working behavior, i.e., their effort and misreporting, but also their reactions to increased monitoring.

Our first two hypotheses predict that teleworkers will reciprocate their employer for being allowed to telework by more effort (H1a) and less misreporting (H1b) compared to office workers. As employees today generally have a preference for telecommuting, teleworkers will reciprocate and office workers will retaliate against their employer (Greer and Payne 2014). Our remaining hypotheses predict a moderating effect of monitoring for effort and misreporting. For effort (H2a), we predict that monitoring has a more negative effect on office workers compared to teleworkers. It follows self-determination theory that monitoring crowds out intrinsic motivation via reduced autonomy (Christ et al. 2012; Enzle and Anderson 1993; Gagne and Deci 2005; Schedlinksy et al. 2020). Monitoring also induces self-awareness, prompting individuals to reflect on themselves and compare their behavior with salient standards shaped by the situation (Davidson 2019; Lerner and Tetlock 1999; Wicklund and Duval 1971). When there is no salient and established performance standard—as in our setting where employees receive fixed compensation for the task and no specific goals exists—the aspect becoming salient is the employee's "self" (Carver 2012). Employees then reflect upon their current level of reciprocity driven by motivation. Particularly, the negative motivational effect of office work is magnified, which results in even less effort under monitoring.

For misreporting (H2b), a salient and established standard exists as individuals usually share a preference for honesty (Evans et al. 2001). In this case, particularly office workers become aware that their intention to misreport due to low reciprocity would move them away from the salient standard of honesty. Thus, office workers misreport less under monitoring and the discrepancy with teleworkers (who report more honestly even in the absence of monitoring) is reduced.

To test our predictions, we conduct a 2×2 between-subjects experiment, manipulating monitoring (present vs. absent) and location (office vs. telework).[4] Monitoring is implemented by video and audio monitoring. In terms of location, participants either complete the experiment in the laboratory (office) or from home (telework). Before the main experiment takes place, a small group of participants assume the role of an employer and decide where their (assigned) employees should work and whether they should be monitored. During the main experiment, other participants assume the role of their employees. Employees work on two tasks: a slider task and a reporting task. We measure effort by the number of sliders moved. While employee-participants receive a fixed compensation, their employer's compensation increases with the number of sliders solved. We use the reporting task to measure misreporting. While misreporting during this task increases employee's payoff, it decreases the employers' compensation.

In line with our hypotheses, we find that teleworkers exhibit greater effort (H1a) and misreport less (H1b) compared to office workers. When monitoring is present, effort and misreporting decrease more among office workers than among teleworkers. Thus, H2a and H2b are supported. Moreover, additional analyses reveal that reciprocity mediates the relationship between location

[4] The research was conducted in an ethical manner. Specifically, subjects were treated anonymously in accordance with the relevant data protection regulations and were not exposed to specific risks. Furthermore, subjects were not deceived in any way or at any time. The institution at which the study was conducted does not have a review board to provide ethical clearance.

(i.e., telework or office) and effort as well as misreporting. Further, we show that monitoring induces self-awareness and thus has an impact on how reciprocity (retaliation) translates into lower effort and misreporting.

Our study contributes to both theory and practice. First, from a theory perspective, we show that teleworkers reciprocate their employer for the opportunity to work remotely. Our study differs from prior research, as employees in our experiment are aware of the fact that it is their employer's decision to allow telework or to force them to work in the office. As employers' compensation is linked to employees' working behavior, reciprocity can unfold. Hence, we contribute by providing a new perspective on the results of prior research (Bloom et al. 2015; Brüggen et al. 2024; Gajendran and Harrison 2007; Gibbs et al. 2021; Golden et al. 2008). For example, Brüggen et al. 2024 examine a setting that is very similar to ours and do not observe significant differences in effort and misreporting between randomly assigned office and teleworkers.[5] Yet, this study differs from ours because—among other things—these authors are interested in a setting where reciprocity does not matter and is, thus, unlikely to affect behavior. Taken together, our study makes practitioners who worry about the negative effects of telework due to loss of control aware of the positive effects of telecommuting resulting from reciprocity.

Second, to the best of our knowledge, this study is the first to examine whether the effects of monitoring depend on location, i.e., whether employees are monitored in the office or while

[5] Brüggen et al. (2024) measure effort based on the number of sliders correctly solved. In contrast, we operationalize effort through the number of sliders moved.

telecommuting.[6] Answering this research question is important as employee surveillance has become widespread (Fortune Business Insights 2024) and is no longer used only in the office but also applied to teleworkers (European Digital Rights 2022). Notably, we examine this interaction effect not only for effort but also for misreporting. As monitoring is argued to lower intrinsic motivation it is important to investigate work dimensions that either depend on intrinsic motivation (i.e., effort) or do not (i.e., misreporting). Investigating both dimensions in a single study helps to provide potential explanations for the mixed findings of monitoring on effort and honesty in prior research (Beck et al. 2018; Dickinson and Villeval 2008; Kroher and Wolbring 2015).

Third, our study examines a setting with imperfect monitoring. In other words, dysfunctional behavior cannot be effectively observed by the employer and, thus, cannot be sanctioned. For this reason, our findings are more generalizable to practice, where perfect monitoring is often too expensive or not feasible. From a theory perspective, this provides clean evidence for the effects of monitoring that are not mixed with the effect of (different types/levels of) sanctions.

II. RESEARCH SETTING AND HYPOTHESES

Research Setting

The research setting we examine can be characterized by three elements: First, we incorporate employer's deliberate decisions to allow or deny telecommuting and to implement monitoring or not. Employees can react to this decision by reciprocating (or retaliating) to their em-

[6] Ko and Baek (2024) use a field-study and implement computer monitoring in addition to a set of output-controls. However, only teleworkers were monitored and their finding—that monitored teleworkers exhibit a higher productivity level compared to unmonitored office workers—is based on the absence of an ideal control group. Hence, using an experiment and holding the treatments constant allows us to examine whether monitoring effects depend on the location. Moreover, Kelly et al. (2024) find in their survey that more intensive monitoring is generally associated with higher perceived productivity. However, when employees work remotely, this relationship reverses: in remote settings, more intensive monitoring tends to be associated with lower perceived productivity. It is important to note that these findings are based on self-reports, and no direct comparison to office workers is provided.

ployer. Second, we implement employee surveillance as commonly observed in practice and capture employees' physical presence. We do so because output is often not available and if it is available other management controls such as incentives can be used. Third, we use imperfect monitoring, i.e., dysfunctional activities are not perfectly detected by the employer. We believe that imperfect monitoring better reflects the real world where employees use mouse jigglers etc. to pretend keyboard activity, for example. Perfect monitoring—if feasible at all—would be expensive for firms but of course could also lead to a first-best-solution.

Hypotheses Development

Location

Teleworking can be generally defined as "[…] a work practice that involves members of an organization substituting a portion of their typical work hours (ranging from a few hours per week to nearly full-time) to work away from a central workplace—typically from home—using technology to interact with others as needed to conduct work tasks" (Allen et al. 2015, 44).[7] Today, employees have—on average—a strong preference for telework (Da Silva et al. 2023; Piacenza et al. 2022). This becomes particularly obvious when firms remove the possibility to work from home. A case in point is Deutsche Bank, Germany's largest financial institution. When the bank announced a limit for remote work of 40% of the working hours, it faced intense criticism on its internal platform in response to the announcement and ultimately decided to disable the comment function (Business Insider 2024b; Osman 2024). Many other companies such as Amazon, Meta, and Tesla have also implemented return-to-office mandates, and have faced similar employee resistance, including petitions and protests (Business Insider 2024a).

[7] Given this definition, telework encompasses a broad range of working agreements where employees perform their job outside the office. This also includes—but is not limited to—working from home. Therefore, we use both terms interchangeably.

Based on employees' preference for telework, our first hypothesis predicts that employees will reciprocate the opportunity to work from home. Effort depends on (intrinsic) motivation which is driven—among other factors (e.g., incentives)—by reciprocity. Reciprocity (Gouldner 1960) is a key concept of gift exchange theory (Akerlof 1982). It argues that individuals respond to kind actions with kindness and unkind actions with retaliation (Falk and Fischenbacher 2006). In this vein, employers who allow telework provide a "gift" that employees are likely to reciprocate. Hence, employees show gratitude for the benefits of working from home (e.g., increased flexibility) which increases their motivation, and ultimately also effort. Vice versa, employees who have to work in the office retaliate against their employer.

Various studies—but not all—support the assumption that teleworking positively affects effort. The studies that document a positive effect use diverse methodologies and datasets. For example, Rupietta and Beckmann (2018) employ data from the Socio-Economic Panel and find that working from home increases effort. Similarly, Bloom et al. (2015) observe improved performance among teleworkers in a field experiment with call center agents. The performance effects are partially attributed to increased effort, as teleworkers spend more minutes actively working per shift. Gibbs et al. (2021) analyze data from an Asian IT services company and find that remote work increased hours worked, i.e., effort, despite a decline in productivity. Similarly, Kelly et al. (2024) find in their survey with MTurk workers that remote work indirectly increases perceived productivity through more hours worked. While these studies suggest that telework increases effort, the results from experimental studies by Dutcher (2012) and Brüggen et al. (2024) provide mixed results. Dutcher (2012) examines the effect of telecommuting on productivity and finds that telecommuting is only beneficial for creative tasks but has—on average—no effect for dull tasks. Brüggen et al. (2024) show that telework has no effect on effort. However, contrary to our study,

the latter two experiments do not incorporate the possibility for employees to reciprocate their employer for the decision regarding the working location.[8]

To sum up, we predict that teleworkers who appreciate the benefits of working from home will reciprocate employers allowing telework by increased motivation and, thus, more effort.[9] On the other hand, office workers are likely to respond with resistance or retaliation, leading to lower motivation and, ultimately, reduced effort. We formally state our first hypothesis as follows:

H1a: Effort is higher for teleworkers compared to office workers.

Employers are not only concerned that teleworkers work less but also that they act dishonestly. Another common fear is that teleworkers engage in misreporting and, e.g., exaggerate working hours without accounting for breaks. The U.S. Patent and Trademark Office (USPTO), for example, has been subject to nationwide investigations due to widespread misreporting of working hours (Ko and Baek 2024).

Contrary to the belief that telework leads to more misreporting, we argue—similar to H1a— that reciprocity will instead mitigate it. Offering telework can trigger employees' sense of moral obligation. This in turn encourages teleworkers to repay employers' trust by reporting accurately and truthfully. This is in line with prior literature indicating that individuals repay trust by acting in a trustworthy manner, even when it involves a cost (Camerer 2011; Johnson and Mislin

[8] Participants in Brüggen et al. (2024) earned money either for themselves or for a university fund, supporting education and providing student subsidies. As a result, increased (decreased) effort primarily benefited (harmed) the participants themselves, limiting the scope for genuine reciprocal behavior towards the employer. As our theory focuses on intrinsic motivation we increased the duration of the slider task compared to Brüggen et al. (2024) to make sure that differences in intrinsic motivation between teleworkers and office workers can materialize if they exist.

[9] The argument based on agency theory that teleworkers exploit information asymmetry and work less appears overly simplistic. In the real world, employees working in the office can similarly avoid work (e.g., by chatting with colleagues or browsing the web on their smartphone). This is particularly true when monitoring is absent. The risk of job loss deters opportunistic behavior regardless of location. Instead of focusing solely on the control loss in telework environments, we also consider its benefits—improved work-life balance, satisfaction, reduced commuting, and flexibility (e.g., Aksoy et al. 2023)—which employees reciprocate.

2011). In contrast, employees required to work from the office perceive their working conditions as unfair and a signal of distrust—particularly when teleworking opportunities are explicitly denied by the employer. Consequently, they respond with negative reciprocity (or retaliation) and report less honestly.

This argument corresponds to the findings of Houser et al. (2012), who observe that individuals feeling treated unfairly are more likely to engage in dishonest behavior to restore the perceived imbalance. Brüggen et al. (2024) find a reducing—but insignificant—effect of teleworking on misreporting when participants are randomly assigned to work locations.[10] They attribute this result primarily to (nine) individuals who preferred working from home but were forced to work at the office, suggesting that perceived unfairness resulted in retaliation (i.e., negative reciprocity).

To sum up, we rely on reciprocity and predict employees report more honestly when their employer deliberately allows telework compared to when the employer requires office attendance. Hence, we formally state our hypothesis as follows:

H1b: Misreporting is lower for teleworkers compared to office workers.

Monitoring

Next, we focus on the moderating effect of monitoring on the behavior of teleworkers vis-à-vis office workers. We argue that monitoring has two effects that we explain first: (a) a crowding-out effect of intrinsic motivation, and (b) a self-awareness effect.

[10] Brüggen et al. (2024) find an increase in misreporting among teleworkers who self-selected into the telework arrangement. The authors conclude that less honest individuals have a preference for telework.

The *crowding-out effect* stems from self-determination theory (SDT) arguing that individuals are inherently self-motivated when basic psychological needs are fulfilled (Ryan and Deci 2000). One of these needs is autonomy, referring to individuals' perceived control over their environments and actions. We argue that a working environment characterized by surveillance leads to lower perceived autonomy. This is in line with prior research showing that external controls can undermine perceived autonomy (Christ et al. 2012; Enzle and Anderson 1993; Schlund and Zitek 2024). SDT further argues that individuals' actions range on a continuum from self-determined and volitional (internal locus of causality) to externally driven by external factors (external locus of causality) (Pelletier et al. 2001; Schedlinksy et al. 2020). As argued by Plant and Ryan (1985), monitoring acts as a mechanism that shifts the locus of causality from internal to external. Monitoring reduces employees' perceived autonomy by diminishing their feelings of self-determination and creating a sense of dependence or lack of control over their actions (Gagne and Deci 2005).[11]

Consequently, we predict that monitoring reduces individuals' perception of autonomy, thereby leading to a decrease in intrinsic motivation. When autonomy is reduced, employees perceive their actions as dictated by external forces rather than their own will. As a result, intrinsic motivation—characterized by engaging in activities out of genuine interest and enjoyment (Farrell et al. 2017; Fessler 2003)—is diminished, resulting in a crowding-out effect of motivation (a).

In addition, monitoring induces a second effect which is (b) the *self-awareness effect*. Self-awareness is a sub-theory of social facilitation theory and can be defined as "the capacity to focus

[11] Noteworthy, SDT does not require an actual shift in the locus of causality for individuals to feel controlled (Deci and Ryan 2012). The perception of control does suffice. Thus, surveillance does not need to impose tangible behavioral restrictions to lower employees' perceived autonomy (Christ et al. 2008; Frey and Jegen 2001; Tessier and Otley 2012). This aligns with research showing that even subtle monitoring cues, such as the mere display of a pair of watching eyes, can significantly alter behavior (Bateson et al. 2006).

attention on oneself, and thus to self-evaluate" (Silvia et al. 2004, 475). When individuals become self-aware, they are prompted to evaluate their actions, often striving to attain consistency in their beliefs and behaviors (Davidson 2019; Wicklund and Duval 1971). Situational cues activate mental scripts and lead individuals to become self-aware (Lerner and Tetlock 1999). We follow prior research showing that, e.g., mirrors, the presence of others, or a video camera can induce such self-awareness (Guerin 1993; Plant and Ryan 1985; Wicklund and Duval 1971). In this respect, we argue that monitoring (e.g., via a camera) provides situational cues that induce self-awareness (Miller et al. 2017). We discuss the effects of self-awareness that differ for effort and misreporting below and explain why we refrain from predicting a main effect for monitoring in the next section.

The Moderating Role of Monitoring

Our next hypothesis (H2a) focuses on the moderating role of monitoring on effort. Building on the two effects discussed above, we predict that monitoring leads to a greater decrease in effort for office workers compared to teleworkers. Effort, among other factors, depends on (intrinsic) motivation, particularly when compensation is not linked to effort (e.g., under fixed-pay contracts).

On the one hand, intrinsic motivation stems from the nature of the task when employees find a task engaging and enjoyable (Farrell et al. 2017; Fessler 2003). On the other hand, intrinsic motivation depends on the level of perceived autonomy (Ryan and Deci 2000). Holding the task and, thus, the joy associated with the task constant for office workers and teleworkers, any difference in the level of intrinsic motivation between these two groups of employees is rooted in the level of perceived autonomy. The crowding-out effect of monitoring harms employees' perceived autonomy and results in less intrinsic motivation and effort.[12]

[12] Notably, while we argue that monitoring reduces autonomy, we have no theory to predict whether this effect is more pronounced for office vis-à-vis teleworkers. On the one hand, the effect might be stronger for teleworkers as

At the same time, monitoring makes employees more self-aware, i.e., they reflect on themselves and compare their behavior with salient standards shaped by the situation (Davidson 2019; Wicklund and Duval 1971). When employees conduct an effort task that depends on intrinsic motivation and is not otherwise enforced (e.g., by incentives), there is no salient or universal standard that the individual can compare his or her behavior to. The level of intrinsic motivation differs between individuals, and a not incentivized, i.e., fixed compensated, task, can be interpreted as a "do your best goal" or even be perceived as a situation where exerting effort is not valued. If there is no standard, the aspect becoming salient under increased self-awareness can be "the self" of the agent and his or her internal stimuli such as emotions, aches or pains (Carver 2012). Carver (2012, 53) concludes "whatever aspect of the self was salient at the moment attention was self-directed would have a disproportionate influence on the person's subsequent subjective experience and behavioral response".

Hence, when employees conduct a task that depends on (intrinsic) motivation, intrinsic motivation becomes salient and self-aware employees reflect more on their true level of motivation. As outlined for H1a, employees' motivation is driven by the level of (positive or negative) reciprocity that stems from the employer's decision to allow or forbid telework. Thus, monitored office workers become more aware of their relatively low level of motivation (vis-à-vis teleworkers). Compared to less self-aware office workers (i.e., not monitored employees), monitored, self-aware office workers respond via a further disproportional reduction of motivation and effort. In other words, the effect of reciprocity on motivation is magnified under monitoring. This leads to

they might perceive monitoring as an intrusion into their privacy (which is not the case in the office). On the other hand, the effect might be stronger for office workers as they work already in a more controlled environment (which is not the case for teleworkers) and surveillance might be perceived as particularly excessive in the office.

our prediction that when monitoring is present rather than absent, effort decreases more for office workers compared to teleworkers. This is formally stated in H2a.

H2a: When monitoring is present rather than absent, effort decreases more for office workers compared to teleworkers.

We refrain from predicting a main effect for monitoring for an important reason. While monitoring damages intrinsic motivation via reduced autonomy, it also makes teleworkers more self-aware of their reciprocity-driven high motivation (as predicted by H1a) which is likely to offset the negative effect. This is not the case for office workers resulting in the interaction effect predicted by H2a.

Our last hypothesis (H2b) focuses on the moderating effect of monitoring on misreporting. Contrary to effort, misreporting does not depend on motivation, but is rather a conscious decision. As we have no theory to predict that the crowding-out effect affects misreporting, we rely only on the self-awareness effect to derive our prediction.

Similar to H2a, we predict that monitoring increases self-awareness having different effects on office workers compared to teleworkers. However, as effort and honesty (or misreporting) are very different constructs with other drivers and antecedents, the mechanism that is caused by increased self-awareness differs. Above we argue that there is no salient and uniform standard that employees can compare their effort to and thus their current (low or high) level of intrinsic motivation is further intensified. A missing standard implies that employees exerting little effort will experience no dissonance between their current behavior and a standard that would redirect them towards a certain level of effort.

This is different for misreporting. Social norms generally expect employees to report honestly. As individuals usually share a preference for honesty (Evans et al. 2001), self-awareness

enhances the salience of internal standards for honest behavior. While individuals may still lie to some extent to benefit from dishonest actions, self-awareness encourages them to critically assess whether such behavior aligns with their moral standards (Mazar et al. 2008). This self-focused attention leads individuals to critically evaluate the ethical implications of deviating from a commonly shared honesty standard, as deviating from their moral standards is likely to evoke psychological discomfort (Wicklund 1975). Consequently, self-aware individuals are generally less likely to misreport. This is also in line with prior research showing that self-awareness activates a moral evaluation process that discourages dishonest behavior (Cappelen et al. 2013; Fischbacher and Föllmi-Heusi 2013). Examples are honesty oaths or signing a declaration form that activate self-awareness and mitigate lying (Beck et al. 2018; Shu et al. 2012).

Building on the premise that self-aware employees are more likely to report honestly, we argue that the honesty-enhancing effect of monitoring is stronger for office workers compared to teleworkers.[13] As proposed by H1b, teleworkers engage in less misreporting compared to office workers in the absence of monitoring. Thus, office workers are further away from the standard of honest behavior. Consequently, when monitoring is present, the adjustment toward greater honesty is more pronounced for office workers compared to teleworkers. Based on these arguments, we formally propose our final hypothesis:

H2b: When monitoring is present rather than absent, misreporting decreases more for office workers compared to teleworkers.

[13] We argue that the honesty-enhancing effect of self-awareness is stronger for office workers, but we still predict that teleworkers, overall, misreport less which is consistent with H1b. First, both office workers and teleworkers become more self-aware under monitoring, and there is no theory to suggest this effect is stronger for one group. However, the adjustment resulting from increased self-awareness is more pronounced for office workers, as they tend to engage in greater misreporting initially. Second, while self-awareness reduces the negative effect of misreporting, it is unlikely to produce a positive effect that increases honesty beyond the baseline observed in the absence of monitoring. Given teleworkers' higher baseline level of honesty, the increased self-awareness of office workers under monitoring will not surpass this level.

Again, we refrain from predicting a main effect for monitoring. As just explained, teleworkers are expected to report more honestly than office workers (as argued by H1b). Thus, becoming more self-aware of the (natural) standard of honesty has little effect on teleworkers.

III. RESEARCH DESIGN

Experimental Design and Procedure

To test our hypotheses, we conducted a computer-based experiment using a 2×2 between-subjects design. We manipulated monitoring (*present* vs. *absent*) and location (*office* vs. *telework*). The experiment was programmed and conducted using the SoPHIE software package (Hendriks 2012). The experimental procedure is depicted in Figure 1.

The experiment consisted of two parts, a pre-study and the main experiment. Ten participants were recruited for the pre-study to assume the role of employers (hereafter employers). Their task was to determine the working conditions for the participants in the main experiment (hereafter employees). Employers learned that some, but not all, employers were matched with employees in the main experiment who would work for them. During the pre-study, the employers answered a brief questionnaire where they made two decisions. First, employers decided whether "their" employees would have the possibility to telework or must work in the office (i.e., the university lab). Second, they determined whether their employees were monitored.[14] Employers were informed that their decisions could impact employee behavior, and that their compensation depended on employee behavior in the main task. On average, participants completed the questionnaire in 10 minutes and received a compensation of €2. Based on their choices on the working conditions,

[14] If employers opted for monitoring, they were asked whether they would personally monitor their assigned employees during the main experiment for an additional compensation of €15 or to have a third person doing this for them.

seven employers were allowed to participate in the main experiment.[15]

In the main experiment, 88 participants assumed the role of employees.[16] Each employee was randomly assigned to one employer. In the first step, participants read the instructions and learned that their working conditions (location and monitoring) had been determined by another participant, i.e., the assigned employer, during the pre-study. Employees were also informed about the tasks and their compensation. After successfully responding to a quiz that ensured that participants' had correctly understood the instructions, they proceeded to the main tasks, i.e., an effort and a reporting task described below. To prevent order effects, an A/B split was implemented, randomly assigning participants to either begin with the effort or the reporting task.[17] Finally, participants completed a post-experimental questionnaire (PEQ) and were informed about their compensation. On average, the main experiment took 60 minutes and participants received a total compensation of €15.36. Compensation consists of a show-up fee of €3, a fixed compensation of €7 for the effort task, another fixed payment of €3 for the reporting task, and a variable payment based on decisions during the reporting task. Employees' behavior during the main task translated into an average compensation of €66.03 for their employers.[18]

[Place Figure 1 here]

[15] Employers were informed that there is a possibility that they might not be selected to take part in the main experiment. When employers made the same choices, we randomly selected participants for the main experiment. To prevent gender effects, we ensured that a female and a male employer were chosen. However, due to employers' choices, only one employer could be assigned to an unmonitored treatment group, resulting in seven instead of eight employers in total. Since this treatment is unmonitored, gender effects (between the employer and the employees) could not materialize.

[16] In total, 91 business students participated in the main experiment. However, one student was excluded after trying to manipulate the source code of the experimental software (instead of focusing on the experiment), and two other were excluded as they left the online conferencing platform which ensured monitoring.

[17] There are no significant differences between group A and B ($p > 0.1$) in terms of our dependent variables effort and misreporting.

[18] This compensation excludes the €15 show-up fee for monitoring employees.

Participants

The participants (i.e., employees) of the main experiment were 88 business students from a large Western European university. Their average age was 25.05 years, 38 (43.2%) were female and 61.4% had a bachelor's degree. There are no significant differences across conditions for age ($p = 0.53$, Kruskal-Wallis test), gender ($p = 0.42$, Chi-square test), educational degree ($p = 0.35$, Chi-square test), device used (e.g., touchpad or computer mouse) ($p = 0.30$, Chi-square test) and distance to the university ($p = 0.46$, Kruskal-Wallis test).[19] Hence, randomization was successful. However, similar to Brüggen et al. (2024) who find that 70% of their participants have a preference to telework, 75% of our participants prefer working from home. Participants' preference for location showed significant differences between office workers and teleworkers.[20] Consequently, we control for location preference in our analyses.

Workplace and Monitoring Manipulation

We randomly assigned participants to the four treatment conditions of the main experiment. There was at least one employer assigned to each condition based on the employer's choices for the working conditions. Thus, employees knew that the employer they would be working for had determined their working conditions (location and monitoring).

We manipulated the working location at two levels: *office* vs. *telework*. Participants were randomly assigned to one condition and informed four days before the experiment where the experiment would take place. Participants in the *office* condition were instructed to come to the university lab at a specified time. Participants assigned to the *telework* condition participated from

[19] All p-values are two-tailed.

[20] We ask participants in the PEQ on a 7-point Likert scale to what extent they agree with the statement: "I prefer to complete work assignments at home rather than at the university." (7-point Likert scale, reversed). Teleworkers agree significantly more with the statement compared to office workers (5.60 vs. 4.73; $t = -2.63$; $p = 0.01$).

home and were also instructed to conduct the experiment at a specified time. All participants received a link and logged on to the identical experimental website. Hence, apart from the physical working location we kept the treatments as consistent as possible, including the time participants conducted the experiment. Following prior research, the laboratory appears to be an adequate office operationalization. The campus can be understood as the students' natural working environment where they regularly attend lectures. Participating from home—away from this central workplace—aligns with the definition of telecommuting and can be considered telework.

The second factor is monitoring (*present* vs. *absent*). Participants in the monitoring-present condition had to log on to a video conferencing system while working on the two main tasks. Instructions on how to sign in were provided and participants were required to switch on their camera and microphone. If the assigned employer was able to see and hear the participants, they received a password via chat that allowed them to proceed to the main tasks. Our operationalization of monitoring was intended to capture the feature of surveillance tools used in practice that monitor physical presence. Each participant entered an individual conferencing room with the employer present and visible but not the peers. After finishing both tasks and before answering the PEQ, employees left the meeting. Employers documented whether employees remained in the meeting throughout.[21] Participants in the monitoring-absent condition did not join a conferencing room.

Effort Task

We used the slider task to measure effort (Araujo et al. 2016; Brüggen et al. 2024; Chan 2018; Gill and Prowse 2012). During this task, participants had to solve as many sliders as possible for 30 minutes. Contrary to previous research, we set the time for the task rather long for several

[21] From the three participants excluded in total, two were excluded due to non-compliance with these instructions, i.e., they both left the meeting—which ensured monitoring—after receiving the password to continue. Including the two (or three) subjects yields inferentially identical results.

reasons. First, it is often assumed that teleworkers do not spend their entire working time on the task assigned due to high opportunity costs when working from home. We argue that this effect will only materialize when the task takes more than just two or four minutes (Araujo et al. 2016; Brüggen et al. 2024; Chan 2018; Gill and Prowse 2019).[22] Second, while participants might find it engaging to work on the task for a short period, it requires much more intrinsic motivation to work on it for 30 minutes. Based on our theory, intrinsic motivation is a crucial determinant, thus we intentionally designed the task to ensure that intrinsic motivation varies.

Given the fact that office workers can also engage in private activities at work (e.g., coffee breaks with colleagues), even though their opportunities are limited, two design choices were made. First, participants in all conditions could take a break from the slider task for up to ten times and play tic-tac-toe for 30 seconds against the computer (e.g., Dutcher 2012). During the tic-tac-toe sessions, participants could not solve any sliders. Second, participants in all treatments were informed that they could use their mobile phones during the experiment.

During the task, 45 sliders arranged across three columns were presented on screen. All sliders were initially positioned at 0. Participants were asked to move as many sliders as possible to the target position of 50. Every 2 minutes, the screen refreshed, and 45 new sliders appeared.[23] To prevent participants from developing strategies based on the slider arrangement on the screen, the sliders within each column were staggered on every page (Gill and Prowse 2019). Additionally, participants could not use the arrow keys on the keyboard to move the sliders. To avoid effects of

[22] This is in line with Brüggen et al. (2024) who report no significant differences in effort among teleworkers and office workers on their 4-minute slider task. Similarly, we find no significant differences in effort when monitoring is absent during the first four minutes of the task ($F = 0.96$, $p = 0.48$, two-tailed). Notably, significant effects only emerge after doubling the task duration to 8 minutes and onwards ($F = 2.20$, $p = 0.05$, two-tailed).

[23] A pretest revealed that it is impossible to solve 45 sliders within 2 minutes. This design choice ensured that an unlimited number of sliders was available.

using different devices, participants had to indicate whether they have and use a computer mouse or a touchpad for their daily work when signing up for the experiment. We used this information to make sure that the percentage of touchpad/mouse users is the same in the office and telework treatments.[24] We also ensured uniformity in the display of sliders by calibrating the pixel frame to various screen sizes.[25] While employee-participants received a fixed compensation of €7 for solving as many sliders as possible, the assigned employers' compensation depended on the number of sliders solved. In detail, a random mechanism determined the remuneration per slider which varied between 10 and 15 lira.[26] This feature—communicated to employers and employees—made sure that there was no perfect monitoring as employers could not use compensation information from the slider task to calculate employee performance. Our main dependent variable used to test the effort hypotheses (H1a and H2a) is the number of sliders moved.[27]

Reporting Task

We measure misreporting using the reporting task by Evans et al. (2001). The task builds on the budgeting task by Antle and Eppen (1985) and has become widely used for assessing honesty (Brüggen et al. 2024; Farrell et al. 2021; Hannan et al. 2006). A typical reporting activity in the real world is budgetary reporting (Brown et al. 2009; Webb 2002), which requires employees to reveal private information to support planning and resource allocation (Antle and Fellingham 1997; Sprinkle 2003). Similarly, many employees report their working hours or time spent on

[24] Based on the responses, we equipped about 44% of workplace participants with touchpads. In the telework treatment, about 47% of participants ended up using a touchpad. There are no significant differences between both treatment groups in terms of the device used for the slider task.

[25] This is particularly relevant as participants in the telework condition use their private computer which can differ in screen size. None of the participants used a tablet or smartphone.

[26] In the experiment, compensation was denominated in the experimental currency lira. At the end of the experiment, lira was converted into euros with 1,000 lira equaling one euro.

[27] This proxy for effort satisfies the three criteria for effort established by Baiman (1982): the individual must have control over the proxy which must be correlated with performance. Finally, the proxy must be costly. These criteria are fulfilled. Participants have control over moving the slider, moving the sliders to the target position is associated with performance and the opportunity costs (e.g., using the mobile phone or playing tic-tac-toe) make effort costly.

specific tasks or projects (Agoglia et al. 2015; Reid 2015). Such situations often entail opportunities and incentives for dishonesty (Church et al. 2012; Hannan et al. 2006; Rankin et al. 2008).

In the reporting task, participants submitted cost reports for four projects. To avoid the end-of-game effect, employees did not know the number of projects ex-ante (Farrell et al. 2021). Each project generated revenues of 2,000 lira (experimental currency) (Brüggen et al. 2024). The actual project costs were randomly drawn but equal for all participants (Church et al. 2012), i.e., 1,000 lira, 200 lira, 800 lira, and 1,700 lira.

Employees could report any value between the actual cost and 2,000 lira (i.e., the project revenue). They knew that the reported value would be accepted, and that the employer would never learn the actual costs. The difference between the reported cost and the actual cost increased employees' payoff. Hence, employees had an incentive to misreport by overstating the project costs. At the same time, this overstatement reduced the employer's compensation. Employers received the difference between the project revenue and the reported cost.[28]

In addition to a fixed pay of €3 for the reporting task, employees earned on average a compensation of €2.36 from misreporting. Consistent with prior literature (Brüggen et al. 2024; Church et al. 2012; Evans et al. 2001), we measure misreporting (our second dependent variable) by dividing the amount participants misreported by the maximum possible amount for misreporting:

$$Misreporting = \frac{\sum_{k=1}^{4} reported\ cost\ k\ - actual\ cost\ k}{\sum_{k=1}^{4} 2{,}000\ - actual\ cost\ k}$$

Misreporting thus ranges from 0 (indicating complete honesty) to 1 (indicating complete dishonesty).

[28] To help employees with the calculation, a pop-up box appeared before submitting a cost report. The actual project cost, the reported cost, and the resulting compensation for the employee and the employer was displayed (Farrell et al. 2021).

IV. RESULTS

Descriptive Results and Hypotheses Tests

Table 1 depicts the mean and standard deviation for our two main dependent variables, i.e., *effort* and *misreporting*. Figure 2 depicts a graphical representation. Effort is measured by the total number of sliders moved and misreporting by the extent to which participants misreport their cost information during the reporting task.

H1a predicts that effort is higher for teleworkers compared to office workers. In line with this prediction, the descriptive statistics reveal that the number of sliders moved, i.e. effort, is greater in the telework condition (333.98) than in the office condition (246.85). To formally test H1a, we use analysis of covariance (ANCOVA). We control for devices used during the slider task and location preference for two reasons: First, the time to adjust a slider in the effort task depends on the device used (i.e., mouse or touchpad). To avoid an interference with our measurement, we include a dummy variable for device. Second, participants in the telework condition exhibit a stronger preference for telework, thus randomization was not completely successful.[29] Thus, we control for location preference.[30] Based on the descriptive results and the ANCOVA, we conclude that effort is higher for teleworkers compared to office workers. The results in Table 2, Panel A confirm that effort is significantly greater for teleworkers compared to office workers ($F = 17.12$; $p < 0.01$).[31] Thus, H1a is supported.

[29] An analysis of variance (ANOVA) using location preference as the dependent variable and treatment as the independent variable shows significant differences between the four treatment groups ($p = 0.09$, untabulated). Hence, randomization was not completely successful.

[30] The results for our hypotheses are inferentially identical if we do not control for location preference. Yet, the p-value for H1b is slightly above conventional levels of significance ($F = 1.96$; $p = 0.17$, two-tailed), or only significant when one-tailed p-values are used.

[31] All p-values are reported two-tailed unless stated otherwise.

H1b predicts that misreporting is lower for teleworkers compared to office workers. The descriptive results in Table 1, Panel B show that misreporting is lower for teleworkers (0.51) compared to office workers (0.59), i.e., while teleworkers ask for 51% of the available budget (project revenue – actual costs), office workers demand 59%. We formally test H1b using ANCOVA. Again, we include location preference as a control variable. In addition to our argument from above, i.e., failed randomization, another reason for including this control exists: Brüggen et al. (2024) report that teleworkers with a preference for telework are less honest. Thus, it is important to control for this effect. Contrary to our test for H1a, we do not control for device, as device matters for the slider task but not for the reporting task. The corresponding ANCOVA results are displayed in Table 3, Panel A and confirm that teleworkers misreport significantly less ($F = 4.02$; $p = 0.05$). Hence, H1b is supported.

[Place Table 1 here]

Next, we examine the moderating effect of monitoring. H2a predicts that when monitoring is present, the decrease in effort is greater for office workers compared to teleworkers. The descriptive results in Table 1, Panel A show that the number of sliders moved, i.e., our proxy for effort, decreases by 37.77 from 266.20 (monitoring absent) to 228.43 (monitoring present) for office workers. For teleworkers, the decrease is only 9.75 (338.96 when monitoring is absent to 329.21 when monitoring is present).

To formally test the pattern predicted by H2a, we use the nonparametric Jonckheere-Terpstra test and planned contrast analysis. The conventional ANCOVA analysis in Table 2 shows an insignificant interaction effect *Location* × *Misreporting* ($p = 0.46$). Yet, while ANOVA is suitable for identifying disordinal interactions, it is less effective in detecting (semi)ordinal interactions (Buckless and Ravenscroft 1990). Since our hypothesis predicts an ordinal interaction, consistent

with the graphical representation in Figure 2, we first apply the conservative nonparametric Jonckheere-Terpstra test. This test does not require specifying contrast weights. The results support H2a ($Z = 4.08$; $p < 0.01$; untabulated). Next, we follow Buckless and Ravenscroft (1990) and use contrast analysis with specified weights. According to our prediction, we use contrast weights of -1 for *Office/Monitoring absent* and -7 for *Office/Monitoring present* showing a greater decrease in effort for office workers compared to teleworkers for whom we use contrast weights of +5 for *Telework/Monitoring absent* and +3 for *Telework/Monitoring present,* as self-awareness is argued to partially offset the autonomy effect for teleworkers. Table 2, Panel B reports the results, which again support H2a ($F = 19.27$; $p < 0.01$).[32] Hence, we conclude that when monitoring is present, the effort decrease is more pronounced for office workers than for teleworkers, supporting H2a.

[Place Table 2 and Figure 2 here]

Our last hypothesis H2b predicts that when monitoring is present, the decrease in misreporting is greater for office workers compared to teleworkers. The descriptive results in Table 1, Panel B are in line with this prediction: While misreporting decreases by 25% in the office condition (monitoring absent: 0.68 vs. monitoring present: 0.51), it declines by only 8% in the telework condition (monitoring absent: 0.53 vs. monitoring present: 0.49). To formally test the pattern predicted by H2b, we again rely on the nonparametric Jonckheere-Terpstra test and planned contrast analysis for the reasons stated above. Without specifying contrast weights, the results of the Jonckheere-Terpstra test support H2b ($Z = 2.14$; $p < 0.03$; untabulated). For the contrast analysis we use contrast weights of +4 for *Office/Monitoring absent* and -1 *Office/Monitoring present* implying a

[32] We follow the three-step approach suggested by Guggenmos et al. (2018) for planned contrasts: 1) our contrast weights visually fit the descriptive data (Figure 2, Panel A), 2) our data significantly match the planned contrast weights ($F = 19.27$; $p < 0.01$) and 3) the q^2 is 0.04, hence the contrast explains 96% of the between-cell variance. Our results for H2a are robust ($F = 19.41$; $p < 0.01$) to using alternative contrast weights of -1 for *Office/Monitoring absent*, -5 for *Office/Monitoring present,* +3 for *Telework/Monitoring absent,* and +3 for *Telework/Monitoring present*.

greater decrease in misreporting compared to teleworkers for which we use contrast weights of -1 for *Telework/Monitoring absent* and -2 for *Telework/Monitoring present* as teleworkers have little reason to adapt misreporting in response to increased self-awareness. As shown in Table 3, Panel B, H2b is supported ($F = 7.58$; $p < 0.01$). [33]

It follows from H2a and H2b that monitoring has a stronger effect on office workers compared to teleworkers. This means that effort and misreporting decrease more when monitoring is present for office workers compared to teleworkers. However, it is noteworthy that from the employer's perspective monitoring has a negative effect on office workers' effort (less effort) but a positive effect on misreporting (less misreporting).

[Place Table 3 here]

Additional Analysis

This subsection presents additional analyses and explores responses from the PEQ to further evaluate our theoretical framework. More precisely, we validate the core assumptions underlying our experimental design and provide process evidence in support of our reciprocity-based explanation for H1 and H2.

Validation of Experimental Design

To validate our experimental design, we first assess whether our monitoring manipulation was successful. Next, we test whether our core assumption for reciprocity, i.e., that participants prefer telework, is met.

[33] We follow again the three-step approach suggested by Guggenmos et al. (2018) for planned contrasts: 1) our contrast weights visually fit the descriptive data (Figure 2, Panel B), 2) our data significantly match the planned contrast weights ($F = 7.99$; $p < 0.01$) and 3) the q^2 is 0.01, hence the contrast explains 99% of the between-cell variance. Our results for H2b are robust ($F = 7.58$; $p < 0.01$) to alternative weights of +3 for *Office/Monitoring absent*, -1 for *Office/Monitoring present,* -1 for *Telework/Monitoring absent,* and -1 for *Telework/Monitoring present.*

In the PEQ, we asked participants on a 7-point Likert scale to what extent they agree with the statement: “I felt monitored during the experiment.” (7-point Likert scale, reversed). Participants in the monitoring-present condition (mean 4.8) felt significantly more monitored ($t = 9.74$; $p < 0.01$) than participants in the monitoring-absent condition (mean 1.84). Thus, we conclude that our monitoring manipulation was successful.

To assess participants' preference for location, we asked to what extent they agree with the statement: “I prefer to complete work assignments at home rather than at the university.” (7-point Likert scale, reversed). Teleworkers agree significantly more with the statement compared to office workers (5.60 vs. 4.73; $t = -2.63$; $p = 0.01$). Notably, participants in both conditions express a clear preference for telework, as the mean scores in each group are significantly above the neutral midpoint of 4 (telework condition: $t = 8.23$; $p < 0.01$; office condition: $t = 2.68$; $p = 0.01$), indicating a pronounced preference for telework.

Process Evidence for Effort

Next, we conduct a path analysis to gain further insights into our theory. The path model for effort is depicted in Figure 3, Panel A and reflects the test of our theory for H1a and H2a. H1a predicts that teleworkers exert more effort than office workers. In our theory development we explain that this direct effect between location and effort (path c’) is mediated by reciprocity and motivation. We argue that location affects reciprocity (path a_2) driving motivation (path d_2). Motivation determines effort (path b).

H2a predicts that under monitoring effort decreases more for office workers compared to teleworkers. The model in Figure 3 shows that monitoring is expected to affect motivation via two channels: First, by reducing autonomy (path a_1), which in turn reduces motivation (path d_1) and second, by moderating the mediating effect of reciprocity on motivation through increased self-

awareness (path ii). We construct the three mediators—autonomy, motivation and (effort) reciprocity—in the model by performing principal component analysis on related items from the PEQ (Table 4).[34]

[Place Table 4 here]

We use the PROCESS macro in SPSS to test our path model including the moderated-mediation (Hayes 2018). We test the significance of each mediation effect by estimating bias-corrected bootstrap confidence intervals with 10,000 resamples (Hayes 2018).

As predicted for H1a, we find that location (with telework coded as 1 and 0 otherwise) affects reciprocity. More precisely, we find that teleworkers (office workers) reciprocate (retaliate) their employer (ß = 0.88; t = 4.55; $p < 0.01$) which increases (decreases) motivation (ß = 0.28; t = 2.13; p = 0.04). Higher levels of motivation increase effort (ß = 22.42; t = 2.04; p = 0.04). The indirect effect of location on effort (through reciprocity and motivation) is significant, irrespective of whether monitoring is absent (the 90 percent CI of 0.28 to 17.15 does not include 0) or present (the 90 percent CI of 2.17 to 33.49 does not include 0). For H2a, we rely on self-awareness and predict that this indirect effect is moderated by monitoring. In fact, we find support for the predicted, moderated mediation (the 90 percent CI of 1.28 to 24.43 does not include 0). The effect of location on effort via the mediators' reciprocity and motivation is 13.71 when monitoring is present and 5.59 when it is absent.

[34] The reciprocity factor for effort has an eigenvalue of 1.87 and a Cronbach's alpha of 0.68, which is only slightly below the conventional level of 0.7 (for a discussion of allowance for broader ranges of Cronbach's alpha see DeZoort and Salterio (2001); Koch and Salterio (2017); Tan and Kao (1999)). The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy is 0.58, meeting the minimum threshold for factor analysis (Kaiser 1970; Stewart 1981). The scale ranges from –2.85 (retaliation) to 1.23 (reciprocity), with higher values reflecting greater willingness to reciprocate. The motivation factor for effort yields an eigenvalue of 1.65, a Cronbach's alpha of 0.78, and a KMO of 0.50, indicating high internal consistency. Autonomy was measured using a single item and is therefore not included in the reliability assessment.

As predicted, we find that monitoring reduces autonomy (ß = -1.30; t = -2.85; p < 0.01). We also find that teleworkers perceive higher autonomy compared to office workers (ß = 0.87; t = 1.94; p = 0.06). The effect of autonomy on motivation is negative, as expected, but not significant (ß = -0.05; t = -0.79; p = 0.43).[35] Hence, it is only reciprocity that determines motivation. Interestingly, teleworkers' autonomy is particularly damaged under monitoring (ß = -1.30; t = -2.85; p < 0.01). This may be because teleworkers perceive surveillance as a violation of their privacy. Overall, the path model generally supports our theory for H1a and H2a.

Process Evidence for Misreporting

We use a similar path model to validate our theory for misreporting (H1b and H2b). For this model, we consider only (misreporting) reciprocity as a mediator, as (dis)honest reporting constitutes a conscious decision and is not affected by intrinsic motivation.[36] The model is shown in Figure 3, Panel B.

[Place Figure 3 here]

We again find that teleworkers are significantly more likely to positively reciprocate compared to office workers (ß = 0.74; t = 3.68; p < 0.01). Further, we find a significant negative effect of reciprocity on misreporting (ß = -0.09; t = −1.94; p = 0.06). Thus, the willingness to reciprocate (retaliate) decreases (increases) individuals' tendency to misreport. Location has no direct effect on misreporting (ß = -0.11; t = −1.18; p = 0.24).[37] Instead, the willingness to reciprocate fully

[35] The indirect effect of location through autonomy and motivation on effort is also insignificant. A potential reason why we fail to find a significant effect of autonomy on intrinsic motivation is that our effort task is rather low in intrinsic motivation. In this vein, Ryan and Deci (2000) argue that the effects predicted by social determination theory (and related sub-theories) depend on task characteristics.

[36] The reciprocity factor for misreporting has an eigenvalue of 1.92 and a Cronbach's alpha of 0.70. The KMO is 0.60. The resulting scale ranges from –3.01 (retaliation) to 1.31 (reciprocity), with higher values indicating greater willingness to reciprocate.

[37] When applying an ANCOVA and controlling for participants' preference of location, we find a significant effect of location on misreporting as predicted by H1b (F = 4.02; p = 0.05).

mediates the relation between location and misreporting. Specifically, telework, compared to office work, results in less misreporting in the absence of monitoring, with a significant indirect effect of -0.07 (the 90 percent CI of -0.13 to -0.01 does not include 0). This pattern also holds true under monitoring, with an indirect effect of -0.05. However, the 90% confidence interval (–0.14 to 0.00) includes zero, placing the effect just above the conventional threshold for significance.[38] This pattern is directionally consistent with our theory for H1b.

For H2b we argue that the effect of location on misreporting via the mediator reciprocity depends on monitoring. More precisely, we argue that the effect of reciprocity (particularly of negative reciprocity) is weakened when monitoring increases self-awareness. We find that the decrease in misreporting for teleworkers compared to office workers is lower when monitoring is present (-0.05) rather than absent (-0.07). Put differently, under monitoring, the location effect on misreporting is reduced. However, the moderated mediation effect is insignificant (the 90 percent CI of -0.08 to 0.09 includes 0). This suggests that there might be other factors that explain the decrease in misreporting under monitoring. Since the direct effect of monitoring on misreporting is negative and significant (ß = -0.18; t = -2.09; p = 0.04), being monitored is likely to increase self-awareness that results in an alignment with individuals' internal moral standards. Surprisingly, this even holds when monitoring is ineffective. This aligns with results by Bateson et al. (2006), who find that the mere display of a pair of watching eyes on a piece of paper increases honest behavior.

[38] When using a confidence interval of 88%, the indirect effect becomes significant (CI of -0.14 to -0.01 does not include 0). Similarly, when refining the reciprocity factor by removing the item capturing participants' resentment toward their working location, the indirect effect of -0.04 is again significant (the 90 percent CI of -0.10 to -0.01 does not include 0). This adjusted two-item measure has a Cronbach's alpha of 0.54. While this indicates modest internal consistency, it aligns with prior accounting research using short or composite measures that reflect related but distinct behavioral dimension (Dearman and Shields 2001; Tan and Kao 1999). Moreover, Cronbach's alpha assumes unidimensionality and can underestimate reliability for constructs that encompass opposing motivations—such as prosocial reciprocity versus disengagement.

Hence, while we provide process evidence that reciprocity mediates the relation between location and misreporting, future research is needed to explore the effects of self-awareness on teleworkers and office workers in the presence of monitoring. Moreover, our findings show that monitoring increases office workers' tendency to retaliate by reducing effort, while simultaneously decreasing their tendency to retaliate through dishonest behavior. It is important to distinguish between retaliation via reduced effort—driven by low motivation—and intentional dishonesty, such as actively deceiving or stealing from an employer.

V. CONCLUSION

Today's working environment is shaped by two megatrends: telecommuting and employee surveillance. While both are widespread in practice, research on how telecommuting affects employee behavior and how it interacts with monitoring is still scarce. To answer these research questions via an experiment, we first examine effort and misreporting of teleworkers vis-à-vis office workers. Second, we investigate the moderating role of monitoring. To increase external validity, we focus on a setting where employees are aware that it is the employer's deliberate decision to allow or deny telework and to implement monitoring or not. Employees can directly reciprocate or retaliate against the employer for these decisions.

Building on reciprocity, we predict and find that teleworkers exhibit greater effort and misreport less than office workers. Under monitoring, effort and misreporting decrease more for office workers compared to teleworkers. For effort, we argue that monitoring increases self-awareness and thereby intensifies the motivational effects of reciprocity. For misreporting, increased self-awareness makes particularly office workers aware that misreporting contradicts well-established preferences for honesty. Thus, the effect of location on misreporting is weakened under monitoring.

Path models confirm that the different levels of effort and misreporting of teleworkers vis-à-vis office workers result from differences in reciprocity. The models also lend further support for our argument that monitoring moderates the mediating effect of reciprocity on motivation and effort.

Our findings may help organizations design the working environment. First, we show that teleworkers reciprocate employer's trust for allowing remote work by more effort and less misreporting. On the other hand, office workers retaliate employers for being denied the option to telework. They exert less effort and misreport more. These findings are important as employers are concerned about opportunistic behavior of teleworkers (e.g., Tesla, Porter 2022), and an increasing number of firms responded with return-to-office policies (Business Insider 2024a). Our results suggest that firms should be aware of the high costs associated with this decision.

Second, our study implies that firms must carefully distinguish whether office workers' performance heavily depends on intrinsic motivation (e.g., effort), where monitoring has negative effects, or is less dependent on intrinsic motivation (e.g., misreporting), where monitoring may yield positive effects. Third, our research setting, which incorporates reciprocity and an ineffective monitoring system, closely mirrors real-world conditions, making our results more generalizable for practical applications.

Future research could further explore this field of research. While our study strictly differentiates between telework and office work, firms also adopt hybrid models in practice. Future research might examine such hybrid work arrangements or investigate settings where teleworkers are forced to return to the office. Further, we investigate the effects of telecommuting and monitoring via an effort and a reporting task. While both tasks are common for many jobs, it would be interesting to explore further performance dimensions. Examples are creativity tasks, collaborative

group tasks, or problem-solving tasks that emphasize critical thinking. Lastly, we purposely implement imperfect monitoring as increasingly observed in practice (e.g., Ball 2021). However, future research could implement different types or even a combination of several surveillance systems. Moreover, we show that the perception of fairness of an employer's decision plays a crucial role in determining an employee's level of reciprocity. Hence, small design choices might influence this perception, such as providing an explanation of why monitoring might be beneficial for the employee (i.e., to prevent overwork).

References

Agoglia, C.P., R. C. Hatfield, and T. A. Lambert 2015. Audit team time reporting: An agency theory perspective. *Accounting, Organizations and Society* 44: 1–14. https://doi.org/10.1016/j.aos.2015.03.005.

Akerlof, G.A. 1982. Labor Contracts as Partial Gift Exchange. *The Quarterly Journal of Economics* 97 (4): 543–569. https://doi.org/10.2307/1885099.

Aksoy, C.G., J. M. Barrero, N. Bloom, S. J. Davis, M. Dolls, and P. Zarate 2023. Working from Home Around the Globe: 2023 Report. *EconPol Policy Brief* 53.

Alge, B.J., Hansen, D. (Eds.) 2013. Workplace Monitoring and Surveillance Research since "1984": A Review and Agenda, 1st ed. Routledge, New York.

Allen, T.D., T. D. Golden, and K. M. Shockley 2015. How effective is telecommuting? Assessing the status of our scientific findings. *Psychological science in the public interest* 16 (2): 40–68. https://doi.org/10.1177/1529100615593273.

Amazon 2024. Message from CEO Andy Jassy: Strengthening our culture and teams. https://www.aboutamazon.com/news/company-news/ceo-andy-jassy-latest-update-on-amazon-return-to-office-manager-team-ratio.

American Psychological Association 2023. 2023 Work in America Survey. https://www.apa.org/pubs/reports/work-in-america/2023-work-america-ai-monitoring.

Antle, R., and G. D. Eppen 1985. Capital Rationing and Organizational Slack in Capital Budgeting. *Management Science* 31 (2): 163–174. https://doi.org/10.1287/mnsc.31.2.163.

Antle, R., and J. Fellingham 1997. Models of Capital Investments with Private Information and Incentives: a Selective Review. *Journal of Business Finance & Accounting* 24 (7-8): 887–908. https://doi.org/10.1111/1468-5957.00140.

Araujo, F.A., E. Carbone, L. Conell-Price, M. W. Dunietz, A. Jaroszewicz, R. Landsman, D. Lame, L. Vesterlund, S. W. Wang, and A. J. Wilson 2016. The slider task: an example of restricted inference on incentive effects. *Journal of the Economic Science Association* 2: 1–12. https://doi.org/10.1007/s40881-016-0025-7.

Baiman, S. 1982. Agency research in management accounting: a survey. *Journal of Accounting Literature* 1 (1): 154–210. https://doi.org/10.1016/0361-3682(90)90023-N.

Ball, K. 2021. Electronic Monitoring and Surveillance in the Workplace. *European Commission Joint Research Centre*. htpps://doi.org/10.2760/5137.

Bateson, M., D. Nettle, and G. Roberts 2006. Cues of being watched enhance cooperation in a real-world setting. *Biology Letters* 2 (3): 412–414. https://doi.org/10.1098/rsbl.2006.0509.

BBC 2020. Barclays scraps 'Big Brother' staff tracking system. https://www.bbc.com/news/business-51570401.

Beck, T., C. Bühren, B. Frank, and E. Khachatryan 2018. Can Honesty Oaths, Peer Interaction, or Monitoring Mitigate Lying? *Journal of Business Ethics* 163 (3): 467–484. https://doi.org/10.1007/s10551-018-4030-z.

Belanger, F. 1999. Workers' propensity to telecommute: An empirical study. *Information & Management* 35: 139–153. https://doi.org/10.1016/S0378-7206(98)00091-3.

Bloom, N., J. Liang, J. Roberts, and Z. J. Ying 2015. Does working from home work? Evidence from a chinese experiment. *The Quarterly Journal of Economics* 130 (1): 165. https://doi.org/10.3386/w18871.

Brown, E. 2020. Employee surveillance software demand increased as workers transitioned to home working. *ZDNet*. https://www.zdnet.com/article/employee-surveillance-software-demand-increased-as-workers-transitioned-to-home-working/.

Brown, J.L., J. H. Evans, and D. V. Moser 2009. Agency Theory and Participative Budgeting Experiments. *Journal of Management Accounting Research* 21 (1): 317–345. https://doi.org/10.2308/jmar.2009.21.1.317.

Brüggen, A., C. Feichter, and K. Haesebrouck 2024. Home Office: Evidence on Location and Selection Effects of Telecommuting. *Journal of Management Accounting Research* 36 (3): 95–113. https://doi.org/10.2308/JMAR-2023-053.

Buckless, F.A., and S. P. Ravenscroft 1990. Contrast Coding: A Refinement of ANOVA in Behavioral Analysis. *The Accounting Review* 65 (4): 933–945.

Business Insider 2024a. The list of major companies requiring employees to return to the office, from The Washington Post to Amazon. https://www.businessinsider.com/companies-requiring-return-to-office-rto-mandate.

Business Insider 2024b. Wegen Unmut über weniger Homeoffice: Deutsche Bank soll Kommentarfunktion im Intranet deaktiviert haben. https://www.businessinsider.de/wirtschaft/deutsche-bank-petition-gegen-die-einschraenkung-des-homeoffice/.

Camerer, C.F. 2011. Behavioral game theory: Experiments in strategic interaction. Princeton university press, Princeton.

Canon 2024. Workplace AI. https://asia.canon/en/business/workplace-ai/product.

Cappelen, A.W., E. Ø. Sørensen, and B. Tungodden 2013. When do we lie? *Journal of Economic Behavior & Organization* 93: 258–265. https://doi.org/10.1016/j.jebo.2013.03.037.

Carver, C.S. 2012. Self-Awareness, in Leary, M.R., Tangney, J.P. (Eds.), Handbook of Self and Identity. The Guilford Press, New York, 50-68.

Chan, E.W. 2018. Promotion, relative performance information, and the peter principle. *The Accounting Review* 93 (3): 83–103.

Chen, R. 2024. Amazon RTO: Employees Don't Want to Work in the Office Five Days a Week. *Blind Workplace Insights*. https://www.teamblind.com/blog/amazon-rto-return-to-office-five-days-week-reaction/.

Christ, M.H., S. A. Emett, S. L. Summers, and D. A. Wood 2012. The Effects of Preventive and Detective Controls on Employee Performance and Motivation. *Contemporary Accounting Review* 29 (2): 432–452. https://doi.org/10.1111/j.1911-3846.2011.01106.x.

Christ, M.H., K. L. Sedatole, K. L. Towry, and M. A. Thomas 2008. When Formal Controls Undermine Trust and Cooperation. *Strategic Finance* 89 (7): 38–44.

Church, B.K., R. L. Hannan, and X. J. Kuang 2012. Shared interest and honesty in budget reporting. *Accounting, Organizations and Society* 37 (3): 155–167. https://doi.org/10.1016/j.aos.2012.01.002.

Da Silva, A.D., D. Georgarakos, and M. Weißler 2023. How people want to work–preferences for remote work after the pandemic. *Economic Bulletin* 1.

Davidson, B.I. 2019. The Effects of Reciprocity and Self-Awareness on Honesty in Managerial Reporting: Social Value Orientation Matters. *Journal of Management Accounting Research* 31 (1): 85–103. https://doi.org/10.2308/jmar-52020.

Dearman, D.T., and M. D. Shields 2001. Cost Knowledge and Cost-Based Judgment Performance. *Journal of Management Accounting Research* 13 (1): 1–18.

Deci, E., and R. M. Ryan 2012. Self-determination theory. *Handbook of theories of social psychology* 1 (20): 416–436.

DeZoort, F.T., and S. E. Salterio 2001. The Effects of Corporate Governance Experience and Financial-Reporting and Audit Knowledge on Audit Committee Members' Judgments. *AUDITING: A Journal of Practice & Theory* 20 (2): 31–47.

Dickinson, D., and M.-C. Villeval 2008. Does monitoring decrease work effort? The complementarity between agency and crowding-out theories. *Games and Economic Behavior* 63 (1): 56–76. https://doi.org/10.1016/j.geb.2007.08.004.

Dutcher, E.G. 2012. The effects of telecommuting on productivity: An experimental examination. The role of dull and creative tasks. *Journal of Economic Behavior & Organization* 84 (1): 355–363. https://doi.org/10.1016/j.jebo.2012.04.009.

Enzle, M.E., and S. C. Anderson 1993. Surveillant Intentions and Intrinsic Motivation. *Journal of Personality and Social Psychology* 64 (2): 257–266. https://doi.org/10.1037/0022-3514.64.2.257.

European Digital Rights 2022. WFH – Watched from Home: Office 365 and workplace surveillance creep. https://edri.org/our-work/wfh-watched-from-home-office-365-and-workplace-surveillance-creep/.

Evans, J.H., R. L. Hannan, R. Krishnan, and D. V. Moser 2001. Honesty in Managerial Reporting. *The Accounting Review* 76 (4): 537–559. https://doi.org/10.2139/ssrn.269448.

Falk, A., and U. Fischenbacher 2006. A theory of reciprocity. *Games and Economic Behavior* 54 (2): 293–315. https://doi.org/10.1016/j.geb.2005.03.001.

Farrell, A.M., J. H. Grenier, and J. Leiby 2017. Scoundrels or Stars? Theory and Evidence on the Quality of Workers in Online Labor Markets. *The Accounting Review* 92 (1): 93–114. https://doi.org/10.2139/ssrn.2424718.

Farrell, A.M., S. A. Peffer, K. Rotaru, and A. K. D. Schulz 2021. The Effects of Forecast Precision and Time Pressure on Motives to Create Budget Slack. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3874286.

Fessler, N.J. 2003. Experimental Evidence on the Links among Monetary Incentives, Task Attractiveness, and Task Performance. *Journal of Management Accounting Research* 15 (1): 161–176. https://doi.org/10.2308/jmar.2003.15.1.161.

Fischbacher, U., and F. Föllmi-Heusi 2013. Lies in Disguise: An Experimental Study on Cheating. *Journal of the European Economic Association* 11 (3): 525–547. https://doi.org/10.1111/jeea.12014.

Fortune Business Insights 2024. Employee Surveillance and Monitoring Software Market. https://www.fortunebusinessinsights.com/employee-surveillance-and-monitoring-software-market-104796.

Frey, B.S., and R. Jegen 2001. Motivation Crowding Theory. *Journal of Economic Surveys* 15 (5): 589–611. https://doi.org/10.1111/1467-6419.00150.

Gagne, M., and E. L. Deci 2005. Self-determination theory and work Motivation. *Journal of Organizational Behavior* 26: 331–362. https://doi.org/10.1002/job.322.

Gajendran, R.S., and D. A. Harrison 2007. The good, the bad, and the unknown about telecommuting: meta-analysis of psychological mediators and individual consequences. *The Journal of applied psychology* 92 (6): 1524–1541. https://doi.org/10.1037/0021-9010.92.6.1524.

Gibbs, M., F. Mengel, and C. Siemroth 2021. Work from Home & Productivity: Evidence from Personnel & Analytics Data on IT Professionals. *SSRN Electronic Journal*. https://dx.doi.org/10.2139/ssrn.3841567.

Gill, D., and V. Prowse 2012. A Structural Analysis of Disappointment Aversion in a Real Effort Competition. *American Economic Review* 102 (1): 469–503. https://doi.org/10.1257/aer.102.1.469.

Gill, D., and V. Prowse 2019. Measuring costly effort using the slider task. *Journal of Behavioral and Experimental Finance* 21: 1–9. https://doi.org/10.1016/j.jbef.2018.11.003.

Global Workplace Analytics 2021. Latest Work-at-Home/Telecommuting/Remote Work Statistics. https://globalworkplaceanalytics.com/telecommuting-statistics.

Golden, T.D., J. F. Veiga, and R. N. Dino 2008. The Impact of Professional Isolation on Teleworker Job Performance and Turnover Intentions: Does Time Spent Teleworking, Interacting

Face-toFace, or Having Access to Communication-Enhancing Technology Matter? *Journal of Applied Psychology* 93 (6): 1412–1421. https://doi.org/10.1037/a0012722.

Gouldner, A.W. 1960. The Norm of Reciprocity: A Preliminary Statement. *American Sociological Review* 25 (2): 161–178. https://doi.org/10.2307/2092623.

Greer, T.W., and S. C. Payne 2014. Overcoming Telework Challenges: Outcomes of Successful Telework Strategies. *The Psychologist-Manager Journal* 17 (2): 87–111. https://psycnet.apa.org/doi/10.1037/mgr0000014.

Guerin, B. 1993. Social Facilitation. Cambridge University Press.

Guggenmos, R.D., M. D. Piercey, and C. P. Agoglia 2018. Custom Contrast Testing: Current Trends and a New Approach. *The Accounting Review* 93 (5): 223–244. https://doi.org/10.2308/accr-52005.

Hannan, R.L., F. W. Rankin, and K. L. Towry 2006. The Effect of Information Systems on Honesty in Managerial Reporting: A Behavioral Perspective. *Contemporary Accounting Research* 23 (4): 885–918. https://doi.org/10.1506/8274-J871-2JTT-5210.

Hayes, A.F. 2018. Introduction to mediation, moderation, and conditional process analysis. The Guilford Press, New York, London.

Hendriks, A. 2012. SoPHIE - Software Platform for Human Interaction Experiments. *Working Paper*.

Houser, D., S. Vetter, and J. Winter 2012. Fairness and cheating. *European Economic Review* 56 (8): 1645–1655. https://doi.org/10.1016/j.euroecorev.2012.08.001.

Jensen, M.C., and W. H. Meckling 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4): 305–360. https://doi.org/10.1016/0304-405X(76)90026-X.

Johnson, N.D., and A. A. Mislin 2011. Trust games: A meta-analysis. *Journal of Economic Psychology* 32 (5): 865–889. https://doi.org/10.1016/j.joep.2011.05.007.

Kaiser, H.F. 1970. A second generation little jiffy. *Psychometrika* 35 (4): 401–415. https://doi.org/10.1007/BF02291817.

Kelly, K., E. LaMothe, and L. Baudot 2024. Remote "Helicopter Bosses": Employee Perceptions of the Effects of Supervisory Controls and Remote Work During the COVID -19 Pandemic*. *Accounting Perspectives* 23 (3): 333–373.

Ko, Y.H., and I. G. Baek 2024. The Effect of Computer Monitoring on Employees' Productivity in Telecommuting Arrangements. *Management Science*: 1–20.

Koch, C., and S. E. Salterio 2017. The Effects of Auditor Affinity for Client and Perceived Client Pressure on Auditor Proposed Adjustments. *The Accounting Review* 92 (5): 117–142. https://www.jstor.org/stable/26551266.

Kroher, M., and T. Wolbring 2015. Social control, social learning, and cheating: Evidence from lab and online experiments on dishonesty. *Social science research* 53: 311–324. https://doi.org/10.1016/j.ssresearch.2015.06.003.

Lerner, J.S., and P. E. Tetlock 1999. Accounting for the Effects of Accountability. *Psychological Bulletin* 125 (2): 255–275. https://doi.org/10.1037/0033-2909.125.2.255.

Mazar, N., O. Amir, and D. Ariely 2008. The Dishonesty of Honest People: A Theory of Self-Concept Maintenance. *Journal of Marketing Research* 45 (6): 633–644. https://doi.org/10.1509/jmkr.45.6.633.

McKinsey & Company 2022. Americans are embracing flexible work—and they want more of it. https://www.mckinsey.com/industries/real-estate/our-insights/americans-are-embracing-flexible-work-and-they-want-more-of-it#/.

Miller, M.K., R. L. Mandryk, M. V. Birk, A. E. Depping, and T. Patel 2017. Through the Looking Glass: Effects of Feedback on Self-Awareness and Conversation during Video Chat. *Proceedings of the 2017 CHI conference on human factors in computing systems*: 5271–5283. https://doi.org/10.1145/3025453.3025548.

Osman, Y. 2024. Zoff bei Deutscher Bank – Verdi startet Petition. *Handelsblatt*. https://www.handelsblatt.com/finanzen/banken-versicherungen/banken/homeoffice-zoff-bei-deutscher-bank/100089278.html.

Owl Labs 2022. State of Remote Work 2022. https://resources.owllabs.com/hubfs/2022-10_SORW/Owl-Labs-State-of-Remote-Work-2022.pdf.

Pelletier, L.G., M. S. Fortier, R. J. Vallerland, and N. M. Briere 2001. Associations Among Perceived Autonomy Support, Forms of Self-Regulation, and Persistence: A Prospective Study. *Motivation and emotion* 25 (4): 279–306. https://doi.org/10.1023/A:1014805132406.

Piacenza, J., E. Moquin, L. Maxwell, A. He, L. Roeschke, M. Lynott, C. Principato, L. Whalen, R. Graziano, C. Tassin, and M. Howe 2022. New Workers, New Normal: Future of Work Report 2022. https://pro.morningconsult.com/analyst-reports/future-of-work-2022.

Plant, R.W., and R. M. Ryan 1985. Intrinsic motivation and the effects of self-consciousness, self-awareness, and ego-involvement: An investigation of internally controlling styles. *Journal of Personality* 53 (3): 435–449. https://doi.org/10.1111/j.1467-6494.1985.tb00375.x.

Porter, J. 2022. Elon Musk reportedly declares remote work 'no longer acceptable' at Tesla. *The Verge*. https://www.theverge.com/2022/6/1/23149784/elon-musk-tesla-remote-work-leaked-email-40-hours.

Rankin, F.W., S. T. Schwartz, and R. A. Young 2008. The Effect of Honesty and Superior Authority on Budget Proposals. *The Accounting Review* 83 (4): 1083–1099. https://doi.org/10.2308/accr.2008.83.4.1083.

Ravid, D.M., D. L. Tomczak, J. C. White, and T. S. Behrend 2020. EPM 20/20: A Review, Framework, and Research Agenda for Electronic Performance Monitoring. *Journal of Management* 46 (1): 100–126. https://doi.org/10.1177/0149206319869435.

Reid, E. 2015. Embracing, passing, revealing, and the ideal worker image: How people navigate expected and experienced professional identities. *Organization Science* 26 (4): 997–1017. https://doi.org/10.1287/orsc.2015.0975.

Ross, S.A. 1973. The Economic Theory of Agency: The Principal's Problem. *American Economic Association* 63 (2): 134–139.

Rupietta, K., and M. Beckmann 2018. Working from home: What is the effect on employees' effort? *Schmalenbach Business Review* 70 (1): 25–55. https://doi.org/10.1007/s41464-017-0043-x.

Ryan, R.M., and E. L. Deci 2000. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist* 55 (1): 68–78. https://psycnet.apa.org/doi/10.1037/0003-066X.55.1.68.

Schedlinksy, I., M. Schmidt, and A. Wöhrmann 2020. Interaction of information and control systems: How the perception of behavior control affects the motivational effect of relative performance information. *Accounting, Organizations and Society* 86. https://doi.org/10.1016/j.aos.2020.101171.

Schlund, R., and E. M. Zitek 2024. Algorithmic versus human surveillance leads to lower perceptions of autonomy and increased resistance. *Communications Psychology* 2 (1). https://doi.org/10.1038/s44271-024-00102-8.

Shu, L.L., N. Mazar, F. Gino, D. Ariely, and M. H. Bazerman 2012. Signing at the beginning makes ethics salient and decreases dishonest self-reports in comparison to signing at the end. *Proceedings of the National Academy of Sciences of the United States of America* 109 (38): 15197–15200. https://doi.org/10.1073/pnas.1209746109.

Silvia, P.J., O'Brien, and Maureen E. 2004. Self-Awareness and Constructive Functioning: Revisiting “the Human Dilemma”. *Journal of Social & Clinical Psychology* 23 (4): 475–489. https://doi.org/10.1521/jscp.23.4.475.40307.

Sprinkle, G.B. 2003. Perspectives on experimental research in managerial accounting. *Accounting, Organizations and Society* 28 (2-3): 287–318. https://doi.org/10.1016/S0361-3682(01)00058-7.

Stewart, D.W. 1981. The Application and Misapplication of Factor Analysis in Marketing Research. *Journal of Marketing Research* 18 (1): 51–62. https://doi.org/10.1177/002224378101800105.

Tan, H.-T., and A. Kao 1999. Accountability Effects on Auditors' Performance: The Influence of Knowledge, Problem-Solving Ability, and Task Complexity. *Journal of Accounting Research* 37 (1): 209.

Tessier, S., and D. Otley 2012. A conceptual development of Simons’ Levers of Control framework. *Management Accounting Research* 23 (3): 171–185. https://doi.org/10.1016/j.mar.2012.04.003.

Waterson, J. 2016. Daily Telegraph Installs Workplace Monitors On Journalists' Desks. *BuzzFeed*. https://www.buzzfeed.com/jimwaterson/telegraph-workplace-sensors.

Webb, R.A. 2002. The impact of reputation and variance investigations on the creation of budget slack. *Accounting, Organizations and Society* 27 (4-5): 361–378. https://doi.org/10.1016/S0361-3682(01)00034-4.

Wicklund, R.A. 1975. Objective Self-Awareness. *Journal of Experimental Social Psychology* 8: 233–275. https://doi.org/10.1016/S0065-2601(08)60252-X.

Wicklund, R.A., and S. Duval 1971. Opinion change and performance facilitation as a result of objective self-awareness. *Journal of Experimental Social Psychology* 7 (3): 319–342. https://doi.org/10.1016/0022-1031(71)90032-1.

TABLE 1

Descriptive Statistics (mean, [standard deviation])

	Location[a]						**Total**
	Office			**Telework**			
	Monitoring[b]			**Monitoring**[b]			
	present	absent	**Total**	present	absent	**Total**	
Number of Subjects	21	20	**41**	24	23	**47**	88
Panel A: Effort (n = 88)							
Number of sliders moved[c]	228.43	266.20	**246.85**	329.21	338.96	**333.98**	293.39
	[80.83]	[119.85]	**[102.25]**	[97.47]	[92.50]	**[94.16]**	[106.80]
Panel B: Misreporting (n = 88)							
Extent of Misreporting[d]	0.51	0.68	**0.59**	0.49	0.53	**0.51**	0.55
	[0.31]	[0.26]	**[0.29]**	[0.26]	[0.30]	**[0.28]**	[0.29]

[a] *Location* has two levels: office and telework. Participants either conducted the experiment in the experimental laboratory at the university (*office*) or at home (*telework*). Location is coded as 1 for the telework condition and 0 otherwise.

[b] *Monitoring* has two levels: present or absent. Participants were either monitored (*present*) or not (*absent*). Monitoring is coded as 1 when monitoring is present and 0 otherwise.

[c] *Number of sliders moved* captures the total adjustments made to sliders during the effort task, regardless of their correctness.

[d] *Extent of Misreporting* represents the extent to which participants lied relative to how much they could have lied. The variable takes on values between 0 and 1. Values closer to 1 indicate more dishonest behavior.

TABLE 2

Effects of Location and Monitoring on Effort – H1a & H2a

Dependent variable: Effort[a] (n = 88)

Panel A: ANCOVA for H1a

Source of variation	SS	df	MS	F-ratio	p-value[f]
Model	259332.40	10	25933.24	2.72	< 0.01
Location[b]	162931.29	1	162931.29	17.12	< 0.01
Monitoring[c]	17250.67	1	17250.67	1.81	0.18
Location x Monitoring	5365.95	1	5365.95	0.56	0.46
Device[d]	3734.79	1	3734.79	0.39	0.53
Location Preference[e]	68588.57	6	11431.43	1.20	0.32
Error	732946.86	77	9518.79		

Panel B: Planned Contrasts for H2a

Source	SS	df	MS	F-ratio	p-value[f]
Model custom contrast[g]	183426.99	1	183426.99	19.27	< 0.01
Error	732946.46	77	9518.79		

[a] The dependent variable *Effort* is operationalized through the number of sliders moved.

[b] *Location* has two levels: office and telework. Participants either conducted the experiment in the experimental laboratory at the university (*office*) or at home (*telework*). Location is coded as 1 for the telework condition and 0 otherwise.

[c] *Monitoring* has two levels: present or absent. Participants were either monitored (*present*) or not (*absent*). Monitoring is coded as 1 when monitoring is present and 0 otherwise.

[d] *Device* is a dummy variable capturing the usage of a mouse (1) or touchpad (0) during the slider task.

[e] *Location Preference* is measured in the PEQ through a 7-point Likert scale asking participants to what extent they agree with the statement: "I prefer to complete work assignments at home rather than at the university." (7-point Likert scale, reversed).

[f] All p-values are two-tailed.

[g] The contrast coefficients are -7 for *Office/Monitoring present*, -1 for *Office/Monitoring absent*, +3 for *Telework/Monitoring present*, and +5 for *Telework/Monitoring absent*.

TABLE 3

Effects of Location and Monitoring on Misreporting – H1b & H2b

Dependent variable: Misreporting[a] (n = 88)

Panel A: ANCOVA for H1b

Source of variation	SS	df	MS	F-ratio	p-value[e]
Model	1.34	9	0.15	2.03	0.05
Location[b]	0.30	1	0.30	4.02	0.05
Monitoring[c]	0.24	1	0.24	3.32	0.07
Location x Monitoring	0.10	1	0.10	1.32	0.25
Preference Location[d]	0.85	6	0.14	1.94	0.09
Residual	5.75	78	0.07		
Total	7.09	87	0.08		

Panel B: Planned Contrasts for H2b

Source	SS	df	MS	F-ratio	p-value[e]
Model custom contrast[f]	0.59	1	0.59	7.99	< 0.01
Error	5.75	78	0.07		

[a] The dependent variable *Misreporting* takes on values between 0 and 1. Values close to 0 indicate honest behavior. The variable is calculated by the sum of the difference between reported cost – actual cost divided by the maximum project revenue of 2,000 – actual cost.

[b] *Location* has two levels: office and telework. Participants either attended the experiment in the experimental laboratory at the university (*office*) or at home (*telework*). Location is coded as 1 for the telework condition and 0 otherwise.

[c] *Monitoring* has two levels: present or absent. Participants were either monitored (*present*) or not (*absent*). Monitoring is coded as 1 when monitoring is present and 0 otherwise.

[d] *Location Preference* is measured in the PEQ through a 7-point Likert scale asking participants to what extent they agree with the statement: "I prefer to complete work assignments at home rather than at the university." (7-point Likert scale, reversed).

[e] All p-values are two-tailed.

[f] The contrast coefficients are -1 for *Office/Monitoring present*, +4 for *Office/Monitoring absent*, -2 for *Telework/Monitoring present*, and -1 for *Telework/Monitoring absent*.

TABLE 4

Items from the PEQ (7-points scale) used for the Path Analyses

Panel A: Autonomy Item

I felt restricted in my actions by my employer's decisions regarding the organization of my work.[a]
(endpoints: totally agree and totally disagree)

Panel B: Factor Analyses for Motivation and Reciprocity

Motivation Items

I was motivated during the experiment.[a]
(endpoints: totally agree and totally disagree)

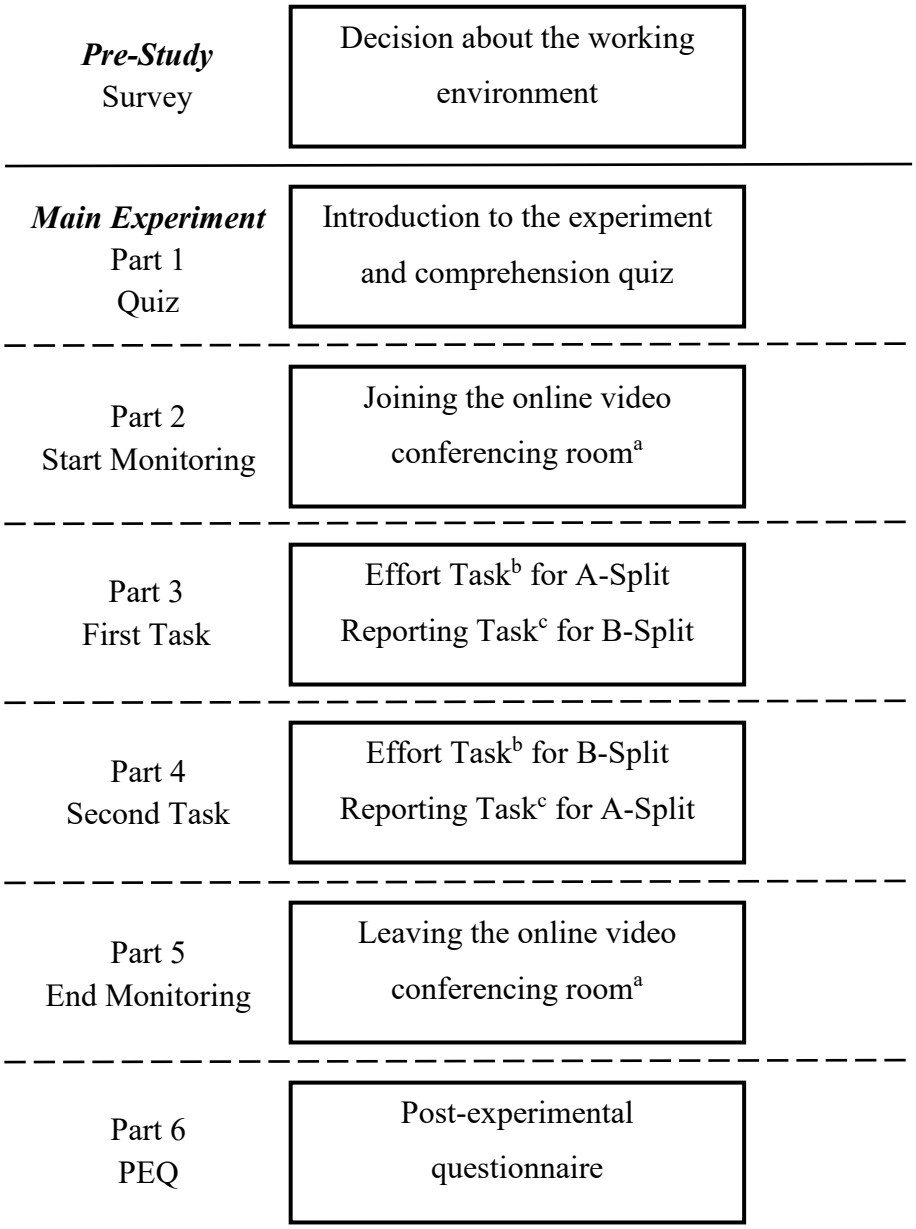
It was important for me to master the task well.[a]
(endpoints: totally agree and totally disagree)

Reciprocity Items	Used for	
	Effort reciprocity	**Misreporting reciprocity**
General Reciprocity Item		
I retaliated against my employer's decision regarding my place of work through my decisions in the tasks. *(endpoints: totally agree and totally disagree)*	x	x
I was annoyed by my employer's decision regarding my place of work. *(endpoints: totally agree and totally disagree)*	x	x
Effort-/Misreporting-specific Reciprocity Items		
I wanted to thank my employer for the choice of my working conditions (place of work and monitoring) and therefore moved a lot of sliders.[a] *(endpoints: totally agree and totally disagree)*	x	
I wanted to avoid that my employer received a lower payout for the project task because of me.[a] *(endpoints: totally agree and totally disagree)*		x

[a] Marked items have been reversed for the respective factor calculation.

FIGURE 1

Experimental Procedure

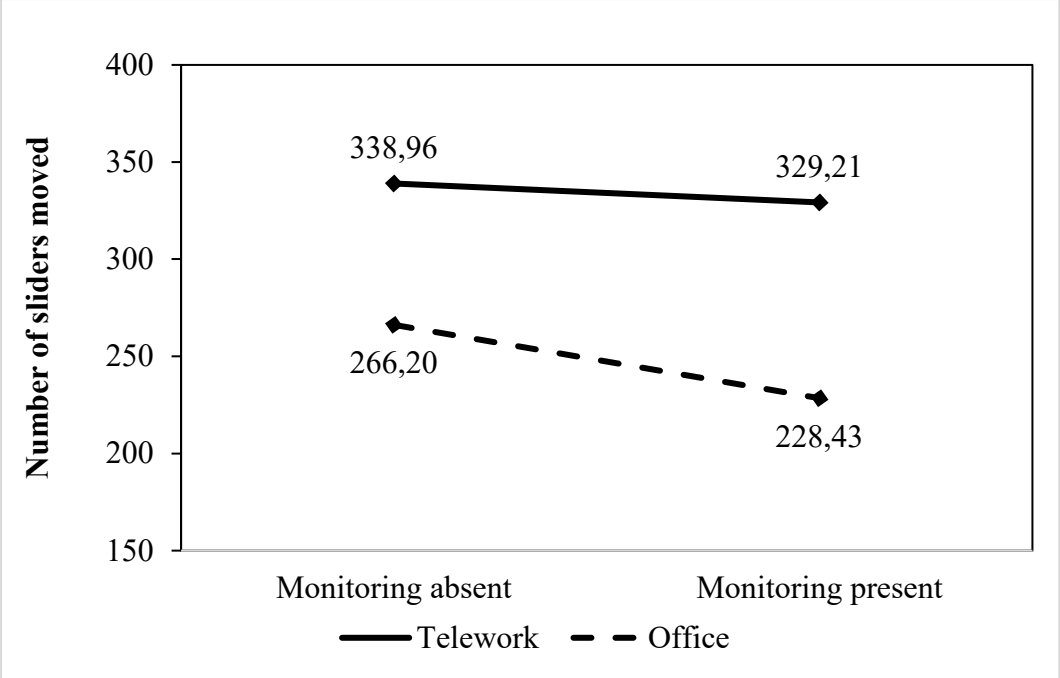


[a] Applies only to participants in the monitoring conditions.
[b] The effort task (slider task) consists of solving as many sliders as possible with the option to play up to 10 rounds tic-tac-toe against the computer.
[c] The reporting task consists of four cost reports. Participants learn the actual costs and have to decide which costs they report.

FIGURE 2

Observed Effects of Location and Monitoring on Effort and Misreporting

Panel A: Observed Effects on Effort (n = 88), H1a and H2a



Panel B: Observed Effects on Misreporting (n = 88), H1b and H2b

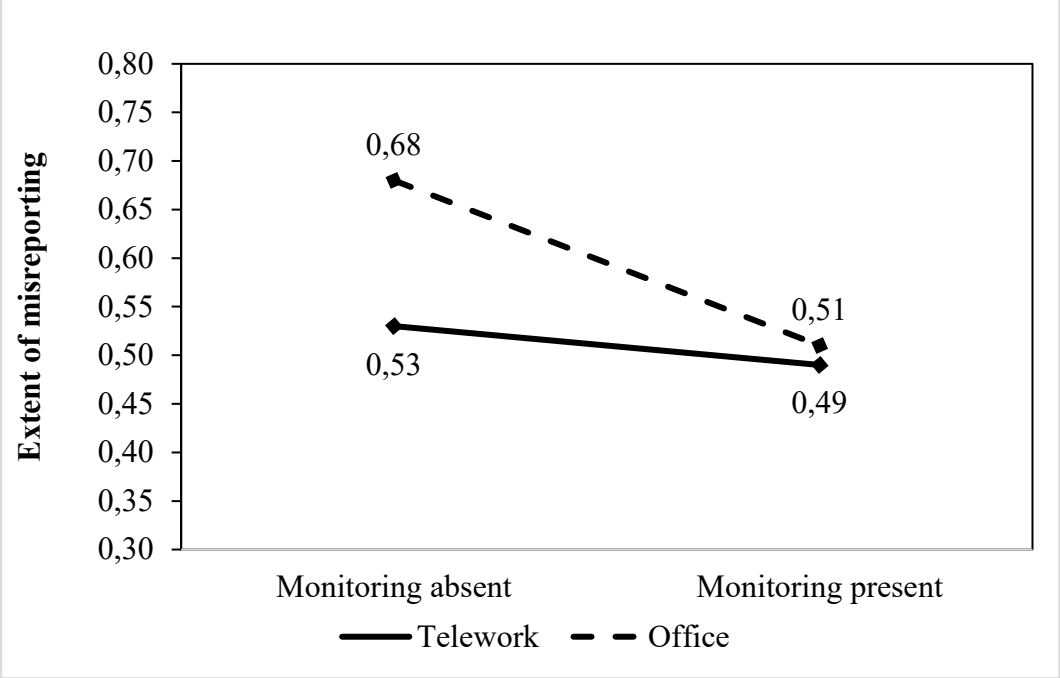
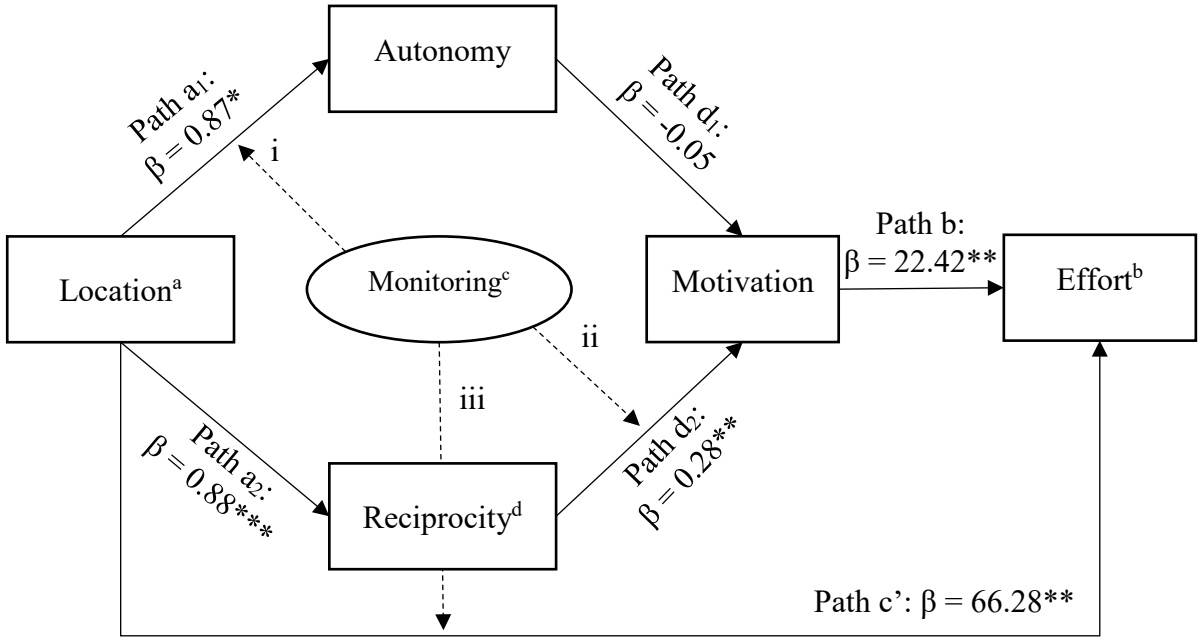


FIGURE 3
Path Analysis

Panel A: Effort



90% BCI for the indirect effect through reciprocity and motivation (a×b; monitoring absent): **(0.28, 17.15)**

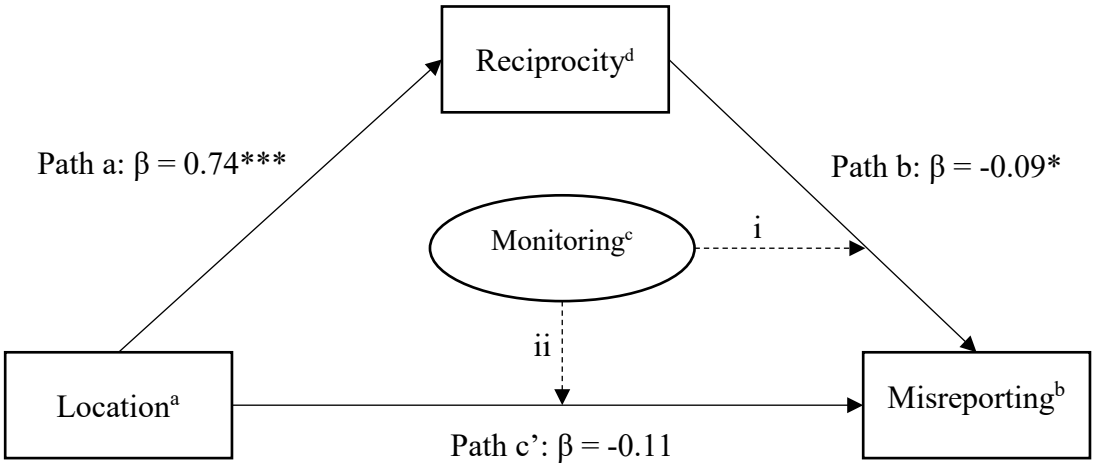
90% BCI for the indirect effect through reciprocity (a×b; monitoring present): **(2.17, 33.49)**

90% BCI for the difference in the indirect effects through reciprocity: **(1.28, 24.43)**

If zero does not appear within the 90% bias-corrected confidence-interval (BCI), then the indirect effect explained by reciprocity (a×b) has statistical significance at the 10% level (displayed in **bold**).

*Place x Monitoring **i***: -1.67, t = -2.66, p < 0.01; direct effect of monitoring on autonomy: -1.30, t = -2.85, p < 0.01.
*Reciprocity x Monitoring **ii***: 0.41, t = 2.16, p = 0.03; direct effect of monitoring on motivation: -0.37, t = -1.63, p = 0.11.
*Place x Monitoring **iii***: 29.19, t = 0.70, p = 0.49; direct effect of monitoring on effort: -31.06, t = -1.02, p = 0.31.
[a] *Location* is the independent variable and coded as 1 for the telework condition and 0 otherwise.
[b] *Effort* is the dependent variable measured by the number of sliders moved.
[c] *Monitoring* is the moderator and coded as 1 when monitoring is present and 0 otherwise.
[d] The *Reciprocity* factor for effort consists of three items from the PEQ (see Table 4).
Panel A depicts our path model estimated using the PROCESS macro in SPSS (Hayes 2018). **Path a_1** represents the effect of location on autonomy ("I felt restricted in my actions by my employer's decisions regarding the organization of my work." (7-point Likert scale, reversed). Higher values indicate a higher perceived autonomy). **Path a_2** reflects the effect of location on (effort) reciprocity (a factor composed of the three questions "I wanted to thank my employer for the choice of my working conditions (place of work and monitoring) and therefore moved a lot of sliders." (7-point Likert scale, reversed), "I retaliated against my employer's decision regarding my place of work through my decisions in the tasks." (7-point Likert scale) and "I was annoyed by my employer's decisions regarding my place of work." (7-point Likert scale). Higher values indicate higher reciprocal behavior.) **Path b** denotes the effect of motivation on effort (motivation is a factor composed of the two questions "I was motivated during the experiment" and "It was important for me to master the task well." (7-point Likert scale, reversed). Higher values indicate higher motivation.). **Path c'** represents the direct effect of location on effort. **Path d_1** reflects the effect of autonomy on motivation. **Path d_2** represents the effect of (effort) reciprocity on motivation.
*** p < 0.01, ** p < 0.05, * p < 0.10

Panel B: Misreporting



90% BCI for the indirect effect through reciprocity (a×b, monitoring absent): **(-0.13, -0.01)**

90% BCI for the indirect effect through reciprocity (a×b, monitoring present): **(-0.14, 0.00)**

90 % BCI for the difference in the indirect effects (-0.08, 0.09)

If zero does not appear within the 90% bias-corrected confidence-interval (BCI), then the indirect effect explained by reciprocity (a×b) has statistical significance at the 10% level (displayed in **bold**).

*Monitoring x Reciprocity **i***: 0.02, t = 0.32, p = 0.75.
*Monitoring x Place **ii***: 0.11, t = 0.91, p = 0.36; direct effect of monitoring on misreporting: -0.18, t = -2.09, p = 0.04.
[a] *Location* is the independent variable and coded as 1 for the telework condition and 0 otherwise.
[b] *Misreporting* is the dependent variable measured by the sum of reported cost – actual cost divided by the sum of the maximum project revenue of 2,000 – actual cost over all four projects.
[c] *Monitoring* is the moderator and coded as 1 when monitoring is present and 0 otherwise.
[d] The *Reciprocity* factor for misreporting consists of three items from the PEQ (see Table 4).
Panel B depicts our moderated mediation model estimated using the PROCESS macro in SPSS (Hayes 2018). Path **a** represents the effect of location on (misreporting) reciprocity (a factor composed of the three questions "I wanted to avoid that my employer received a lower payout for the project task because of me." (7-point Likert scale, reversed), "I retaliated against my employer's decision regarding my place of work through my decisions in the tasks." (7-point Likert scale, reversed) and "I was annoyed by my employer's decisions regarding my place of work." (7-point Likert scale). Higher values indicate higher reciprocal behavior.). Path **b** reflects the effect of (misreporting) reciprocity on misreporting. Path **c'** represents the direct effect of location on misreporting.
*** p < 0.01, ** p < 0.05, * p < 0.10