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Fostering support for work floor energy conservation policies

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Published in:
Journal of Organizational Behavior

DOI:
[10.1002/job.1831](https://doi.org/10.1002/job.1831)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2013

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Bolderdijk, J. W., Steg, L., & Postmes, T. (2013). Fostering support for work floor energy conservation policies: Accounting for privacy concerns. *Journal of Organizational Behavior*, 34(2), 195-210.
<https://doi.org/10.1002/job.1831>

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Fostering support for work floor energy conservation policies: Accounting for privacy concerns

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Summary

The advent of electronic monitoring technology (e.g., smart meters and in-car GPS devices) poses the opportunity for organizations to promote energy conservation behaviors among their employees through individual feedback and incentives. Although electronic monitoring thus can help in reducing the organization's environmental footprint, organizations may be reluctant to take such steps because of privacy concerns that may arise among those whose behavior is being monitored. This paper examines the roots of such privacy concerns. On the basis of literature on motivated cognition, we expect that people may sometimes construe privacy concerns in a self-serving fashion. Three empirical studies support this assumption and suggest an interesting and potentially controversial conclusion: electronic monitoring in itself may not necessarily raise concerns about privacy, except when people anticipate that monitoring will lead to negative consequences for them personally. Thus, this paper offers clear policy advice for organizations aiming to implement work floor energy conservation policies that rely on electronic monitoring of employee behavior: communicating the individual benefits for employees may alleviate employee privacy concerns and boost organizational support. Copyright © 2012 John Wiley & Sons, Ltd.

Keywords: privacy; electronic monitoring; energy conservation; motivated cognition

Globally, the awareness that current consumption patterns cannot be sustained is slowly sinking in. Carbon emissions due to the combustion of fossil fuels are intensifying climate change (Intergovernmental Panel on Climate Change, 2010), and energy prices have reached an all-time high. These issues have prompted governments and households to take steps to curb their consumption of resources and energy (Stern & Gardner, 2008). Organizations have also become aware of these issues (McGuire, 2010) and have started including ecological sustainability as an integral part of their corporate social responsibility code (Fenwick, 2007).

Within organizations, the goal of ecological sustainability is often equated with efforts to reduce the organization's environmental footprint¹ (Hammond, 2006; Wackernagel & Rees, 1996) and more specifically, with achieving energy savings. Organizations can achieve significant energy savings by investing in energy-efficient equipment and materials (e.g., by insulating offices and by adopting more energy-efficient appliances). However, such energy savings may be limited or even offset by growing consumption levels (Jackson, 2005) and wasteful employee behaviors (Sorrell & Dimitropoulos, 2008). Employees contribute significantly to organizational energy use through direct (e.g., consumption of electricity at the work floor and fuel during work-related car travel) as well as indirect consumption of energy (e.g., paper requires energy to be produced). To reduce the organization's environmental footprint, organizations thus also need to motivate employees to curtail their use of existing equipment and materials (e.g., by turning off unused appliances, driving fuel efficiently in company cars,

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¹“the area of productive land and water ecosystems required to produce the resources that the population consumes and assimilate the wastes that the population produces” (Wackernagel & Rees, 1996).

and printing less often; Gardner & Stern, 2002). The success of organizations in reducing their environmental footprint therefore depends strongly on their ability to stimulate energy conservation behaviors among their employees.

Modern electronic monitoring technologies (such as smart meters, in-car GPS devices, and printing registration software) allow organizations to monitor and manage employees' individual use of electricity, fuel, and paper. However, such practices may fail to get implemented because of concerns about employee privacy. This paper examines the roots of such privacy concerns. Before we explain our hypotheses, we first introduce the background and rationale of the research.

The challenge of changing employee behaviors

Organizations are starting to realize that employee involvement is crucial in efforts to reduce the organization's environmental impact (Bansal & Roth, 2000; Boiral, 2006; McGuire, 2010). But how can employees be motivated to engage in energy conservation behaviors? Prior research indicates that, while at home, many people seem willing and motivated to engage in conservation behaviors, particularly when the required behavior does not require too much time, money, or effort (Abrahamse, Steg, Vlek, & Rothengatter, 2007; Diekmann & Preisendörfer, 2003). Motivating conservation behaviors on the work floor, however, may prove more difficult (for recent efforts, see Scherbaum, Popovich, & Finlinson, 2008; Siero, Boon, Kok, & Siero, 1989; Siero, Bakker, Dekker, & van den Burg, 1996; Staats, van Leeuwen, & Wit, 2000; and Carrico & Riemer, 2011).

The reason for this is that at home, people face a personal incentive for energy conservation: individual reductions in gas and electricity use will eventually be reflected in a lower energy bill. Moreover, energy bills provide households individual feedback about the consequences of their personal energy-conserving behaviors. Within the work environment, such motivational forces are lacking. Employees jointly contribute to overall organizational energy consumption and typically have no way of seeing how their individual conservation behaviors (e.g., turning off one's computer during lunch, limiting one's paper usage, and using public transport rather than a company car) contribute to the organization's overall goal of energy conservation. As such, employees may not feel personally responsible for reducing the organization's environmental footprint. Moreover, employees are not explicitly rewarded for their conservation behaviors, so there are few personal incentives for individual employees to engage in conservation behaviors. Together, these circumstances may explain why people may be less motivated to conserve energy at work than at home (Carrico & Riemer, 2011).

In sum, employees—unlike homeowners—do not receive regular feedback and face no direct incentive to conserve energy. One way to circumvent this problem would be to log individual behavior and make the consequences of specific conservation behaviors visible to employees. The advent of electronic monitoring technology (such as smart meters and on-board car units, see also Beyea, 2010) may help in this respect. Organizations can utilize this technology to provide feedback about the energy savings realized by specific employee conservation behaviors and/or administer incentives for individual energy-saving behaviors (see, for example, www.cloudapps.com/sustainability-software-products/). GPS technology, for instance, can be used to monitor and financially reward employees who use a fuel-efficient driving style when using company cars (cf. Bolderdijk, Knockaert, Steg, & Verhoef, 2011). Similarly, smart energy meters or devices (see, for example, plugwise.com) could be installed in offices to measure (appliance-specific) electricity consumption and provide (comparative) feedback (cf. Ayres, Raseman, & Shih, 2009; Nolan, Schultz, Cialdini, Goldstein, & Grisevicius, 2008; Siero et al., 1996).

Research suggests that providing feedback and incentives could be effective in producing behavior changes and associated energy savings (Dietz, Gardner, Gilligan, Stern, & Vandenbergh, 2009), especially when feedback and financial consequences are delivered near the target behavior (Abrahamse et al., 2007; Fischer, 2008; Lehman & Geller, 2004; Winett, Kagel, Battalio, & Winkler, 1978) and when individual performance is compared with that of peers (Ayres et al., 2009; Nolan et al., 2008; Siero et al., 1996). Mail-van drivers, for instance, adopted a more

fuel-efficient driving style when they received feedback that related their van's weekly gasoline usage to that of coworkers (Siero et al., 1996).

Concerns about employee privacy

Although the utilization of electronic monitoring technologies may—by enabling specific incentives and feedback—help the organization in reducing its environmental footprint, one barrier preventing their implementation is concerns about privacy. Extensive monitoring of employee behavior (e.g., recording keystrokes, emails, or employee availability) has been argued to create unpleasant psychological states in employees (e.g., fear, stress, distraction, loss of control, feelings of unfairness), making the organization a less satisfying and stimulating place to work in (Moore, 2000; Smith & Tabak, 2009; Spinello, 1995; Thompson, Sebastianelli, & Murray, 2009; Zweig & Webster, 2002). Likewise, it is conceivable that employees will not accept electronic monitoring of specific conservation behaviors. Employees may, for instance, perceive technology that monitors one's driving behavior an invasion of one's right to privacy (cf. Ogden, 1999; Schlag & Teubel, 1997; Sivak et al., 2007): in-car monitoring systems may reveal information about an employee's whereabouts, which seems particularly unattractive for those who want to be able to appear unavailable and control their own agenda (Zweig & Webster, 2002). Employees could also object to the electronic monitoring of office electricity use. Energy retailers, for instance, reported difficulties introducing smart meters in new buildings owing to concerns about privacy (Wood, 2010). In sum, employees may not accept electronic monitoring of their conservation behaviors owing to concerns about privacy.

It is pivotal for organizations to take employees' privacy concerns seriously: a lack of employee privacy may result in adverse consequences, including decreased employee performance (Thompson et al., 2009), a loss of creativity, and decreased willingness to engage in organizational citizenship behaviors (Alge, Ballinger, Tangirala, & Oakley, 2006). Organizations thus need to consider whether gathering information on employee conservation behaviors is appropriate and legitimate, given that extensive monitoring could negatively affect employee well-being and performance (cf. Bies, 1993; Culnan & Bies, 2003; Milberg, Smith, & Burke, 2000; Smith & Tabak, 2009). Moreover, the successful implementation of any organizational policy ultimately depends on the engagement and cooperation of its employees (Boiral, 2009; Fenwick, 2007; L'Etang, 1995; Weick & Quinn, 1999). Thus, electronic monitoring will not likely be implemented if employees do not support its implementation. In sum, safeguarding a basic sense of employee privacy is essential to both employee well-being and the organization's ability to successfully implement work floor energy conservation policies.

From the above, it is clear that it is important to gain more insights into privacy concerns that may result from electronic monitoring of employee conservation behaviors. Will electronic monitoring of work floor conservation behaviors inevitably raise privacy concerns among employees? Under what circumstances are privacy concerns more and less likely to arise? The current research aims to address these questions. Understanding the roots of privacy concerns may help organizations better understand and manage employee privacy concerns and thereby foster organizational support for work floor energy conservation policies. We start our analysis by discussing two possible determinants of privacy concerns: awareness of being monitored and anticipated consequences of being monitored.

Awareness of being monitored

According to Altman (1977), privacy is a universal, inherent need that serves psychological functions. Having privacy is seen as an important condition for happiness, as it allows people to feel free and autonomous. As such, privacy is conceived as an inherently valuable and moral good that warrants protection against potential threats. Electronic monitoring forces people to disclose private information and may thereby pose a threat to one's feeling of autonomy and freedom, resulting in heightened concerns about privacy. This implies that privacy concerns

may increase when people come to understand how much information they are actually disclosing by consenting to electronic monitoring. After all, people can only experience privacy concerns when they are aware their behavior is being monitored (Norberg & Horne, 2007). This view could, for instance, explain why people generally accept behavioral monitoring from retailers: consumers may be simply unaware they are disclosing personal information by, for example, using loyalty cards (Graeff & Harmon, 2002).

Closer inspection, however, suggests that this explanation of privacy concerns does not cover the full story. People who claimed to be unwilling to disclose certain pieces of private information readily did so when prompted (Norberg, Horne, & Horne, 2007), the so-called privacy paradox (Norberg & Horne, 2007). Milne (1997) found that as much as 90 percent of the people surveyed were willing to disclose their phone number in return for a lottery ticket, despite being aware of the fact that this information could be used for marketing purposes. Thus, the behavior of consumers in market transactions suggests that privacy concerns cannot be entirely explained by monitoring awareness. If it is not awareness *per se* that leads to privacy concerns, then what is? And how can individual differences in privacy concerns be explained? We propose that privacy concerns, at least partially, can be traced back to motivated decision making.

Motivated cognition

Conventional views of privacy presuppose a rather objective assessment of privacy: privacy concerns are a function of the perceived threat to one's sense of autonomy (Altman, 1977). However, literature has suggested that people's opinions and beliefs on various subjects are not created objectively but are steered by motivation (Gilovich, 1983; Kunda, 1987). People may select, process, and interpret information in a self-serving manner, leading them to draw conclusions that have favorable implications for themselves. For example, whereas Republicans prefer to receive information from Fox News and avoid information from CNN and NPR, Democrats showed the opposite pattern, suggesting that people select TV channels on the basis of anticipated agreement (Iyengar & Hahn, 2009). Motivation influences not only which information people pay attention to but also how people process and interpret the very same information. Threatening health messages, for instance, were perceived as less convincing by those who were at risk of actually attracting the disease (Kunda, 1987) and climate change denial seems most prevalent among those who stand most to lose from a change in the status quo (McCright & Dunlap, 2011).

We argue that privacy concerns about electronic monitoring of conservation behaviors may come about via a similar process: those who expect to benefit personally from the implementation of electronic monitoring may be motivated to downplay privacy concerns, whereas those who expect to be worse off may be motivated to inflate their privacy concerns. This view could offer one answer to the question why people value privacy differently in different domains: in the face of the many benefits of loyalty cards, people may be motivated to downplay privacy concerns. In contrast, when thinking about a new monitoring technology that does not involve obvious benefits (e.g., GPS devices to monitor energy-efficient driving by employees), such motivation may be lacking, leading people to draw the conclusion that their privacy is unjustly breached. To summarize, we expect that privacy concerns about electronic monitoring of conservation behaviors may be construed in a self-serving manner: privacy concerns should be least pronounced when people anticipate that implementation will lead to additional benefits instead of costs.

Current research

In this paper, we present three studies that examine the relationship between privacy concerns and anticipated consequences of energy conservation policies that involve electronic monitoring of individual behavior. Drawing upon literature on motivated cognition, we predicted that the level of privacy concerns people express depends on anticipated policy consequences, such as personal financial consequences. We expected that people who are

expecting to financially benefit from the implementation of an energy conservation policy will be less likely to express privacy concerns than people who do *not* expect benefits or expect to be worse off.

If this reasoning is correct, we should find that privacy concerns should be negatively correlated with anticipated benefits (Hypothesis 1). Furthermore, we expected that privacy concerns about different electronic monitoring technologies are causally related to motivation. So, privacy concerns should depend on the presence of potential costs and benefits: people will be more likely to express privacy concerns when they are informed that electronic monitoring of conservation behaviors could result in additional costs (Hypothesis 2a). On the other hand, people will be less likely to express privacy concerns when they are informed that electronic monitoring could result in additional benefits (Hypothesis 2b). We tested Hypotheses 2a and 2b by manipulating anticipated policy consequences and by measuring their effects on privacy concerns. We expected people will be less likely to express privacy concerns when they expect to benefit from implementation.

We respectively examined students', car owners', and employees' responses to various electronic monitoring technologies that are similar to those currently available to organizations. In the first set of studies, we tried to establish internal validity by testing our hypotheses in both correlational (Study 1) and experimental research designs (Study 2). In Study 1, we tested responses to smart meters that monitor individual electricity consumption. In Study 2, we surveyed responses to in-car devices as a tool for automobile insurance companies to monitor driving behavior. Next, in Study 3, we aimed to establish external validity by testing our reasoning in an organizational setting: we examined employees' responses to an office printing registration system.

Study 1

Within organizations, energy is jointly consumed, and individual members have no way of identifying how their individual conservation efforts contribute to overall reductions in energy consumption. How would people respond to electronic monitoring technologies that track individual energy conservation behaviors and provide incentives for individual energy conservation efforts? On the basis of motivated cognition, we would expect that potential privacy concerns would be lower among those who anticipate benefiting financially from implementation. We tested the validity of this reasoning in a student sample. We examined how inhabitants of college dorm rooms would respond to an electronic monitoring technology that would enable usage-based charging of individual energy consumption. We examined how privacy concerns are related to the extent to which participants' expected to benefit from the implementation of the electronic monitoring technology (i.e., the smart meter; Wood, 2010).

Method

We asked students in an introductory psychology course of a medium-sized university in Eastern USA to fill out an Internet survey as part of a classroom exercise. Forty-seven participants—26 women; 21 men; mean age, 19.8 years—filled out the questionnaire. Participants read that the university intended to introduce smart meters in dorm rooms in an attempt to reduce energy use in campus dorms. The scenario explained that, through frequent readings, smart meters would allow constant monitoring of energy use per individual dorm room, which would enable the university to charge inhabitants for the actual amount of energy consumed in individual dorm rooms. Under the new system, the costs of each individual dorm room's energy use would be included in the monthly rent payment. This new system would thus provide inhabitants an incentive to reduce the energy consumed per dorm room (now students are charged a fixed fee, irrespective of their individual use). The scenario continued by stressing the potential benefits of the monitoring system, in this case by mentioning that dorm rooms that use less than the average amount of energy would end up paying less rent than before: "As compared to now, dorm rooms that consume relatively little energy can save up to \$200 annually on rent."

Additionally, as discussed in our general introduction, people may simply be unaware of how much information they are disclosing by consenting to specific monitoring technology. We therefore decided to examine the relationship between anticipated benefits and privacy concerns across both low and high monitoring awareness samples. We manipulated monitoring awareness by explicitly explaining or not explaining the data mining potential of smart meters to participants. Participants in the low awareness condition read a neutral description, in which the data mining potential of the smart meters was not mentioned: "Via smart meters, the university hopes to have found an effective way to reduce energy use among students living on campus." Participants in the high awareness condition read about the specific data mining potential of smart meters: "Via smart meters, the university will be able to see peaks and drops in energy use per dorm room. Using this system, the university might get some information on the living patterns of students, such as when they enter and leave their houses, how they use their home appliances, and at what time students are turning off their TV-sets".

After the participants read the scenario, we asked them to answer some questions on the university's intended policy of using smart meters in dorm rooms. Participants gave responses on a 7-point scale. Relative energy use (an indirect measure of anticipated costs) was measured by "My dorm room uses more energy than the average dorm room," (1—*completely disagree* to 7—*completely agree*). We measured anticipated financial benefits directly: "I would benefit financially from this measure," (1—*completely disagree* to 7—*completely agree*). Next, participants indicated their privacy concerns; "This policy compromises my privacy," (1—*completely disagree* to 7—*completely agree*). Additionally, some questions probed participants' general opinion about installing smart meters in dorm rooms to measure energy use. These questions are beyond the scope of this paper and are therefore not reported here. We randomized the order in which the items were presented to participants to counter artificially high inter-item correlations.

Results and discussion

Independent sample *t*-tests demonstrated that explicitly describing data mining possibilities significantly increased privacy concerns. Privacy concerns were lower in the low monitoring awareness condition ($M=2.21$, standard deviation [SD]=1.17) than in the high monitoring awareness condition ($M=3.68$, $SD=1.61$), $t(45)=-3.56$, $p<.01$, $d=1.04$. Next, we calculated correlations between relative energy use, anticipated financial benefits, and privacy concerns for both the high and low monitoring awareness groups separately.

As can be seen in Table 1, the directions of correlations are the same in the low and high monitoring awareness samples. Not surprisingly, relative energy use and anticipated financial benefits were negatively correlated: inhabitants of dorm rooms that use relatively much energy correctly anticipated that they would *not* benefit financially from the proposed energy conservation policy. Importantly, as hypothesized, there was a positive correlation between relative energy use and privacy concerns: participants who believed they used more energy than average claimed to be more concerned about their privacy than participants who believed they used less energy. Moreover, as expected, we found a negative correlation between anticipated financial benefits and privacy concerns: the

Table 1. Inter-item correlations for low-awareness sample ($n=28$, upper correlation) and high-awareness sample ($n=19$, lower correlation).

	Anticipated financial benefits	Privacy concerns
Relative energy use	-.22	.44**
	-.48**	.32
Anticipated financial benefits		-.37*
		-.55**

*Significant at the .10 level. **Significant at the .05 level.

more participants expected to financially benefit from implementation, the less likely they were to raise privacy concerns.

All correlations support our reasoning that privacy concerns are related to anticipated benefits, although some correlations (perhaps due to limited sample size) were not statistically significant. Inhabitants of dorm rooms that use relatively much energy expected to be financially worse off under the new measure and indeed expressed higher levels of privacy concerns. Overall, these results suggest that, independent of monitoring awareness levels, people may construct privacy concerns in a self-serving manner: those who anticipated positive financial consequences rated the very same energy conservation policy as less privacy invasive than people who anticipated negative financial consequences.

Study 2

Study 1 provides some initial support for our reasoning that privacy concerns can be construed in a self-serving manner. Owing to the correlational nature of Study 1, however, alternative accounts cannot be excluded. For example, it is possible that energy-intensive dorms happen to attract privacy-aware tenants, thereby explaining the positive correlation between privacy concerns and current energy use. To exclude this possibility, and thus enhance internal validity, we conducted a second study in which we manipulated—rather than measured—anticipated policy consequences.

As in Study 1, we asked participants in Study 2 to evaluate an energy conservation policy that uses a potentially privacy-invasive electronic monitoring technology—an in-car tracking device. This time, we tested the causal link between anticipated policy consequences and privacy concerns by portraying either financial *costs* or *benefits* that could result from the implementation of electronic monitoring. If privacy concerns are (at least partially) construed in a self-serving fashion, we should find that the expressed levels of privacy concerns are higher when potential financial costs, rather than benefits, are highlighted.

We examined our reasoning in the context of privacy concerns that may accompany the electronic monitoring of individual driving patterns. Specifically, we examined car owners' opinions about a new type of car insurance policy, "Pay-As-You-Drive Vehicle Insurance" (PAYD). Various car insurance companies around the world currently implement PAYD (e.g., MyRate by Progressive in the United States). Although there are many variations, PAYD generally entails that the insurance premium depends on the number of kilometers actually driven. PAYD thus offers an additional incentive for drivers to conserve energy: the fewer kilometers people drive, the less premium they pay (Litman, 2005).² A small in-car device is typically used to monitor driving behavior and to transmit driving behavior data to the insurance company, which uses the information to calculate the insurance premium. Until so far, PAYD has not been popular among drivers. One of the most frequently cited reasons by those queried about the lack of interest in participating in an American PAYD pilot is the issue of privacy (Buxbaum, 2006). PAYD therefore seems a highly relevant and suitable context to test our hypotheses.

We manipulated the anticipated policy consequences that result from PAYD and examined the effect on privacy concerns. We highlighted the additional *positive* or *negative* personal consequences that could result from the implementation of PAYD. Both conditions involved the same private information being disclosed to insurance companies—information about one's driving behavior. However, following the motivated cognition perspective, we expected that car owners would express most privacy concerns when negative rather than positive consequences were portrayed.

²A similar system has been introduced to motivate employees to save fuel by using their leased cars less frequently (see www.athloncarlease.com).

Method

A research assistant handed out questionnaires door-to-door in a diverse set of neighborhoods in a medium-sized city in the Netherlands. The research assistant would ring the doorbell and ask the resident to participate in a study on “driving behavior”. About 39 percent of the residents who opened their doors accepted a questionnaire. The research assistant was able to collect 79 percent of the distributed questionnaires a few days later. Sixty questionnaires were completed. The mean age of the sample—40 men, 19 women, 1 unknown, all car owners—was 48.05 years. Compared with the city average, this sample was older and consisted of relatively many men. Anticipated policy consequences of PAYD were manipulated as a between-subjects variable by randomly handing out one of two versions of the questionnaire.

All participants first read a general description of PAYD.

Insurance companies are considering introducing a new type of vehicle insurance, Pay-As-You-Drive Vehicle Insurance. With Pay-As-You-Drive Vehicle Insurance, premiums are directly based on how much you drive. You can influence how much insurance premium you have to pay by driving more or less kilometers. Research has shown that the likelihood of being involved in a traffic accident is strongly related to the number of kilometers driven. With Pay-As-You-Drive Vehicle Insurance, you pay premium according to the risk you run.

Next, the description explained that driving behavior would be monitored through a black-box: “The insurance company uses an in-car device to monitor how many kilometers you drive in a year.”

Experimental manipulation followed the general description of PAYD. Anticipated policy consequences were manipulated by describing either the potential financial benefits from PAYD (the positive policy consequences condition) or the potential financial costs (the negative policy consequences condition). For participants in the positive consequences condition, the description continued with “The less you drive, the less likely it is that you will be involved in an accident, and the more you save on your premium.” Additionally, participants in the positive policy consequences condition read, “Imagine that over the course of a year, you’ve reduced your mileage by 20 %. This means you would save € 200 on your insurance premium.” For participants in the negative consequences condition, the statement “The more you drive, the more likely it is that you will be involved in an accident, and the more additional premium you have to pay.” followed the general description. Additionally, participants in the negative consequences condition read, “Imagine that, over the course of a year, you’ve increased your mileage by 20 %. This means you would have to pay an additional insurance premium of € 200.”

As a manipulation check, we asked participants to envision and write down consequences of the implementation of PAYD in their specific situation. We limited our analyses to those participants who did mention consequences of PAYD in their answers ($n = 50$). The dependent variables entailed the extent to which participants felt that their privacy would be invaded by PAYD. We used two questions to measure privacy concerns, “The insurance company is invading my sense of privacy” and “I feel watched by the insurance company,” both on a 7-point scale (1—*completely disagree* to 7—*completely agree*). We averaged the two items to form a privacy invasion index ($r = .65$), which was used in the analyses.

Results and discussion

We used t -tests to test for differences between positive and negative consequences conditions. Participants in the negative consequences condition claimed to be much more concerned about the invasion of their privacy ($M = 4.52$, $SD = 1.76$) than participants in the positive policy consequences condition ($M = 3.31$, $SD = 2.00$), $t(48) = -2.25$, $p < .05$, $d = .64$. The results converge with those of Study 1 and are in line with the reasoning that people may construe privacy concerns in a self-serving manner: when a policy’s potential for additional costs, rather than benefits, are stressed, people tend to rate the monitoring technology as being more privacy-invasive (Table 2).

Table 2. Privacy concerns for negative and positive policy consequences ($n = 50$).

	Policy consequences		<i>t</i>	<i>df</i>
	Negative ($n = 23$)	Positive ($n = 27$)		
Privacy invasion index	4.52 (1.76)	3.31 (2.00)	−2.25*	48

Standard deviations appear in parentheses below the means.

*Significant at the .05 level **Significant at the .01 level.

Study 3

Studies 1 and 2 demonstrated that, as predicted by the motivated cognition perspective, privacy concerns regarding the electronic monitoring of conservation behaviors may be construed in a self-serving fashion. We found support for this reasoning among samples of students and car owners. We however expected that employee responses to electronic monitoring of office conservation behaviors would be shaped by the same basic mechanism.

We thus aimed to replicate our prior findings in an organizational setting. We decided to examine employees' responses to a technology that is currently available to organizations (see, for example, www.contek-office-tech.com): electronic monitoring of office printing behavior. Additionally, we now also included a control condition in which we recorded participants' "baseline" privacy concerns in a situation where we did not explicate the financial consequences of implementation.

Across different conditions, we systematically varied anticipated consequences. First, we varied whether or not monitoring of office printing behavior would result in a potential bonus. Second, we varied the way in which the bonus was introduced: we either highlighted that employees who printed 20 percent less than the company average could *earn* a bonus, or we highlighted that employees who did *not* print 20 percent less than the company average would *forego* (i.e., not receiving) the bonus. Regardless of how the bonus was framed, we expected that participants who read about a potential bonus would anticipate more benefits and thus express less privacy concerns than participants who did not read about a potential bonus.

Method

We constructed an online questionnaire that examined employees' responses to an office printing registration system. We asked representatives from various Dutch organizations to distribute our questionnaire among colleagues who work in office spaces. These organizations included, among others, a social housing agency, an energy utility, a food distribution center, and a consultancy firm.

After opening the link to the online questionnaire, signing the informed consent form, and filling out some socio-demographic and work-related items, participants responded to items regarding their office paper use (e.g., "How often do you print out PDF documents?"). These items were meant to prompt participants to think about their current office printing behavior, as to make the subsequent scenario more relevant.

The questionnaire then introduced the office printing registration system. We first explained the background ("Many organizations aim to reduce their environmental impact." . . . "As an employee, you can contribute by reducing office paper consumption."). On the next screen, we explained the specific features of the intended system.

Imagine the following situation: The board of your organization has decided to start registering the printing behavior of individual employees. State-of-the art monitoring software will be installed on the organization's computer network, which is able to track and store the printing behavior of individual employees.

Next, we randomly assigned participants to different follow-up texts. In the gain and non-gain conditions, the scenario continued with explaining the financial consequences of registration of office printing behavior. We informed participants in the gain condition that registration of office printing behavior could result in *receiving* a bonus: “This information is used by the board to determine who receives a bonus. Employees who succeed in printing 20 % less than the company average receive a bonus of 150 Euros at the end of the year.” We informed participants in the non-gain condition that registration of office printing behavior could result in *foregoing* a bonus: “This information is used by the board to determine who receives a bonus. Employees who do not succeed in printing 20 % less than the company average forego a bonus of 150 Euros at the end of the year.” On the basis of framing literature (Tversky & Kahneman, 1981), we expected that by highlighting the opportunity to *forego* a bonus, participants would expect fewer benefits from the policy measure and thus would express more privacy concerns than participants who read that they could *earn* a bonus.³ In the control condition, no reference was made to a potential bonus. The scenario instead continued with “This information is used by the board to get a better view of office paper consumption.”

A pilot study suggested that participants required, on average, 25–30 seconds to read the screen that included the condition-specific information. By logging how much time passed before participants clicked to proceed to the next screen, the online questionnaire allowed us to check how much time participants took to read their scenario. As a conservative cut-off point, we reasoned that participants could not possibly have read and understood the full scenario within 10 seconds.

After reading the scenario, participants answered a battery of items that, among others, included four items that probed participants’ privacy concerns regarding the presented policy measure (“I don’t mind my printing behavior being monitored,”⁴ “This policy constitutes an unacceptable invasion of my privacy,” “Registration of office printing behavior undermines my right to privacy,” and “I think it is unacceptable that information about printing behavior is being collected”). General privacy awareness scales inspired the specific items (Smith, Milberg, & Burke, 1996). We scored all items on a 7-point scale (1—*completely disagree* to 7—*completely agree*), and averaged. Together, the items formed an internally reliable index of privacy concerns ($\alpha = .87$, $M = 3.12$, $SD = 1.50$).

To be able to check whether our manipulation of anticipated consequences was successful, we also included three items that probed participants’ anticipated policy consequences (“This measure will have beneficial consequences for me,” “This measure results in financial benefits for me,” and “I estimate that I currently already print 20 percent less than the company average.”) Again, we scored all items on a 7-point scale (1—*completely disagree* to 7—*completely agree*), and averaged. Together, the items formed a reliable index ($\alpha = .74$, $M = 3.82$, $SD = 1.37$).

We randomized the order of the different items in the battery. Participants were thanked and debriefed after completing the questionnaire.

Results and discussion

In total, 163 employees (105 men, 58 female) from various age categories (mean age 40.0 years, $\min_{\text{age}} = 20$ years, $\max_{\text{age}} = 66$ years) completed the online questionnaire that was advertised as “a survey on office paper use.” Most participants (81.0 percent) described themselves as staff, whereas a minority (19.0 percent) described themselves as having a managerial function. Most of the participants (66.3 percent) characterized their organization as commercial, and the remaining participants characterized their organization as governmental/non-commercial (33.7 percent). There were 16 participants who spent less than 10 seconds on the screen that explained the intended policy measure. As initially planned, we discarded these participants in further analyses. Thus, we conducted our analyses on a sample of 147 employees.

³We decided to use this relatively “safe” framing manipulation of anticipated financial consequences to be realistic (organizations are not likely to impose penalties or additional costs on employees, but they may use conditional bonuses), as well as to obtain approval to run the questionnaire within an actual organizational setting.

⁴This item was reverse scored.

Table 3. Privacy concerns and anticipated benefits means for bonus and control group ($n = 147$).

	Policy consequences		<i>t</i>	<i>df</i>
	Bonus group ($n = 103$)	Control group ($n = 44$)		
Anticipated financial benefits	4.13 (1.43)	3.10 (0.88)	-5.33**	145
Privacy concerns	2.94 (1.43)	3.53 (1.61)	2.22*	145

Standard deviations appear in parentheses below the means.

*Significant at the .05 level. **Significant at the .01 level.

We used a one-way analysis of variance to test whether our manipulation of anticipated benefits was successful. Across the control, gain, and non-gain conditions, participants significantly differed in their estimation of anticipated benefits, $F(2, 146) = 11.16$, $p < .001$, $d = .55$. Tukey post hoc comparisons of the three groups suggest that both participants in the gain condition ($M = 3.92$, 95 percent CI [3.52, 4.33]) and participants in the non-gain condition ($M = 4.32$, 95 percent CI [3.93, 4.72]) anticipated more benefits from the policy measure than participants in the control condition ($M = 3.10$, 95 percent CI [2.83, 3.37], $p = .007$ and $p < .001$, respectively). It thus appears that participants read and understood the scenario correctly: participants who read that they could receive (gain condition) or forego (non-gain condition) a bonus correctly anticipated more financial benefits than participants who did not read about a potential bonus. In contrast to our reasoning, however, participants in the gain condition did not anticipate more benefits than participants the non-gain condition.⁵ Apparently, our framing manipulation did not affect anticipated benefits. We therefore decided to collapse the gain ($n = 49$) and non-gain ($n = 54$) groups into one bonus group. This allowed us to directly compare privacy concerns among participants who did ($n = 103$) and participants who did not ($n = 44$) read about a potential bonus (see Table 3 for the group means of the bonus and experimental group).

We used a between-subjects *t*-test to test for differences in privacy concerns between the bonus and control groups.⁶ As predicted, we found that participants who learned that monitoring of their office printing behavior use could result in a potential bonus ($M = 2.94$, $SD = 1.43$) expressed significantly less privacy concerns than participants who did not learn about any bonus ($M = 3.54$, $SD = 1.61$), $t(73.43) = 2.12$, $p < .05$, $d = .39$. Participants thus expressed less privacy concerns about their printing behavior being monitored when they anticipated a potential bonus. As hypothesized, we found that privacy concerns are lower if implementation of an electronic monitoring technology is anticipated to result in financial benefits.

We conducted Study 3 in an organizational setting, and it focused on a monitoring technology that could actually be implemented within organizations—monitoring of office printing behavior. The empirical results provide additional support for our reasoning that privacy concerns may be steered by motivation: employees who were informed that electronic monitoring of conservation behaviors could result in a potential bonus were less concerned about their privacy than employees who were not informed on the presence of a bonus. These results thus converge with those of Studies 1 and 2, suggesting that employee concerns about privacy are shaped by the same basic principle (viz., people are prone to engage in self-serving biases when making decisions).

⁵In fact, if anything, it seems that participants anticipated somewhat more benefits in the non-gain than in the gain condition, but this difference was not significant ($p = .27$).

⁶As the sample sizes across conditions were unequal, we report the results of a Welch's *t*-test.

General Discussion

In three studies, we examined the relationship between privacy concerns and anticipated consequences of energy conservation policies that involve electronic monitoring of individual behavior. We reasoned that potential privacy concerns among those being monitored would be colored by motivation: privacy concerns would be constructed in a self-serving fashion. We first tested the theoretical implications of our reasoning among samples of students and car owners and subsequently replicated our findings in an organizational setting.

In Study 1, we found that privacy concerns decrease as students anticipate financial benefits owing to the implementation of smart energy meters in dorm rooms. In Study 2, we found that stressing the negative instead of the positive financial consequences of an objectively equivalent electronic monitoring technology (viz., an in-car device) intensifies privacy concerns among car owners. Study 3 demonstrated the relevance of our reasoning to organizations and showed that employees were less likely to express privacy concerns when they are led to believe that electronic monitoring of their printing behavior could result in a potential bonus. Together, these studies suggest that privacy concerns depend on anticipated consequences of electronic monitoring. The results converge with literature on motivated cognition that posits that people select, process, and interpret information differently, depending on whether that information is in their personal interest.

This interpretation of privacy concerns allows for an interesting proposition: the fact that individual energy conservation behaviors are being monitored, in itself, does not necessarily raise moral concerns about privacy. In fact, reviewing the means of the different privacy items in the studies, it seems that most participants were not particularly concerned about technology that measured their individual conservation behaviors. If anything, privacy concerns seem mainly prevalent among people who anticipate that implementation of electronic monitoring will lead to negative consequences for them personally. This view thus offers a clear policy advice for organizations aiming to implement work floor energy conservation policies that rely on the electronic monitoring of individual behavior: be sure to communicate the individual benefits for employees, as this strategy may alleviate potential privacy concerns that may prevent implementation.

Future research could elaborate on these findings and, for example, explore whether privacy concerns—through the process of motivated cognition—also decrease when *collective* rather than *individual* benefits are stressed. Moreover, such research could test the boundaries of the motivated cognition perspective on privacy concerns: it is conceivable that financially driven biases in privacy concerns will be less pronounced when electronic monitoring becomes more invasive (e.g., when used to explicitly track employee availability; Zweig & Webster, 2002).

One specific risk of electronic monitoring is that employees may suspect managers to exploit energy-monitoring technology to covertly monitor employee attendance and output. Such misuse could result in negative financial consequences for employees (e.g., forfeiting a salary increase). The current research suggests such negative consequences are likely to intensify privacy concerns among employees and could consequently prevent the implementation of an otherwise effective and acceptable work floor energy conservation policy. To successfully implement energy conservation policies that require monitoring of individual behavior, organizations should therefore safeguard and communicate that such policies are exclusively used for the monitoring of conservation behaviors and are not exploited or mistaken for worker performance surveillance measures (O'Donnell, Jetten, & Ryan, 2010).

Limitations

We conducted Studies 1 and 2 within relatively small samples. Moreover, we used single items to measure privacy concerns in Studies 1 and 2. These methodological issues can potentially threaten the reliability of our findings and thereby limit the relevance of our findings to organizational settings. However, the results derived from these studies are corroborated by Study 3, in which we used a reliable multi-item privacy index within a larger sample of employees working in organizations, suggesting that the findings from our initial studies are indicative of a robust pattern.

Indeed, across three different studies, using samples from multiple countries (US students, European students and employees) and examining responses to different electronic monitoring technologies that are similar to those available to employers (viz., energy meters, in-car devices, and printing registration software), the same pattern keeps emerging: privacy concerns decrease as participants anticipate more benefits. This suggests that relationships between key variables do not depend on specific characteristics of the particular samples, monitoring technique, or specific wording of the privacy items.

Across Studies 2 and 3, we found that people express less privacy concerns when they anticipated positive rather than negative personal outcomes. Although indicative of a self-serving bias, one could also argue that this finding is due to a framing effect: the prospect of a positive outcome may make people attentive to the positive aspects in a situation, whereas a negative prospect may focus people on the negative aspects. The setup of our specific studies does not allow us to definitely disentangle which of, and to what extent, these two processes are responsible for our results. Future research using a more elaborate research design that allows the disentanglement of both effects should shed more light on this matter.

Theoretical implications

As we operationalized anticipated consequences in our studies as *financial* costs and benefits, an economist may interpret these findings as trading of personal information for benefits. Indeed, according to the economics of privacy (Posner, 1981), personal information is a commodity, and people should be willing to “sell” any information if the price is high enough. This view, however, diametrically opposes conventional views of privacy (e.g., Altman, 1977), in which privacy is seen as a sacred value (Tetlock, 2003) that is excluded from market transactions. A motivated cognition account of privacy concerns could help in understanding how people can simultaneously endorse the former *and* latter views of privacy (cf. Norberg & Horne, 2007): although some personal information may indeed be considered “priceless,” it depends on an individual’s motivation whether privacy will be considered when contemplating whether to disclose that information.

The three studies support the general reasoning that people construct privacy concerns in a self-serving manner. However, the question remains whether this process is volitional (e.g., people *expressing* more privacy concerns that they actually perceive when anticipating costs) or non-volitional (e.g., people actually *experiencing* more privacy concerns when they perceive anticipated costs). The current research design cannot discern the two possibilities but will hopefully spark future research into this question.

Conclusions

Although literature offers some potentially effective ways to use electronic monitoring to stimulate energy conservation behaviors among employees, such policies may fail to get implemented because of concerns about employee privacy. The current research sheds more light on the underlying roots of such privacy concerns and suggests that employee privacy concerns may be traced back to the lack of apparent positive personal consequences. Consequently, our research suggests that employees may become more supportive of electronic monitoring when it is utilized to introduce incentives rather than disincentives (e.g., rewards for conservation behaviors, rather than penalties for wasteful behaviors). These conclusions add to previous literature that has suggested that employee privacy concerns about monitoring practices are less pronounced when employees participated in the design and implementation of electronic monitoring technology (Alge, 2001) and when employees subscribe to the rationale of being monitored (Zweig & Webster, 2002).

Although these practices may persuade employees to consent to being monitored, it does not legitimize the careless treatment of private data. On the contrary, as already noted by Altman (1977), privacy is an inherently valuable good worth protecting. Extensive monitoring of employee behavior bears the risk of decreased employee

satisfaction (Moore, 2000; Spinello, 1995), impeded performance (Thompson et al., 2009), and loss of creativity (Alge et al., 2006). Organizations that value both sustainable development and employee well-being should therefore carefully balance the benefits of electronic monitoring with potential risks before deciding upon implementation (Bies, 1993; Culnan & Bies, 2003; Kenneth, Jordan, Tansey, & Framinan, 2000; Milberg et al., 2000). Moreover, organizations should carefully explain the rationale behind electronic monitoring of conservation behaviors, as well as the importance it assigns to conservation behaviors. Not only because it is the organization's ethical duty to inform their employees of any monitoring activity, and thus allows employees to make an informed choice (Moore, 2000), but also because this strategy is likely to generate support: employees may be less motivated to express privacy concerns when they understand and subscribe to the organizational aim of reducing its environmental footprint.

Acknowledgements

We thank the reviewers for their insightful suggestions, as well as Cobus van der Poel and Goda Perlaviciute for their comments on an earlier draft of this article. We thank Willem Spronk and E. Scott Geller for their help with collecting data.

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