

On the consequences of electronic performance monitoring in organizations: theory and evidence

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Abstract

Purpose – The potential applications of information and communication technologies in the workplace are wide-ranging and, especially since the COVID-19 pandemic, have increasingly found their way into the field of electronic performance monitoring (EPM) of employees. This study aims to examine the influence of EPM on individual performance considering the aspects of privacy invasion, organizational trust and individual stress within an organization. Thus, important insights are generated for academia as well as business.

Design/methodology/approach – A theoretical framework was developed which conceptualizes perceived EPM as independent variable and individual performance as dependent variable. Moreover, the framework conceptualizes three mediator variables (privacy invasion, organizational trust and individual stress). Based on a large-scale survey (N = 1,119), nine hypotheses were tested that were derived from the developed framework.

Findings – The results indicate that perception of EPM significantly increases privacy invasion, reduces organizational trust, increases individual stress and ultimately reduces individual performance. Moreover, it was found that privacy invasion reduces organizational trust and that this lowered trust increases individual stress. Altogether, these findings suggest that the use of EPM by employers may be associated with significant negative consequences.

Originality/value – This research enriches the literature on digital transformation, as well as human-machine interaction, by adopting a multidimensional theoretical and empirical perspective regarding EPM in the workplace context, in which the influence of EPM perceptions on individual performance is examined under the influence of different aspects (privacy invasion, organizational trust and individual stress) not currently considered in this combination in the literature.

Keywords Electronic performance monitoring, Privacy invasion, Organizational trust, Individual stress, Individual performance, Surveillance

Paper type Research paper

1. Introduction

The pressure to perform in the workplace is omnipresent (Mitchell *et al.*, 2019) and increases even more when a person is immersed in a range of technologies that are seen as complex and cause



employees to be stressed (Ayyagari, Grover, & Purvis, 2011; Tarafdar *et al.*, 2010). The use of diverse applications and the increasing adoption of information and communications technologies (ICTs) in the workplace have changed working behavior (Hu *et al.*, 2021). For instance, Meyer *et al.* (2017) studied ICT usage patterns among “heavy users” and found that the study participants collectively used over 331 different applications over a period of 11 working days. Even though the use of ICT can bring many benefits (e.g. increased access to information, as well as enhanced performance and productivity; Brynjolfsson, 1996; Brynjolfsson and Hitt, 2000; Keeney, 1999), it may also have negative consequences, a fact which has been aggravated since the COVID-19 pandemic (Kalischko & Riedl, 2021). The workplace has undergone a significant transformation that results from increased ICT usage in organizational, social, and individual contexts. Organizations’ responses to this phenomenon of digital transformation have become perennial discussion topics (Gong and Ribiere, 2021).

The current state of research on digital transformation can be described as fragmented, spanning different approaches and views. This fact is illustrated by recent reviews, which have viewed digital transformation research from procedural (Vial, 2019), innovation and entrepreneurship (Nadkarni and Prügl, 2021), multidisciplinary (Verhoef *et al.*, 2021) and organizational change (Hanelt, Bohnsack, Marz, & Antunes Marante, 2021) perspectives. Vial (2019) defines digital transformation as “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies” (p. 118). The implementation of organizational information systems (IS) which offer the potential for EPM (e.g. enterprise resource planning systems, process mining tools or more specific monitoring software) could be viewed as an instance of digital transformation. However, it is questionable whether EPM use improves an organization, in particular, if viewed from the employees’ perspective.

Many organizations have been taking steps to transfer employees from working face-to-face to working remotely, and teleworking that depends largely on electronic communication is becoming the “new normal”, particularly as a consequence of the COVID-19 pandemic (Hu *et al.*, 2021; Society of Human Resource Management, 2021). This change has given the surveillance industry a new lease on life (BBC, 2020; Businessinsider, 2020; MIT Technology Review, 2020). The Guardian (2018) reported that EPM has become a significant privacy issue in companies. Similar reports can be found in other magazine and newspaper reports (New York Times, 2021, 2018; Süddeutsche Zeitung, 2019). Such surveillance scenarios, which were already described by Spiekermann (2015) and other authors several years ago, are now increasingly finding their way into our everyday working lives and are therefore becoming increasingly relevant for research (Ball, 2021; Kalischko and Riedl, 2020, 2021, 2022; Ravid, Tomczak, White, & Behrend, 2020). The core focus of such systems is to monitor operational performance, with the ultimate goal to improve work performance.

However, EPM can be reacted to in a variety of ways by employees. They can, for example, accept the surveillance implementation and gradually lose their privacy, or they might resist and risk making themselves unpopular with the employer. Some employees express displeasure due to the use of workplace surveillance, leave the organization or engage in reverse surveillance (Watkins Allen *et al.*, 2007). Studies already exist on the effect of EPM on individual performance. However, research shows a mixed picture (Aiello & Douthitt, 2001; Aiello and Svec, 1993; Bartels & Nordstrom, 2012; Becker and Marique, 2014; Davidson and Henderson, 2000; Goomas and Ludwig, 2009; Huston *et al.*, 1993; Irving *et al.*, 1986; Mallo *et al.*, 2007; Stanton and Sarkar-Barney, 2003).

Although the use of technology to monitor employees experienced an upsurge as early as the 1980s (e.g. Irving *et al.*, 1986) and is, therefore, a phenomenon that has been around for approximately four decades, the consequences of EPM on work itself, including employee perceptions and reactions, have not yet been systematically explored in detail and hence significant research potential exists (Ravid, White, Tomczak, Miles, & Behrend, 2022). Because the existing EPM literature is predominantly based on rather outdated technologies (e.g. cameras in working

environments), and considering the fact that employee and user behavior have significantly changed during the past decade (e.g. more and more people track their own physiological parameters such as heart rate and behaviors such as steps per day or sleeping behavior), it is not surprising that recent articles made explicit calls for new studies on the consequences of EPM (Ball, 2021; Kalischko & Riedl, 2021; Ravid *et al.*, 2020). As a direct response to these calls, in the present study, we develop a theoretical framework that uses perceived EPM as an independent variable and individual performance as a dependent variable. Moreover, the framework conceptualizes three different mediator variables: privacy invasion, organizational trust and individual stress. Based on a large-scale survey study in three German-speaking countries (Germany, Austria and Switzerland; N = 1,119), we tested nine hypotheses that we derived from our framework.

We are thus interested in exploring the assumption that perceived EPM affects individual employee performance and that performance is also influenced by perceived privacy invasion, organizational trust and individual stress, which in turn are influenced by perceived EPM. Against this background, the current paper addresses the following research questions: *Does perceived electronic performance monitoring influence self-reported individual employee performance? If so, is this relationship mediated by an employee's perceptions of privacy invasion, organizational trust and individual stress?*

The rest of this article is structured as follows: In Section 2, we present the theoretical background and develop a framework and the corresponding hypotheses. Then, in Section 3, we present the methodology. This is followed by a presentation of the results and the discussion in Section 4. Finally, we outline limitations, as well as possible avenues for future studies, and provide concluding comments in Section 5.

2. Theoretical background and hypothesis development

In this chapter, we review the related work that forms the basis for our theoretical framework. Specifically, individual theories were examined for five constructs (individual performance, privacy invasion, organizational trust, individual stress and perceived EPM) and substantiated with empirical results from the EPM literature in order to generate theoretically informed and—where possible—empirically grounded hypotheses. Importantly, we selected the above-mentioned five constructs as they have been identified recently as major phenomena in the workplace surveillance and electronic monitoring settings (Ball, 2021; Kalischko & Riedl, 2021; Ravid *et al.*, 2020). Moreover, our dependent measure (individual performance), as well as the three mediators (privacy invasion, organizational trust and individual stress), are major constructs in IS research and beyond, as signified by meta-research analyzing IS publications' research topics (e.g. Sidorova *et al.*, 2008; Steininger *et al.*, 2009) and by seminal research papers in IS and related disciplines (e.g. Spiekermann and Cranor (2009) for privacy, Mayer *et al.* (1995) for organizational trust and Ayyagari *et al.* (2011) for (techno)stress).

2.1 Defining and conceptualizing EPM

To develop a common understanding of the term *electronic performance monitoring*, definitions of the three most frequently cited articles in this field are given below (Table 1). These definitions are complemented by a seminal definition by the US Congress back in 1987.

Analysis of these definitions indicates that they consider different aspects of EPM. Using the definition of the US Congress as a basis, the definition of Aiello and Kolb (1995) emphasizes the possibility to monitor employees at any time during the working day. Stanton (2000) also focuses on continuous monitoring but also refers to the large amount of data it generates. Moreover, Holman *et al.* (2002) stress automatic monitoring and the collection of quantitative data. Despite the fact that the definitions consider different aspects, if considered collectively they provide a consistent overall picture of the possibilities of EPM. Monitoring has always been a practiced method to ensure the economic efficiency of a company; however,

Table 1.
Overview of main
definitions for EPM of
the Literature

Source	Definitions of “Electronic performance monitoring”
US Congress, Office of Technology Assessment (1987, p. 27) Aiello and Kolb (1995)	“... computerized collection, storage, analysis, and reporting of information about employees’ productive activities.” “Using network technology, EPM systems provide managers with access to their employees’ computer terminals and telephones, allowing managers to determine at any moment throughout the day the pace at which employees are working, their degree of accuracy, log-in and log-off times, and even the amount of time spent on bathroom breaks.”
Stanton (2000)	“EPM can occur continuously and can record voluminous data about multiple dimensions of work performance.”
Holman, Chissick, and Totterdell (2002)	“Electronic performance monitoring involves the automatic and remote collection of quantitative data (e.g. key strokes, call times). It also permits the continuous monitoring of performance.”

Source(s): Tables created by authors

the most important distinction from traditional monitoring is the electronic component. A major distinction is also made between different monitoring levels (Edwards, Martin, & Henderson, 2018).

The technological evolution of employee surveillance through time is summarized by Edwards *et al.* (2018) in a recent publication. In essence, they introduce three distinct levels of surveillance: Surveillance 1.0 refers to extensive analog monitoring, Surveillance 2.0 records keyboard inputs, application usage and mouse clicks, while Surveillance 3.0 tracks emails and website activity, giving access to information on “personal relationships, thoughts, opinions, preferences, and interactions” (p. 5). It has recently become possible to conduct “real-time, ubiquitous and unobtrusive surveillance of employees [...] by small cheap sensor technology capable of being embedded within the working environment,” (p. 6) also known as Surveillance 4.0, thanks to ubiquitous computing and the Internet of Things (IoT). Currently, EPM is focusing on Surveillance 5.0. The age of algorithms is becoming more and more prevalent, in which “data analytics algorithms are designed to generally spot patterns in large amounts of data, enabling categorization and profiling [...] enabling] automated or assisted decision making about hiring, firing, and internal promotion or disciplining” (Edwards *et al.* p. 6). The technological foundation for this most advanced kind of monitoring is made up of machine learning algorithms, big data and artificial intelligence (Kalischko & Riedl, 2021; Wenzel and Van Quaquebeke, 2018). Numerous EPM techniques are already in use, including video monitoring using CCTV (Kalischko & Riedl, 2021; Sarpong and Rees, 2014), the webcam of laptops (Claypoole and Szalma, 2019), location and movement tracking such as digital camera surveillance or location tracking (Ball, 2021), call monitoring (as it is common in call centers) (Bhave, 2014), tracking computer content and usage times, GPS tracking (Jeske and Santuzzi, 2015), biometric monitoring such as smartwatches (Ball, 2021; Kalischko & Riedl, 2021), emotion monitoring (Ball, 2021), electronic time clock systems, e-mail as well as Internet usage monitoring (Ravid *et al.*, 2020). However, the future of work monitoring may lie in techniques like microchip wrist implants (Kalischko & Riedl, 2021; New York Times, 2017; Ravid *et al.*, 2020) and body heat sensor desk hardware (Ravid *et al.*, 2020). All these EPM techniques can be used to exploit vast amounts of data about employees.

EMP differs significantly from traditional monitoring without ICT use. In the traditional setting, data is gathered via human observation. Specifically, supervisors usually keep an eye out for particular behaviors in various work settings (Ravid *et al.*, 2020). However, monitoring possibilities are limited by supervisor attention and perception. In contrast, in the EPM setting, employees can be monitored continuously and without their notice (Ajunwa, 2017). Thus, two

main differences to traditional, non-electronic monitoring are the frequency and level of detail, as a manager's observational resources are limited and those of an EPM system seem inexhaustible (Ravid *et al.*, 2020). Moreover, the electronic storage of monitoring data seems to be unlimited, while the storage in human (supervisor) memory is not (Ravid *et al.*, 2020).

According to a typology of EPM put forward by Ravid *et al.* (2020), the monitoring traits of purpose, invasiveness, synchronicity and transparency interact to influence individual-level work outcomes. The typology developed by Ravid *et al.* (2020) offers a conceptual framework and a vocabulary for discussing and researching EPM characteristics.

Purpose refers to the function or justification for EPM use (Ravid *et al.*, 2020). Different monitoring objectives convey various organizational values, affecting reactions to electronic surveillance (Jeske & Kapasi, 2017; Wells *et al.*, 2007). For instance, if employees are only monitored to quantify the work they perform, this may impair the quality of their work (Stanton and Julian, 2002). However, when used more constructively, performance evaluations can increase organizational commitment, motivation, work satisfaction and feelings of procedural fairness (Bartels & Nordstrom, 2012; Fairness and Wells, 2003; Wells *et al.*, 2007). Also, it has been argued that when EPM is utilized in training and development, it may give learners insightful feedback so they can grow (Holman *et al.*, 2002). When EPM is employed to guarantee safety, it can reassure staff members that they are protected in risky situations (Sewell *et al.*, 2012). However, monitoring can also lead to significant negative attitudes, such as perceptions of diminished fairness and justice (McNall and Roch, 2007), decreased satisfaction, increased stress and negative effects on performance when employees do not know the explicit purpose of EPM use (Ball, 2021; Becker and Marique, 2014).

Invasiveness describes how intrusive and restricting EPM use is, particularly, when it comes to a person's feeling of privacy or autonomy (Ravid *et al.*, 2020). Individualized monitoring is often seen as a privacy breach (Zweig and Webster, 2003). Monitoring that is task-focused is more acceptable than monitoring that is person- or location-focused (Jeske and Santuzzi, 2015). When employees have control over how information is utilized, monitoring is seen as fairer and less invasive (Alge, 2001). When employees can influence when monitoring occurs, they also view it as fairer and less invasive. Evidence also indicates that giving workers the option to turn off monitoring can improve performance (Ball, 2021; McNall and Stanton, 2011).

EPM's temporal properties, including the synchronicity of feedback transmission and data gathering, are characterized by synchronicity (Ravid *et al.*, 2020). Employees can be monitored continuously or at specific times. Interestingly, continuous monitoring may be preferred to monitoring at certain times (if employees are not informed about the specific times) because such a situation, ironically, comes along with a higher level of perceived control (Jeske and Santuzzi, 2015). However, research has also shown that some people prefer monitoring at certain times (Aiello & Kolb, 1995; Lund, 1992). Differences in research findings have been attributed to the studies' monitoring designs and variations in cultural expectations regarding job monitoring (Ball, 2021).

Transparency refers to the level of access to monitoring information (Ravid *et al.*, 2020). Transparency of monitoring is positively related to perceived fairness and justice (Hovorka-Mead *et al.*, 2002). Transparency of EPM also has a positive impact on performance (McNall and Roch, 2009). Higher levels of informational fairness and managerial trust follow from more openness and transparency, reducing employee turnover. Importantly, evidence indicates that low transparency is likely to give the impression that monitoring is dictatorial and without a purpose (Alder *et al.*, 2006).

2.2 Individual performance

When analyzing reviews of EPM in the workplace of the last few years, a variety of potential outcomes emerge (Ball, 2021; Kalischko & Riedl, 2021; Ravid *et al.*, 2020). Although the term

EPM no longer exclusively refers to performance aspects, but also to behavior (Business Insider, 2020; Financial Times, 2021; Montealegre and Cascio, 2017), emotions (Ravid *et al.*, 2020; The Guardian, 2018), as well as physiological states (Ball, 2021), the primary reason for companies to introduce such a system is to ensure and improve the productivity and performance of the organization (derStandard, 2021; Fortune, 2021; New York Times, 2021; Washington Post, 2021). Since there are currently no conclusive results regarding the performance effect of EPM use, a more detailed investigation of this construct is of high importance (Ravid *et al.*, 2022).

Considering Zajonc's social facilitation theory (Zajonc, 1965), the fear of being judged by others and the resulting desire to present oneself in a certain way to others is critical in human social interaction. As an explanation for the impacts of social facilitation, numerous ideas have been developed. Drive theories, social comparison theories and cognitive process theories are the three groups into which social facilitation theory can be divided (Guerin, 1993). These categories are useful for evaluating particular social presence responses that mediate performance effects. The first type of reaction is heightened arousal or drive. According to Zajonc (1965, 1980), individuals' drive or arousal levels rise in the (mere) presence of others, and it is this rise that either improves or degrades performance of simple tasks. The second group includes worries about being judged by others. People may start to worry about how they appear or perform in comparison to others when they are around other people. These worries include the fear of being judged by others (Cottrell, 1972), the desire to appear a specific way to others (Baumeister, 1982; Bond, 1982) or the need to perform at a level that has been set by society (Aiello & Douthitt, 2001; Carver and Scheier, 1981). The third category comprises a change in cognitive processing speed caused by other people's distraction (Baron, 1986). In essence, humans typically seek to adapt their own performance to a socially recognized standard (Aiello & Douthitt, 2001; Baumeister, 1982; Bond, 1982; Carver and Scheier, 1982; Cottrell, 1972) and research indicates that the presence of others can increase task performance, especially if the tasks are simple (Zajonc, 1965). What follows is that perceived monitoring through a passive observer (e.g. supervisor) may have—at least in some situations—a positive and direct performance effect.

Positive (Davidson and Henderson, 2000; Huston *et al.*, 1993; Irving *et al.*, 1986; Nebeker, Tatum, Nelbeker, & Tatum, 1993) as well as negative effects (Becker and Marique, 2014; Mallo *et al.*, 2007; Smith *et al.*, 1992) and also no effects (Griffith, 1993; Kolb and Aiello, 1996) characterize the literature. However, most positive employee performance effects through EPM are either based on laboratory studies (predominantly with student samples) or were found in the specific context of call center employees (e.g. Bhawe, 2014; Stanton & Julian, 2002). Moreover, it is of utmost importance that the type of work may significantly affect the influence of EPM on individual performance. Research (Goomas and Ludwig, 2009) shows that when people perform physically demanding work and are observed by another person, then performance typically increases—this phenomenon constitutes a major foundation of social facilitation theory, which was published several decades ago when computer work did not play a role (Zajonc, 1965). However, whether this finding generalizes to the context of knowledge workers who predominantly perform their work based on computer technology in mentally complex and psychologically demanding, yet in relatively physically undemanding environments, is not clear today.

Based on self-determination theory (Ryan & Deci, 2000), we argue that an employee's perception of being electronically monitored may even have negative effects on individual performance. Self-determination theory (SDT) is an approach to human motivation that emphasizes the importance of humans' evolved inner resources for personality development and behavioral self-regulation (Ryan *et al.*, 1997). According to Ryan and Deci (2000), SDT's "arena is the investigation of people's inherent growth tendencies and innate psychological needs that are the basis for their self-motivation and personality integration, as well as for

the conditions that foster those positive processes” (p. 68). People are more likely to perform better, learn better and be more appropriately adjusted when they recognize the value and purpose of their work, feel ownership and autonomy in carrying it out and receive clear feedback and support. The extrinsic focus that results from controlling motivation, whether through contingent rewards or power dynamics, can, however, limit the range of employees’ efforts and have detrimental knock-on effects on subsequent performance and engagement at work (Deci, Olafsen, & Ryan, 2017). Importantly, a non-controlling positive feedback culture positively affects self-motivation and individual performance (Deci, Connell, & Ryan, 1989). However, because an organization with an EPM system in use is quite the opposite of a non-controlling positive feedback culture, we hypothesize as follows.

H1. EPM is negatively correlated with individual performance.

2.3 Privacy invasion

Westin (1967) defines that privacy is “the claim of individuals, groups, or institutions to determine for themselves when, how and to what extent information about them is communicated to others” (p. 7). The term “privacy invasion” refers to a breach of one’s privacy. The communication privacy management theory (CPMT) (Petronio, 2015) constitutes an advancement of an earlier theory called communication boundary management theory (Petronio, 1991). CPMT can be applied to a wide range of personal communication issues. It explains how people communicate when they seek to control or safeguard private information using principles and practices. CPMT can also be used to explain and test privacy responses (Petronio, 2013), and its usefulness has already been demonstrated with respect to surveillance in the workplace (Stanton and Stam, 2003; Watkins Allen *et al.*, 2007). However, the human desire for social contact and interpersonal interactions contrasts with the demand for seclusion. As a result, how judgments about one’s privacy are made is influenced by this duality (Margulis, 2011; Petronio, 2015; Petronio and Durham, 2008).

First, according to CPMT, privacy behavior aims to achieve two opposing goals at the same time. On the one hand, in the context of the present study, employees desire to maintain control over privacy and over their personal information. However, on the other hand, they desire to be sociable and hence must provide sensitive information in order to connect interpersonally and establish a trustworthy connection with co-workers and with their organization. Thus, as a consequence of social interaction employees lose some control over their sensitive information. How privacy decisions are made is shaped by the tension between being open to others and maintaining one’s autonomy. *Second*, CPMT requires that employees follow a set of rules that define how and with whom information is shared. These rules may change over time and in different scenarios (Petronio, 2015, 1991; Siegel *et al.*, 2021). According to CPMT, the intrusiveness of a monitoring system is determined by the limits that employees allocate to particular information and the privacy norms that employees will follow (Siegel *et al.*, 2021). If EPM is used in a company, then it can lead to a violation of individual privacy, as the self-established rules regarding privacy can be violated. In home office settings, where private IT infrastructure is routinely used, privacy invasion has also become a ubiquitous phenomenon. As a result, this subject has been addressed in recent EPM research (e.g. Kalischko & Riedl, 2021; Ravid *et al.*, 2020) and in practice reports (Ball, 2021). Stanton and Stam’s (2003) work was among the first to incorporate CPMT into the workplace. They conceptualized employee data as a significant organizational resource that may be accessed through a variety of technologies. In line with evidence on EPM in organizations (Alge, 2001; McNall and Roch, 2007; McNall and Stanton, 2011; Yost *et al.*, 2019; Zweig and Webster, 2002), and the main argumentation line of CPMT (namely, individuals have ownership rights over their private information and establish privacy boundaries to control the disclosure of that information), EPM potentially encroaches upon employees’ privacy

boundaries (Petronio, 2013; 1991; Petronio and Durham, 2008). Importantly, EPM can be perceived as a privacy invasion because it violates individuals' expectations of privacy and disrupts their established privacy boundaries. The monitoring of electronic activities, such as emails, internet usage or computer screen captures, may make employees feel uncomfortable, exposed or lacking control over their personal information. Therefore, we propose that EPM in the workplace may increase the effect on employees' perception of privacy invasion.

H2a. EPM is positively correlated with privacy invasion.

In CPMT, boundary turbulence frequently leads to negative and unpleasant attitudes about sharing information. Not being able to trust is one of the unpleasant sensations (Chang *et al.*, 2015). Boundary management requires trust since the more permeable one's privacy boundaries are, the more vulnerable one becomes. Furthermore, one must trust a colleague or a supervisor not to violate the agreed-upon privacy standards (Petronio, 2015; Petronio and Durham, 2008; Snyder, 2010). In terms of CPMT and its boundary ownership and turbulence, a negative impact on trust in the organization that occurs due to privacy invasion is reported (Watkins *et al.*, 2007; Snyder, 2010). In a trustworthy relationship, employees are more likely to match their beliefs and expectations with the organization's goals, and trust decreases conflict and enhances collaboration (Anderson and Narus, 1990). Studies have already shown that employees are quite willing to disclose private information if they trust the recipient of the information. According to research in the public sector, methods that collected personal information that was deemed unnecessary and had a less obvious connection to work performance raised more privacy concerns among employees (Charbonneau & Doberstein, 2020). Employees perceived organizational monitoring procedures to be less fair when it came to the surveillance of online communications due to a priori privacy concerns. The trust that the staff had in the company was lower (Chory *et al.*, 2016). However, perceived privacy invasion can damage trust in the organization. Therefore, based on CPMT and the existing evidence reported in the literature, we formulate the following hypothesis.

H2b. Privacy invasion is negatively correlated with organizational trust.

Organizations require information on the skills and performance of their workers throughout the employment relationship. Organizations should arguably also have knowledge of the integrity of their staff members and put in place controls to prevent unproductive, unethical and/or unlawful work conduct (Bhave *et al.*, 2020). Employees choose whether to share (border openness) or keep (boundary closure) performance and non-performance information based on the perceived costs and advantages of sharing, their connection with the organization and the planned applications of the data (Stanton and Stam, 2003; Watkins Allen *et al.*, 2007). Privacy invasion can lead to boundary turbulence, which, according to CPMT, can have consequences in the organizational environment. In essence, privacy invasion negatively affects the organization (Petronio, 2015). The link between privacy invasion and its impact on performance has been described as marginal in the literature (Pedersen, 1997; Westin, 1967), but these are older studies in which digital technologies did not at that time define everyday work. Newer work has shown that there can be a significant reduction in employee performance due to technologically driven invasion of privacy (Tarafdar *et al.*, 2010). Smith and Brunner conducted a study in which participants thought about how sharing personal information can affect how they are viewed at work. Some participants believed that disclosing personal information at work would have a negative impact on how their performance is perceived because others might attribute their performance at work to information they knew about their personal lives (e.g. difficulties with their families or financial issues). However, other participants believed that sharing information may improve other people's perceptions of their performance. These participants stressed the significance of communicating health-related information to coworkers and

supervisors on a need-to-know basis that may have an impact on how other people perceive their performance (Smith & Brunner, 2017). Against the background of the presented arguments and evidence, and in line with the arguments of CPMT (namely that the invasion of privacy caused by EPM can lead to boundary turbulence and that employees may experience conflicts, discomfort or tension as a result of their privacy expectations being violated), they may perceive monitoring as intrusive, leading to a sense of mistrust or resentment toward the organization. The intrusion of privacy can have a negative impact on individual performance. When employees feel that their privacy is invaded, it can lead to decreased productivity, lower quality of work and decreased overall performance (Petronio, 2015, 2013, 1991; Petronio and Durham, 2008; Tarafdar *et al.*, 2010). Therefore, we hypothesize that.

H2c. Privacy invasion is negatively correlated with individual performance.

EPM can potentially influence individual performance through the mediating variable of privacy invasion, as per CPMT. Petronio's CPMT (2002) posits that individuals believe they own their personal information and have the right to control its dissemination. In the context of EPM, the monitoring process can be perceived as an invasion of privacy, as it involves the organization accessing information about the employee's performance (e.g. based on data regarding emails answered per day, which does not even imply that an employer has access to the specific content of the email messages). This perceived invasion of privacy can impact individual performance. If employees feel their privacy is being violated, it can lead to discomfort and stress, subsequently leading to a decline in performance. Conversely, if the organization effectively communicates the reasons for EPM and manages the privacy concerns, it can mitigate the perception of privacy invasion and potentially enhance individual performance (Aiello & Kolb, 1995; Alder, 2001; Douthitt and Aiello, 2001; Petronio, 2013; 2002; 1991; Petronio and Durham, 2008; Smith *et al.*, 2011; Stanton, 2000). Therefore, privacy invasion can act as a mediator between EPM and individual performance, as explained by the CPMT and related empirical evidence.

2.4 Organizational trust

The Oxford English Dictionary defines trust as, "firm belief in the reliability, truth, or ability of someone or something;" this definition is in agreement with important scholarly work (e.g. Rousseau *et al.*, 1998). Employees in companies should be able to trust one another, their superiors, and the organization as a whole (Mayer *et al.*, 1995). Electronic monitoring and its settings serve as a proxy for management's trust in staff. A high level of EPM is associated with an employee's perception that the employer, or superior, does not trust them (Ball, 2021).

To examine the impact of trust on performance, we use social exchange theory (SET). Within the last 60 years, SET has continued to evolve and prove itself in disciplines such as social psychology (e.g. Homans, 1958; Thibaut and Kelley, 1959), sociology (e.g. Blau, 1964) or anthropology (e.g. Firth, 1978; Sahllins and Graeber, 2017). Social exchange consists of a sequence of contacts that produce responsibilities (Cropanzano & Mitchell, 2005). These relationships are typically viewed as interdependent and contingent on the actions of another person. It underlines that such interdependent transactions also have the potential to produce high-quality relationships; however, this will only happen in particular conditions (Blau, 1964; Cropanzano & Mitchell, 2005). Relationships that mature through time become trusted, loyal and reciprocal commitments, according to one of the fundamental pillars of SET. To do so, parties must follow particular rules. Exchange rules provide a normative characterization of the situation that develops among or is embraced by participants in an exchange relationship. In this sense, exchange rules and norms serve as guides for exchange processes. Thus, the usage of SET in organizational behavior models is framed by the exchange rule.

The majority of management research focuses on reciprocity expectations (Cropanzano & Mitchell, 2005; Emerson, 1976). Within current management research, the concept of workplace relationships has received by far the greatest study attention (Ball, 2021). According to SET, some workplace antecedents lead to interpersonal interactions, also known as social exchange relationships. When companies take care of their employees, social exchange relationships develop, which have a positive impact on organizational trust. However, the reverse can lead to a situation where trust suffers if the criteria are neglected (Cropanzano & Mitchell, 2005). CPMT asserts that border turbulence can swiftly erode the trust that has developed through time between individuals. As a result, boundary turbulence in the form of a privacy violation is thought to have a detrimental influence on employee-employer trust (Chang *et al.*, 2015; Petronio, 2002; 1991) and may entail a lower level of trust in the information co-owner who has violated the privacy rules (Petronio *et al.*, 1998). When organizational employee monitoring goes beyond the employees' expectations, they become distrustful of the organization. In relation to workplace surveillance this can lead to a distrustful relationship between employees and the organization (Chang *et al.*, 2015; Petronio, 2002; 1991). Employees' attitudes about EPM are more favorable when they have higher organizational trust (Workman, 2009). According to Alge *et al.* (2004), a lack of trust in employees leads to higher EPM use. Employees organizational trust may be harmed by the usage of EPM (Holland, Cooper, & Hecker, 2015; Jensen and Raver, 2012; Stanton and Sarkar-Barney, 2003). Blau's SET (1964) suggests that perceived benefits must outweigh the perceived costs for a relationship to be considered valuable. In the workplace context, EPM can be construed as a cost by employees, as it may be perceived as an invasion of privacy or a manifestation of organizational distrust. If employees perceive the costs associated with EPM, such as loss of privacy or autonomy, to outweigh the benefits, such as improved decision-making on the supervisor (management) level, it can lead to a decrease in organizational trust. This perception could engender a belief that the organization does not trust them to perform their tasks appropriately without constant surveillance, which can undermine the social exchange relationship and decrease overall trust (Blau, 1964; Cropanzano & Mitchell, 2005). Moreover, Petronio's CPMT (2002) suggests that individuals believe they own their personal information and have the right to control its dissemination. EPM can be interpreted as a violation of this privacy, as it involves the organization accessing information about the employee's performance. If not properly managed, this can lead to a decrease in trust, as employees may feel that the organization is not respecting their privacy, particularly if the organization does not effectively communicate the reasons for the EPM and how the data will be used (Petronio, 2013; 2002, 1991; Petronio and Durham, 2008). Here, it is critical to emphasize that trust implies reliance on the integrity of a person or organization and the risk of betrayal (e.g. misuse of private information) (e.g. Riedl & Javor, 2012). Therefore, we hypothesize.

H3a. EPM is negatively correlated with organizational trust.

Unauthorized third-party access to personal data in corporate electronic systems jeopardizes trust relationships in the workplace. Importantly, job stress can be caused by an imbalance between an individual's subjective views and expectations of the workplace and the actual reality of the workplace (Guinot *et al.*, 2014). In the context of EPM distrust is an issue (e.g. Holland *et al.*, 2015; Jensen and Raver, 2012). Distrust is the belief that others will not behave in one's best interests (Govier, 1994), and that some people will not act in a responsible manner (Barber, 1983). According to Lau and Tan (2006), it is expected that if commitment levels rise and relationships are cordial, there will be less stress, anxiety and tension at work. Contrarily, feelings of unease, uncertainty and worry result from distrust (Carlson and Perrewé, 1999; Gambetta, 1988; Govier, 1994). Additionally, supervisors' careless actions greatly contribute to the strain that employees experience at work (Buck, 1972; Govier, 1994;

McLean, 1979). The fact that trust can reduce the individual stress level (Guinot *et al.*, 2014) has already been shown in other disciplines and is also assumed in the context of this study. No study could be identified in the EPM literature that examined the relationship between trust and stress. However, in the context of general organization research, evidence indicates that trust is negatively related to stress in organizations (Costa, Roe, & Taillieu, 2001; Guinot *et al.*, 2014). Against this background, we hypothesize.

H3b. Organizational trust is negatively correlated with individual stress.

One focus of this study is on the work setting and how SET interprets it in terms of EPM, trust, and the resulting job performance. When we conceptualize social exchange relationships, we refer to the interaction between two parties. The common assumption is that employees may develop distinct social exchange relationships with their direct supervisor (Liden, Sparrowe, & Wayne, 1997). Relationships of this type have an impact on behavior. It is likely that people return good will and helpfulness if they receive a favor (Cropanzano & Mitchell, 2005). This means that employees may sense a responsibility to reciprocate with improved performance and more positive attitudes, including trust, if they receive fair treatment from their supervisors, according to exchange theory (Whitener, 1997). Trust was identified as an outcome of positive social exchange within the SET literature (Blau, 1964; Holmes, 1981) and was thus manifested as an important factor in understanding exchanges within an organization. It was found that trust in the supervisor acted as a mediator in the relationship between interactional justice and job performance (Aryee, Budhwar, & Chen, 2002). Following the SET and Blau's (1964) derivations, namely, that the perception of unfairness can erode trust in the organization and negatively impact their performance and that employees may become less willing to share information, collaborate with colleagues or engage in discretionary effort, further impairing individual performance, it can be argued that trust also plays an important role in the EPM context when it comes to job performance. According to the exchange theory and existing empirical studies, we formulate the following hypothesis.

H3c. Organizational trust is positively correlated with individual performance.

EPM can potentially influence individual performance through the mediating variable of organizational trust, a concept that can be substantiated using CPMT (Petronio, 2013; 2002, 1991; Petronio and Durham, 2008) and SET (Blau, 1964). Petronio's CPMT (2002) posits that individuals believe they own their personal information and have the right to control its dissemination. In the context of EPM, the monitoring process can be perceived as an invasion of privacy, which can impact organizational trust. If employees feel their privacy is being violated, it can lead to decreased trust in the organization, which can subsequently lead to a decline in performance. Simultaneously, Blau's SET (1964) suggests that relationships are predicated on an exchange process. If employees perceive the organization's use of EPM as a sign of distrust, it can negatively impact the social exchange relationship and decrease overall trust and performance. Therefore, organizational trust can act as a mediator between EPM and individual performance, as explained by the CPM- and SE-theories.

2.5 Individual stress

In general, humans must deal with an almost infinite number of stressors, both physical (e.g. noise, lack of sleep or low blood sugar) and psychological (e.g. public speaking, social rejection and human-computer interaction). Both types of stressors have been found to significantly activate biological stress systems in humans (Lazarus & Folkman, 1984; Riedl, 2013). The sensation of personal dysfunction that an employee goes through as a result of conditions or events they perceive to be happening at work is known as job stress (Guinot

et al., 2014). Specifically, job stress is defined as the psychological and physiological response brought on by an environment at work where the employee feels unwelcome, unimportant, endangered or overloaded (Chen *et al.*, 2006; Guinot *et al.*, 2014; Montgomery, Blodgett, & Barnes, 1996). Major causes of work stress, also referred to as work stressors, are job demands, decision latitude, a lack of workplace support, bad working relationships and changes to the job and the organization (Rothmann and Cooper, 2015). The interpersonal or psychosocial aspects of the workplace environment are among the factors in a job that might cause significant stress for an employee. Negative interpersonal interactions can also be detrimental to a worker's mental health (Weinberg *et al.*, 2010). EPM is conceptualized as a psychological stressor in the present study. Crucially, according to social facilitation theory (SFT), stress can potentially arise as a result of monitoring. Within the framework of SFT, stress can be considered a possible byproduct of monitoring. The awareness of being observed or evaluated, the pressure of performance expectations and the invasion of personal privacy boundaries can contribute to increased stress levels (Zajonc, 1965). This understanding helps explain why monitoring can elicit stress reactions in individuals and highlights the importance of considering the potential psychological impact of monitoring practices within organizations.

Survey evidence indicates that employees' stress increases when EPM is used (Amick & Smith, 1992). EPM can lead to increased job boredom, anxiety, anger, exhaustion, health issues and psychological strain (Smith *et al.*, 1992). Experimental evidence confirms the stress potential of EPM (Carayon, 1993; Hawk, 1994; Henderson *et al.*, 1998; Rogers *et al.*, 1990; Varca, 2006). However, some studies also report only a weak or even non-existent link between employees' stress levels and EPM (Bartels & Nordstrom, 2012; Galletta and Grant, 1995; Huston *et al.*, 1993; Nebeker *et al.*, 1993). Academics indicated that more research is needed in this area since non-significant research findings may be attributable to laboratory conditions (Galletta and Grant, 1995; Huston *et al.*, 1993) or sample characteristics, such as the use of students as subjects (Bartels & Nordstrom, 2012). Considering these calls for more research on the stress consequences of EPM, as well as the presented arguments, we formulate the following hypothesis.

H4a. EPM is positively correlated with individual stress.

As recently summarized by Chen, Wang, Li, and Liu (2022), burnout – which manifests as fatigue and frustration (Mansour and Tremblay, 2018) – may be caused by employee work stress (Barello *et al.*, 2020; Choi *et al.*, 2019). Work stress is also linked to a number of negative reactions, including job dissatisfaction, low organizational commitment and a high propensity to resign (Lu and Gursoy, 2016; Uchmanowicz *et al.*, 2020). In the end, it also has a detrimental effect on staff performance (Prasad and Vaidya, 2020). Despite the fact that recent studies have shown a connection between workplace stress and employee performance (Saleem *et al.*, 2021; Song *et al.*, 2020; Yu *et al.*, 2022), there are still certain shortcomings that need to be fixed. From a psychological standpoint, job stress impacts employees' mental states, which in turn affects how much effort they put into work (Lai *et al.*, 2018; Richardson and Rothstein, 2008). Workplace stress has a significant influence on employee performance since it is the product of the individual's efforts at work (Robbins *et al.*, 2018). However, prior studies have not consistently come to a conclusion about the link between employee work-related stress and performance. According to one theory, there is a considerable positive association between workplace stress and employee performance (Ismail *et al.*, 2015; Soomro *et al.*, 2019), indicating that stress can motivate workers to put in extra effort, thereby increasing their productivity. In contrast, another theoretical perspective indicates that work-related stress impairs employee performance (Chen *et al.*, 2022; Yunus *et al.*, 2018) because employees must manage their stress, thereby increasing their workload and reducing their productivity (Chen *et al.*, 2022). SFT explains that subjects perform better

on simple tasks in the mere presence of fellow subjects and that when executing complex tasks, this facilitation reverses and the individual's performance declines. Importantly, SFT also describes that stress is a possible byproduct of monitoring (Zajonc, 1965). Conventional monitoring procedures entail direct observation of employee performance by a supervisor who must be present physically to undertake the observation. The employee can typically determine when and to what extent he or she is being monitored as a result of physical presence. EPM, however, entails the supervisor observing the employee from any place. Surveillance can take place via digital technologies, and it can happen with or without the employee's awareness (Aiello & Douthitt, 2001). The physical presence of observers while performing a job is a well-known source of stress (Kushnir, 1986). Therefore, we propose the following hypothesis.

H4b. Individual stress is negatively correlated with individual performance.

EPM, therefore, can influence individual performance through the mediating variable of individual stress, a concept that can be substantiated using the SFT (Zajonc, 1965) and the Yerkes–Dodson Law (Yerkes and Dodson, 1908). The SFT posits that individuals tend to perform differently when in the presence of others or under observation. In the context of EPM, the constant monitoring can create a sense of being observed, which can induce stress in individuals (Zajonc, 1965). This stress can then influence performance, as explained by the Yerkes–Dodson Law, which postulates an inverted U-shaped relationship between arousal (or stress) and performance (Yerkes and Dodson, 1908). According to this law, moderate levels of stress can enhance performance by keeping individuals alert and focused. However, when stress levels become too high, performance can decline due to factors such as anxiety, distraction and decreased cognitive function. Therefore, individual stress can act as a mediator between EPM and individual performance, as explained by the SFT and the Yerkes–Dodson Law (Aiello and Svec, 1993; Spector, 1998; Yerkes and Dodson, 1908; Zajonc, 1965). Figure 1 summarizes all hypotheses and their effects.

To substantiate the contribution of the present study, we analyzed the existing EPM literature regarding examined constructs (the review methodology along with a complete presentation of the review results is presented elsewhere, Kalischko & Riedl, 2021). Table 2 summarizes the results of our analysis. Obviously, a study must examine at least two constructs, and EPM must always be part of a study. Since we study the consequences of

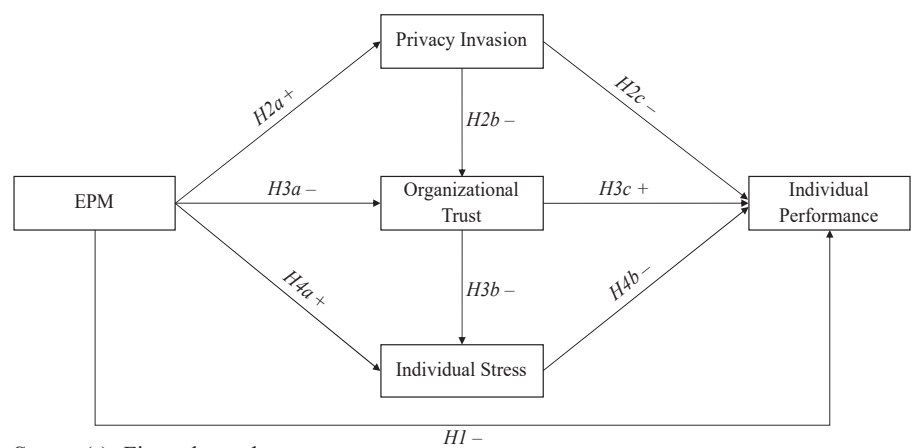


Figure 1.
Theoretical framework
and hypotheses

Source(s): Figure by authors

EPM, it follows that EPM itself is always the independent variable in our analyzed studies. As shown in the column “Consequences,” most studies (77%, 37 out of 48 studies) investigated EPM’s relationship with one further construct. Specifically, 10 studies examined the relationship between EPM and privacy invasion, 6 studies the relationship with trust, 10 with stress and 11 with performance. Moreover, Table 2 shows that fewer studies (23%, 11 out of 48 studies) examined the relationship of EMP with two constructs. Specifically, only one study investigated: EPM, privacy invasion and trust; EPM, trust, and stress; and EPM, trust and performance. However, eight studies examined the relationship between EPM, stress and performance. Thus, our analysis of 48 empirical EPM studies shows that *no* empirical study in the scientific literature has ever investigated EPM, privacy invasion, organizational trust, individual stress and individual performance collectively. Moreover, previous studies have not empirically tested the related (and holistic) effects of privacy, organizational trust and stress under the influence of EPM in any specific context. In conclusion, research exists on organizational performance, privacy, organizational trust, stress, and EPM. However, to the best of our knowledge, no study exists which has conceptualized and empirically tested these outcomes in combination. The present study fills this void.

A comprehensive account of the 48 studies examined can be found in Appendix. The numbers in square brackets refer to the list of references in the table in Appendix.

3. Methodology

In this section, we explain the survey study and the underlying analytical processes used to validate our research model.

3.1 Survey design and measurement development

We have chosen a survey design because it is ideally suited to gathering personal facts, beliefs and attitudes and because it has the benefit of improving the generalizability of study findings (Fang *et al.*, 2014; Kerlinger, 1966). Surveys are an established method in the EPM literature; this finding is not surprising as the capture of *individual perception* of phenomena (e.g. EPM, privacy invasion) is of utmost importance (Kalischko & Riedl, 2020). Specifically, we collected our data by means of an online survey, which was distributed by a market research company (Bilendi; see <https://www.bilendi.de/>). In advance, the questionnaire checked whether the respondent was currently employed in a job that was primarily performed on a computer. If this was not the case, then the questionnaire was ended at this point. The data below refer exclusively to responses that answered positively to the initial questions regarding employment and work on the computer. We presented an opening text that discussed EPM (based on Kalischko & Riedl, 2021) and the most prevalent technologies

Independent variable	Consequences		Number of studies and references
	Construct 1	Construct 2	
EPM	Privacy invasion		10 [4, 7, 12, 30, 31, 34, 41, 46–48]
EPM	Trust		6 [3, 4, 11, 21, 22, 25]
EPM	Stress		10 [10, 14, 16, 19, 35–37, 39, 43, 44]
EPM	Performance		11 [2, 5, 9, 15, 17, 18, 24, 27, 28, 33, 40]
EPM	Privacy invasion	Trust	1 [38]
EPM	Trust	Stress	1 [46]
EPM	Trust	Performance	1 [41]
EPM	Stress	Performance	8 [1, 8, 13, 20, 23, 26, 29, 32]

Source(s): Tables created by authors

Table 2.
Analysis of the
empirical EPM
literature on
consequences

behind it (Ayyagari *et al.*, 2011) (e.g. e-mail tools and word processing software) to help survey participants understand what the study is about. This provided a consistent and a shared starting point for all participants. The aim was to collect a sample that is representative for the target countries Germany, Austria and Switzerland (see Table 3 regarding age and gender distribution). Moreover, the market research company guarantees per contract random selection of study participants. The only limitation to this randomness was consideration of specific age and gender distributions (to secure representativeness) and country distribution (to secure an equal sample size across the three German-speaking countries Germany (DE), Austria (AT) and Switzerland (CH). The questionnaire itself was then sent randomly via the market research company to people in the DACH region, irrespective of other criteria such as salary or position in the company, but with the aim of achieving the average age of the respective countries as well as an equal distribution of the answers to the respective countries and the respective gender in order to be able to guarantee generalizability. We received a total of 1,261 completed surveys, of which we had to remove 112 records due to missing data, and another 30 records due to low engagement (e.g. standard deviation of answers below 0.5) (e.g. DeSimone *et al.*, 2015; Meade and Craig, 2012). This results in a final sample of N = 1,119 which was used for statistical analyses. The data were then divided at random into two sub-samples, one for the evaluation of the EFA and one for the CFA (MacKenzie and Podsakoff, 2011). Table 3 lists the characteristics of these samples and, when data were available, compares them to those from the DACH census (World Bank Open Data, 2023; World Economics, 2023). Overall, it can be seen that the samples (Sample 1 and Sample 2) are similar to the DACH average data. Hence, the results of the current study can be generalized well to the entire working population in the German-speaking area with respect to age. The same holds true for gender (Table 3 indicates a minimal difference in the gender distribution between Sample 1 and Sample 2 and the DACH census data).

We only used validated survey instruments for construct measurement, and we translated the items into German. We used a 7-point Likert scale for the measurements (1 – strongly disagree to 7 – strongly agree). To measure EPM, we used Snyder's (2010) scale (note that Snyder's (2010) original scale was developed in the context of email monitoring and also included some items on privacy invasion perceptions which we measured separately in our study; hence, we adjusted the scale to our EPM context and removed items with direct reference to the measurement of privacy invasion perceptions). A sample item is: "My organization has too many ways to monitor and record the content of the ICT I use." Privacy invasion was measured based on Fischer, Reuter, and Riedl (2021) scale. A sample item is: "I fear that my use of ICT is less confidential than I would like." For organizational trust measurement, we used a scale by Cook and Wall (1980). A sample item is: "I trust that my employer will always try to treat me fairly." To measure individual stress, we used a combination of scales by Motowidlo, Manning, and Packard (1986) and Siegrist, Wege, Pühlhofer, and Wahrendorf (2009). A sample item is: "I feel great stress due to my job."

	Sample 1 (N = 552)	Sample 2 (N = 567)	DACH census
Age	Avg.: 40.91 (SD.: 11.78)	Avg.: 39.41 (SD.: 11.67)	DACH Avg.: 43.16
Gender	Female: 273 (49.5%)	Female: 276 (48.7%)	DACH Avg.: 50.6% (female)
	Male: 279 (50.5%)	Male: 291 (51.3%)	
Country	Germany: 192 (34.8%)	Germany: 191 (33.7%)	DE Avg.: 44.9 years
	Austria: 194 (35.1%)	Austria: 183 (32.3%)	AT Avg.: 42.8 years
	Switzerland: 166 (30.1%)	Switzerland: 193 (34.0%)	CH Avg.: 41.8 years

Table 3.
Overview of samples **Source(s):** Tables created by authors

Finally, individual performance was measured based on a scale by [Koopmans et al. \(2012\)](#). A sample item is: “I think the customers and colleagues are satisfied with my work.” The survey and its factor loadings can be found in [Appendix](#).

3.2 Data analysis technique

For the analyses performed, our sample was split into two random subsamples using SPSS. One subsample was used for the exploratory factor analysis (EFA) ($N = 552$) and the other subsample was used for conducting a confirmatory factor analysis (CFA) ($N = 567$). After dividing the whole sample into two sub-samples, Levene’s test was applied to check whether the two samples showed statistical differences. Testing revealed that there was no significant difference at the 0.05 level, making the samples comparable. In [Table 3](#), we have presented descriptive data of the two samples in a summary. The item-to-subject ratio is 19:1 rounded up ($N = 560/30$ items), which is above the recommended thresholds of 10:1 and close to 20:1 (Costello and Osborne, 2005).

3.3 Reliability and validity assessment

Before performing an EFA using SPSS 28, we checked for the normality assumption of all indicators using the Shapiro-Wilks test. The test revealed that univariate normality was not present, and therefore principal axis factoring was used as the extraction method instead of maximum likelihood (Costello and Osborne, 2005). We utilized Promax for the rotation since oblique approaches are often suggested for the social and behavioral sciences, where correlations between constructs should always be predicted ([Fischer & Riedl, 2020](#); Matsunaga, 2010; Reio and Shuck, 2014; Treiblmaier and Filzmoser, 2010). We utilized the extraction to five components since we had an a priori idea of the dimensionality of our indicators, which is often preferred over unconstrained extraction based on Eigenvalues alone (Costello and Osborne 2005; Reio and Shuck, 2014).

Bartlett’s test was significant ($p < 0.001$), and we achieved a KMO (Kaiser–Meyer–Olkin criteria) of 0.866 (“meritorious” according to Kaiser and Rice, 1974; values above 0.90 would be considered “marvelous”), indicating good dimension reduction potential. The five retrieved components explained 63.08% of the total variance, which is much higher than the required criterion of 40% (Reio and Shuck, 2014). We resulted in the factor structure shown in [Appendix](#) after deleting items with high cross-loadings or low loadings on their principal factor. It is important to note here that although items had to be removed, no factor contained fewer than three high-loading items (Costello and Osborne, 2005; Reio and Shuck, 2014). The table with all loadings and cross-loadings for the EFA can be found in [Appendix](#).

Using our second sample, our measurement model was tested using a confirmatory factor analysis (CFA) (Matsunaga, 2010) using AMOS 28. The model fit was tested for this, which was acceptable with a χ^2 of 388.70, d.f. of 165, $\chi^2/\text{d.f.}$ of 2.355 (< 5 (Wheaton et al., 1977); CFI of 0.960 (> 0.95 ; Hu and Bentler, 1999); and SRMR of 0.045 (< 0.08 ; Hu and Bentler, 1999). Based on the results presented here, the factor structure of our measurement model was accepted.

We looked at the average variance extracted (AVE) for each construct, which should be greater than .5 for convergent validity (MacKenzie and Podsakoff, 2011), which was true for all cases. We used the Fornell–Larcker criterion for discriminant validity (i.e. a construct’s square root of AVE should be greater than any correlations with other constructs (Fornell and Larcker, 1981)), which was met in all cases.

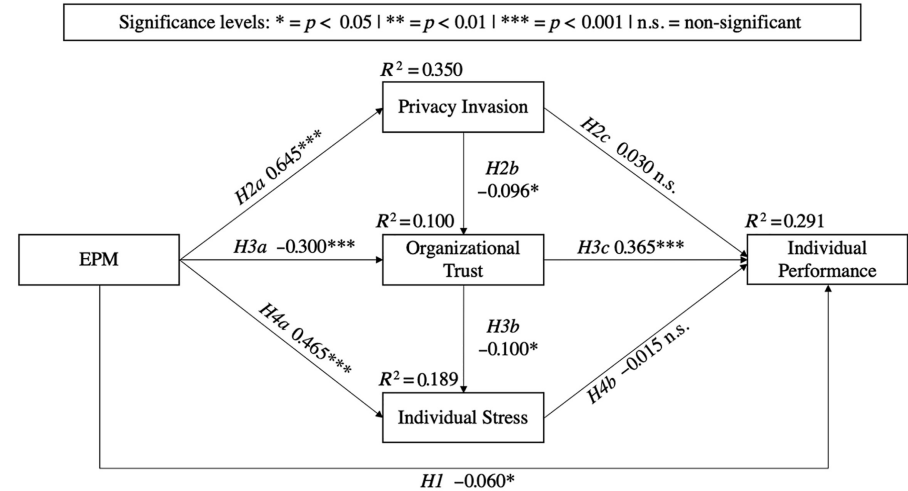
We evaluated the impact of common method bias because all of our data was collected in the same way (Podsakoff et al., 2003). We used numerous ways to examine the impact of common method bias (CMB) on our results, in accordance with current recommendations (Turel et al., 2011; Turel, 2015). The first and largest factor explained 24.60% of the entire variance, which is significantly below a majority of the whole variance, according to

Harman’s Single Factor (Harman, 1976) test in SPSS (i.e. principal component analysis with no rotation). Second, we looked for significant correlations above 0.90 (Pavlou *et al.*, 2007) in the inter-construct correlations matrix. This criterion does not imply common method bias because our correlations range from |0.090| to |0.532|. Third, we used the common latent factor approach (Podsakoff *et al.*, 2012; 2003; Turel, 2016) in AMOS to compare an unconstrained model ($\chi^2 = 360.6$, d.f. = 140) to a zero-constrained model ($\chi^2 = 387.5$, d.f. = 171) and found no statistically significant difference ($\chi^2 = 26.9$, d.f. = 31, $p = 0.100$). As a result, we can rule out the possibility of common method bias having a significant impact on our results.

We wanted to make sure that multivariate normality could be inferred based on our data because AMOS employs Maximum Likelihood for model estimation (Kline, 2011). For this, we used SPSS to check for multicollinearity for our endogenous variable. We can rule out multicollinearity as an influencing factor because the variance inflation factors (VIF) are all below 10 (Kline, 2011) and even below 4 (O’Brien, 2007). We next used Cook’s Distance (Cook, 1977) in SPSS to look for influential outliers. We can also rule out outliers as a relevant factor because the biggest Cook’s Distance was clearly below the threshold of 1 (Cook and Weisberg, 1982), implying multivariate normality. Because our data does not have a univariate normal distribution, we employed bootstrapping using 2000 samples for all model estimations.

3.4 Model estimation

For our main dependent variable, control variables were introduced (age, gender), which in sum accounted for 2.5% of the variance. Our research model fit (see Figure 2) was acceptable with a χ^2 of 5.2, d.f. of 4, χ^2 /d.f. of 1.3 (<5 (Wheaton *et al.*, 1977)), CFI of 0.978 (>0.95; (Hu and Bentler, 1999), RMSEA of 0.008 (<0.60/0.80 (Hooper *et al.*, 2008; Hu and Bentler, 1999); SRMR of 0.025 (<0.05/0.08; (Hooper *et al.*, 2008; Hu and Bentler, 1999), GFI of 0.989 (>0.90; (Hooper *et al.*, 2008), AGFI of 0.966 (>0.90; (Hooper *et al.*, 2008), NFI of 0.971 (>0.90/>0.95; (Bentler and



Overview of study results. χ^2 /d.f. of 1.30 (<5; Wheaton *et al.*, 1977), CFI of 0.978 (>0.95; Hu & Bentler, 1999), RMSEA of 0.008 (<0.60/0.80; Hooper *et al.*, 2008; Hu & Bentler, 1999) SRMR of 0.025 (<0.05/0.08; Hooper *et al.*, 2008; Hu & Bentler, 1999), GFI of 0.989 (>0.90; Hooper *et al.*, 2008), AGFI of 0.966 (>0.90; Hooper *et al.*, 2008), NFI of 0.971 (>0.90/>0.95; Bentler & Bonett, 1980; Hu & Bentler, 1999), and TLI of 0.958 (>0.80/>0.95; Hooper *et al.*, 2008; Hu & Bentler, 1999)

Source(s): Figure by authors

Figure 2.
Overview of study
results

Bonett, 1980; Hu and Bentler, 1999) and TLI of 0.958 ($>0.80/>0.95$; (Hooper *et al.*, 2008; Hu and Bentler, 1999).

4. Results and discussion

The key findings of our model estimation are presented in [Section 3.1](#), followed by their implications for research and practice in [Section 3.2](#).

4.1 Results of model estimation

The estimations for the effects included in our study model, their effect sizes and whether or not the corresponding hypotheses were supported are summarized in [Table 4](#). Altogether, we found empirical support for seven out of nine hypotheses. The results show that [H1](#) is significant ($p < 0.05$). It also shows that EPM has a significant impact on privacy invasion ([H2a](#), $p < 0.001$), organizational trust ([H3a](#), $p < 0.001$), as well as individual stress levels of employees ([H4a](#), $p < 0.001$). It follows that employees who are exposed to EPM feel more restricted in their own privacy. Special attention should be paid here to the significant result of $\beta = 0.645$, $p < 0.001$ and the high effect size of $f^2 = 0.713$. This suggests that privacy invasion is a particularly interesting construct and should also be considered more in future research. The restriction in one's own privacy also has the consequence that the trust in one's own organization decreases ([H2b](#), $p < 0.034$); yet the lowered privacy does not have a significant influence on individual performance ([H2c](#), n.s.). Another negative influence associated with the use of EPM is that on organizational trust. It is not only negatively influenced by the invasion of privacy that accompanies the use of EPM, but also directly by its perceived use, which in turn can bring further negative consequences because less organizational trust correlates with increased individual stress ([H3b](#), $p < 0.026$) and also leads to a significant increase of the individual performance ([H3c](#), $p < 0.001$). Therefore, high trust in the organization is aspirational from a business point of view. An additional negative impact of EPM has been found on the individual stress level. Specifically, individual stress increases significantly with the perception of EPM. However, individual stress itself did not show any significant influence on performance ([H4b](#), n.s.).

Altogether, our results show that the four possible consequences which we studied significantly suffer from the perception of EPM use. Specifically, we modeled individual performance as a dependent variable and the effect of EPM on performance is also mediated

Effects	Model estimates	Effect sizes ^a	Support
H1 : EPM → PERF	$\beta = -0.060$, $p = 0.049$, $f^2 = -0.074$	Small	Yes
H2a : EPM → PRIVINV	$\beta = 0.645$, $p < 0.001$, $f^2 = 0.713$	Large	Yes
H2b : PRIVINV → TRUST	$\beta = -0.096$, $p = 0.034$, $f^2 = -0.095$	Small	Yes
H2c : PRIVINV → PERF	$\beta = 0.030$, $p = 0.234$, $f^2 = -$	–	No
H3a : EPM → TRUST	$\beta = -0.300$, $p < 0.001$, $f^2 = -0.250$	Medium	Yes
H3b : TRUST → STRESS	$\beta = -0.100$, $p = 0.026$, $f^2 = -0.093$	Small	Yes
H3c : TRUST → PERF	$\beta = 0.365$, $p < 0.001$, $f^2 = 0.591$	Large	Yes
H4a : EPM → STRESS	$\beta = 0.465$, $p < 0.001$, $f^2 = 0.433$	Large	Yes
H4b : STRESS → PERF	$\beta = -0.015$, $p < 0.509$, $f^2 = -$	–	No

Note(s): * = indicates non-significant effects based on a $p < 0.05$ threshold

EPM = electronic performance monitoring; PERF = individual performance; PRIVINV = privacy invasion; TRUST = organizational trust; STRESS = individual stress. a = Effect size assessment based on f^2 thresholds proposed by (Cohen, 1992)

Source(s): Tables created by authors

Table 4.
Results

by privacy invasion, organizational trust and individual stress. As an impairment of privacy is linked to reduced organizational trust and increased individual stress, we argue that the avoidance of perceptions of privacy invasion is the “regulation screw” to positively affect organizational outcome variables like trust, stress and performance. Altogether, our findings suggest that the use of EPM by employers may be related to significant negative consequences and hence we advise against this increasingly used surveillance practice. At least, it is critical to ensure that employees do not develop a perception of privacy invasion. Existing studies already provide some evidence that specific measures taken by an employer could in fact reduce privacy invasion, namely: to leverage possible benefits of EPM (e.g. workplace safety, increased productivity) and avoid drawbacks (Kalischko & Riedl, 2021); to involve employees in the decision on monitoring policies (Alder and Tompkins, 1997); to inform employees about what is being monitored and how employee privacy will be protected (Jiang *et al.*, 2020) and to anchor a holistic data protection concept (Holthaus *et al.*, 2015); to find the so called “zone of acceptance” in which it is ensured which degree of monitoring is accepted by the employees (Stanton & Stam, 2006).

4.2 Implications for research and practice

From a theoretical standpoint, our research substantiates the SFT (Zajonc, 1965), as we observed a decline in performance within elaborate operational environments when EPM is present. What follows is that our findings provide evidence for the explanative power of SFT. Our findings also support SDT (Ryan & Deci, 2000) because the presence of EPM creates a controlling environment, characterized by low trust and high stress, which undermines employees’ sense of autonomy, competence and relatedness, which are basic psychological needs. Non-fulfillment of psychological needs may come along with decreased performance, a fact which is explained by SDT based on lowered motivation as a mediating mechanism. Moreover, we found that the presence of EPM leads to a decrease in perceived privacy. This result is in line with CPMT (Petronio, 2015, 2013, 1991; Petronio and Durham, 2008). We also found that the perception of privacy invasion through the presence of EPM leads to a decrease in employees’ trust in the organization. This result is also in line with CPMT’s prediction. CPMT also suggests that privacy invasion may have a negative impact on individual performance. However, our results were not significant. Therefore, our findings provide a basis for future studies to explore the applicability of CPMT in explaining the relationship between privacy invasion and individual performance.

Considering the negative impact of EPM presence on organizational trust as found in the present study, our data also support predictions of SET (Blau, 1964; Cropanzano & Mitchell, 2005; Homans, 1958) because social exchange relationships are based—according to this theory—on the expectation of mutual trust and reciprocity. Our study also supports the novel finding that a decrease in organizational trust can increase individual stress. This highlights the importance of organizational trust as a factor that affects employee well-being (Guinot *et al.*, 2014). Moreover, SET indicates that organizational trust can increase individual performance (Blau, 1964). This rationale is confirmed by our data, highlighting that social exchange relationships like those between employer and employee are typically based on the expectation of mutual trust and reciprocity, and deviation from this expectation may decrease individual performance.

Our study also provides evidence that EPM can increase individual stress, which fills a research gap in the literature (Bartels & Nordstrom, 2012; Galletta and Grant, 1995; Huston *et al.*, 1993; Nebeker *et al.*, 1993). Our study addresses this gap and highlights the importance of considering the potential negative impact of EPM on individual stress. Moreover, our study also explored the relationship between individual stress and individual performance. Although the physical presence of observers while performing a job is a well-known source of

stress (Kushnir, 1986), our data do not support the notion that increased individual stress decreases individual performance in the context of EPM. Therefore, our study contributes to the literature by providing insights into the relationship between these two constructs in the context of EPM. Our findings suggest that while EPM can increase individual stress, this may not necessarily result in a decrease in performance. According to the Yerkes–Dodson law, an increase in individual stress resulting from EPM may not necessarily lead to a decrease in performance (inverted U-shaped relationship). The impact of stress on performance depends on the individual's optimal arousal level. Moreover, the relationship between stress and performance may be influenced by additional factors that require further investigation. It is important to note that individual differences, such as stress tolerance, experience, self-efficacy and coping mechanisms, could also influence how individuals respond to stress and perform under different levels of arousal (e.g. Jex *et al.*, 2001; Lazarus & Folkman, 1984). The individual, task characteristics and the context of EPM implementation also may play significant roles in determining the relationship between stress and performance.

In addition to the discussed theoretical contributions which are largely interesting from a research perspective, the findings of the present study are also relevant to practitioners. For practice, our results imply that the use of EPM systems in organizations must be well considered. As shown, negative consequences are associated with the use of such systems and it must be evaluated whether EPM use is worthwhile or ultimately harmful. Specifically, our data show that the implementation of EPM has negative consequences, including reduced performance, increased stress, privacy invasion and lower trust in the organization. However, organizations can adopt measures to minimize these adverse effects. What follows is that if organizations implement EPM, assuming that the legal regulations in a specific country are considered, the responsible decision-makers could consider the following procedures (Kalischko & Riedl, 2021). First, organizations should assess their specific goals for implementing EPM and ensure that they align with the organization's overall mission and values. For example, in industries where safety or security is critical, such as transportation or finance, the use of EPM may be appropriate or even necessary based on legal regulations. Second, organizations should carefully select EPM tools that are effective, reliable and collect data pertinent to specific performance metrics deemed important by the organization. What follows is that it should be avoided that data are collected which are not directly related to performance (e.g. general usage behavior of application systems). Third, organizations should provide training to both employees and managers on how to use EPM tools effectively, interpret data and provide constructive feedback, thereby reducing stress and ensuring employee support during the monitoring process. Fourth, organizations should establish clear policies for the use of EPM, including data collection, storage, usage and employee privacy protection. Fifth and finally, organizations should continuously monitor the effectiveness of their EPM systems and be prepared to adjust them as needed to achieve their goals while minimizing negative consequences.

The findings on the consequences of implementing EPM can provide valuable insights into how organizations should approach digital transformation. When organizations implement new digital tools or systems, they must consider not only the potential benefits but also the potential negative consequences that can arise from their use. To apply these findings to digital transformation, organizations must take a comprehensive and strategic approach that considers the potential impacts of new technologies on employees and the organization as a whole. For instance, when implementing new technologies, organizations should consider the potential impact on employee privacy, trust, performance and stress levels.

Besides the possible negative aspects that may come along with EPM use in organizations, it is important to indicate the possible positive aspects too. First, EPM may be a leveler, ensuring that more thorough and impartial data is gathered to support work

analysis or training needs analysis (Ravid *et al.*, 2020). Second, researchers have also discovered positive relationships between EPM use and task performance (e.g. Bartels & Nordstrom, 2012; Griffith, 1993; Stanton and Julian, 2002). For example, increases in task speed on typing, data input and sorting tasks are reported in the literature (Ravid *et al.*, 2020). Moreover, Hovorka-Mead *et al.* (2002) report positive correlations between perceptions of fairness, justice and job satisfaction and the transparency of electronic monitoring or the amount to which employees are informed about it. What follows is that the way how EPM is implemented in organizations and how they are informed about it may affect outcome measures such as performance (Ball, 2021; McNall and Roch, 2009). In essence, EPM may promote accountability and hence fairness within organizations. When performance is objectively measured and tracked, it ensures that all employees are held to the same standards and that evaluations are based on concrete data rather than subjective judgments by supervisors or other managers. This can reduce bias and favoritism, creating a more equitable work environment. However, currently, there is a paucity of corresponding empirical studies and hence future work should also investigate the potential positive effects of EPM.

For example, one study on platform workers found that they generally exhibited a favorable attitude toward task output monitoring. From their perspective, monitoring was viewed as a protective measure, providing evidence of completed work and safeguarding against wage theft by the platform (Ball, 2021; Locke and Latham, 2006; Ravid *et al.*, 2022; Wood *et al.*, 2019).

For a more detailed overview of the positive effects of EPM, we refer the reader to Table A1 in the Appendix.

It is worth mentioning that research indicating favorable connections between EPM (employee proactive behavior) and other variables mainly relied on controlled environments such as laboratories and involved participants who were either students or employees in call centers. In these settings, engaging in EPM may be considered a normal part of the job or the context. Examples of such studies include Bhawe (2014), Moorman and Wells (2003) and Stanton and Julian (2002). On the other hand, studies that discovered negative relationships between EPM and other factors were typically carried out using diverse online participant pools, as seen in Jeske (2011) or reported by Ravid *et al.* (2020).

Furthermore, we highlight two additional potential avenues for future research. First, EPM could contribute to employee development and skill enhancement. By tracking performance metrics, employees can identify their strengths and weaknesses, allowing them to focus on areas that require improvement. This can lead to targeted training and development opportunities, fostering continuous learning and professional growth. Applying the SFT by Zajonc (1965) in the context of EPM, the monitoring aspect can create a similar sense of arousal or awareness in employees, akin to the presence of others. In this case, employees might be aware that their performance is being monitored electronically, which could prompt them to enhance their focus, exert more effort and elevate their performance on tasks. The increased level of attention and focus could enhance their skills over time as they continually strive to improve their performance. Second, EPM could facilitate communication and feedback between supervisors and employees. With access to performance data, supervisors can provide specific and constructive feedback, guiding employees toward achieving their goals. Regular feedback sessions can also enhance employee engagement and job satisfaction, as they feel supported and valued in their work.

When interpreting our findings, one must consider that it is unclear today whether our results generalize to other populations, in particular blue-collar workers. What follows is that future research should replicate our study in this domain. A related avenue for future research is to test our model in specific knowledge worker contexts such as software companies or universities. In addition, it would be interesting to ask how our results would

change if we had examined software engineers or professors. Both groups heavily use ICT to complete their professional tasks and are typically used to great work autonomy. The perception of being electronically monitored by the employer (e.g. analysis of login data on platforms such as Microsoft Teams) could instigate a self-reinforcing cycle via privacy invasion perceptions, a climate of distrust and stress perceptions. Hence, future research could apply our theoretical framework, or similar frameworks, to study specific populations. As indicated, if our framework generalizes to such contexts too, the use of EPM systems could ultimately “backfire” on the organization’s overall productivity and performance.

At this point, it should be noted that the present results are mainly applicable to those individuals who work mainly in front of a PC. While increasingly more people work digitally as knowledge workers, this limitation must nevertheless be kept in mind. Our study has further limitations, which may provide additional opportunities for future research. The survey was sent to people who mainly work with PCs. No distinction was made as to whether these people are actually monitored by their employers or not. Thus, our study is focused on *individual perceptions* with regard to being electronically monitored. It would, therefore, be interesting in future studies to make a distinction between people who know that they are monitored by their employer and those who suspect they are monitored.

Another limitation is that our data was gathered using an online cross-sectional survey. Despite the fact that we adjusted for common method bias, our data gathering implies challenges that should be addressed in future research. In particular, a causal inference may only be made using longitudinal data or experimental designs that suggest purposeful manipulation of the independent variable. In addition to self-reports, it might be important to study the possibility of alternative methods of data collecting to cast further light on the consequences associated with EPM systems. As an example, it is a well-established fact that measurement of stress based on self-reports alone cannot provide a complete picture and therefore neurophysiological measures such as saliva measurement of hormones or heart rate measurement are critical (e.g. [Riedl, Kindermann, Auinger, & Javor, 2012](#); [Riedl, 2013](#); [Tams et al., 2014](#)). This should be considered in future studies.

The present study deals with employees’ perceptions of EPM. However, future research should also deal with managers’ or supervisors’ perceptions of EPM use. Existing findings refer to managers’ performance evaluation ([Fenner et al., 1993](#)) and attitudes toward behavioral employee monitoring (e.g. [Vaught et al., 2000](#)). These studies could serve as a starting point. Another direction for future research concerns the development of a new measurement instrument for perceived EPM [1]. In our survey, we used an adapted instrument from the monitoring domain, but it is a worthwhile research endeavor to create a new measurement instrument due to the rapidly evolving EPM phenomenon. Also, especially due to the Corona pandemic and the resulting shift toward working from home, the question of the work setting arises. Are employee perceptions of EPM in the home office different from perceptions of EPM in the traditional office setting? And how do possible differences affect performance of employees? And how does the work setting affect privacy invasion perceptions, as well as trust and stress? A further avenue for future research is based on the possibility that the relationships between the examined constructs are of a more complex nature than linear relationships. It is possible that the reality of the relationships among our framework’s constructs could be more complex and possibly non-linear or moderated by other variables not considered in your study. For example, the perception of EPM may not always reduce organizational trust or increase individual stress. It could depend on the nature of the job, the organization’s culture or the individual’s attitudes toward monitoring. Moreover, different occupations may have distinct characteristics, work environments and job demands, which can influence how employees perceive and experience EPM. Investigating the variations in EPM perception across occupations can provide insights

into how different occupational contexts shape employees' attitudes, reactions, and responses to monitoring practices. By considering the role of occupation in EPM studies, researchers can gain a deeper understanding of the nuanced effects, dynamics and implications of monitoring practices across different work contexts. This exploration can facilitate the development of occupation-specific guidelines, policies and best practices for implementing EPM that consider the unique characteristics and needs of diverse occupations.

Finally, we make a call for future research to be conducted in a different culture. We collected data in the German-speaking area (Germany, Austria and Switzerland). However, it is interesting to see whether the present results generalize to other cultural contexts too.

5. Conclusion

Performance monitoring is driven in particular by changes in technology and the recent COVID-19 pandemic has increased the adoption rate of home office, thereby shifting employee control into the purely digital realm. Among other things, this and also the ever-increasing degree of monitoring in traditional office environments has led to an increased perception of surveillance among employees in many organizations, and it is the goal of many employers to increase employee performance through the implementation of EPM systems. These changing circumstances and advances in technological innovation raise questions regarding the use of such surveillance software and its implications. For this purpose, a survey study was conducted with a total of 1,119 participants. Different theories and existing empirical evidence were used as a basis for the development of a theoretical model and corresponding hypotheses. The influence of EPM perception on perceptions of privacy invasion, organizational trust, individual stress and individual performance, and the interrelationships among these factors, were examined.

Our findings show that perception of EPM significantly increases privacy invasion, reduces organizational trust, increases individual stress and ultimately reduces individual performance. Moreover, it was found that privacy invasion reduces organizational trust and that this lowered trust increases individual stress. These findings suggest that the use of EPM may be associated with significant negative consequences, a fact that should be considered by employers when implementing EPM systems.

Note

1. We thank one anonymous reviewer for this suggestion.

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The list below presents major references used in this study. However, a more comprehensive list, as used during the review process, is available from the authors upon request.

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(The Appendix follows overleaf)

Appendix

No.	Authors	Privacy invasion	Trust	Stress	Performance
1	Aiello and Kolb (1995)			—	~
2	Aiello and Svec (1993)				—
3	Alder <i>et al.</i> (2006)		+		
4	Alge (2001)	+			
5	Al-Rjoub <i>et al.</i> (2008)				~
6	Alge <i>et al.</i> (2004)		+		
7	Allen <i>et al.</i> (2007)	—			
8	Bartels and Nordstrom (2012)			~	+
9	Becker and Marique (2014)				—
10	Carayon (1994)			—	
11	Carpenter <i>et al.</i> (2016)		~		
12	Chang <i>et al.</i> (2015)	—			
13	Davidson and Henderson (2000)			~	~
14	DiTecco <i>et al.</i> (1992)			~	
15	Douthitt and Aiello (2001)				—
16	Galletta and Grant (1995)			~	
17	Goomas and Ludwig (2009)				+
18	Griffith (1993)				~
19	Hawk (1994)			—	
20	Henderson <i>et al.</i> (1998)			—	+
21	Holland <i>et al.</i> (2015)		—		
22	Hovorka-Mead <i>et al.</i> (2002)		+		
23	Huston <i>et al.</i> (1993)			—+	+
24	Irving <i>et al.</i> (1986)				+
25	Jensen and Raver (2012)		—		
26	Kolb and Aiello (1996)			—	~
27	Larson and Callahan (1990)				+
28	Ludwig and Goomas (2009)				+
29	Mallo <i>et al.</i> (2007)			—	—
30	McNall and Roch (2007)	—			
31	McNall and Stanton (2011)	—			
32	Nebeker and Tatum (1993)			~	+
33	O'Donnell <i>et al.</i> (2013)				+
34	Posey <i>et al.</i> (2011)	—			
35	Rogers <i>et al.</i> (1990)			—	
36	Sarpong and Rees (2014)			+	
37	Smith <i>et al.</i> (1992)			—	
38	Snyder (2010)	—	—		
39	Sprigg and Jackson (2006)			—	
40	Stanton and Barnes-Farrell (1996)				~
41	Stanton and Sarkar-Barney (2003)		—		~
42	Stanton and Stam (2003)	—			
43	Varca (2006)			—	
44	Visser and Rothmann (2008)			—	
45	Watkins and Allen 2007	—			
46	Westin (1992)		—	—	
47	Yost <i>et al.</i> (2019)	—			
48	Zweig and Webster (2002)	—			

Table A1.
Research findings on
EPM consequences

Note(s): The use of EPM can have a positive [+], negative [–], or no effect [~] on an outcome variable
Source(s): Appendix created by authors

Constructs and items ^a	Loadings
<i>Electronic performance monitoring (Snyder, 2010)</i>	$\alpha: 0.721$
My organization has too many ways to monitor and record the content of the ICT I use	
I do not have enough control over who can read the content I send and receive at work using ICT	
I am uncomfortable with the way my organization monitors my ICT content.*	
I feel that my ability to self-regulate who can read the content I send and receive at work using ICT is restricted by my organization.*	
When I send and receive content at work using ICT, I have full control over who sees that content.*	
<i>Privacy invasion (Fischer et al., 2021)</i>	$\alpha: 0.930$
I fear that my use of ICT is less confidential than I would like	
I fear that the information I share via ICT is not sufficiently well protected	
I fear that malicious individuals (e.g. hackers) can easily copy my identity through ICT	
ICT makes my personal information too easily accessible	
I fear that my personal information can be easily stolen by others on the Internet	
<i>Trust in Organization (Cook & Wall, 1980)</i>	$\alpha: 0.780$
When I have difficulties at work, I can rely on my colleagues	
I trust that my colleagues will always support me when needed	
I trust that my employer will always try to treat me fairly	
I can trust that most of my colleagues/staff will act as they say they will	
My supervisors would potentially be in a position to gain advantages by deceiving co-worker(s).*	
<i>Individual stress (Motowidlo et al., 1986; Siegrist et al., 2009)</i>	$\alpha: 0.860$
I am constantly under pressure due to my high workload	
I experience many interruptions and disruptions during my workday	
Over the last few years, my job has become more and more demanding	
I feel great stress due to my job	
I experience very few things at work that cause me stress.*	
My job is extremely stressful	
I almost never feel stressed at work.*	
<i>Individual performance (Koopmans et al., 2012)</i>	$\alpha: 0.870$
I can meet my deadlines	
I can fulfill my duties.*	
Cooperation with others works well.*	
Communication with others leads to the desired result.*	
I think the customers and colleagues are satisfied with my work	
Note(s): ^a Items were measured on a 7-point Likert scale, with 1 indicating strong disagreement and 7 indicating strong agreement. To guarantee content validity, the survey was done in German, with survey items being translated and back-translated by a professional translator and native English and German speakers. The authors may provide a complete list of German products upon request *Indicates items that were removed due to high cross-loadings and/or low loadings on their factor Source(s): Appendix created by authors	

Table A2.
Overview of constructs
and items in the online
survey

DTS
3,1

78

Items/Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
EPM_01	0.430	0.363			
EPM_02	0.450	0.345			
PRI_01	0.850				
PRI_02	0.894				
PRI_03	0.857				
PRI_04	0.851				
PRI_05	0.837				
TRU_01			0.858	0.517	
TRU_02			0.828	0.480	
TRU_03			0.678	0.381	
TRU_04			0.791	0.431	
TRU_05	−0.391	−0.378			
STR_01		0.853			0.397
STR_02		0.592			
STR_03		0.526			
STR_04		0.856			0.438
STR_05		0.452			0.788
STR_06		0.832			0.433
STR_07		0.507			0.887
PER_01			0.366	0.746	
PER_02			0.413	0.850	
PER_03			0.627	0.736	
PER_04			0.578	0.664	
PER_05			0.475	0.758	

Table A3. **Note(s):** *Values lower than 0.3 have been omitted for better readability
Results of initial EFA* **Source(s):** Appendix created by authors

Items/Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
EPM_01					0.747
EPM_02					0.724
PRI_01	0.842				
PRI_02	0.886				
PRI_03	0.854				
PRI_04	0.885				
PRI_05	0.853				
TRU_01			0.872		
TRU_02			0.856		
TRU_03			0.659		
TRU_04			0.768		
STR_01		0.854			
STR_02		0.600			
STR_03		0.554			
STR_04		0.873			
STR_06		0.861			
STR_07		0.561			
PER_01					0.724
PER_02					0.896
PER_05					0.738

Table A4. **Note(s):** *Values lower than 0.3 have been omitted for better readability
Results of final EFA* **Source(s):** Appendix created by authors

Table A5.
Reliability and validity
assessment

	CR	AVE	STRESS	PRIVINV	EPM	TRUST	PERF
STRESS	0.849	0.540	0.733				
PRIVINV	0.922	0.747	0.254	0.854			
EPM	0.737	0.584	0.405***	0.561***	0.764		
TRUST	0.873	0.633	−0.100*	−0.096*	−0.254***	0.796	
PERF	0.835	0.629	−0.016	−0.031	−0.072*	0.478	0.793

Note(s): No validity concerns**Source(s):** Appendix created by authors**Corresponding author**Thomas Kalischko can be contacted at: thomas.kalischko@pm.me

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