Effects of Electronic Monitoring Types on Perceptions of Procedural Justice, Interpersonal Justice, and Privacy[1]

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Electronic performance monitoring and control systems (EPMCSs) are raising fairness and privacy concerns in many organizations. Researchers typically have treated different types of EPMCSs as equal, yet various EPMCS types (e.g., computer monitoring, eavesdropping, surveillance) may exert differential influences on fairness and privacy perceptions. In this study, 246 participants read scenarios describing different technologies for evaluating performance. Results indicated that EPMCS types significantly influenced perceptions of procedural justice, interpersonal justice, and privacy. Computer monitoring was perceived as the most procedurally just; but traditional direct observation by a supervisor without electronic monitoring was perceived as the most interpersonally just, and the least invasive in terms of privacy. These findings suggest that employers should be cautious in the type of monitoring used.

Consumers often hear "this call may be monitored or taped for quality commitment purposes," or "this call may be recorded so we can serve you better." The obsession with monitoring is reflective of the exponential growth in technological capability in the past decade (Griffith, Northcraft, & Fuller, 1998). *Electronic performance monitoring and control systems* (EPMCSs) can be defined as systems in which electronic technologies are used to collect, store, analyze, and report the actions or performance of workers (Alge, 2001; Nebeker & Tatum, 1993). In 2001, the American Management Association reported that more than three quarters of major U.S. firms (77%) record and review employee communications and activities on the job. A more recent survey found that a wide variety of techniques are being used for monitoring. In particular, 36% of organizations track content keystrokes, and time spent at the keyboard; 50% store and review computer files; 51% monitor telephone use; and 51% engage in video monitoring (American Management Association & The ePolicy Institute, 2005). Critics argue that the proliferation of

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sophisticated monitoring technologies brings concerns over invasion of privacy (U.S. Office of Technology Assessment, 1987), stress (Nussbaum & duRivage, 1986; Smith, Carayon, Sanders, Lim, & LeGrande, 1992), and deterioration of morale (McLaughlin, 1989). On the other hand, proponents argue that EPMCSs provide employees with more feedback and more objective performance evaluations (Fenner, Lerch, & Kulik, 1993; Grant & Higgins, 1989) while increasing productivity levels (Bylinsky, 1991). In light of such conflicting arguments, there appears to be no clear-cut answer to the controversy surrounding EPMCSs. According to Ambrose and Alder (2000), the use of a justice framework provides insight into the factors that lead to acceptance of EPMCSs. That is, when organizations design, implement, and utilize monitoring systems in a manner consistent with organizational justice rules, employees' reactions to monitoring will be more positive.

One important factor that has not been previously studied but that may have potentially important implications for both justice and privacy perceptions is the type of EPMCSs used. Thus, the purpose of the present study is to investigate the effects of different types of EPMCSs on *procedural justice*, which is feelings of fairness about the procedures used to make decisions (e.g., Colquitt, Conlon, Wesson, Porter, & Ng, 2001); and *interpersonal justice*, which is the extent to which people are treated with politeness, dignity, and respect by an authority enacting a procedure (Colquitt et al., 2001). In addition, the study also examines the impact of EPMCSs on *privacy*, which is the extent to which individuals believe they have control over their personal information (Stone & Stone, 1990). Alge (2001) demonstrated that privacy plays an important role in justice-based models of EPMCSs.

Organizational Justice and EPMCSs

In recent years, organizations have recognized the importance of their employees' fairness concerns (Greenberg, 1990). Early work in organizational justice focused on *distributive justice*, or the fairness of outcomes and consequences of organizational processes and decisions (Greenberg, 1987). Thibaut and Walker's (1975) research on legal procedures shifted the focus of organizational justice to the process by which outcomes are determined. Thibaut and Walker showed how control over the process or input in the process is associated positively with perceptions of procedural justice. Leventhal (1980) extended this research by suggesting that perceptions of procedural justice are based on the extent to which the decision process is consistent, free of bias, accurate, correctable, representative, and ethical. Bies and Moag (1986) introduced a third type of justice by turning attention to the importance of the

interpersonal treatment people receive when procedures are implemented, or *interactional justice*. More recently, Colquitt (2001) indicated that interactional justice actually is composed of two types of justice. Interpersonal justice is associated with the interpersonal treatment by an authority figure, whereas informational justice is associated with the adequacy of explanations offered by an authority figure. Colquitt found that interpersonal and informational justice were highly correlated, but not so highly correlated as to combine them into one overall interactional justice measure.

According to Stanton (2000), organizational justice provides a framework for predicting the perceived fairness of EPMCSs. Most researchers have focused solely on perceptions of procedural justice under conditions of electronic monitoring because employees are most commonly concerned about how an outcome was determined, rather than the actual outcome itself. Kidwell and Bennett (1994b) found that procedural justice was an important antecedent in determining employees' reactions to EPMCSs.

Ambrose and Alder (2000) also included procedural justice in their comprehensive model of computer performance monitoring, which they based on previous frameworks (Carayon, 1993; Grant & Higgins, 1989; Hawk, 1994). They argued that particular dimensions of EPMCSs should influence various procedural justice rules, which in turn should drive perceptions of procedural justice. Especially relevant to the current study is Ambrose and Alder's tasks-monitored dimension. They argued that EPMCSs can monitor a larger number of worker activities and, consequently, employers must decide which activities to monitor (Ambrose & Alder, 2000). Ambrose, Alder, and Noel (1998) distinguished between clearly task-related activities (e.g., handling customer requests during working hours) and non-task-related activities (e.g., using the bathroom during scheduled breaks). Alder and Tompkins (1997) argued that organizations should capture only legitimate, work-related activities, which should result in greater perceptions of procedural justice.

The decision to use EPMCSs to monitor particular types of tasks has implications for two of Leventhal's (1980) procedural justice rules. First, the *ethicality rule of procedural justice* states that "allocative procedures must be compatible with the fundamental moral and ethical values accepted by that individual" (p. 45). Leventhal goes on to say that "the ethicality rule may dictate that methods of observation that . . . invade privacy are unfair" (p. 46). When employers use EPMCSs to collect information that is not related to job performance, employees may feel that monitoring procedures violate their expectation of privacy, which creates perceptions of injustice (Ambrose & Alder, 2000).

Second, EPMCSs may violate the accuracy rule of procedural justice because this rule requires that organizations monitor activities directly

related and clearly tied to successful job performance (Ambrose & Alder, 2000). Opponents of EPMCSs claim that organizations too often rely on quantifiable information because it is easy to measure, but this information is not necessarily the most relevant to job performance. For instance, if a worker's primary objective is customer service, monitoring the number of keystrokes may be perceived as an inappropriate basis for performance evaluations, which in turn could lead to perceptions of unfairness.

Although previous research has not examined the type of tasks captured by EPMCSs, Stanton (2000) examined employees' beliefs about the accuracy of monitoring in organizations with traditional and electronic monitoring techniques. He found that the perceived accuracy of monitoring influenced perceptions of procedural and interactional justice. Based on this research, it seems likely that electronic technologies that capture mostly work-related information will be perceived as more accurate and, consequently, more procedurally just. In addition, EPMCSs that focus on work-related information should be related to perceptions of interpersonal justice because Stanton's measure of interactional justice included interpersonal justice items.

Lind and Tyler's (1988) group-value model may help to explain how the types of tasks monitored by EPMCSs may be related to perceptions of interpersonal justice. According to this model, individuals care about fair treatment from an authority figure (e.g., a supervisor) because they derive a sense of identity and self-worth from fair treatment. When a supervisor monitors non-work-related activities via EPMCSs, the employee may perceive interpersonal unfairness because it implies that the employee cannot be trusted, and this could threaten the employee's self-worth.

Ambrose et al. (1998) stated that the "close supervision and visual observation of sensitive nonperformance related areas, like restrooms and locker rooms, can make employees feel . . . as though their dignity has been compromised" (p. 69). Supervisors could potentially use non-work-related information from EPMCSs to embarrass and humiliate an employee. According to Bies (2001), when interpersonal treatment conveys disrespect—such as "actions intended to embarrass and humiliate a person" (p. 105)—it should evoke a sense of injustice. It seems that some monitoring procedures, especially ones that capture non-work-related activities, may make it difficult for the supervisor to treat employees with respect and dignity. The knowledge that the supervisor receives certain types of non-work-related information may be sufficient to influence perceptions associated with interpersonal treatment. Thus, EPMCSs may have implications for justice perceptions associated not only with organizational procedures, but also with the supervisor (e.g., interpersonal justice). Table 1 presents a summary of the key organizational justice rules that pertain to the current study.

Table 1

Description of Organizational Justice and Privacy Rules

Rule/Source	Description
Procedural justice (Ambrose & Alder, 2000)	
Accuracy	Decisions are based on as much good information as possible
Ethicality	Procedures are consistent with members' standards
Interpersonal justice (Colquitt, 2001)	
Interpersonal treatment[a]	Amount of politeness, dignity, and respect by authorities executing a procedure
Invasion of privacy (Bies, 1993)	
Intrusiveness	Psychological impact of information-gathering procedures on individual
Relevance of information	Decisions are based on relevant information

[a]Ambrose and Alder (2000) considered interpersonal treatment a procedural justice rule. However, evidence from Colquitt (2001) suggests that interpersonal treatment is defined more accurately as interpersonal justice, a justice dimension that is separate and distinct from procedural justice.

Organizational Privacy and EPMCSs

Even though organizational justice research has made an important contribution to the development of justice-based models of EPMCSs, this research has neglected the role of privacy until recently (Alge, 2001). According to Stone and Stone (1990), the concept of privacy has been defined in many ways in a variety of disciplines, resulting in a lack of conceptual clarity. They noted that *privacy* has been defined as control of information about the self, control over the amount of interactions with others, and freedom from the control of others. For the purposes of the present study, we define privacy from the perspective of information control, such that individuals have privacy when they are able to control information about themselves (Stone & Stone, 1990).

Alge (2001) argued that "perceived loss of control can be seen as invasion of privacy" (p. 797). Critics of EPMCSs provide examples of how employers use electronic technologies to invade worker privacy. For instance, oppo-

nents cite examples of hidden video cameras in employee dressing rooms and recordings of the number of bathroom trips (Alder & Tompkins, 1997). One worker described a typical workday: "I can't even go to the bathroom without being watched. I have to put up a flag at my terminal, wait till the rest room is empty, sign out, sign back in, and remove my flag" (Nussbaum & duRivage, 1986, p. 17). Most employees have an expectation of privacy when they engage in the aforementioned activities. The close supervision of non-work-related activities associated with some EPMCS types may be in violation of the expectation of privacy that most workers feel is their right (Ambrose et al., 1998).

As mentioned earlier, Leventhal (1980) first articulated a relationship between privacy and procedural justice in his discussion of the ethicality rule. Subsequent empirical research has supported the notion of invasion of privacy and procedural justice as distinct, albeit related constructs (Eddy, Stone, & Romero-Stone, 1999; Racicot & Williams, 1993). Bies (1993) identified privacy factors that also were related to perceptions of procedural justice. Two of these factors—relevance of information used in decision making, and intrusiveness of the information-gathering procedure—may be particularly relevant in the context of EPMCSs.

Organizations gather a multitude of information about their employees for many reasons. According to Bies (1993), whether information gathered is viewed as an invasion of privacy may depend on the relevance of the information. Employers use EPMCSs to collect data on workers' activities, and the relevance of that information may play a key role in determining if it is viewed as an invasion of privacy. Tolchinsky et al. (1981) found that subjects reported greater levels of invasion of privacy when the data collected were based on personality information (irrelevant), as opposed to performance data (relevant). Similarly, Woodman et al.'s (1982) study of employees in five multinational companies revealed that employees regarded relevance of personal information for organizational decision making as central to perceptions of invasion of privacy. It is clear that relevance of information derived from research on privacy is very similar to the aforementioned tasks-monitored dimension in the electronic monitoring and procedural justice literature.

The procedures used to collect information about workers' behavior may be considered psychologically intrusive to the individual and, therefore, an invasion of privacy (Bies, 1993). For instance, Stone and Bowden (1989) conducted a study to see if the direct monitoring of providing a urine sample would impact whether an applicant accepted a job offer. Indeed, applicants were more likely to agree to a job offer if they were not monitored while giving a urine sample. Table 1 presents a summary of the key privacy rules that pertain to the present study.

EPMCS Types in a Privacy-Procedural-Justice Framework

Alge (2001) proposed a framework drawing on procedural justice (Leventhal, 1980), justice-based models of EPMCSs (Ambrose & Alder, 2000; Kidwell & Bennett, 1994a), and organizational privacy (Stone & Stone, 1990). In a study of temporary workers, Alge argued that job relevance was an antecedent to privacy and procedural justice. In a high-relevance condition, participants were evaluated on performance-relevant information only; whereas those in a mixed-relevance condition were evaluated on both relevant and non-relevant information (e.g., activities during break time). He found that individuals exposed to EPMCSs that monitored only performance-relevant activities perceived less of an invasion of privacy and enhanced perceptions of procedural justice relative to the mixed-relevance condition. He also found that privacy perceptions fully mediated the relationship between relevance and procedural justice, thus supporting a justice-privacy framework.

Although a justice-privacy framework shows great promise for increasing our understanding of reactions to EPCMSs, one major problem remains that has gone largely unaddressed by researchers is that most investigators overlook the extensive range of techniques that organizations use to monitor their employees electronically (Ambrose et al., 1998). All monitoring systems are not created equal. Ambrose et al. argued that EPMCSs can be divided into three broad categories: surveillance, computer monitoring, and eavesdropping. Each can be distinguished by the type of electronic device utilized by the system, the kind of activities captured by the system, and the scope of monitoring (see Table 2).

Table 2

Key Characteristics of Three Categories of Monitoring

	Surveillance	Computer monitoring	Eavesdropping
Type of device	Primarily visual	Computer hardware/ software	Telephonic
Scope of monitoring	Broad	Narrow	Moderate
Activities monitored	Work, non-work	Work	Primarily work

Note. From Ambrose, Alder, and Noel (1998).

First, *electronic surveillance* uses visual equipment, typically in the form of video cameras, to observe workers' behavior and to track movement. Second, *computer monitoring* uses computer hardware and software to record workers' computer-driven activities. Third, *eavesdropping* utilizes telephonic equipment to listen in on telephone conversations or voicemail messages. Each of these three categories of EPMCSs can be compared with the traditional form of monitoring employees, which consists of a supervisor directly observing his or her employees without any electronic devices.

Furthermore, Ambrose et al. (1998) argued that it is critical to examine the scope of monitoring and the activities monitored to understand the differences between the various types of EPMCSs. In Ambrose et al.'s surveillance category, employees' work- and non-work-related behaviors are captured, thus making the scope of monitoring very broad and potentially invasive. In contrast, Ambrose et al.'s computer monitoring category only looks at keystroke recording, so the scope of monitoring is much smaller because only employees' work-related activities are captured. Internet or e-mail monitoring was not part of Ambrose et al.'s (1998) computer monitoring category, probably because these EPMCSs were not nearly as common at the time of their work as they are today. Hence, the computer monitoring category in this study is limited to keystroke recording, which generates only work-related statistical data and does not include Internet or e-mail monitoring.

Finally, the eavesdropping category shares similarities to both of the aforementioned types of monitoring. For example, when a worker's telephone conversation is monitored, the conversation may or may not be work-related. Although the conversation is most likely work-related, there is potential to collect non-work-related materials. Therefore, eavesdropping is unique in that it shares characteristics of both surveillance and computer monitoring.

Ambrose et al.'s (1998) proposal to categorize the various forms of EPMCSs has gone unnoticed by most researchers. Instead, researchers have either placed all types of EPMCSs into one category, or have focused on one EPMCS type. For instance, Ambrose and Alder's (2000) work on enhancing organizational justice referred only to computer performance monitoring. One exception is Stanton's (2000) research on workers' perceptions of fairness in electronically monitored and traditionally monitored work environments. Stanton found that it is not the type of monitoring per se that influences fairness, but the way monitoring is implemented that matters most.

With the exception of Stanton's (2000) study, no empirical research has been conducted to examine the differences between various categories of EPMCSs; and it should be noted that Stanton only surveyed participants regarding their impressions of electronic monitoring, and did not manipulate

the different types of monitoring. Thus, many questions still remain about whether it is even useful to talk about EPMCSs as one broad category or as consisting of several subcategories. Could various types of EPMCSs have different implications based on the kinds of activities captured by the systems? Ambrose et al. (1998) contended that considering all forms of monitoring under the general label of EPMCSs may mask important differences and inhibit constructive discussions about how to manage EPMCSs. Future research would benefit from knowing if differences exist between EPMCS types and perceptions of fairness and privacy.

The Present Study

The present study seeks to understand the relationship between EPMCS type and organizational justice and privacy. Drawing on previous research (Alge, 2001; Ambrose & Alder, 2000; Kidwell & Bennett, 1994a), the current study tests the differential effects of EPMCS type on procedural justice, interpersonal justice, and privacy. For the purposes of this study, EPMCSs are divided into Ambrose et al.'s (1998) three major groups (surveillance, computer monitoring, and eavesdropping). The EPMCS categories are also compared to a fourth type of monitoring, termed direct observation. *Direct observation* is defined as a lack of electronic monitoring, the traditional type of monitoring. That is, the supervisor monitors performance by observation, but does not use any form of electronic technology to gather employee information. To the best of our knowledge, previous research has not compared traditional monitoring to the three categories of electronic monitoring put forth by Ambrose et al.; or investigated if different types of EPMCSs result in varying perceptions of procedural justice, interpersonal justice, or privacy. Interpersonal justice in particular has been neglected by researchers investigating EPMCSs.

Researchers have demonstrated the importance of procedural justice in electronically monitored work environments (Alge, 2001), but have not investigated the possible influence of EPMCS types on procedural justice. It may be that some types of EPMCSs violate the ethicality and accuracy rules of procedural justice. Thus, EPMCS types that capture mostly task-related activities should be viewed as more ethical and accurate—and, hence, more procedurally fair—than EPMCSs designed to monitor fewer task-related activities. Similarly, employees should perceive their supervisors who use EPMCSs as more respectful and thus, more interpersonally fair, when the EPMCSs capture mostly task-related activities. In contrast, EPMCSs that capture more activities unrelated to the task may violate the interpersonal treatment rule and, consequently, lower perceptions of interpersonal justice.

Thus, computer monitoring (defined as keystroke recording) should be perceived as the most procedurally and interpersonally just since this technique captures only work-related activities. Surveillance should be perceived as the least procedurally and interpersonally just, since this technique captures both work- and non-work-related activities. The following hypotheses are proposed:

> *Hypothesis 1*. EPMCS types will differ in terms of perceptions of procedural justice, with computer monitoring perceived as the most procedurally just and surveillance perceived as the least procedurally just.
>
> *Hypothesis 2*. EPMCS types will differ in terms of perceptions of interpersonal justice, with computer monitoring perceived as the most interpersonally just and surveillance perceived as the least procedurally just.

Some types of EPMCSs may be perceived as intrusive and as gathering irrelevant information. Employees should perceive EPMCSs that gather relevant information in the least intrusive manner as less of an invasion of privacy than EPMCSs that gather irrelevant information in an intrusive manner. Computer monitoring should be perceived as the least invasive in terms of privacy since this technique captures the most relevant information in the least invasive way. Surveillance should be perceived as the greatest invasion of privacy since this technique captures the least relevant information and, at the same time, is the most intrusive. The following hypothesis is proposed:

> *Hypothesis 3*. EPMCS types will differ in terms of perceptions of invasion of privacy, with computer monitoring perceived as the least invasive and surveillance perceived as the most invasive.

Alge (2001) suggested that privacy might be an antecedent to procedural justice perceptions. As mentioned previously, he found that invasion of privacy fully mediated the effect of monitoring job-relevant activities on procedural justice. Because various kinds of EPMCSs capture different types of activities (relevant and non-relevant), privacy may mediate the relationship between EPMCS type and procedural justice. The following hypothesis is proposed:

> *Hypothesis 4*. Privacy will mediate the relationship between EPMCS type and procedural justice.

Method

Participants

Study participants were 248 undergraduates (118 men, 128 women, 2 people did not provide gender information) from a large northeastern university who completed the experiment in exchange for 1 hr of research credit. Of the participant sample, 96% were between the ages of 18 and 25. With regard to ethnicity, 53% were Caucasian, 7% were African American, 9% were Hispanic American, and 31% were "other." For work experience, 46% of the sample had 3 to 6 years of experience; and 41% of participants indicated that their employer had monitored their work activities electronically.

Measures

All self-report scales were rated on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Procedural justice. Procedural justice was measured using a five-item scale derived from Colquitt (2001). There are two items from Colquitt's scale that were withheld because the items did not fit the context of the current study. Slight modification of the items was required to make the items appropriate in the present context.

Mean alpha across the four types of monitoring was .57. Given the low alpha level, an exploratory factor analysis was conducted, which revealed two factors with an eigenvalue greater than 1. The first factor explained an average of 38.3% of the variance across the four types of monitoring and contained items focusing on accuracy, bias suppression, and consistency, which are procedural justice factors identified by Leventhal (1980). The second factor explained an average of 21.5% of the variance across the four types of monitoring and contained items on ethicality and influence. Because the items loading on the first factor were more closely related to the definition of procedural justice, these items were used to measure procedural justice. Mean alpha across the four types of monitoring using the first factor was .62. A sample item is "The procedures that would be used to monitor my performance will be applied consistently."

Interpersonal justice. Interpersonal justice was measured using a three-item scale from Colquitt (2001). There is one item from Colquitt's scale that was not used because the item did not fit the context of the current study. Like procedural justice, slight modifications of the interpersonal justice items were required to fit the present study. Cronbach's alpha, averaged across the

four types of monitoring, was .86. A sample item is "Given the (type of monitoring), I think my supervisor will be able to treat me with respect."

Privacy. Invasion of privacy was measured using a 10-item scale derived from Alge (2001). There are three items from Alge's scale that were not used because they did not fit the context of the present study. Cronbach's alpha, averaged across the monitoring conditions, was .89. A sample item is "I feel like the manner in which I will be evaluated is an invasion of my privacy."

Demographics. There are eight items that assessed various demographic variables. Sample items are age, ethnicity, gender, major, and work experience.

Experimental Scenarios

In each of four scenarios, a different type of monitoring was presented. In the direct observation condition, participants read "At Organization D, you are told that your supervisor will monitor your performance by observing you at work." The three other conditions included one type of electronic monitoring system in addition to direct observation: computer monitoring, eavesdropping, or surveillance.

Participants read the following description of the computer monitoring condition:

> At Organization C, a computer monitoring device monitors your performance. Using a keystroke accounting system, your supervisor will determine your work speed, work completed, and error rate throughout the workday. Your supervisor also monitors your performance by observing you at work.

Participants read the following description of the eavesdropping condition:

> At Organization E, an eavesdropping device monitors your performance. Using a telephone call observation system, your supervisor will listen in on your conversations throughout the workday. Your supervisor also monitors your performance by observing you at work.

Finally, participants read the following description of the surveillance condition read:

> At Organization S, a surveillance device monitors your performance. Using video camera observation, your supervisor will

> determine your movement throughout the workday. Your supervisor also monitors your performance by observing you at work.

Design and Procedure

Participants arrived at the experiment and were randomly given a packet containing a coversheet, the four monitoring scenarios, and a demographics survey. Thus, the study used a within-subjects design in which all participants read through the four hypothetical scenarios, but each of the scenarios was counterbalanced to control for potential order effects. The experimenter read aloud the verbal instructions and the coversheet that asked participants to imagine that they are looking for a job as a reservation agent. The position was described in terms of main job responsibilities and duties as defined by O*NET. Participants were told that they had been offered jobs at four organizations, and a major difference between the organizations was the techniques used to gather information about the worker's performance. Finally, participants read through each scenario and answered the questions that followed each hypothetical organization. Participants worked through the packets at their own pace. The experiment lasted approximately 40 min.

Results

Data were analyzed for 246 of the 248 participants. Data were discarded for 2 participants because they failed to identify the order of their scenarios. We first conducted a confirmatory factor analysis to examine the distinctiveness of procedural justice, interpersonal justice, and privacy.

We used AMOS software (Arbuckle & Wothke, 1999) to examine the fit of the model, which included procedural justice, interpersonal justice, and privacy as separate constructs. The average chi square was 253.93 ($p = .00$). Although the chi-square value suggests an inadequate fit, Byrne (2001) noted that the chi-square indices provide limited guidance in determining the extent of model fit.

Other goodness of fit indices suggest that the model would fit approximately well in the population. The average root mean square error of approximation (RMSEA) value was .08, which is close to the recommended criterion of .05 or less. The mean comparative fit index (CFI) and the mean Tucker–Lewis index (TLI) were .92 and .90, respectively, which reaches or exceeds the recommended criterion of .90. The mean goodness-of-fit index (GFI) and mean adjusted goodness-of-fit index (AGFI) values were .88 and

Table 3

Descriptive Statistics for Dependent Variables

	M	*SD*	1	2
1. Procedural justice	3.16	0.52	—	
2. Interpersonal justice	2.99	0.59	.40*	—
3. Privacy	3.30	0.48	−.26*	−.32*

*$p < .01$.

Table 4

Descriptive Statistics for Procedural Justice by Monitoring Type

Procedural justice	*M*	*SD*	1	2	3
1. Direct observation	3.07	0.70	—		
2. Surveillance	3.17	0.80	.27*	—	
3. Computer monitoring	3.37	0.81	.19*	.41*	—
4. Eavesdropping	3.01	0.79	.20*	.33*	.27*

*$p < .01$.

.84, respectively, approaching the recommended cutoff of .90. Thus, our procedural justice, interpersonal justice, and privacy measures appear to be representing three distinct constructs. Table 3 presents means, standard deviations, and intercorrelations of the dependent variables.

Procedural Justice

Hypothesis 1 predicted that the EPMCS types would result in varying procedural justice perceptions. The results of a one-way repeated-measures ANOVA with procedural justice as the dependent variable reveal a significant main effect for EPMCS type, $F(3, 732) = 3.34$, $p < .05$, $\eta^2 = .01$. It should be noted that the order of the monitoring scenarios served as a covariate to control for any effects as a result of the sequence in which participants read about each of the EPMCS types.

Subsequent pairwise comparisons applying Bonferroni's correction reveal that computer monitoring was perceived as significantly more just than the

other monitoring types. In addition, surveillance was viewed as significantly more just than eavesdropping, but not significantly more just than direct observation. However, eavesdropping and direct observation were not perceived as significantly different from one another. An examination of the mean differences shows that participants viewed computer monitoring ($M = 3.37$, $SD = 0.81$) as more procedurally just than surveillance ($M = 3.17$, $SD = 0.80$), direct observation ($M = 3.07$, $SD = 0.70$), and eavesdropping ($M = 3.01$, $SD = 0.79$).

Thus, Hypothesis 1 was partially supported in that computer monitoring was viewed as the most procedurally just. Contrary to the hypothesis, however, surveillance was not perceived as the least procedurally just. Eavesdropping was perceived as the least procedurally just, but was not significantly different from direct observation. In turn, direct observation was not significantly different from surveillance.

Interpersonal Justice

Hypothesis 2 predicted that EPMCS types would result in differing perceptions of interpersonal justice. A one-way repeated-measures ANOVA with scenario order as a covariate reveals a significant main effect, $F(3, 705) = 12.01$, $p < .01$, $\eta^2 = .05$, after applying the Greenhouse–Geisser correction since Mauchly's test was significant ($p < .05$). It appears that the different types of EPMCSs led to varying perceptions of interpersonal justice. Means, standard deviations, and correlations are presented in Table 5.

Pairwise comparisons using Bonferroni's correction show that although computer monitoring was viewed as significantly different from the other monitoring types, it was not viewed as the most interpersonally just. Also, surveillance was perceived as significantly less just than direct observation,

Table 5

Descriptive Statistics for Interpersonal Justice by Monitoring Type

Interpersonal justice	*M*	*SD*	1	2	3
1. Direct observation	3.39	0.74	—		
2. Surveillance	2.78	0.85	.27*	—	
3. Computer monitoring	3.10	0.79	.41*	.36*	—
4. Eavesdropping	2.67	0.92	.37*	.39*	.33*

*$p < .01$.

but not significantly different from eavesdropping. A review of the mean differences illustrates that direct observation ($M = 3.39$, $SD = 0.74$) was perceived as the most interpersonally just, followed by computer monitoring ($M = 3.10$, $SD = 0.79$), surveillance, ($M = 2.78$, $SD = 0.85$), and eavesdropping ($M = 2.67$, $SD = 0.92$). Therefore, Hypothesis 2 was supported only partially. There were significant differences between the EPMCS types, but contrary to expectations, direct observation was perceived as significantly more interpersonally just than were the other EPMCS types. Surveillance and eavesdropping were perceived as the least interpersonally just, significantly less just than direct observation and computer monitoring.

Privacy

Hypothesis 3 predicted differences among EPMCS types in terms of perceptions of privacy. A one-way repeated-measures ANOVA with scenario order as a covariate reveals a significant main effect, $F(3, 732) = 14.05$, $p < .01$, $\eta^2 = .05$. Table 6 presents the means, standard deviations, and correlations.

Finally, pairwise comparisons applying Bonferroni's correction indicate that computer monitoring was viewed as significantly different from the other EPMCS types, but not as the least invasive. Additionally, surveillance was viewed as significantly more invasive than direct observation, but not significantly different from eavesdropping. An evaluation of mean differences demonstrates that direct observation ($M = 2.75$, $SD = 0.68$) was perceived as the least invasive in terms of privacy, followed by computer monitoring ($M = 3.00$, $SD = 0.75$), surveillance ($M = 3.66$, $SD = 0.80$), and eavesdropping ($M = 3.80$, $SD = 0.80$). Once again, Hypothesis 3 was only partially supported.

Table 6

Descriptive Statistics for Privacy by Monitoring Type

Privacy	*M*	*SD*	1	2	3
1. Direct observation	2.75	0.68	—		
2. Surveillance	3.66	0.80	.21*	—	
3. Computer monitoring	3.00	0.75	.25*	.17*	—
4. Eavesdropping	3.80	0.80	.21*	.25*	.22*

*$p < .01$.

Even though, as predicted, there were significant differences between EPMCS types, direct observation (not computer monitoring) was viewed as the least invasive, and was significantly different from all other EPMCS types. Surveillance and eavesdropping were both seen as the most invasive; significantly more so than direct observation and computer monitoring.

Mediator Analysis

Hypothesis 4 predicted that privacy would mediate the relationship between EPMCS type and procedural justice. Following the recommendations set forth by Baron and Kenny (1986), three conditions were examined to test for mediation. The first condition stated that EPMCS type should affect privacy, and this was supported, $F(3, 732) = 14.05$, $p < .01$, $\eta^2 = .05$. The second condition stated that EPMCS type should affect procedural justice, and this was found also, $F(3, 732) = 3.34$, $p < .05$, $\eta^2 = .01$. Finally, privacy was entered as a covariate in a one-way repeated-measures ANOVA with EPMCS type as the independent variable and perceptions of procedural justice as the dependent variable. In this case, the effect of EPMCS type was no longer significant, $F(3, 239) = 1.34$, $p > .05$.

Unfortunately, given the constraints of the repeated-measures analyses, we were not able to determine the significance of privacy as the covariate. We can only determine that EPMCS type is no longer a significant predictor of procedural justice once privacy is entered into the equation. We do, however, know that overall privacy perceptions are significantly correlated with procedural justice perceptions ($r = -.26$, $p < .01$). Thus, it is highly likely that privacy mediates the relationship between EPMCS type and procedural justice using the steps outlined by Baron and Kenny (1986), and the reported analyses lend support for the mediating effect of invasion of privacy, even though they cannot determine conclusively whether this is the case.

Ancillary Data

Prior experience with monitoring. Subsequent analyses were conducted to determine whether respondents who had personally experienced electronic monitoring responded differently to the justice and privacy items than did those who did not have experience with being monitored. Repeated-measures ANOVAs with experience as an independent variable and EPMCS type as the repeated measure reveal no significant main effects or interactions for experience in determining procedural justice, interpersonal justice, or invasion of privacy. Therefore, it appears that whether a person had personally experienced electronic monitoring did not influence the results.

Scenario believability. Two items assessed participants' perceptions of the believability of the scenarios and were rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). When asked if participants had a hard time imagining themselves looking for a job as a reservation agent, most disagreed ($M = 2.66$, $SD = 1.10$). Participants also believed that the supervisors at each of the four organizations would base their performance ratings on the procedures that were explained in each of the scenarios ($M = 3.53$, $SD = 0.96$).

Discussion

Advances in information technology have increased the number of ways that organizations can monitor employee performance. Empirical research, however, has neglected to take into account the notion that various types of EPMCSs may impact fairness and privacy differently. The current study clearly indicates that differences exist between EPMCS types and perceptions of procedural justice, interpersonal justice, and privacy. This adds to our understanding of how EPMCSs influence employee attitudes.

As predicted, computer monitoring was viewed as the most procedurally just type of monitoring. This result was expected, given that computer monitoring systems, defined as keystroke recording, collect exclusively job-related activities. Surprisingly, eavesdropping was viewed as the least procedurally just, but not significantly less just than direct observation, which in turn was not significantly different from surveillance. Thus, participants did not discriminate between the procedures used to evaluate performance in the eavesdropping and direct observation conditions, nor the direct observation and surveillance conditions.

One possible explanation for these findings is that people perceive a violation of procedural justice any time a monitoring system has the potential to gather non-work-related information, and all three types have the potential to do just that. Drawing from Bies and Moag's (1986) agent-system model, it may be that procedural justice perceptions tend to be associated with the system, rather than the agent; thus, computer monitoring is viewed as the most just because it ensures that only job-relevant information is collected, indicating a fair system. Another plausible explanation for the lack of distinction among EPMCS types might be the measure of procedural justice, which had a low alpha level, even though the items were based on Colquitt (2001).

On the other hand, the relationship between EPMCS type and interpersonal justice was quite different than that of procedural justice. Contrary to expectations, participants perceived direct observation to be the most inter-

personally just form of monitoring, significantly more so than any EPMCS type. It seems that most people tend to favor traditional means of evaluating performance in terms of interpersonal justice. According to Bies and Moag's (1986) agent-system model, interactional justice, which subsumes interpersonal justice, emphasizes the agent, often the supervisor. It may be that what is important for interpersonal justice is not only that job-relevant information is collected, but a general feeling of being treated with dignity and respect, which are critical components of interpersonal justice (Colquitt, 2001).

According to Tyler and Degoey (1996), trust is linked strongly with being treated with dignity and respect by an authority. When a supervisor relies on traditional monitoring, this may convey a sense of trust and dignity, whereas any type of electronic monitoring may imply some degree of distrust. Thus, as far as interpersonal justice is concerned, it may not just be the type of tasks monitored, but also the scope of monitoring that influences perceived justice. For example, Strickland (1958) found that extensive surveillance of subordinate performance erodes trust. In Strickland's study, high levels of monitoring led supervisors to believe that subordinates were less trustworthy. It may not only be supervisor perceptions that are influenced by the amount of monitoring, but also subordinate perceptions. Any type of electronic monitoring deemed extensive by subordinates may indicate a lack of trust and dignity.

Interestingly, participants perceived eavesdropping as the least interpersonally just, but eavesdropping was not significantly different from surveillance. One explanation may be that people feel disrespected by these forms of monitoring because they perceive the eavesdropping and surveillance systems as gathering information that potentially is unrelated to their jobs. This also would illustrate why computer monitoring is perceived as more interpersonally just than other EPMCS types since this device gathers only job-related information, even though the results regarding interpersonal justice indicate that any type of electronic monitoring is too much monitoring.

A similar pattern of results was found for invasion of privacy. Participants perceived less of an invasion of privacy when their supervisors did not use any form of electronic technology to monitor their activities. It could be that participants believed that any type of monitoring technology creates a loss of perceived control, which in turn increased perceptions of invasion of privacy (Eddy et al., 1999). Eavesdropping was perceived as the greatest threat to privacy, but was not significantly different from surveillance. Participants may not have distinguished between eavesdropping and surveillance because both EPMCS types have the potential to capture non-work-related activities, thereby leading to a sense of uncontrollability and invasion of privacy.

This study also answers Alge's (2001) call to investigate invasion of privacy as a mediator. The data show that it is highly likely that privacy

mediated the effect of EPMCS type on procedural justice. EPMCS type no longer predicted procedural justice when privacy perceptions also were considered. This is expected, given that Alge found that invasion of privacy fully mediated the relationship between relevance and procedural justice. It would follow that EPMCS types should have a differential effect on procedural justice via privacy because EPMCS types differ on whether relevant information is collected. In other words, EPMCS type may be a proxy for the relevance of information. Different types of EPMCSs represent different levels of relevance, which in turn influence privacy perceptions, and these privacy perceptions directly influence procedural justice perceptions. The mediation findings are plausible, given the results of the statistical analysis coupled with the theoretical rationale suggesting that invasion of privacy is a precursor to procedural justice. More research is needed to determine if this is indeed the case, and to understand why EPMCS types influence privacy and fairness perceptions.

Future research also should examine the perceptions of other forms of electronic technologies. In particular, it would be appropriate to investigate e-mail and Internet monitoring because the American Management Association and the ePolicy Institute (2005) survey found that 76% of organizations monitor workers' Web site connections, and 55% store and review e-mail messages. In fact, a recent survey of 192 companies found that 92% of managers check employees' e-mail and Internet use at work ("E-mail and Web monitoring," 2003). The current study, however, focused solely on the categories put forth by Ambrose et al. (1998).

It is possible that e-mail and Internet monitoring share similarities to Ambrose et al.'s (1998) eavesdropping category. That is, monitoring of e-mail activity probably will capture work-related activities, but also has the ability to collect non-work-related activities. Similarly, an employee may use the Internet to research a topic for a work-related presentation, but he or she could also do personal shopping online. Future research should look at whether e-mail and Internet monitoring share similarities with eavesdropping, or if they have unique qualities that merit further classification.

Overall, however, the present study has several important practical implications for managers designing and implementing EPMCSs in organizations. First, it would be wise for organizational decision makers to investigate the various monitoring techniques, given that this study found differing levels of justice and privacy perceptions, depending on EPMCS type. Second, the current study suggests that surveillance and eavesdropping probably should not be utilized because of threats to procedural justice, interpersonal justice, and privacy. It may be possible, however, to implement a computer monitoring system without reducing employee perceptions of justice. The current study found that such a device actually results in higher levels of procedural

justice than does direct observation alone. In addition, computer monitoring was perceived as the most interpersonally just and the least invasive in terms of privacy of the three electronic monitoring types. Organizations must be cautious, however, when designing and implementing such a system because most people still prefer direct observation to electronic monitoring in terms of interpersonal justice and privacy.

If organizational decision makers decide to put a computer monitoring system in place, there should be a process to reduce potential decrements in interpersonal justice and privacy. One way to enhance perceptions of interpersonal justice may be to provide training to supervisors on how to treat employees with respect and dignity while utilizing the data collected from the computer monitoring system. At the same time, the organization also must work toward decreasing the invasion of privacy that people experience as a result of computer monitoring. It may be useful to give employees the ability to turn off the monitoring system in order to enhance their perceptions of control and to help alleviate some of the stress that results from large amounts of monitoring.

The results of the current study also have important theoretical implications. First, researchers should not consider all EPMCS types as one and the same. Rather, it is critical for researchers to acknowledge that important differences exist between EPMCS types that otherwise go unnoticed when they use the same label to describe all types of EPMCSs. Second, it may be more useful to categorize EPMCS types based on whether the device has the potential to gather non-work-related information. Contrary to Ambrose et al.'s (1998) assertion that three categories exist (i.e., computer monitoring, eavesdropping, and surveillance), the results of the current study indicate that it may be more useful to place EPMCSs on a continuum according to the degree that relevant activities are captured by the system. Third, the results of this study clearly support Colquitt's (2001) assertion that organizational justice is best conceptualized as multidimensional. In particular, EPMCS types exerted differential effects on procedural and interpersonal justice. Future research should continue to examine the justice dimensions as distinct constructs in order to uncover important differences that may exist. Finally, the results of the present study lend support for the conceptual link between privacy and procedural justice. Future research should continue to explore the mediating role of invasion of privacy and the implications of privacy as a procedural justice issue (Bies, 1993).

It is important to note that the present study has several limitations. First, a scenario study has several drawbacks in comparison to simulations or field studies. Reading scenarios about electronic monitoring, instead of actually experiencing the monitoring firsthand, is likely to reduce psychological realism. However, participants did not have difficulty imagining that they

were looking for a job as a reservation agent. This may be because college students could relate to seeking out entry-level positions where monitoring may be more prevalent. In addition, the participants believed that the supervisor at each of the four organizations would base performance ratings on the procedures that were explained in each of the scenarios. Moreover, since significant differences were found between EPMCS types and procedural justice, interpersonal justice, and privacy, it is likely that these differences would be even more pronounced in a field setting in which an employee actually experiences monitoring on a daily basis. According to Eddy et al. (1999), the results of scenario studies tend to underestimate the impact of procedural variables in real-world contexts. Future research should attempt to bolster the present findings by investigating the relationship between EPMCS types and organizational justice and privacy using a simulation or a field setting.

Another potential limitation of the present study is the use of a college student population. College students often have limited work experience. A large number of the college students used in this study, however, had work experience and familiarity with electronic monitoring. In fact, 46% of the sample had between 3 and 6 years of work experience; and 41% of participants indicated that their employers had electronically monitored their work activities. In other words, many participants were aware of electronic monitoring in their own workplaces, and the results show that whether the participants had experienced electronic monitoring personally did not influence their justice and privacy perceptions. Thus, even though the participants were drawn from a student sample, this sample closely represents the working population for the type of job represented in the scenarios; that is, an entry-level job with high probability of being monitored.

In conclusion, the purpose of the present study was to investigate the effect of EPMCS type on procedural justice, interpersonal justice, and privacy. The results indicate that differences exist between various kinds of EPMCSs and perceptions of procedural justice, interpersonal justice, and privacy. It appears that if organizations decide to monitor their employees electronically, computer monitoring is a viable option. However, the organization must take steps to bolster perceptions of interpersonal justice and privacy in order to make such a system successful.

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