Pergamon

Computers in Human Behavior, Vol. 12, No. 3, pp. 407–423, 1996

0747-5632/96 $15.00 + 0.00

S0747-5632(96)00016-7

The Effects of Electronic Performance Monitoring on Stress: Locus of Control as a Moderator Variable

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Abstract — *In recent years, there has been a substantial increase in the number of companies using electronic performance monitoring (EPM) systems to evaluate their employees. Data from several case studies suggest that employees who are monitored using EPM experience more stress than employees who are monitored by other means. However, it is difficult to draw firm conclusions from this research, because organizations tend to introduce other programs at the same time as EPM systems are installed. Additionally, little existing research examines the role that employee characteristics play in determining EPM's impact. The current study represents an attempt to address these issues. Laboratory subjects worked on two relatively simple computerized tasks and were told either that their work would be monitored via a supervisory computer networked to their terminal, or that their work would not be observed. All other work climate variables were held constant. After completing the tasks, subjects' locus of control and perceived stress were measured. Locus of control was found to moderate the relationship between EPM and stress. Internals felt more stress when their work was electronically monitored. In contrast, externals felt more stress when their work*

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was not monitored. These findings are interpreted using a person–environment fit framework.

Managers have always monitored employees' performance in the workplace. They do this to ensure that work standards are met, to assess employee productivity, and to determine training needs. Most employees have learnt to expect that some portion of their work will be observed and evaluated. If they believe that monitoring increases the likelihood that they will be evaluated fairly, employees may even appreciate the fact that their supervisors are observing their work.

Recent technological advances provide companies with the ability to monitor employee performance more frequently and at a more microscopic level than was previously possible. Using computer networks and private branch exchanges, electronic performance monitoring (EPM) systems let managers 'tap into' their employees' computer terminals and telephones and obtain a continuous accounting of their moment-by-moment performance. These systems allow managers to determine, at any point in the workday, the pace at which individual employees are working and their level of accuracy, as well as the amount of time spent on nonproductive activities, such as bathroom breaks and personal telephone calls (Office of Technology Assessment, 1987).

Presently, approximately 10 million American workers are evaluated using measures derived from EPM systems, and that number is growing at a rapid rate (9to5, 1990). In fact, one study estimated that between 25 and 35% of all clerical workers in the USA are monitored electronically at work (Office of Technology Assessment, 1987).

Because of its increasing use, researchers have begun to examine the impact that EPM has in the workplace. Most of this research (Cahill & Landsbergis, 1989; Grant & Higgins, 1989) consists of case studies and surveys, in which the responses of employees working in organizations using EPM systems are compared with the responses of employees working in non-EPM environments. These studies tend to find that electronically monitored workers are more productive when they work on simple tasks (Chomiak, Aiello, & Kolb, 1993), less productive when they work on difficult tasks (Aiello & Svec, 1993), and experience lower job satisfaction and more stress than employees who are monitored in other ways (Grant & Higgins, 1989; Irving, Higgins, & Safayeni, 1986).

Unfortunately, it often is difficult to draw firm conclusions from this research, because organizations tend to introduce other programs, such as feedback and contingent reward systems, at the same time as EPM systems are installed. These concomitant practices make it difficult to determine when

differences in employee behavior can be attributed to EPM alone, and when they should be attributed to the management practices that accompany EPM (Aiello & Kolb, 1995; Goodman & Fenner, 1988).

Additionally, very little research has examined the degree to which employee characteristics moderate EPM's influence. This is problematic, because studies show that employees' locus of control (Abdel-Halim, 1980), growth needs (Hackman & Oldham, 1976), and other personal characteristics (Vecchio, 1981) influence their response to different supervisory practices. The study presented in this paper attempts to address this issue by examining the impact that locus of control has on people's response to EPM. Specifically, this study examined whether locus of control moderates the relationship between EPM and stress. The study was conducted in a simulated work setting, to limit the degree to which the work climate factors that tend to accompany EPM could confound results.

EPM AND STRESS

Research conducted in organizations shows that electronically monitored employees tend to experience more stress than employees working in non-EPM environments (Amick & Smith, 1992; 9to5, 1990; Rogers, Smith, & Sainfort, 1990). For example, one study compared the survey responses of 762 monitored and nonmonitored telecommunications workers, and found significantly higher levels of tension, anxiety, depression, anger, and fatigue among respondents working in EPM organizations (Smith, Carayon, Sanders, Lim, & LeGrande, 1992). Another study compared the survey responses of 50 electronically monitored clerical workers employed in the insurance industry to the responses of 94 nonmonitored workers who performed comparable jobs, and found that monitored workers reported feeling more stress (Irving et al., 1986). These results were replicated in a laboratory study (Aiello et al., 1991), in which electronically monitored subjects who received feedback about their performance reported feeling more anxious than nonmonitored subjects.

One factor that appears to mediate the relationship between EPM and stress is the loss of social support. A case study found that electronically monitored airline reservationists and directory assistance operators were reluctant to make even brief comments to their coworkers, because they feared that their momentary work break would be detected by the EPM system (Cahill & Landsbergis, 1989). Electronically monitored workers also have reported feeling that they have less contact with their coworkers and are 'lonelier' at work (Aiello, 1993). It appears that under conditions of continuous and unobtrusive observation, electronically monitored workers

restrict their interactions with one another, thus limiting their opportunities to receive social support (Aiello & Kolb, 1995; Amick & Smith, 1992). In turn, this lack of social support can increase feelings of stress (House, Landis, & Umberson, 1988).

Electronically monitored employees also may experience more stress because they perceive that they have less job-related autonomy than employees who are monitored by other means. Several studies (Irving et al., 1986; Rogers et al., 1990; Smith et al., 1992) have found that electronically monitored employees report having heavier work loads and less decision latitude than employees who work in non-EPM settings. Electronically monitored employees have indicated that they feel 'coerced' by the EPM system into working more rapidly. They also perceive that they can no longer set their own work pace, because even momentary deviations from preestablished standards are detected by the system (9to5, 1990). According to Karasek's Demands-Control Model (Karasek, 1979; Karasek & Theorell, 1990), employees who work in jobs characterized by high demands for productivity coupled with few opportunities to exercise control experience significantly more strain than people who work in high demand/high autonomy jobs. This suggests that electronically monitored employees may experience more stress because monitoring increases perceived demands for productivity while simultaneously decreasing perceived autonomy.

EPM, LOCUS OF CONTROL, AND STRESS

Very little attention has been devoted to examining how employee characteristics influence workers' responses to EPM. However, one study did find that low ability employees experienced more mood disturbance than high ability employees when both groups' work was electronically observed (Schleifer, Galinsky, & Pan, 1992).

Another employee characteristic that is likely to moderate EPM's impact is locus of control. Locus of control refers to the relatively stable beliefs people hold about their role in influencing events in their lives. People with an internal locus of control tend to believe that they are responsible for the outcomes they experience, whereas people with an external locus of control tend to believe that the outcomes they experience primarily are determined by fate, chance, or powerful others (Rotter, 1966). A number of studies have found that externals experience more work-related strain than internals (Denney & Frisch, 1981; Lefcourt, Miller, Ware, & Sherk, 1981). For example, one study found that managers with an external locus of control experienced significantly more tension at work than managers with an internal locus of control (Gemmill & Heisler, 1972). Another study found

that externals tend to use maladaptive coping strategies, such as avoidance, when they face problems, which may explain why they also tend to experience more stress (Anderson, 1977).

Consistent with these findings, Aiello and Svec (1993) demonstrated that when laboratory subjects were electronically monitored while working on a complex anagram solving task, externals experienced significantly more anxiety than internals. Moreover, when subjects were told that their work would not be monitored, externals experienced significantly less anxiety than internals. In other words, externals were most anxious when their work was monitored and internals were most anxious when their work was not monitored.

Although the findings of Aiello and Svec (1993) are consistent with the pattern of results presented in the general stress literature, research examining autonomy and locus of control suggest that a different outcome is possible. In her review of the relationship between control and stress, Folkman (1984) hypothesized that people feel most threatened in situations in which their desire for autonomy is not matched by perceived opportunities to exercise control. This suggests that people with an internal locus of control should feel more stress in situations that limit their autonomy and, in contrast, people with an external locus of control should feel more stress in situations that provide them with a substantial amount of autonomy. Because EPM is often perceived as limiting one's opportunities to exercise control in the workplace (Rogers et al., 1990; Smith et al., 1992), it follows that electronically monitored internals might feel more stress than electronically monitored externals, because of the mismatch that exists between internals' expectations about control and the restricted opportunities for control provided by the EPM environment. The study presented in this paper explores this possibility.

The study was conducted in a simulated work setting, in order to limit the impact that selection factors and different management practices have on employee behavior. Because task difficulty appears to moderate EPM's impact on productivity (Aiello & Kolb, 1995), a simple task was used in this study, in contrast to the complex task used by Aiello and Svec (1993), allowing us to explore whether task difficulty might also influence EPM's impact on stress. Some subjects were led to believe that their work on two relatively simple tasks would be electronically monitored while others were led to believe that their work could not be observed. Then, locus of control and perceived stress were measured.

Consistent with prior research (Amick & Smith, 1992; Rogers et al., 1990), it was expected that electronically monitored subjects would experience more stress than nonmonitored subjects. Additionally, consistent with the hypothesis that people feel most anxious in situations in which a mismatch

exists between their desire for control and the amount of control they perceive they can exercise, we predicted that locus of control would moderate the relationship between EPM and stress. Internals were expected to experience more stress when they were electronically monitored, whereas externals were expected to experience more stress when they were not monitored.

METHOD

Subjects

Subjects were 66 undergraduate students enrolled in an introductory psychology course at a large, northeastern university. They received partial course credit for their participation. Complete data was obtained from 63 of those who participated. Of these, 19 subjects were male, 38 were female, and 6 did not have their sex recorded. Most subjects had a moderate amount of experience working with computers prior to participating in the study.

Design

Subjects performed two relatively simple, computerized tasks: a numerical data entry task, and a vowel/consonant identification task. The presence or absence of EPM was manipulated so that some subjects believed that their performance on both tasks would be electronically monitored while others believed that their work would not be observed. Task order also was varied, with approximately half of the subjects working on the data entry task first and the remainder working on the vowel/consonant task first. After completion of the tasks, subjects completed a brief questionnaire that assessed their locus of control and perceived stress.

Tasks

In the data entry task, subjects keyed six-digit random numbers from a worksheet into a computer. In the vowel/consonant identification task, subjects specified whether random letters were vowels or consonants by keying appropriate codes into a computer. A computer program was designed to guide subjects through a session on one task, switch them back to the other task, switch them back to the first task again, and so on until each subject had completed three 8-min sessions of data entry and three 8-min sessions of vowel/consonant identification. The computer program recorded

the number of entries subjects attempted on each task, as well as the number of entries that they accurately keyed.

Measures

Locus of control was measured using the Locus of Control Scale developed by Rotter (1966). This scale consists of 23 pairs of statements and 6 filler items. In each statement pair, one statement expresses an internal viewpoint and the other expresses an external viewpoint. Respondents complete the scale by indicating, for each statement pair, which of the two statements they agree with most. Scores range from 0, indicating that no external statements were endorsed, to 23, indicating that all of the external statements were endorsed. Test–retest reliabilities for the scale are generally in the range from .49 to .83, when the intervening period is between 1 and 2 months long (Rotter, 1966), although reliability coefficients as high as .57 have been found when the intervening period was 1 year long (Layton, 1985). This suggests that Rotter's scale is stable, at least over relatively short spans of time.

Stress was assessed using 11 semantic differential-type questionnaire items developed specifically for this study (Appendix A). In this questionnaire, subjects were asked, "When you were working on the data entry (vowel/consonant) task, how did you feel? 1 = not distressed, 7 = distressed." Similar items assessed the degree to which subjects felt stressed, aroused, and disturbed. Stress scores were obtained by adding together subjects' responses to each item, after 6 items were reverse-scored. Therefore, subjects could obtain a stress score as low as 11, indicating that they did not feel any stress, or as high as 77, indicating that they felt a great deal of stress.

Subjects also completed a brief manipulation check questionnaire which asked them to indicate whether their performance on the data entry and vowel/consonant tasks were monitored by their supervisor. In this same questionnaire, subjects also indicated the amount of experience that they had working with computers prior to this study.

Procedure

Subjects reported in small groups to a personal computer laboratory where the experiment was conducted. The computer laboratory was equipped with 35 IBM personal computers arranged in five rows. One computer in the fifth row, the 'supervisory computer', was surrounded by manuals and other official-looking materials that distinguished it from the other computers in the laboratory.

Two experimenters participated in each session of the study. One assumed the 'experimenter' role, and the second assumed the 'supervisor' role. The experimenter greeted the subjects upon their arrival, and assigned them seats in the first three rows of the laboratory.

After the experimenter obtained the signed consent of each participant, the supervisor instructed subjects on how to perform the first task (either the data entry or the vowel/consonant task, depending on the task order being used in the experimental session). Subjects practiced this task for 4 min. The supervisor then instructed subjects on how to perform the second task, after which subjects practiced that task for 4 min.

Upon completion of the two practice sessions, the experimenter explained that the purpose of this study was to explore how people interact with computers when information is presented to them in different formats. The supervisor indicated that she would act as their supervisor during this study, while the experimenter would help administer the experiment, collect necessary forms, etc.

The supervisor then initiated the monitoring manipulation. In the nonmonitoring condition, the supervisor informed subjects that she was busy with other work and could not monitor their performance on either the data entry or the vowel/consonant task. Subjects were instructed to follow the directions that displayed on their computer screens for the rest of the experiment. The supervisor then left the laboratory until subjects had completed the six work sessions.

In the monitoring condition, the supervisor told subjects that their computers were networked to the supervisory computer at the rear of the laboratory. Subjects were informed that through the supervisory computer, their performance on both the data entry and the vowel/consonant tasks would be observed. Furthermore, subjects were told that they were being informed about the monitoring because the university "human subjects committee required that in any monitoring situation, like when work is being monitored by computer, students must be notified that monitoring is taking place. Therefore, they should consider themselves informed about the monitoring that was about to take place." Subjects were instructed to follow the directions that appeared on their computer screens for the rest of the experiment. The supervisor sat at the supervisory computer and appeared to monitor the subjects while they worked.

The experimenter remained in the laboratory throughout the study; however, subjects were told that he/she was occupied with other work and could not monitor their performance. To reduce the possibility that subjects would perceive that the experimenter was 'supervising' their work, the

experimenter was trained to avoid appearing as though observing subjects and read a book during each session of the experiment.

At the conclusion of the experiment, subjects completed the stress questionnaire, the locus of control scale, and the manipulation check questionnaire. Then, they were thoroughly debriefed.

RESULTS

All subjects responded correctly to the questionnaire item that asked them to indicate whether their work was monitored by their supervisor during the experiment. Subjects assigned to the monitoring condition indicated that their work was monitored, whereas subjects assigned to the nonmonitoring condition indicated that their work was not monitored.

The postexperimental questionnaire also contained two items that asked subjects to indicate the degree of experience they had entering information into a computer and working with a computer or computer terminal prior to this study. As a group, subjects indicated that they had a moderate amount of prior experience entering information into a computer (M = 4.40, where 1 = "no experience" and 7 = "a lot of experience") and working with computers (M = 5.11). Thus, although the subjects did not consider themselves to be computer experts, their experience of working with computers was comparable with that of many clerical employees. No significant difference was detected between subjects assigned to the monitoring and nonmonitoring conditions, with respect to prior experience entering information into a computer, $F(1, 61) = 1.12$, $p > .10$, and prior experience working with computers, $F(1, 61) = .85$, $p > .10$.

A stress score was created for each subject by summing together responses on the 11 questionnaire items that measured perceived stress, after 6 items were reverse-scored (Cronbach's alpha = .86). Mean performance, locus of control, and stress scores are reported in Table 1. This table shows that monitoring did not have any influence on the number of entries subjects attempted to key, $F(1, 61) = 0.00$, $p > .10$ or keyed correctly, $F(1, 61) = 0.01$, $p > .10$. None the less, subjects who were monitored obtained higher locus of control scores (i.e., they were more external) than subjects who were not monitored, $F(1, 61) = 4.77$, $p < .05$, despite the fact that subjects were randomly assigned to the two test conditions.

Following procedures specified by Cohen and Cohen (1975) for detecting the presence of an interaction, hypotheses regarding the influence of EPM on stress were tested using hierarchical regression (Table 2). In one equation, stress scores were regressed on locus of control and a dummy variable

Table 1. Mean Performance, Locus of Control and Stress Scores

	Monitoring Condition		
	Nonmonitored	Monitored	Total
Entries attempted			
M	602.20	602.27	602.24
SD	149.14	163.52	155.58
Entries correct			
M	566.10	563.12	564.54
SD	151.21	152.78	150.81
Locus of control*			
M	10.26	12.42	11.40
SD	3.83	3.99	4.03
Stress			
M	36.83	35.00	35.87
SD	12.99	12.99	12.92
N	30	33	63

Note. The following ranges of scores were obtained: entries attempted, 232–1042; entries correct, 198–959; locus of control; 1–20; stress, 12–69.
*$p < .05$.

Table 2. Stress as a Function of Locus of Control and Monitoring Condition

Independent Variable	*b*	*t*	R^2	*F*
Main effects model			<.01	.15
Intercept	37.07	5.00		
Locus of control (A)	−.02	.43		
Monitoring condition (B)	−1.78	.52		
Interaction model			.16	3.83*
Intercept	22.24	3.46		
Locus of control (A)	1.42	2.42		
Monitoring condition (B)	28.03	2.95		
A × B	−2.65	3.33*		

*$p < .05$.

representing monitoring condition. In a second equation, the multiplicative term, locus of control × monitoring condition, was added to the list of predictor variables included in the first equation.

As can be seen in Table 2, these analyses revealed that neither monitoring condition nor locus of control had any effect on the amount of stress subjects experienced during the experiment. R^2 for the model containing the main effects terms was less than .01, $p > .10$. Contrary to expectations, monitored subjects did not report feeling any more stress than subjects who were not monitored. Similarly, subjects with an external locus of control did not experience more stress than subjects with an internal locus of control.

None the less, perceived stress was affected by the interaction of locus of control and monitoring condition, $F(3, 59) = 3.83$, $p < .05$. To investigate the form of this interaction, the sample was divided into internals and externals based on subjects' median locus of control score. Then, mean stress scores for the nonmonitored internals and externals were plotted agains mean stress scores for the monitored internals and externals (Figure 1). This figure shows that, as predicted, subjects with an internal locus of control experienced more stress when their work was electronically monitored and

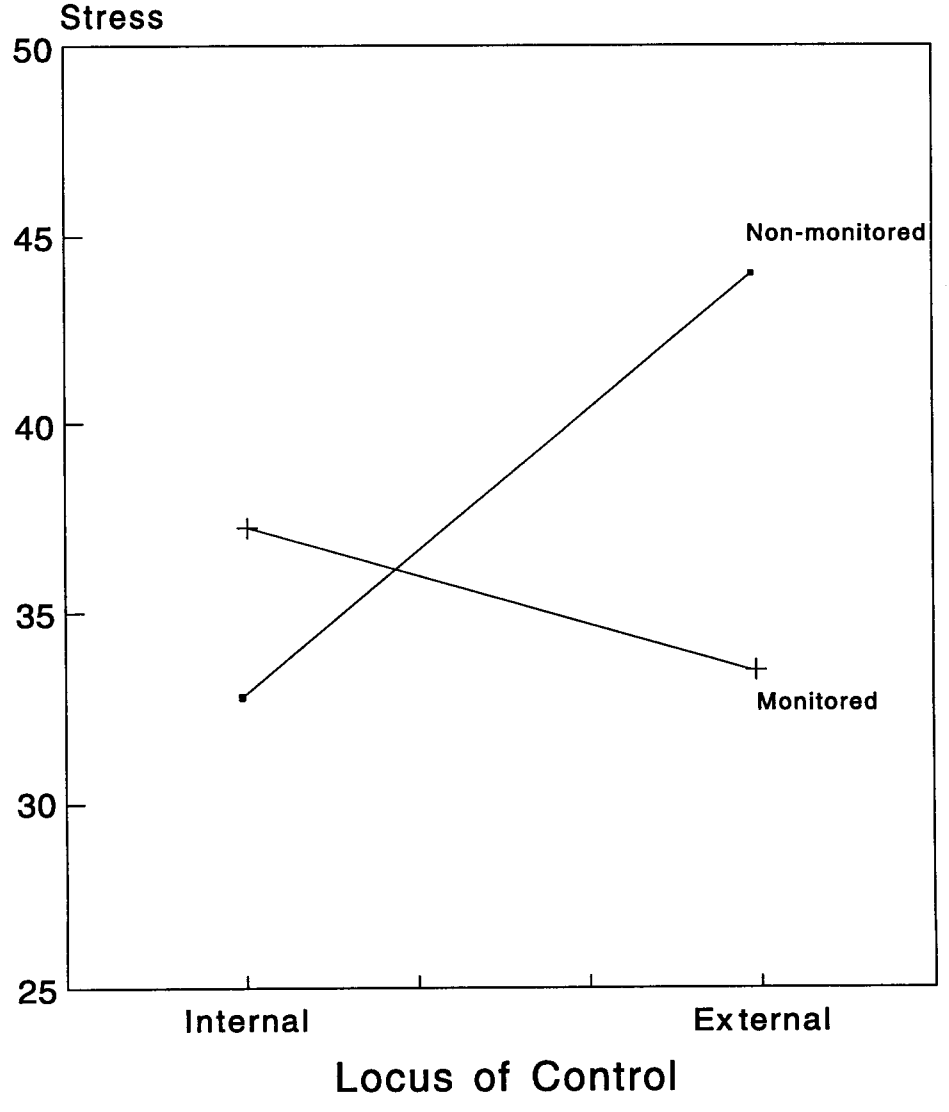

Figure 1. Interaction of locus of control and monitoring condition.

less stress when their work was not monitored. Subjects with an external locus of control displayed the opposite pattern of results. That is, externals reported experiencing more stress when they were not monitored and less stress when they were monitored.

Because prior research has found that low ability employees tend to experience more stress than high ability employees when they are monitored (Schleifer et al., 1992), the impact that task performance had on stress was also assessed. To do this, the total number of entries subjects attempted to key on the data entry and vowel/consonant tasks was added as a predictor variable to the regression equations specified earlier. In a separate set of analyses, the total number of entries subjects keyed correctly was included as a predictor variable. Neither measure of task performance emerged as a significant predictor of stress, for both beta coefficients $p > .10$.

DISCUSSION

Several studies (Amick & Smith, 1992; Rogers et al., 1990) have found that electronically monitored workers experience more stress than employees who are monitored by other means. Unfortunately, most of this research has not explored the role that employee characteristics play in determining the impact of EPM. The current study attempted to address this issue by examining whether the relationship between EPM and stress is moderated by employees' locus of control. As predicted, people with an internal locus of control experienced more stress when their work on two simple tasks was monitored, and less stress when their work was not monitored. In contrast, externals experienced less stress when their work was electronically monitored than when their work was not observed. Contrary to expectations, monitored subjects did not experience any more stress than nonmonitored subjects.

These findings are consistent with the view that stress in the workplace is determined, at least in part, by a lack of fit between employees' needs and expectations and opportunities provided in the workplace to satisfy those needs (Harrison, 1978). In the present study, it is quite likely that subjects with an internal locus of control expected to exercise a certain amount of autonomy over their work and felt threatened when opportunities for autonomy were restricted by EPM. On the other hand, subjects with an external locus of control may have experienced stress when they were provided with more autonomy than they wanted (i.e., when they were not monitored) and actually may have felt more comfortable with the limitations that EPM imposed.

This pattern of results also suggests that people who are electronically monitored at work will not invariably experience more stress than people who are not monitored, and that people with an external locus of control will not inevitably experience more stress than people with an internal locus of control. In the present study, electronically monitored subjects did not report feeling more stress than nonmonitored subjects. Likewise, externals did not report feeling more stress than internals. These findings are also consistent with the position that stress arises when a mismatch exists between opportunities provided by the environment to exercise autonomy (which may be restricted by EPM) and people's autonomy expectations (as measured by their locus of control).

None the less, the results of the current study contrast with those found in an earlier laboratory experiment. When Aiello and Svec (1993) examined laboratory subjects working on a complex anagram solving task, they found that subjects with an external locus of control felt more stress when their work was electronically monitored and that internals felt more stress when their work was not monitored. The present study found the opposite pattern of results, despite the fact that many of the procedures used by Aiello and Svec were replicated here. In the present study, subjects worked on two relatively simple tasks (data entry and vowel/consonant identification), whereas in Aiello and Svec's study, subjects worked on one relatively complex task (solving difficult anagrams). This suggests that task difficulty may moderate the relationship between EPM, locus of control, and stress. That is, it may be that externals experience more stress than internals when work on complex tasks is electronically monitored, whereas internals may experience more stress than externals when work on simple tasks is electronically observed.

In a field study that examined the relationship between job-related autonomy, locus of control, and stress, task difficulty also emerged as an important moderator (Parkes, 1991). In this study, civil servants and teachers who had an external locus of control and who worked under conditions of low demand for productivity (i.e., the work was easy) felt more anxious when they were provided with significant opportunities to exercise autonomy, and less anxious when opportunities to exercise control were restricted. However, this same pattern of results was not obtained when the subjects worked in jobs characterized by high demands for productivity (i.e., when the work was difficult). Parkes explained that externals may have experienced strain because of the mismatch that existed between their expectations and need for structure and the amount of structure provided by the low demand/high autonomy work environment.

This suggests that externals may be quite comfortable when they work on easy tasks that are monitored, because monitoring provides them with the

sense of structure that they enjoy. In contrast, internals may experience stress under these conditions, because they consider the structure imposed by monitoring to be an annoying intrusion. In addition, externals may experience stress when they work on complex tasks that are monitored, because the chances of failing on the complex task are higher, and monitoring increases the possibility that their work will be evaluated negatively. Internals may feel more comfortable in these conditions, because they can draw upon their personal resources to cope with the impending evaluation. More research needs to be conducted to examine this possibility.

LIMITATIONS AND IMPLICATIONS

In the present study, monitored subjects were more likely to have an external locus of control than nonmonitored subjects, despite the fact that subjects were randomly assigned to the two test conditions. This may represent a sampling anomaly, or may suggest the operation of a more significant phenomenon. For example, in the current study locus of control was measured after subjects were exposed to EPM, providing an opportunity for monitoring to influence locus of control. Several studies (Berger & Koocher, 1972; Davidson & Bailey, 1978) have shown that locus of control can be experimentally manipulated, suggesting that this relatively stable personality trait may also have a state component. According to this view, on any given day, a person's locus of control may vary depending on the immediate environment and the person's perception of it. Thus, it is possible that exposing subjects to EPM caused them to become, at least temporarily, more external, limiting the extent to which conclusions can be drawn from the current study. Of course, other research has found that locus of control is a relatively stable personality dimension that can be changed only through intensive intervention or significant life events (Diamond & Shapiro, 1973; Layton, 1985). This suggests that, in the current study, monitored subjects may have been more external simply because of an anomaly that might not have occurred if a larger sample was used.

If monitoring did cause subjects in the current study to become more externally oriented, this has some disturbing implications for employees in the workplace. That is, employees who are continuously exposed to EPM may, over time, begin to feel that they have less control over the outcomes they experience at work, at least when monitoring is implemented as it was in the current study (i.e., in the absence of a contingent reward system). Other research has shown that when employees work in jobs that provide them with little decision latitude, they are socialized into a state of learned helplessness and passivity (Karasek & Theorell, 1990). In fact, one recent field study

(Landsbergis, Schnall, Deitz, Friedman, & Pickering, 1992) found that employees who worked in low autonomy jobs were more likely to have an external locus of control than employees who worked in high autonomy jobs, although selection factors could have contributed to these results. The implication is that, over time, EPM may cause employees to develop a more external locus of control. This is disturbing because externals also tend to experience more job-related strain than internals (Denney & Frisch, 1981; Lefcourt et al., 1981).

Of course, interpreting the results of this study is limited by the fact that the study was conducted in a laboratory with college students who were exposed to EPM for only a short period of time. In the workplace, employees understand that the products of EPM often are used to determine their future employment prospects with their company. Therefore, the motivation of monitored employees certainly differs from the motivation of monitored college students. Had the current study been conducted in the field, support may have been found for the hypothesis that monitored subjects, regardless of locus of control, would experience more stress than nonmonitored subjects (Smith et al., 1992). Likewise, a field study may have determined that, over time, even externals feel stressed by the constant surveillance that EPM imposes.

The current study suggests that employers should consider that employees may respond differently to EPM depending on their individual beliefs about control. When tasks are routine and relatively simple, employees with an internal locus of control may respond more negatively to EPM than externals because it violates their expectations about and desire for autonomy in the workplace. Longitudinal research conducted in field settings certainly is needed to provide us with more information about the impact that EPM has on stress in the workplace.

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APPENDIX A

Stress Questionnaire Items

What degree of stress did you experience while working on the data entry tasks during the study?

no stress	1	2	3	4	5	6	7	a great deal of stress

What degree of stress did you experience while working on the vowel/consonant tasks during the study?

no stress	1	2	3	4	5	6	7	a great deal of stress

How would you describe the climate/atmosphere for working on tasks in this study?

not frustrating	1	2	3	4	5	6	7	frustrating

When you were working on the data entry task, how did you feel?

stressed	1	2	3	4	5	6	7	not stressed
aroused	1	2	3	4	5	6	7	not aroused
distressed	1	2	3	4	5	6	7	not distressed
undisturbed	1	2	3	4	5	6	7	disturbed

When you were working on the vowel/consonant task, how did you feel?

stressed	1	2	3	4	5	6	7	not stressed
aroused	1	2	3	4	5	6	7	not aroused
distressed	1	2	3	4	5	6	7	not distressed
undisturbed	1	2	3	4	5	6	7	disturbed