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ELECTRONIC PERFORMANCE MONITORING AND MOTIVATION: A BEHAVIORAL MODIFICATION PERSPECTIVE

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The increasing use of electronic monitoring has resulted in considerable debate among the public, labor groups, business groups, and increasingly among academicians. However, electronic monitoring research to date has been lacking and contradictory. This paper applies organizational behavior modification theories to argue that, when properly implemented, electronic monitoring can be an effective motivational tool. Organizational decisions regarding purpose and disclosure of monitoring, feedback source and monitoring-related standards are theorized to affect the relationship between monitoring and employee motivation.

Introduction

An organizational control system has been defined as a set of mechanisms designed to increase the probability that people will behave in ways that lead to the attainment of organizational objectives (Flamholtz, 1979, p. 51). Edwards (1979) argues control systems are essential because the relationship between workers' interests and those of their employing organizations are often contradictory and conflict results. Such conflict is frequently evidenced in the form of worker resistance and less than maximum effort. To eliminate this potential conflict, employers feel compelled to motivate their workers through systems of control

Several theorists have modeled the process of organizational control. Tompkins and Cheney's (1985) double interact of control conceptualizes control as a three step process. First, a supervisor gives orders to a subordinate. Next, the subordinate complies or fails to comply with the order and is monitored. Finally, the superior assesses the subordinate's behavior and performance and distributes rewards or punishment accordingly. Similarly, Flamholtz (1979) contends that there are four basic components of organizational control systems. These include goals for performance, standards of performance, a method of measurement for monitoring performance, and a method of administering rewards. These conceptualizations of organizational control are clearly similar in that each has as its central purpose motivating workers towards organizationally desirable behavior through monitoring and reinforcing appropriate behavior.

In view of the importance of organizational control and the central role monitoring plays in control, it is not surprising that organizations have always monitored their members (Alder & Ambrose, 2005b). It is also not surprising that, concurrent with society's transition to the information age, an extensive number of organizations have turned to electronic technology to enhance monitoring

efforts. Recent estimates indicate that as many as 75% of large companies electronically monitor their employees (American Management Association, 2000) and at least 40 million US workers may be subject to electronic monitoring (Alder & Ambrose, 2005a). The increasing use of electronic performance monitoring (EPM) has resulted in considerable debate among labor unions, politicians, business groups, and the public (Hays, 1999; Kovach et al., 2000). Supporters of EPM argue that it is a valuable tool that can help increase productivity, improve quality and service, and reduce costs. In contrast, critics of the practice contend that it may prove detrimental to both organizations and their employees. They argue that EPM diminishes productivity and quality. Critics further contend that EPM invades consumer and employee privacy, decreases job satisfaction, increases stress, and engenders work environments characterized by diminished trust and negative work relationships. As a result, EPM is often referred to with descriptors like "Big Brother," "electronic sweatshops," and "electronic whips". Parenti (2001) refers to the use of EPM as, "A new digital Taylorism, where every motion is watched, studied and controlled by and for the boss."

Both sides of this debate have research support to back their case. On the one hand, case studies and anecdotal accounts suggest that a number pf companies have realized enhanced productivity and quality as a result of EPM (Bylinsky, 1991; Gerdelman, 1993). Early EPM research similarly suggests a link between EPM and productivity (Griffeth, 1993; Nebeker & Tatum, 1993). Nebeker and Tatum (1993) separated database operators into six groups working under different levels of performance standards. Results indicated that workers who were aware that their performance was being recorded and were given performance feedback were more productive than workers who were either not monitored or were unaware of being monitored. In a follow up study, Nebeker and Tatum (1993) found that changes in satisfaction and stress occurred when financial rewards were made contingent on above standard

performance. Specifically, the most positive outcomes resulted when rewards were offered in conjunction with easy standards. Explaining the results based on expectancy theory, Nebeker and Tatum conclude that, "with proper design (moderately high standards when no rewards are offered, and easy standards when rewards are offered) it should be possible to gain the benefits of increased productivity, increased satisfaction, and reduced stress all at the same time" (1993: 534).

Although there is evidence that EPM may potentially benefit organizations, there is also evidence that EPM may have a dark side that negatively impacts organizational effectiveness and individual employees. Grant, Higgins, and Irving (1988) found that monitoring has the potential to degrade the quality of the product offered to the customer and the overall work environment. Using social facilitation theory, Aiello and Svec (1993) hypothesized that subjects would perform a complex task more poorly when monitored either in person or electronically than when working alone without monitoring. They found that task performance was severely impaired for participants who were monitored electronically as well as for those who were monitored in person. Based on their results, Aiello and Svec recommend that computer monitoring not be used on complex tasks because constant watching reduces performance.

In addition to research that focuses on the organizational outcomes of EPM, several studies indicate undesirable effects of EPM on employees. This research indicates that EPM may negatively affect job satisfaction and positively affect worker stress (Aiello, 1993; Irving, Higgins, & Safayeni, 1986). Aiello (1993) interviewed monitored and nonmonitored workers in two large insurance companies. He found that monitored workers were not as satisfied with their jobs as they had been prior to monitoring and experienced a greater number of physical and psychological problems such as headaches, eyestrain, anxiety, depression, and irritability. Smith et al. (1992) similarly found that monitored workers reported higher levels of job boredom, tension, anxiety, depression, anger, and fatigue than did workers who were not monitored.

In contrast to the popular discussion of EPM and the approach taken by early EPM research, more recent research recognizes that EPM technology itself is neutral. According to this perspective, it is how the system is designed, implemented, and used that affects employee reactions to the system (Ambrose & Alder, 2000; Stanton, 2000). To date, the majority of this research has focused on the relationship between monitoring system characteristics and employees perceptions of privacy invasion, fairness, and satisfaction. For example, Alge (2001) found that monitoring job-relevant activities and affording those who

were monitored input into the process (participation) reduced invasion of privacy and enhanced procedural justice. Alder and Ambrose (2005a) similarly found that the feedback individuals received in connection with monitoring influenced their perceptions of fairness. Although privacy and perceptions of fairness are important, the effect of specific monitoring system characteristics on additional outcomes is needed. One such outcome is worker motivation.

There is reason to think EPM may have a detrimental effect on worker motivation. For example, research suggests that Taylorism may lead to job dissatisfaction, increased stress, and reduction in employees' sense of accomplishment and motivation (Parker, 2003; Melin et al., 1999). Thus, to the extent that EPM is a "new Taylorism", it may be expected to similarly diminish employee motivation. On the other hand, there is evidence that employees may respond positively or negatively to EPM depending on how it is implemented. As such, the effect of EPM on motivation likely depends on how it is utilized.

Although it may be inferred that EPM has an impact on worker motivation, no research has directly examined this relationship. As a result, the nature of the relationship between EPM and motivation is not clear. Given the concerns raised by critics of EPM regarding the potentially detrimental impact of EPM on worker performance, the lack of research on the effect of EPM on motivation is an important gap in the literature. Clearly, one avenue through which EPM may influence worker productivity is through its effect on motivation. This paper begins to fill that gap in the EPM literature by examining the potential impact of EPM on motivation. Building on recent monitoring research, rather than argue that EPM, in and of itself, either increases or decreases motivation, this paper argues that the manner in which EPM technology is implemented will lead to differential levels of employee motivation. I make this argument by applying behavioral modification theory to EPM.

Organizational Behavioral Modification

According to behaviorist theories of motivation, individuals' future behavior is determined by past behaviors that have been positively reinforced. For example, operant conditioning theory maintains that two events, antecedents that occur before behavior and consequences (reinforcers) that occur after behavior, largely determine voluntary behavior (Komaki, Zlotnick, & Jensen, 1986). Organizational Behavior Modification (OBM) is an organizational intervention tactic based on behaviorist theory that aims to replace inappropriate worker behavior with more appropriate behavior. The main tactic employed

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to sustain appropriate behavior is to provide clear consequences in the presence of specific antecedents (Weiss, 1991). Behavioral antecedents are discriminative stimuli that set the occasion for a behavior-consequence relationship by providing a signal as to whether the behavior will be followed by consequences (Weiss, 1991). Although a wide variety of elements may serve as behavioral antecedents, among the more frequently examined antecedents are written and verbal instructions, standards and appropriate training (Komaki, Collins, & Penn, 1982).

Behaviorist research pays a great deal more attention to the role of consequences in behavior than it has to the role of antecedents. Komaki, Collins, and Penn explain that, "the principle that behavior is a function of its consequences provides the key to understanding why persons behave the way they do and is the cornerstone of behavioral programs designed to improve performance in the workplace" (1982: 334). Scott and Podsakoff similarly describe the importance of performance consequences: "If in a given setting, an operant of a given topography is followed by a stimulus consequence identified as a positive reinforcer, there will be an increase in the probability that operants of that topography will occur again in that setting" (1985, p. 39). As with antecedents, behavioral consequences may take any of several forms including recognition, praise, money, promotions, and feedback (Flamholtz, 1979).

OBM techniques have been demonstrated to be an effective intervention in a wide variety of areas including absenteeism, safety, lateness, production, and performance (Weiss, 1991). Stajkovic and Luthans' (1997) meta-analysis of over 20 years of empirical research on the effectiveness of OBM interventions indicates a 17 percent average increase in performance. Moreover, Stajkovic and Luthans (2001) compared the performance effects of money administered through the OBM model to the performance effects of routine pay for performance in a field experiment. Results indicate that the money intervention based on OBM led to a performance increase of 37% whereas routine pay for performance increased performance by only 11%.

The work of Komaki and colleagues provides several examples of successful OBM interventions in the area of employee health and safety. Using an intervention consisting of both antecedents (a safety slide show) and consequences (feedback and verbal recognition), Komaki, Barwick, and Scott (1978) et al. increased the frequency of recorded safe behaviors by 37 percent in one department and by 28 percent in a second department. Komaki, Collins, and Penn (1982) similarly investigated the impact of performance antecedents and consequences on the safety performance of employees in a poultry processing plant.

This study consisted of three sequential phases: baseline, antecedent, and performance consequence. Results indicated safety improvements in only two of the four departments in the antecedent alone phase. However, with feedback, employees improved their performance over their initial levels and any improvements that had occurred during the previous phase. Komaki et al. conclude that performance consequences such as feedback play a critical role in work motivation and that antecedents alone may not be effective in all cases.

Several researchers have described the role that behavioral theories play in effective leadership. For example, Scott and Podsakoff (1985) argue that effective selection and training guarantee that employees already possess the skills and abilities necessary to successfully perform their roles. Therefore, the leader's role is to bring behavior under the control of appropriate stimuli. This consists of three tasks: 1) Role specification in which relevant operants are determined; 2) providing discriminative stimuli for performance in the form of verbal instructions and training; and 3) determining what consequences they have control over in order to sustain evoked behavior. Komaki and associates (1986; Komaki, Deselles, & Bowman, 1989; Komaki et al., 1986) have likewise associated behavior-based theories with effective leadership. These studies have strongly emphasized the connection between effective leadership and monitoring and will be discussed in the following section.

Although behavioral theory has its origins in learning theory, it is often extended to motivation. Weiss defends this application of the theory by arguing that, "much of what is categorized as organizational behavior modification, although derived directly from research in animal learning, has to do with motivation, since the effect of organizational behavior modification procedures is primarily disinhibitory or inhibitory" (Weiss, 1991: 173). Clearly, in many interventions, new behaviors are not learned. Instead, different feedback patterns affect the display of already learned behaviors. In addition to these theoretical arguments, empirical investigations have repeatedly demonstrated that performance consequences, such as feedback, may enhance motivation (Kanfer, 1991).

EPM and Behavioral Modification

EPM is, "the computerized collection, storage, analysis, and reporting of information about employees' productive activities" (U.S. Congress, Office of Technology Assessment, 1987: 27). EPM provides employers with the capability to perform a wide range of monitoring activities from counting the number of calls a worker receives or the rate at which data are input into a computer to the

observation of every move workers make without them being aware they are being observed EPM technology also enables supervisory monitoring to be constant, unblinking and pervasive (Alder & Ambrose, 2005b). Although no work has been done on EPM from an operant perspective, Komaki and colleagues (1986; Komaki et al., 1989; Komaki et al., 1986) used operant theory to argue that highly successful managers would monitor worker performance more frequently than less successful managers.

Based on the theory of operant conditioning, Komaki, Zlotnick, & Jensen (1986) developed Operant Supervisory Taxonomy and Index (OSTI) which consists of seven categories of supervisory behavior: performance consequences, performance monitors, performance antecedents, own performance, work related, nonwork related, and solitary. They define performance antecedents as providing instructions about performance, performance monitors as collecting performance information, and performance consequences as indicating knowledge of performance. They further argue that performance monitors are necessary because accurate information about performance is essential to the providing of contingent consequences. Komaki et al. (1986) report the results of two field studies that confirm the OSTI's reliability and feasibility as well as its sensitivity to behavior differences.

Komaki (1986) subsequently used the OSTI to assess behavioral differences among effective and marginal supervisors in a large medical insurance firm. She found that although there was no difference in the amount of performance antecedents and consequences provided by effective and ineffective managers, effective managers spent significantly more time monitoring performance than ineffective managers. Komaki (1986) concludes that monitoring enabled managers to obtain fair and accurate information and, as a result, provide contingent consequences. This suggests that contingency of consequences may be a more important ingredient to effective supervision than quantity or amount of consequences.

Komaki, Deselles, and Bowman (1989) utilized the OSTI to investigate the activities of sailboat leaders during racing competitions. Based on previous research (Komaki, 1986), Komaki et al. (1989) ignored performance antecedents and hypothesized that team leader effectiveness would be positively related to the frequency with which they provided performance consequences and monitors. They found that leaders who collected performance information or gave feedback during races were more likely to be successful in leading teams to victory). Komaki et al. (1989) conclude that, "leaders should gather information about how team members are performing and feed back

that information" (1986: 528). In sum, Komaki's research indicates that monitoring may be an effective tool for improving worker performance because it gives managers additional information that may enhance their ability to provide contingent consequences. However, this research also leaves several areas in need of further investigation.

First, Komaki operationalizes antecedents solely in terms of instructions. However, antecedents are discriminative stimuli, and Komaki et al. do not assess the relationship between the antecedents (instructions) and reinforcement (Weiss, 1991). In addition, Komaki does not discuss the stimulating impact of antecedents or the possibility that monitoring itself may serve as an antecedent. Weiss (1991) argues that the failure to adequately operationalize antecedents as discriminative stimuli may largely explain why the frequency at which leaders provide antecedents did not distinguish effective from ineffective leadership. Second, this research treats monitoring outcomes as dichotomous. The correlation between effective supervisors and the amount of time spent monitoring leads to the conclusion that monitoring improves performance. This approach fails to recognize any potential interaction or moderator affects and fails to acknowledge conflicting evidence concerning the potential dark side of monitoring (Niehoff & Moorman, 1993). Third, the research provides no discussion of the impact of EPM or how it may differ from other forms of monitoring. Finally, the research does not assess the impact of monitoring on motivation. The remainder of this paper will address these gaps beginning with an examination of the role of EPM as a behavioral antecedent.

EPM as a Behavioral Antecedent

Behavioral antecedents are discriminative stimuli that draw workers' attention to desired operants and signal to them that behavior will be followed by consequences. Instructions, training, and standards are the most frequently considered antecedents (Komaki et al., 1982) because they inform workers of assigned tasks and frequently indicate what consequences might follow from either compliance or lack of compliance to orders. Komaki and associates (1986; Komaki et al., 1986) classify performance antecedents and monitoring performance as two separate leadership behaviors. However, performance monitoring may also serve as an antecedent if it calls workers' attention to desired behaviors and indicates potential consequences.

Flamholtz (1979) argues that performance measurement has a dual aspect in organizational control systems. One aspect consists of using the numbers to monitor the extent to which performance has resulted in the achievement of organizational goals. The purpose of this

aspect is to provide corrective feedback and to evaluate performance. The second aspect of measurement concerns the act of measurement itself. The very fact that something is measured may influences behavior because, "there is a tendency for greater attention to be focused upon the measured dimensions of a job or measurable goals than on unmeasured factors" (Flamholtz, 1979: 54). Although traditional antecedents (e.g., instructions) also call workers' attention to the desired behavior, they may have less of a stimulating impact than monitoring because monitoring also signals the fact that performance is being measured or observed and will have consequences.

Larson and Callahan's (1990) research supports the idea that monitoring may serve as an antecedent to behavior and motivation. Drawing on social information processing, they argue that monitoring serves as a behavioral cue by shaping that individual's beliefs about the relative importance of his or her various work activities. They further hypothesize that monitoring signals whether or not the subordinate can expect to be rewarded or punished for performing well or poorly on a given task. Consistent with their expectations, Larson and Callahan (1990) found that the amount of work completed on tasks increased significantly when performance on those tasks was monitored compared to when it was not monitored and this effect was moderated by the tasks' perceived importance. In sum, monitoring may increase workers' awareness of the importance of desired behaviors and likelihood of contingent consequences and thereby serve as an effective behavioral antecedent. Additionally, EPM enables monitoring at any given moment or on a continuous basis (Alder & Ambrose, 2005b). As a result, EPM may be a more effective antecedent than other forms of monitoring. This rationale suggests proposition 1: Disclosed EPM will be associated with higher levels of motivation than will traditional supervisory monitoring or conditions where performance is not monitored when the effects of monitoring-related consequences and moderators are controlled for.

EPM and Behavioral Consequences

Consequences of prior behavior are a primary determinant of current behavior. Nebeker and Tatum indicate that, "results from goal setting and incentives have repeatedly shown that observing the performance of workers and providing feedback to them leads to impressive productivity increases. These gains are typically between 10% and 40% in a wide variety of work situations and we can predict that CM [computer monitoring] is likely to produce equivalent gains" (1993: 510). In this section, I argue that EPM may be used to increase the effectiveness

of behavioral consequences. Thus, Nebeker and Tatum (1993) may have understated the potential impact of EPM.

Behavioral research indicates that two elements are essential for consequences to effectively reinforce desired behavior. First, they must be based on accurate, objective measurements of performance (Weiss, 1991). Second, they must be contingent on performance. Komaki, Zlotnick, and Jensen (1986) claim that, "hundreds of experimental studies...have shown substantial improvements in performance when desired performance was clarified and when contingent, frequent consequences were provided."

EPM may be used to satisfy these criteria in several ways. First, EPM systems permit the collection of vast amounts of quantitative, objective data on employee performance that could not be obtained using traditional monitoring methods. Second, EPM may be used to increase the accuracy of performance measurements. For example, Fenner, Lerch, and Kulik (1993) found that computerized monitoring increases evaluation accuracy by permitting supervisors to devise information search strategies best suited to the appraisal and by reducing the occurrence of memory-related biases. Third, EPM enables organizations to provide contingent consequences by more closely linking rewards to performance (Irving, Higgins, & Safayeni, 1986). Fourth, EPM can facilitate feedback efforts (Alder & Ambrose, 2005b).

This is crucial because research demonstrates that extrinsic consequences (such as rewards and money) are insufficient motivators without accompanying intrinsic consequences such as feedback and recognition (Kanfer, 1991). Research indicates that two key components of effective feedback are immediacy and continuity. In general, shorter time periods between behaviors and feedback produce better results. Similarly, continuity is essential to overcome the problem of extinction often associated with behavioral interventions (Komaki, Barwick, & Scott's, 1978). EPM techniques facilitate the provision of more immediate feedback. Angel (1989) describes how EPM may be used to provide continuous and immediate reinforcement as well as to make feedback more meaningful. He points out that, "The summary reports produced by electronic monitoring techniques can provide immediate feedback that employees can use to modify their behavior. They can use the printouts to determine whether their responses are congruent with the predefined, desired responses" (1989: 68). Angel further argues that EPM may make feedback more meaningful and effective because the data can be presented in graphic as well as numeric form and workers can be given a visual device that more clearly links responses and behaviors.

Thus, EPM may improve the effectiveness of behavioral consequences in several ways leading to

proposition 2: EPM will be associated with higher levels of worker motivation that is sustainable over a longer period of time than will traditional supervisory monitoring or conditions where performance is not monitored when antecedent and moderators are controlled for.

Moderators

The previous section suggests EPM may be used to increase worker motivation. However, monitoring technology may be applied in a number of different ways and employee reactions to EPM vary depending on how it is implemented and utilized (Alder & Ambrose, 2005b; Stanton, 2000a). Although there are a number of I focus on five aspects related to the implementation of EPM technology that may influence outcomes of EPM and are directly relevant to the effectiveness of behavioral antecedents and consequences, and therefore worker motivation. It is suggested that I focus on five considerations are relevant to these considerations: 1) covert vs. disclosed monitoring; 2) employee participation; 3) purpose for monitoring workers; 4) performance standards, and 5) feedback source.

Covert vs. Disclosed Monitoring. It was posited previously that EPM may be an effective antecedent by virtue of its ability to draw people's attention to the importance of desired behaviors and their potential consequences. However, this will only hold if workers are aware that their performance is being monitored (Larson & Callahan, 1990). Covert monitoring in which supervisors monitor employees without informing them of the monitoring is widespread (Ambrose & Alder, 2000; Hovorka-Mead, Ross, Whipple, & Renchin, 2002). In order to catch employees engaged in undesirable behavior or substandard performance, many managers believe it is important not to inform employees of monitoring (Hovorka-Mead et al., 2002). However, covert monitoring may diminish EPM's motivating potential. Indeed, Nebeker and Tatum (1993) found that workers who are aware that their performance is being recorded are more productive than workers who are unaware of monitoring. This is likely due to the fact that whereas disclosed monitoring may be an effective behavioral antecedent, covert monitoring fails to call attention to the fact that performance is being measured and therefore does not serve as a stimulating antecedent.

Proposition 3: Disclosed EPM will be associated with higher levels of worker motivation than will covert EPM. DeTienne and Abbott (1993) similarly argue that EPM systems are more successful when employees are allowed to provide input into the design of the system because they are more likely to accept and support it. Allowing employee input and participation in the design and implementation of

monitoring systems may impact worker motivation in two ways. First, soliciting employee input may increase motivation by providing employees with an increased sense of control and voice. Privacy theory proposes that employee involvement will increase workers' sense of control, in the form of greater knowledge of how information is being used. In turn, a belief in control over one's environment has long been considered an essential element in human motivation (Terry & Jimmieson, 1999). Monitoring research has examined the effect of control (Douthitt & Aiello, 2001; Aiello & Svec, 1993; Stanton & Barnes-Farrell, 1996). This research typically provides individuals control over monitoring conditions by enabling them to turn off or delay monitoring with a control switch. Results indicate that monitored individuals perform better when they have this type of control.

However, organizations may be reluctant to allow employees to turn monitoring on or off at their discretion (Alder & Ambrose, 2005a). Alternatively, a more organizationally palatable avenue to providing workers a sense of control may be to allow them input into the design of the system. Second, employee participation in the design and implementation of monitoring systems may increase monitoring's stimulating impact as a behavioral antecedent. Clearly, allowing employees to participate in key decisions pertaining to the monitoring system, including what is monitored as well as how data obtained through monitoring are used, will further increase workers' awareness of desired behavior and potential consequences. Accordingly, allowing for such participation should enhance EPM's effectiveness as a behavioral antecedent resulting in heightened motivation.

Proposition 4 is offered: EPM systems will be associated with higher levels of motivation when employees participate in their design and implementation than when employees do not participate in their design and implementation. As with performance appraisals, organizations may utilize EPM for either developmental or administrative purposes. When organizations utilize EPM for developmental purposes, they often emphasize positive feedback, coaching, and training, as a means to improve both worker ability and motivation (Bylinsky, 1991; Gerdelman, 1993). In contrast to these approaches, some organizations utilize electronically obtained data solely for administrative or punitive purposes. The Communication Workers of America (CWA) reports that monitoring, "isn't being used in a way that helps train new employees or helps people improve the quality of service, but rather as an electronic whip, as a means of harassment or as a way of intimidating workers" (Laabs, 1992). When EPM is used for these purposes, feedback is often nonexistent until the formal appraisal session (Nussbaum & duRivage, 1986). This naturally precludes

immediacy and continuity of consequences, and consequently, EPM's impact on motivation is greatly reduced.

When monitoring is done for administrative or punitive purposes and more frequent feedback is provided, it is often negative and intimidating. For example, some EPM systems are designed to provide workers with messages such as "You are not working as fast as the person next to you" or "Lousy lead, start over." This type of feedback may reduce monitoring's effectiveness and lead to negative outcomes. Smith and colleagues (Smith et al., 1990) argue that because constant negative performance feedback may lead to high levels of stress and poorer worker health, monitoring that is used to badger employees can be expected to increase stress. In contrast, research indicates that immediate and continuous, supportive feedback may enhance individuals' reactions to monitoring. Alder and Ambrose (2005a) provided monitored participants negative feedback that was either constructive or destructive. They found that constructive feedback was associated with higher perceptions of fairness which was associated with both task performance and task satisfaction. In sum, the nature of the feedback provided to monitored employees will affect their motivation. However, organizations have different purposes for utilizing EPM technology to monitor workers and their purpose impacts both the frequency and type of feedback provided to workers.

Proposition 5: EPM conducted primarily for developmental purposes will be associated with higher levels of worker motivation than will EPM conducted for punitive or administrative purposes which will be associated with lower levels of motivation than when performance is not monitored.

Performance Standards. Monitoring is often accompanied by the establishment of work standards to assess employee performance (Smith et al., 1990). Expectancy theory indicates that motivation is influenced by the expectation that increased effort will result in increased performance and reward. Accordingly, realistic standards may be associated with higher levels of motivation while unrealistically high standards may have a detrimental impact on motivation. Consistent with this logic, Nebeker and Tatum's (1993) found that computer monitoring combined with an optimum mix of performance standards and reward levels resulted in increased productivity, satisfaction, and reduced stress.

Although Nebeker and Tatum's (1993) research suggests that monitoring used in connection with realistic performance may increase worker motivation, monitoring-related standards are sometimes based on the capabilities of machinery rather than on scientific grounds resulting in

increasingly excessive and unrealistic standards (Smith et al., 1990). Indeed, much of the criticism against EPM is that it is frequently used in connection with unrealistic standards. For example, Nussbaum and duRivage argue that EPM has resulted in production quotas and speedups that are, "chillingly reminiscent of management practices in nineteenth century garment industry workshops" (1986: 18). They describe workers who, in order to meet unfair production goals, "feel forced to cut off customers, enter incomplete data, delete documents from other worker's files, or even drop paper clips into the machinery to slow it down" (p. 18). Aiello (1993) similarly found that that almost 25 percent of directory assistance operators admitted to cheating in order to reach computer-monitor-based standards. Aiello (1993) also reports that those who did not cheat felt that, given the stringent standards, they could not provide the high-quality service they wanted to.

In short, monitoring research suggests that EPM may result in excessively difficult performance standards resulting in diminished worker motivation. This might suggest that EPM will be more effective when used in combination with lower performance standards. However, monitoring organizations must strike a balance here. A long line of research in goal-setting theory (GST) indicates that individuals with specific hard goals perform better than those with vague goals or specific easy goals (Latham, 2004). In combination, the EPM literature and GST research suggest a an inverted U relationship between EPM-based standards and motivation such that moderately high standards will be associated with higher levels of motivation than will low or high standards.

Proposition 6: EPM that is used in conjunction with moderately high performance standards will be associated with higher levels of motivation than will EPM that is used in conjunction with low or excessively high performance standards. Additionally, EPM that is used in conjunction with excessively high performance standards will be associated with lower levels of motivation than when performance is not electronically monitored.

Source of Feedback. Control systems, of which performance monitoring is an integral part, are intended to maximize the probability that people will be motivated to achieve organizational goals by promoting an identity between the goals of organizational members and the organization as a whole (Flamholtz, 1979). Tompkins and Cheney (1985) argue that when members identify with an organization, they adopt 'organization personalities' and are motivated to act in the best interest of the organization. Tompkins and Cheney's (1985) theory of concertive control describes how organizations may instill identification in their members through concertive, unobtrusive control practices. Concertive control emphasizes the inculcation of

shared values and objectives through non-threatening, face-to-face communication between superiors and subordinates. In short, the theory maintains that organizational practices that serve to maintain positive face-to-face communication between supervisors and subordinates will lead to higher levels of organizational identification and motivation.

Alder and Tompkins (1997) extend the theory of concertive control to describe how EPM may be used in a concertive manner to effectively increase levels of organizational identification and commitment. They argue that the key is to maintain face-to-face communication between supervisors and subordinates when utilizing electronically obtained data to provide workers with feedback. With EPM technology, supervisors may be excluded from the feedback loop. EPM systems may be designed to compile performance information and provide that information directly to the employee without supervisor involvement (Alder & Ambrose, 2005b). When technology is utilized in this manner, the face-to-face communication necessary to instill high levels of organizational identification is eliminated. As a result, the effectiveness of consequences may be drastically reduced and motivation may suffer. Alder and Ambrose's (2005a) laboratory study provides indirect support for this argument. They found that face-to-face feedback was associated with higher levels of monitoring fairness, task satisfaction, and performance than was computer-mediated feedback. In sum, when EPM technology reduces face-to-face interaction, it may also be expected to decrease employee motivation. In contrast, face-to-face interaction in combination with EPM may enhance motivation.

Proposition 7 reflects this argument: When face-to-face supervisor-subordinate interaction is maintained, EPM will enhance employee motivation. However, EPM that diminishes supervisor-subordinate interaction will reduce worker motivation.

Implications

As part of their efforts to motivate workers to behave in an appropriate manner, organizations have always sought to control their members. Performance monitoring has long played a critical role in these efforts. Recently, an increasing number of organizations have been utilizing EPM technology to monitor their workers. Despite the prevalence of EPM, however, relatively little is known about its impact on employee motivation. This paper provides a framework to guide managers interested in utilizing EPM in a way that maximizes employee motivation while minimizing its potential negative consequences. Specifically, organizational behavior modification theory is applied to monitoring to demonstrate

how this tool may used to increase worker motivation by acting as a behavioral antecedent and by improving performance consequences such as feedback. However, managers must pay attention to several potential moderators and approach EPM in a way that will enhance, not diminish, its motivational impact.

Although empirical research is needed to support the propositions advanced herein, this paper suggests several factors that organizations should consider when implementing and utilizing EPM systems. Specifically, five specific steps are offered as approaches that may improve monitoring's effectiveness as a motivator: 1) inform workers that they are being monitored; 2) allow employees to participate and give input into the design and implementation of the monitoring system; 3) use EPM for developmental purposes not solely for administrative purposes or as a punitive tool to intimidate or threaten workers; 4) use EPM in connection with realistic performance standards; and 5) supplement computer-provided feedback with supervisory feedback, coaching, and training.

To ensure that these five steps are adhered to, it would behoove organizations to train their supervisors in the effective use EPM technology. Indeed, organizations may intend that EPM be used positively and in a way that enhances employee motivation. However, unless these guidelines are clearly communicated and unless those managers and supervisors who actually use the technology are trained in the effective use of the EPM systems, these intentions may never materialize. Supervisors presented with new technology that affords them the opportunity to tightly monitor workers and obtain vast amounts of information about them, may be tempted to utilize EPM oppressively in the belief that doing so will maximize their performance. Absent effective training, even well-intentioned supervisors may be uncertain how to utilize new EPM technology in ways that will optimally benefit both workers and the organization.

Until recently, research on EPM has lagged behind public interest in the topic, has focused on a limited number of outcome variables, and has viewed the effects of monitoring to be dichotomous (either it increases stress or it doesn't). Contradictory evidence, however, indicates that EPM may lead to different outcomes depending on how organizations utilize monitoring technology. Future research in EPM may pursue at least three avenues. First, the impact of monitoring on additional variables, such as motivation, should be investigated. Second, greater attention should be paid to the existence of potential moderators of the outcomes of electronic monitoring. Specifically, how do different organizational approaches impact reactions to and results of monitoring?

Finally, electronic technology increasingly permits a wide array of new working arrangements including telecommuting and the virtual office. Organizations are naturally as concerned about maximizing productivity in these working arrangements as they about maximizing productivity in the traditional office. Extending the application of EPM to the virtual office may facilitate these efforts. However, as with the traditional workplace, EPM in these settings will likely generate positive or negative reactions depending on how it is applied. Additionally, privacy issues may become more salient when EPM reaches virtual offices located in traditionally private realms such as employees' homes. It is likely that a number of the moderators identified in this paper will be applicable in the monitoring of the virtual office. However, some moderators may be less relevant to that context while still others may take on greater importance. Thus, research on the application of EPM in the virtual office should prove valuable. This paper suggests several potential moderators and provides a framework for further empirical investigation of these questions.

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