

**CERIAS Tech Report 2004-89**  
**Remote Control: Predictors of Electronic Monitoring Intensity and Secrecy**  
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PERSONNEL PSYCHOLOGY  
2004, 57, 377-410

## **REMOTE CONTROL: PREDICTORS OF ELECTRONIC MONITORING INTENSITY AND SECRECY**

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Electronic monitoring research has focused predominantly on the reactions of monitored employees and less attention has been paid to the processes that trigger managers' decisions to electronically monitor subordinates. Employing a distributed virtual team simulation, this study examined the effects of dependence, future performance expectations, and propensity to trust on team leaders' decisions to electronically monitor their subordinates. Results indicate that team leaders electronically monitor subordinates more intensely when dependence on subordinates is high or future performance expectations are low. Moreover, team leaders are more likely to monitor in secret when dependence is high or propensity to trust is low. Although team leaders increased their level of electronic monitoring over time, this tendency was stronger when the leader had consistently low performance expectations.

From microbased reinforcement theory (Skinner, 1953) to macro-based agency theory (Jensen & Meckling, 1976), the monitoring of employees is argued to be a necessary component of performance management. Similarly, cybernetic control theories, which focus on the monitoring of performance and making adjustments based on feedback, have become an important approach for understanding behavior in organizations (Bandura, 1991; Carver & Scheier, 1998; Klein, 1989). Thus, monitoring employees' activities in order to control their performance is seen as a fundamental managerial function (Tenbrunsel & Messick, 1999).

With the advent of new technologies, managers now can monitor the activities of their subordinates through the use of electronic monitoring systems (Aiello, 1993; Ambrose & Alder, 2000). Moreover, such systems can provide differing amounts of information about employee performance ranging from simple summaries to detailed information about specific employee behaviors (Aiello, 1993; Carayon, 1993). They also

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We thank Michael Champion, David Harrison, Brad Marley, Mike Sarris, and Tom Yemc for their helpful comments related to this research. We also thank David Lehman, Rebecca Bull, Vijaya Venkataramani, Jason Little Owl, and Greg Till for their help with data collection and analysis. An earlier version of this paper was presented at the 2002 Academy of Management Meeting, Denver, CO.

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can allow secret monitoring of employee performance. With such capabilities, it is not surprising that recent surveys by the American Management Association (2001) indicate that electronic monitoring is on the rise, with over 78% of all firms surveyed indicating they electronically monitor their employees to some extent; 62% of firms track Internet use; 54% of firms track e-mail.

At the same time, organizations are increasingly relying on virtual teams, where team leaders and members are distributed geographically and must communicate and perform their work using electronic technologies (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2001; Cascio, 2000; McGrath & Hollingshead, 1994). Managerial problems are often amplified in virtual teams. According to Townsend, DeMarie, and Hendrickson (1998, p. 23), "in the virtual work environment, traditional social mechanisms that facilitate communication and decision making are effectively lost and participants must find new ways to communicate and interact." Moreover, virtual teams are often formed to solve a specific problem and then disbanded. Thus, virtual team lifespans are often temporary or short term, and, unlike many standing teams, members are often expected to perform with little prior interaction among team members. Expectations about one's reliability and trustworthiness can be complicated in situations where managers cannot physically see or monitor work progress. Consequently, virtual team leaders are increasingly confronted with "remote control" decisions, including whether to electronically monitor team members, how much to monitor them, and whether to monitor in secret.

Such decisions are not simply made. Although electronic monitoring can serve legitimate business functions including the monitoring and control of progress toward organizational goals, the practice is also controversial because of the negative consequences surrounding the implementation of such monitoring. If poorly designed, electronic monitoring can have a negative effect on employees' perceptions of privacy and fairness (Alge, 2001; Ambrose & Alder, 2000; Kidwell & Bennett, 1994; Stanton, 2000). Electronic monitoring can increase stress, inhibit social interaction, and create unrelenting demands on employees (Aiello, 1993; Aiello & Kolb, 1995; Smith, Carayon, Sanders, Lim, & LeGrande, 1992). Consequently, some label organizations utilizing such practices as "electronic sweatshops" (Garson, 1988; Lee, 1994). Thus, managers face risks in the decision to electronically monitor employees.

Research on electronic monitoring of employee performance, however, provides us little insight into when and how managers will choose to electronically monitor. Similar to traditional monitoring and control research, the majority of research efforts focusing on electronic monitoring have examined the reactions of those being monitored. We are

aware of only a small set of studies that focus on those responsible for the initiation of electronic monitoring, and those studies examine how managers interpret or use information derived from the monitoring (Fenner, Lerch, & Kulik, 1993; Kulik & Ambrose, 1993). We could find no research that examines when and how managers will choose to electronically monitor and when they might do so secretly.

The purpose of this research, therefore, is to examine when and how individuals are likely to initiate electronic monitoring of subordinates in a virtual team context. In so doing, this research makes contributions to our understanding of electronic monitoring and control processes in several ways. First, this research draws on traditional theory and research on control to develop and test a set of hypotheses regarding the initiation of electronic monitoring. This grounds our understanding of electronic monitoring in existing theory and allows us to examine control theory propositions that have received little empirical attention. We focus on team leaders' decisions to electronically monitor subordinates in a virtual team. This microfocus extends our understanding of monitoring initiation by complementing extant research that has had a predominantly macro-orientation (e.g., interfirm monitoring, corporate governance).

Second, this study is the first empirical research to examine factors that influence the initiation of electronic monitoring by individuals, shedding light on an important managerial decision. Moreover, this research provides a rich view of this question by examining monitoring intensity, that is, the levels of monitoring that team leaders choose to implement. Finally, this study also examines when individuals are likely to engage in secret monitoring. This question has received no attention to date and deserves investigation, particularly in light of recent research that shows that secret monitoring can have negative psychological effects on employees (Alge & Ballinger, 2001; Hovorka-Mead, Ross, Whipple, & Renchin, 2002).

Because of the theory testing thrust of this research, the sensitive nature of the phenomena under study (electronic monitoring and secrecy), and the need to study monitoring decisions in real time, we chose to conduct a laboratory experiment that simulated a virtual team context. By doing so, we were able to create a reasonable level of realism, study monitoring processes as they unfolded over multiple trials, and exert sufficient experimental control to examine causal relationships between control theory factors and a leader's monitoring decisions.

### *Electronic Monitoring Intensity*

Given a variety of available technologies, the decision to electronically monitor is more than a simple choice of monitoring or not. Man-

agers often can choose from a variety of technologies that allow different levels of *monitoring intensity*, where more intense monitoring systems provide more detailed information on employee behavior (Aiello, 1993; Carayon, 1993). Low intensity monitoring systems may provide delayed or asynchronous summary statistics on the performance or behavior of a target. More intense monitoring systems may provide a more intimate intensive look at the specific actions or behaviors of the target. For example, some systems may provide a detailed, post hoc audit trail of all Web sites that an employee visited but other systems can even provide a continuous, real-time peek into the onscreen activities of employees. Thus, in deciding to electronically monitor, managers may have to choose the level of monitoring intensity to use.

This choice is complicated. More intense monitoring may be attractive to a manager because it provides more detailed information about employee performance and greater opportunity to effectively control that performance (Latham & Wexley, 1994). Intense monitoring, on the other hand, can have deleterious effects on employees, despite providing more detailed information on employee behavior. Thus, it becomes important not only to study if team leaders choose to electronically monitor, but also the intensity with which they choose to do so. Although monitoring intensity has been identified in prior theoretical work (e.g., Aiello, 1993; Carayon, 1993) and has been manipulated to examine its effects on monitoring targets (Griffith, 1993), there has been no empirical research on how managers choose a level of electronic monitoring intensity. Therefore, in this research, we examine the decision to electronically monitor by examining the levels of monitoring individuals choose to implement, ranging from no monitoring to the gathering of detailed, real-time monitoring of specific employee behaviors. Because increased monitoring of employees' behavior is a critical step to increasing the level of control a manager exerts over an employee, we looked to the control literature for theoretical guidance. In that literature, Green and Welsh (1988) proposed a theoretical model that speaks directly to the decision of a manager to initiate control and describes conditions that favor the initiation of control. Those conditions appeared relevant to our electronic monitoring context and appeared to provide a sound basis for predicting the initiation of electronic monitoring.

### *Dependence and Control*

Building on cybernetic control and resource dependence theories, Green and Welsh (1988) argue that a manager's motivation or need to initiate control over subordinates is motivated by two key factors: dependence of the manager on those subordinates for critical resources

and the extent to which the manager expects the future performance of those subordinates to lead to unacceptable resource flows from them. Assuming a need is present, the cost of implementing control processes and the extent to which cybernetic control is feasible are depicted as affecting judgments about whether implementing control is possible. Although Green and Welsh's model has not been empirically validated, their propositions concerning the need for control appear directly relevant to decisions to initiate electronic monitoring. Thus, in this research we focus on the *dependence* and *future performance expectations* factors while controlling for the cost of control and its feasibility.

According to the resource dependence perspective, organizations often depend on subunits to provide necessary resources (Pfeffer & Salancik, 1978). A dependence relationship exists when a higher order unit (e.g., organization or manager) needs valuable resources from a subunit (e.g., department or subordinate) in order to attain its goals, and those resources cannot be easily substituted or obtained elsewhere. Green and Welsh (1988) contend that as dependence on a unit grows, management is more likely to initiate control over that unit. In essence, coordination or control mechanisms are seen as a solution to the problems of managing that dependence and uncertainty (Pfeffer & Salancik, 1978). Because monitoring is a key component of control, it follows that higher levels of dependence are also likely to provoke increased levels of monitoring.

Agency theory (Jensen & Meckling, 1976) provides a similar set of theoretical arguments about the relationship between dependence and monitoring decisions. Agency theory is predicated upon the existence of principal-agent relationships in which a principal (e.g., owner) is dependent upon an agent (e.g., manager) to perform for the firm. Because these dependence relationships can create information asymmetries that benefit the agent, there is a chance that the agent can exploit the principal through opportunistic behavior. Consequently, principals may implement monitoring as a way of limiting potentially opportunistic behaviors of agents. Although agency theory often focuses on macro-oriented agency relationships, manager-employee relationships also fall within this framework (Welbourne, Balkin, Gomez-Mejia, 1995; Whitener, Brodt, Korsgaard, & Werner, 1998). For example, team leaders who do not monitor the behavior of virtual team members could be exploited by those employees engaging in activities that are detrimental to team and organizational goals. As with control theory, agency theory suggests that the more managers are dependent on employees as agents, the more likely that manager is to increase his or her monitoring of those employees. Following the theoretical arguments of control and agency theory:

*Hypothesis 1:* Dependence is positively related to electronic monitoring intensity.

### *Future Performance Expectations*

According to Green and Welsh's (1988) model, however, dependence is not the only issue in deciding to implement control. Managers' expectations about the future performance of employees upon whom they depend is another key factor in determining whether managers initiate control. Managers are more likely to initiate control in dependence relationships where they expect that the subordinates are more likely to fail in providing timely, adequate resources in the future.

Although many factors influence future performance expectations, knowledge of a subordinate's past track record has been shown to be particularly important. Research has shown, for example, that investors are more likely to monitor entrepreneurs who fail to provide timely feedback (Sapienza & Korsgaard, 1996). Similarly, when team leaders cannot trust subordinates to satisfactorily provide needed resources, control is argued to be a likely response to try to increase the reliability and predictability of future resource flows (Das & Teng, 2001). Indeed, a survey of professional managers from an executive MBA program demonstrated a strong correlation between judgments about the reliability of an employee's performance and an ad hoc self-report measure of control-based monitoring (McAllister, 1995). In this study, we manipulate team leaders' expectations of future performance through the past performance of subordinates. Team leaders' performance expectations about future performance are then assessed in terms of how much they trust the employees to perform well. In conditions where team leaders' performance expectations about a subordinate's future performance are lower, we expect them to increase their levels of monitoring.

*Hypothesis 2:* Future performance expectations are negatively related to electronic monitoring intensity.

Although the above hypotheses predict that both dependence and future performance expectations will influence the decision to implement monitoring, Green and Welsh (1988) suggest that the effect of future performance expectations on initiation of control will be strongest when dependence is high. When dependence on the subordinate is high, the potential harm created by any future poor performance of that subordinate is more pronounced. Thus, team leaders are more likely to be motivated to control that individual and are more likely to implement monitoring. This logic argues that the intensity of electronic monitoring

will be predicted by an interaction between future performance expectations and dependence.

*Hypothesis 3:* Dependence and future performance expectations will interact to predict electronic monitoring intensity, such that the negative relationship between future performance expectations and electronic monitoring intensity will be stronger when dependence is high than when dependence is low.

When implementing control, management's goal is to ensure the adequate flow of resources over time (Green & Welsh, 1988). Consequently, control decisions may change over time as reliability data about a subordinate provides information about the likelihood that needed resources will be forthcoming in the future. Research on managerial control of poor performance shows that the persistence of poor performance is likely to lower a manager's future performance expectations and to increase a manager's motivation to exert control. As an employee's performance problem persists, the manager is increasingly likely to deliver negative feedback in an attempt to forestall future problems, that is, exert control (Larson, 1989). Similarly, when managers see a pattern of poor performance repeating over time, the manager's expectations for future performance become more pessimistic and the manager tends to increase the levels of control being exerted over that employee (Fairhurst, Green, & Snively, 1984). When employees have repeated episodes of poor performance, managers also are more likely to attribute that performance problem to the employee (a stable cause that is likely to persist) and to use more intense levels of control in an attempt to minimize future problems, that is, more severe disciplinary procedures (Liden, Wayne, Judge, Sparrowe, Kraimer, & Franz, 1999).

This same pattern is expected to be observed in team leaders' use of electronic monitoring of employee performance. When team leaders have lower future performance expectations, we expect those team leaders to be more likely to monitor an employee's performance. In addition, future performance expectations also are expected to interact with time in predicting the levels of monitoring used by a team leader. If lower future performance expectations persist over time, we expect the effect of future performance expectations on monitoring intensity to strengthen over time.

*Hypothesis 4:* Future performance expectations and time will interact to predict electronic monitoring intensity such that, team leaders will increase the level of electronic monitoring intensity to a greater extent when future performance expectations are lower (repeatedly poor performance) than when future performance expectations are higher (repeatedly good performance).



*Propensity to Trust*

Although dependence and future performance expectations likely will influence a manager's decision to initiate control, dispositional tendencies also may come into play. Specifically, we believed that *propensity to trust* would influence the decision to implement monitoring. That is, individuals vary in how much they "demonstrate a consistent tendency to be willing to depend on others across a broad spectrum of situations and persons" (McKnight, Cummings, & Chervany, 1998, p. 477). This disposition to trust is most likely to predict trusting intentions in organizational relationships between individuals who do not have a history with each other, as can be the case in virtual teams (McKnight et al., 1998). Moreover, newly formed virtual teams may experience less initial trust than similar face-to-face teams (Alge, Wiethoff, & Klein, 2003). Given that success in virtual teams is predicated upon "trust that one's coworkers will fulfill their obligations and behave predictably" (Cascio, 2000, p. 83), a person's disposition to trust, absent social cues, might drive their decision to implement monitoring.

Although there are many definitions and dimensions of trust (Hosmer, 1995), trust can be thought of as a willingness of one party to be vulnerable to another party in situations entailing risk. Theoretically, trust is strongly linked to decisions about monitoring and control (Gambetta, 1988; Grey & Garsten, 2001; Mayer, Davis, & Schoorman, 1995; Reed, 2001; Strickland, 1958). According to Luhmann (1979), trust and control serve as alternative mechanisms for resolving the problem of order and organization. Absent trust, monitoring is often seen as necessary to ensure cooperation (Ouchi, 1979). We anticipate that team leaders who have a dispositional tendency to trust will be less likely to monitor and control others.

*Hypothesis 5:* Propensity to trust is negatively related to electronic monitoring intensity.

*Secrecy and Electronic Monitoring*

Finally, because of the nature of electronic monitoring, we also were interested in the conditions under which a manager might initiate such monitoring in secret. Clearly, some electronic technologies allow secret monitoring of performance. Thus, managers face the complicated decision of whether to monitor in secret or not. *Secrecy* can be considered a form of deception, defined as a deliberate attempt to conceal or misrepresent information vital to an exchange (Shell, 1991). Situations where team leaders choose to electronically monitor in secret have significant potential to impact subordinates' perceptions of unfairness and to create

negative organizational outcomes (Alge & Ballinger, 2001; Ambrose & Alder, 2000; Hovorka-Mead et al., 2002). Thus, it becomes important to identify not only factors that influence the electronic monitoring decision, but also factors that influence the decision to do so secretly, without subordinate knowledge. Here, we anticipate that both dependence and propensity to trust will affect the secrecy in which team leaders choose to electronically monitor.

Managers may feel that they can achieve some balance in the power-dependence relationship with a subordinate that they are dependent upon if they can gather information about the subordinate without that person's knowledge. If managers can monitor in secret without the expectation of getting caught, and can benefit or create leverage from doing so by gathering critical information on a resource they need, they might be more likely to engage in less ethical forms of control (Brief, Dukerich, Brown, & Brett, 1996). This reasoning suggests that with higher levels of dependence on a subordinate, team leaders would be more likely to choose to monitor the subordinate in secret.

*Hypothesis 6:* Dependence is positively related to secrecy of electronic monitoring.

A second factor likely to predict secret monitoring is a team leader's propensity to trust. Team leaders with a greater tendency to trust are less likely to suspect that subordinates in a virtual team environment will be tempted to act opportunistically. This would lead to a selection of more ethical approaches to restructuring dependence relationships or initiating control in the relationship. Trust is "bound up with ethical action" (Provis, 2000, p. 145). Indeed, integrity and benevolence are building blocks of trustworthiness (Mayer et al., 1995; Trevino, Hartman, & Brown, 2000), and people with a general willingness to trust are more likely to ascribe to these values. We propose that individuals with high levels of dispositional trust will not be as tempted to break a trust-based relationship as those with lower levels by monitoring secretly.

*Hypothesis 7:* Propensity to trust is negatively related to secrecy of electronic monitoring.

## *Methods*

### *Sample and Design*

Ninety undergraduate students were recruited from an upper-division class at a large Midwestern university and offered course credit for their participation in a "simulation exercise" assessing their skills at "virtual team management." The students were offered a base monetary incen-

tive of \$5 for participating. The mean subject age was 20.8 years and 62% of the subjects were men. We created a virtual team manager simulation involving a 2 (dependence: high vs. low)  $\times$  2 (future performance expectations: high vs. low)  $\times$  3 (trials) mixed factorial design, with dependence as the between subjects factor and future performance expectations and trial as within subjects factors.

### *Procedures*

Approximately 2 weeks prior to the managerial simulation, students filled out a personality measure that included an assessment of their propensity to trust.

For the virtual team simulation, each subject reported to a room with a conference table and a PC workstation, where one confederate was waiting. Within a few minutes, a second confederate entered and all parties were introduced. The experimenter then explained that they were participating in a study testing their virtual team management skills. The subject was informed that he or she had been randomly selected to be the "virtual team leader" for the exercise with the confederates serving as "team members." Immediately after this, the experimenter told the subject to wait while he took the confederates to other rooms in the same building for the exercise. Once away from the subject, confederates were paid for their time and excused.

Teams were instructed that they would receive an initial allocation of \$15 (\$5 per team member) for participating in the simulation. Their team performance, however, would be judged by "independent management experts" who would rank their efforts against other virtual teams participating in the same exercise. If their team scored above the 40th percentile, each team member would be awarded an extra \$5, and, if their team scored above the 60th percentile, each team member would receive an additional \$10. Thus, teams could earn as much as \$45 (\$15 per team member) upon completing the simulation. However, they could also incur costs, to be subtracted from total team compensation, based on team leader decisions involving monitoring and resource acquisition (described below).

For the simulation task, the subject was seated at the workstation and was responsible for preparing summary charts of monthly stock prices from companies in a selected industry. Data for one company was supplied to the subject in a printout; this was to be entered directly into the spreadsheet by the subject. Subjects were told that the other "team members" were to research two competitors of the subject's firm and send the stock prices for the month to the subject via electronic mail. The subjects were informed that their team members would get their

stock price data by conducting research on the Internet. After all of the data had been received and put into the spreadsheet, the subject was asked to answer four questions comparing the stock prices for the three companies. These tasks were to be completed over a 5-minute period for each trial. Subjects were informed that there were to be five trials with the first trial being a practice trial. Subjects were also informed that, as team leader, they would have an opportunity to review the performance of each of their two team members after each trial and send them comments to guide their performance on subsequent trials. In sum, subjects were given clear instructions on how to conduct their portion of the task, what data they could expect to receive from team members based on members' Internet research, and a report template in Excel in which to plug in the necessary data to conduct the analysis. After answering questions for the subject, the experimenter began the practice trial. At the beginning of the trial, the experimenter would leave the room and go to an office with a workstation where he would monitor and control the performance information the subject received during the trial.

After the practice trial, the experimenter returned and gave the subject two "team member performance review" forms to complete. Subjects rated their performance expectations of each team member and could include written comments that would be provided to each team member before the start of the next trial. After the subject completed the performance evaluations, the experimenter introduced a set of electronic monitoring options. Subjects were informed that before beginning the next trial they had the option of electronically monitoring the performance of their team members. Thus, feasibility of monitoring was ensured in all conditions. In addition to a no monitoring option, three other electronic monitoring options were offered of increasing intensity: (a) low intensity, where at the end of the trial, the subject could get a chart providing a summary of team members' Web usage in aggregate format; (b) moderate intensity, where at the end of the trial, the subject could get a detailed list of the actual Web sites visited by team members during the trial; (c) high intensity, where during the trial, the subject could view team members' Internet use "live" through use of a special software program that allowed for streaming video access of team members' on-screen activities including which Web sites they visit and any other activity that they may have performed on their computer.<sup>1</sup>

In order to mirror actual managerial control processes, it was important to convey to team leaders that their monitoring decisions and

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<sup>1</sup> The monitoring options made available to subjects were based on those offered in commercially available Internet monitoring software products such as Spector CNE and SurfControl. These products allow managers the option of receiving summary reports of employee productivity, more detailed recording of Web sites visited or the ability to capture

performance evaluations could have an impact on subordinates, thus, motivating them to utilize these tools. As noted above, subjects were explicitly informed that their team members would receive and have an opportunity to process their feedback. We included a section for open-ended comments to give team leaders an opportunity to provide detailed feedback if desired. Team leaders were given detailed descriptions of their monitoring options and the types of information each could provide. Moreover, team leaders received the monitored data for a trial, prior to filling out a performance evaluation that followed the trial.

Because monitoring is not a cost-free decision (Welbourne et al., 1995), each monitoring option had a cost associated with it that was based on the amount of detailed information that monitoring option provided. This cost, to be deducted from a team's total compensation, was 50¢ for the low intensity option, 75¢ for the medium intensity option, and \$1.00 for the high intensity option per team member per trial. This nominal charge was included to enhance realism, but it was identical across all experimental conditions. Thus, cost of monitoring would not affect any of the hypothesized effects. In addition, cost was kept low so subjects would still consider monitoring as a viable option. The \$1.00 cost was chosen for the most intense option so subjects would still have an opportunity to make money (beyond their base pay) over the course of the simulation, even if they chose this option at every trial (assuming such decisions enabled the team to reach the 60th percentile in performance). By including these costs, we hoped to reflect the real world costs incurred on managers who choose to electronically monitor, for example, the cost in time incurred to monitor and process data, the opportunity cost of doing something else, or the cost on system resources to conduct the monitoring.

After the subject was given the opportunity to choose a monitoring option for each team member, the experimenter checked the sheets for completeness and told the subject that he was leaving to "deliver the performance reviews to the team members." After excusing himself for several minutes, the experimenter returned and started the next trial. These procedures were repeated for each trial that was conducted.

All subjects completed a practice trial, Trial 1, and Trial 2. After completing the performance appraisals for the completed second trial and selecting monitoring options for the upcoming third trial, subjects were asked to complete a brief questionnaire containing the dependence

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and view videos of onscreen activity for users on a network. Promotional materials for the software products generally treat the provision of more detailed surfing information as richer and more valuable to managers than summary data; indeed, one proprietor refers to the ability to capture and view video images of onscreen activity as "the most powerful way to visually record and review everything they do online and offline."

manipulation check, while the experimenter left the room to deliver the performance reviews to the team members. After the form was completed, the experimenter returned and told the subject that the 1-hour period allotted for the experiment had run out and there would be no more trials. Subjects then were debriefed and excused. Notably, subjects were told that several teams still needed to complete the simulation and that their final performance would be evaluated relative to the other teams in order to determine their final compensation (base pay plus bonuses earned minus costs incurred). After all sessions, all subjects were further debriefed and received the maximum pay of \$15 per person.

### *Manipulations*

*Future performance expectations.* We manipulated future performance expectations in the team leader by varying the performance levels the leader observed in each of the two "team members." During each trial, the experimenter, acting for Team Member 1, e-mailed stock price data within 1.5 minutes to the leader. Those data included summary calculations in a format that allowed the leader to simply cut and paste the data into their spreadsheet, thereby saving the leader time and effort. Thus, the team leader observed Team Member 1 providing useful and timely data that allowed the leader to easily add the data to the spreadsheet and make the necessary comparisons. Under these conditions, the leader was expected to form positive expectations for future performance (future performance expectations high). In contrast, the experimenter acting for Team Member 2 did not provide such useful and timely information to the leader. The stock price data e-mailed from Team Member 2 came without summary calculations in a format that was cumbersome to use. The information also was in a different software format that did not permit easy transfer to the spreadsheet. Finally, the information sent by Team Member 2 arrived after 4 minutes had passed, leaving little time in the trial for the subject to effectively use those data. In this condition, the leader observed poor performance from Team Member 2 and was expected to form less positive expectations for future performance (future performance expectations low).

*Dependence.* Because dependence is reduced by providing individuals with alternative sources of resources in a relationship (Emerson, 1962; Green & Welsh, 1988), dependence was manipulated in this study by varying the availability of information from sources other than the team members. Subjects in the *low dependence* condition were given two envelopes labeled "Team Member #1" and "Team Member #2" and were informed that if they felt a team member was not performing ade-

quately, they could gather the data from another source. Subjects were shown the two envelopes and told that the data they need from each team member could be found in the marked envelopes. Thus, subjects in the low dependence condition were provided an alternative source of the needed information. They also were informed that if they accessed the data by opening the envelope, they would be charged \$1.00 for each envelope opened, which would be deducted from any earnings they receive. Again, this cost was identical across all experimental conditions and allowed the participants to make money (beyond base pay) even if they chose the envelope in every trial (once again, assuming such decisions enabled the team to reach the 60th percentile in performance). Subjects in the high dependence condition were provided no alternative source of information and were told that the data they need to complete the reports can only be provided by their team members via the Internet.

### *Measures*

Unless otherwise noted, items are based on a 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*.

*Manipulation checks.* McAllister (1995) defines cognition-based trust as a judgment that another will act responsibly, competently, reliably, and dependably in the future and notes that "reliability and dependability *expectations* [emphasis added] must usually be met for trust relationships to exist and develop and evidence to the contrary provides a rational basis for withholding trust" (p. 26). Thus, a leader's future performance expectations about a team member's ability to perform and provide necessary resources in the future (e.g., effort, information, etc.) should be well reflected in the levels of cognition-based trust that the team leader displays. Therefore, the manipulation of future performance expectations was assessed through the adaptation of a cognition-based trust measure that was developed by McAllister (1995) and was completed by the leader on the performance evaluation form for each of the team members after each trial. The 5-item scale ( $\alpha = .83$ ) included items such as: "Given this person's track record, I see no reason to doubt his/her competence and preparation for the job," and "I can rely on this team member not to make my job more difficult by careless work."

The manipulation of dependence on team members was measured using a 3-item scale ( $\alpha = .71$ ) that focused on the extent to which the leader needed the information provided by the team members and how readily available it was from other sources (Emerson, 1962). A sample item is "I do not have to rely on my team members to get the information I need" (reverse scored).

*Propensity to trust.* We measured the propensity to trust independent variable using an 8-item measure reported in Mayer and Davis (1999), and based on earlier work by Rotter (1967). A sample item is, "Most people can be counted on to do what they say they will do" ( $\alpha = .66$ ).

*Monitoring intensity.* The monitoring intensity dependent variable was measured through the monitoring choices completed by the subject before each trial. The monitoring level for each team member for each trial was coded in increasing values to reflect the level of monitoring that the subject requested. Monitoring levels were coded: 0 = *no monitoring*, 1 = *for low intensity*, 2 = *for medium intensity*, and 3 = *for high intensity*.

*Monitoring secrecy.* Secrecy, as we use it, refers to the act of monitoring someone without that person knowing it. Alternatively, someone can be informed that they will, in fact, be monitored in advance of the monitoring. These are the two options that we examine here. We do not consider the case where one knows that they could be monitored, but are unsure at any point in time if they are actually being monitored. For each instance subjects chose to electronically monitor, they also had to indicate whether they wanted the monitored subordinate to know in advance that they were being monitored ("inform," coded "0"), or if they wanted to monitor in secret ("keep secret," coded "1"). For those who chose to keep the monitoring secret, there was no provision to inform "team members" later that they had been electronically monitored. Thus, it was at the sole discretion of the team leader as to whether "team members" would be aware that they were or were not electronically monitored, and team leaders could maintain secrecy of monitoring throughout the trials if they desired.

### *Results*

Before testing hypotheses, we evaluated the efficacy of the future performance expectations and dependence manipulations. To examine future performance expectations, we conducted a repeated measures analysis of variance (ANOVA) with both cognition-based trust and trial serving as repeated measures. ANOVA results revealed significant effects for trial,  $F(2,88) = 7.11, p < .01$ , trust,  $F(1,89) = 177.35, p < .001$ , and the trial by trust interaction,  $F(2,88) = 36.91, p < .001$ . Inspection of the means revealed that expectations of future performance were significantly lower in the low performance expectations condition. This difference became greater over time, confirming the efficacy of the performance expectation manipulation. Subjects in the high dependence condition also rated themselves as significantly more dependent on their team members ( $M = 5.67$ ) than did subjects in the low dependence con-



dition ( $M = 4.85$ ;  $t(88) = 3.13$ ,  $p < .01$ ), confirming the efficacy of the dependence manipulation.

Of the 90 subjects in the study, 66 (73.3%) chose to electronically monitor a team member at least once during the simulation but 24 subjects did not monitor at all. Of the 540 possible monitoring incidents (90 subjects by three trials by two team members), subjects electronically monitored team members in 138 (25.5%) of them. The mean level of monitoring intensity was 0.37 ( $SD = 0.37$ ). Of the 138 monitoring incidences, subjects chose to keep the presence of electronic monitoring secret from their team members 54 times (39%). Thirty-nine of the 66 (59.1%) subjects who chose to monitor did so in secret at least once during the experiment. Recall that for subjects in the low dependence condition, they could access materials that were necessary to complete the assigned tasks by opening envelopes with the data. During the study, the envelopes that had the material that would be supplied by the low performing team member were opened 12 times, once in Trial 2 and 11 times in Trial 3. Frequency counts for each level of monitoring intensity and secrecy by condition along with the weighted average monitoring intensity level by condition across all trials can be found in Table 1. Zero-order correlations among measured and behavior variables are in Table 2.

A review of the written feedback on the performance evaluations indicated that the choice to monitor affected the amount and type of feedback team leaders provided to subordinates. To illustrate, we examined the content of the comments team leaders provided to poor performers after the second performance trial where 70 team leaders (78%) provided written feedback to their poor performing subordinate. Team leaders who monitored their poor performer provided a greater amount of written feedback (total number of words) compared to those who did not monitor,  $\chi^2_1 = 4.73$ ,  $p < .05$ . Such feedback also contained a higher proportion of task-specific comments,  $\chi^2_1 = 6.41$ ,  $p < .05$ , compared to those who did not monitor. For the 37 subjects who monitored the poor performer in this trial, the selection of monitoring intensity itself did not appear to influence the amount or content of the comments. Similarly, no significant differences were found in the amount or content of the comments provided by team leaders who disclosed monitoring versus those who kept it secret. Overall, 26% of the team leaders that chose to monitor at least one time referred to monitoring in their subsequent written feedback to team members, suggesting that they were using the monitoring and feedback in conjunction to control team members (see Larson & Callahan, 1990).

All hypotheses were tested using generalized linear modeling employing the generalized estimating equations (GEE) approach intro-

TABLE 1  
*Descriptives: Cell Mean Monitoring Level (Weighted Average), Monitoring Frequency and Secrecy Frequency by Level Across Trials*

Dependence performance expectations	Future performance level	Mean level	Trial												
			1				2				3				
			None	Low	Med	High	None	Low	Med	High	None	Low	Med	High	
High	0.22	36	8(2)	1(0)	0(0)	0.22	37	6(2)	2(1)	0(0)	0.11	41	3(1)	1(1)	0(0)
Low	0.33	31	13(4)	1(0)	0(0)	0.69	24	14(7)	4(2)	3(1)	0.98	16	18(10)	7(2)	4(4)
High	0.18	39	4(0)	2(1)	0(0)	0.09	43	1(1)	0(0)	1(0)	0.11	42	2(1)	0(0)	1(0)
Low	0.27	36	6(1)	3(1)	0(0)	0.6	29	7(4)	7(1)	2(1)	0.69	28	8(1)	4(2)	5(3)

*Note:* Values in parentheses indicate incidence of secret monitoring.

TABLE 2  
*Descriptives: Zero-Order Correlations Among Measured and Behavioral Variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Cognition trust (high perf.) - T1															
2. Monitoring intensity (high perf.) - T1	-.32														
3. Cognition trust (low perf.) - T1	.48	-.16													
4. Monitoring intensity (low perf.) - T1	-.30	.75	-.24												
5. Cognition trust (high perf.) - T2	.64	-.05	.29	-.06											
6. Monitoring intensity (high perf.) - T2	-.16	.34	-.08	.36	-.16										
7. Cognition trust (low perf.) - T2	.33	-.24	.64	-.31	.16	.01									
8. Monitoring intensity (low perf.) - T2	-.10	.17	-.21	.15	.03	.05	-.28								
9. Cognition trust (high perf.) - T3	.50	-.03	.26	-.12	.75	.00	.07	.03							
10. Monitoring intensity (high perf.) - T3	.11	.11	.05	.05	.04	.13	.01	.02	.01						
11. Cognition trust (low perf.) - T3	.21	-.29	.45	-.35	.03	.01	.85	-.39	.00	.03					
12. Monitoring intensity (low perf.) - T3	-.02	.02	-.12	.15	-.01	.05	-.21	.21	-.06	.35	-.30				
13. Propensity to trust	.24	-.01	.14	.01	-.02	.06	.07	-.25	.11	.05	-.01	-.11			
14. Average monitoring intensity	-.21	.58	-.24	.63	-.05	.46	-.33	.59	-.05	.43	-.45	.66	-.13		
15. Average secrecy	.05	-.14	-.09	-.14	.01	.04	.08	-.08	.01	-.15	.03	.24	-.23	-.03	

Note: Correlations above .21 are significant at the  $p < .05$  level.

duced by Liang and Zeger (1986). The method is appropriate in that the monitoring intensity dependent variable is a repeated categorical outcome. GEEs take into account within-subject correlation of responses and extend regression models for use with nonnormal exponential distributions such as Poisson and other multinomial distributions (Zeger & Liang, 1986). As a means of illustrating the improvement of fit, we compute the Pseudo  $R^2$  (similar to a model  $R^2$  in linear regression), which compares the  $-2LL$  log likelihood function of the specified model against the  $-2LL$  log likelihood function of a base (intercept only) model (Hair, Anderson, Tatham, & Black, 1998). The resulting difference between log likelihood functions is interpreted as  $\chi^2$  test statistic. Treatment effects in repeated measures GEE are tested using a Wald  $\chi^2$  distributed test statistic (Horton & Lipsitz, 1999). The size of these effects are interpreted through analysis of odds ratios (Hardin & Hilbe, 2003).

### *Electronic Monitoring Intensity*

Tests for treatment effects along with final GEE parameter estimates for Hypotheses 1–4 can be found in Table 3. Overall, a model predicting monitoring intensity from dependence, future performance expectations, and trial was superior to the base (intercept only) model ( $\chi^2_7 = 43.63$ , Pseudo  $R^2 = .10$ ,  $p < .001$ ). Results suggest that team leaders initiate more intense monitoring when their dependence on subordinates is higher,  $\chi^2_1 = 4.84$ ,  $p < .05$ . Examination of the regression coefficient in Table 3 indicates a significant positive relationship between dependence and electronic monitoring intensity,  $\beta = 0.82$ ,  $p < .05$ , in support of Hypothesis 1.<sup>2</sup> Following procedures for ordered multinomial outcomes (Hardin & Hilbe, 2003), the odds ratio for dependence indicates that team leaders in higher dependence relationships are 1.9 times more likely to increase their level of monitoring intensity than team leaders in lower dependence relationships. Likewise, team leaders' future performance expectations of subordinates had a significant effect on electronic monitoring intensity,  $\chi^2_1 = 32.97$ ,  $p < .001$ . As predicted in Hypothesis 2, team leaders monitored subordinates more intensely when future performance expectations were low versus high,  $\beta = -2.27$ ,  $p < .001$ . Team leaders are 5.3 times more likely to increase electronic monitoring intensity when future performance expectations are low. Thus, both dependence and future performance expectations significantly affected whether team leaders chose to initiate electronic control and at what level of intensity.

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<sup>2</sup>For all hypotheses involving monitoring intensity, we also examined the dichotomous decision to monitor (regardless of intensity level) versus not monitor. The results from this analysis parallel those for monitoring intensity.

TABLE 3  
*Treatment Effects and Regression Parameter Estimates for Monitoring Intensity Using GEE Approach*

Variable	df	$\chi^2$ (Wald)	Parameter	Parameter estimate ( $\beta$ )	Empirical standard error	Z-score
Trial	2	.45	Trial 1 to Trial 2 Trial 2 to Trial 3	-1.02 -.12	.45 .41	-2.30* -.30
FPE <sup>a</sup>	1	32.97**	FPE	-2.27	.67	-3.37**
Dependence	1	4.84*	Dependence	.82	.41	1.98*
FPE × Dependence	1	.13	FPE × Dependence	-.52	.89	-.59
FPE × Trial	2	16.96**	FPE by Trial 1 to Trial 2 FPE by Trial 2 to Trial 3	1.79 -.30	.89 1.04	2.00* -.29
Dependence × Trial	2	.95	Dependence by Trial 1 to Trial 2 Dependence by Trial 2 to Trial 3	-.34 -.50	.59 .50	-.58 -.99
FPE × Dependence × Trial	2	2.55	FPE × Dependence by Trial 1 to Trial 2 FPE × Dependence by Trial 2 to Trial 3	.48 1.71	1.12 1.20	.43 1.43

Note: N = 540 (monitoring decisions). Model Pseudo  $R^2 = .10, p < .001$ .

<sup>a</sup> FPE = Future performance expectations. \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

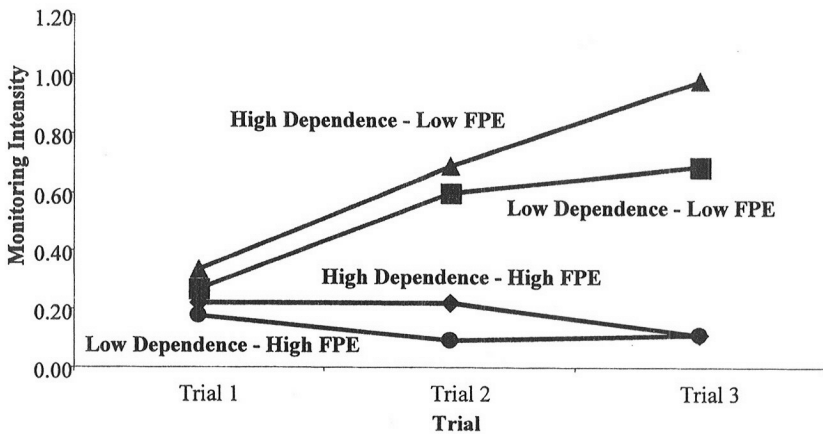


Figure 1: Mean Monitoring Intensity Levels by Dependence and Future Performance Expectations (FPE) Across Trials

These main effects, however, were not qualified by a significant interaction between dependence and future performance expectations. We had expected to find that the negative relationship between future performance expectations and electronic monitoring intensity would be stronger when dependence on a subordinate was high. As can be seen in Table 3, the interaction of dependence and future performance expectations was not significant,  $\chi^2_1 = .13$ ,  $p = .72$ , providing no support for Hypothesis 3.

We expected that as future performance expectations are reinforced over time (through repeated poor or good performance), team leaders would initiate more intense electronic monitoring levels for poorer performers over time. Indeed, as can be seen in Table 3, the future performance expectations by trial interaction is significant,  $\chi^2_2 = 16.96$ ,  $p < .001$ . Analysis of the expectations-by-trial regression coefficients in Table 3 shows that this effect is most pronounced between Trial 1 and Trial 2. The change from Trial 1 to Trial 2 represents a significant change in monitoring intensity levels of low performing subordinates as compared to high performing subordinates,  $\beta = 1.79$ ,  $p < .01$ . As can be seen in Figure 1, differences in monitoring intensity became more pronounced over time with team leaders choosing to monitor more intensely as expectations about a subordinate's poor performance persisted. Moreover, monitoring intensity levels remain unchanged over repeated performance episodes for good performers. Hypothesis 4 is supported.

In addition to situational determinants of electronic monitoring initiation, we expected propensity to trust would be negatively related to

TABLE 4  
*Treatment Effects and Regression Parameter Estimates for Monitoring  
 Secrecy Using GEE Approach*

Variable	df	$\chi^2$ (Wald)	Parameter estimate ( $\beta$ )	Empirical standard error	Z-score
Dependence	1	5.38*	0.84	.36	2.32*
Propensity to trust	1	12.30**	-0.60	.17	-3.53**

Note:  $N = 121$  (monitoring decisions). Model Pseudo  $R^2 = .15, p < .001$ .

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

electronic monitoring intensity. Eighty-three of the 90 subjects who participated in the lab simulation completed the propensity to trust measure. Results of GEE analysis indicate no effect of propensity to trust on electronic monitoring intensity,  $\chi^2_1 = .44, p > .10$ . Hypothesis 5 was not supported.

### *Secrecy*

For those team leaders who chose to initiate electronic monitoring ( $n = 66$ ), we were also interested in factors that influenced whether they would do so secretly, without subordinates' knowledge. Tests for treatment effects and final GEE parameter estimates for secrecy are found in Table 4. Overall, a model predicting monitoring secrecy from dependence and propensity to trust was superior to the base (intercept only) model ( $\chi^2_2 = 13.89$ , pseudo  $R^2 = .15, p < .001$ ). As expected, both dependence ( $\chi^2_1 = 5.38, p < .05$ ) and propensity to trust ( $\chi^2_1 = 12.30, p < .001$ ) influenced the team leaders' decisions to secretly monitor subordinates electronically. Team leaders were more likely to electronically monitor subordinates in secret when their dependence on the subordinate was high (versus low),  $\beta = .84, p < .05$ . Interpretation of the odds ratio suggests team leaders are 2.3 times more likely to disclose monitoring when dependence is low (vs. high). Moreover, team leaders with higher propensity to trust were less likely to electronically monitor subordinates in secret than team leaders with lower propensity to trust,  $\beta = -.60, p < .001$ . The odds ratio suggests that team leaders are 1.8 times more likely to disclose monitoring when propensity to trust is higher. Hypotheses 6 and 7 were supported.

### *Supplemental Interviews with Managers*

To address concerns of external validity stemming from a lab simulation involving students and to uncover additional insights on the ini-

tiation of electronic monitoring, we conducted follow-up qualitative interviews with 22 practicing managers. The purpose of these interviews was to understand better the conditions under which practicing managers would consider electronically monitoring employees. In addition, we wanted to see how sensitive managers were to future performance expectations and dependency issues when deciding to monitor. Managers were drawn from a convenience sample, based largely on alumni records drawn from the business schools of one public and two private universities. Managers were interviewed either by phone or in person. We requested and received permission to taperecord the interviews for 19 of the 22 managers. The sample consisted of 19 male and 3 female managers. The average age of managers was 35 years. All managers indicated that they use e-mail to communicate with their subordinates. Thirty-three percent of the managers listed e-mail as their medium of choice when communicating with their subordinates (other preferences included face-to-face or phone). The average span of control was 10.36 subordinates per manager. Fifty-percent of our sample indicated that at least two or more of their subordinates worked remotely, at a different location.

We adopted an unstructured approach, posing several open-ended hypothetical questions to managers. We did this for several reasons. First, we did not want to constrain the responses of managers as we felt this would provide rich information on how managers think about electronic monitoring decisions, thereby informing existing theory and our lab results. Thus, although we were looking for the emergence of future performance expectations, trust, and dependence as key factors influencing monitoring decisions, we did not want to limit managers' responses to these issues. Second, the sensitive nature of the employee monitoring topic also raised concerns that managers may respond in socially desirable ways. By framing questions hypothetically, we hoped to reduce this concern. Because prior research shows that individuals will project their own motives when explaining the behaviors of others (Mowday, 1981), we felt this was a reasonable initial strategy for understanding this phenomenon in the field. Finally, field studies on electronic monitoring in general, and electronic monitoring initiation specifically, are rare. Thus, with little guidance from prior empirical field research, an unstructured approach allowed us to explore these questions more fully. Two graduate students blind to our research objectives content coded the interview responses. Employing a stepladder approach, a third rater was brought in to help resolve any disagreements between the first two raters.

We began each interview describing the following organizational situation:



Suppose a project team manager is working remotely with project team members that are geographically separated. As part of that project, the Web and e-mail are frequently used and are integral to the project work. Software is available that allows the manager to monitor the e-mail communication and Web usage of his/her employees, and this practice has been used by his/her company.

We then asked each manager the following question, what are some reasons that would lead this manager to electronically monitor certain employees? All 22 managers responded to this question and the pattern of results is clear. Concerns about past and future performance were the overwhelming reasons given as to why a manager would electronically monitor (Coded as "1" if any mention of past, current, or anticipated future task or contextual performance as defined by Motowidlo & Schmit, 1999 appeared in the response; otherwise coded as "0", interrater agreement, 100%). Virtually all of the managers (95%) identified performance concerns (e.g., lack of productivity, abuse of the system, failing trust) as a primary factor in the monitoring decision. In general, managers espoused a logic that said that unacceptable past performance patterns would lead managers to question future performance which in turn increased their likelihood of monitoring. For example, a property manager stated monitoring was more likely "if he's seen a decline in certain employees and he believes that they are starting to slack on the job." A financial services manager noted that "lack of productivity" would lead him to monitor to "find out what the employee was really doing." A male manager from an energy consulting firm indicated that such monitoring would likely occur "if the manager felt some employees are not holding their weight, contributing unequally to the group." Similarly, a mortgage insurance manager stated, "one reason one might choose to use monitoring would be if you suspect abuse" or if you "suspect they are not participating to the degree they should." These comments were echoed by a female HR manager for a large pharmaceutical company who suggested monitoring "when you suspected abuse, for example, if you suspected a performance problem related to Web or e-mail." Eighty-two percent of the managers referred to task performance (e.g., poor productivity; interrater agreement, 82%) and 32% of the managers mentioned contextual performance in their responses (e.g., abuse, misuse of resources, harassment; interrater agreement, 77%).

Dependence (evidence of the dependence of the manager on subordinates for critical resources was coded as "1", else "0") did not spontaneously emerge as a primary factor in the monitoring decision (interrater agreement, 91%). As a result, we followed up the first question by asking managers, "If an employee were central or critical to a manager's project work, how would that affect a manager's decision to mon-

itor?" In response to this probe, the managers' sensitivity to dependence issues was revealed in several ways. First, although several of the managers indicated that dependence would have little or no effect, 64% percent of the managers indicated that greater dependence would increase their likelihood of initiating monitoring (interrater agreement, 82%). Managers said that greater criticality or centrality of an employee would make them "more likely to spend the time to monitor" (aerospace) and "more inclined to . . . monitor that individual's work to make sure they were doing a good job" (wealth management) and make them "watch them (the employee) more closely, of course, and . . . make sure that they are not making any wrong moves" (property management). In a number of cases, however, managers qualified their statements about dependence effects on monitoring decisions. For example, a leasing manager stated that "it (monitoring) depends on how close their relationship is, otherwise they (the critical employee) would be the first to monitor." Similarly, a financial services manager responded that "if they (the employee) were central and critical and he didn't feel they were living up to the bar, it might force him to want to monitor them and maybe not even tell them." Again, a mortgage insurance manager commented "if that person's the cog in the project team, and the team is faltering, then they (the manager) are going to go ahead and monitor." Thus, we conclude that managers believe that greater dependency on an employee increases the likelihood of monitoring that employee, but that decision may be contingent on other conditions such as performance or the quality of the working relationship.

Several managers also exhibited a different form of sensitivity to dependency issues. These managers said they would try to avoid dependency on poor performers, rather than use monitoring to try to control such employees. In other words, when possible, these managers would place only high performers in critical roles, reducing the managers' need to control performance. For example, an HR manager from a large pharmaceutical company stated, "If an employee (position) is central or critical to the work, you would only put employees that you have high regard for in that situation." Similarly, a consultant commented that if an employee was critical or central, he or she "would have proven their productivity in the past." In these cases, the managers show sensitivity to dependence but try to avoid its potential negative effects by "restructuring the dependence relationship" so that control would not be needed, a strategy that also is consistent with Green and Welsh's (1988) model but not the focus of our lab study. Of course, sometimes managers may not have the flexibility to restructure their relationships.

The findings on dependence restructuring also point out the difficulty of teasing apart future performance expectations and dependence in

the field. Managers often equate high performers as those serving the critical roles or attempt to structure work so that only high performers are in such roles. As a result, it was useful to manipulate these variables in the lab, where these constructs could be separated and provide a more complete test of the Green and Welsh propositions. Where such a separation might occur in the field is when managers inherit a poor performer in a central or critical role. According to one HR manager, "if a manager inherits an employee in a critical role, monitoring might be a way to get information." Thus, the monitoring can be viewed as a way of reducing the dependence on the critical resource. Over time, however, we might expect managers to first attempt to restructure the dependence relationship when feasible (putting a higher or more trusted performer in that role) before attempting to initiate electronic monitoring.

In sum, the supplemental interviews provide some initial evidence from the field that the concepts examined in the lab study may extend to the field. The managers' comments reassure us that dependency and performance expectations are relevant to managers' decisions about electronic monitoring and that such issues are actively considered by managers. These interviews also provided a richer view of these processes and additional theoretical insights. The theoretical and practical implications of our findings are discussed in greater detail below.

### *Discussion*

Five of our seven hypotheses were supported. The results of this study shed light on electronic monitoring decisions and confirm aspects of Green and Welsh's (1988) model of control and agency theory in that dependence and future performance expectations were important determinants of control initiation. In a virtual team context, team leaders initiated more intense electronic monitoring when (a) they depended on subordinates for critical information (high dependence relationship) and (b) they had lower performance expectations about their subordinates. Levels of monitoring intensity also were time dependent. Over time, team leaders increased electronic monitoring intensity to a greater extent when future performance expectations for subordinates were consistently low. Finally, managers who were more dependent on subordinates for critical resources or who had a lower propensity to trust were more likely to electronically monitor in secret.

Two hypotheses were not supported. First, propensity to trust had no effect on electronic monitoring intensity. Second, the effect of future performance expectations on electronic monitoring intensity was not strengthened when team leaders were more dependent on subordinates, contravening Green and Welsh's position. This latter finding,

however, could be attributable to an insufficiently strong manipulation of dependence. Although perceived levels of dependence were significantly different between high and low dependence subjects, the mean level of perceived dependence in the low dependence condition was still above the scale midpoint (4.85 on a 7-point scale). Thus, even in the low dependence condition, subjects may have felt dependent on their team members. Recall, the virtual team task entailed a type of reciprocal task interdependence wherein subordinates completed tasks needed by the leader and the leader provided feedback to subordinates (see Bell & Kozlowski, 2002). The task also entailed outcome interdependence as member rewards were dependent on the combined efforts of the team. The fact that some leaders could obtain critical resources elsewhere did not appear to strongly affect the team leaders' perceived dependence. This finding also raises theoretical questions about how dependence influences control decisions. It may be that even low to moderate levels of dependence are sufficient to trigger the need to control. Or, perhaps, the manipulated differences in resource dependence were not sufficient to offset leaders' beliefs that team members were interdependent at least in terms of rewards. Thus, only when dependence is very low or virtually absent would we find dependence interacting with future performance expectations to influence control decisions. Of course, some level of dependence is required within in any team, and the task and outcome interdependence team members experience is complex and likely varies substantially across different types of teams (Bell & Kozlowski, 2002; Wageman, 1995). Future research needs to examine these questions further.

Collectively, the results from this study have theoretical implications in several areas of inquiry. In addition to extending our understanding of electronic monitoring initiation, the findings also suggest that linkages exist between trust and control and provide insights into situational and dispositional determinants of ethical decision making.

The notion that managers might restructure relationships to manage dependence needs to be elaborated. Few managers in the lab study chose to use alternative sources of information, even when it was available. Yet, managers in our interviews commonly spoke of dependence restructuring strategies (e.g., removing poor performers from highly dependent roles). This suggests that restructuring decisions can be attractive to managers as a way to manage dependence, but they are likely to be affected by complexities such as potential damage to work relationships or to the reputation of a manager who cannot "control" an employee. However, although the interview data suggest that managers ideally prefer to restructure dependence relationships by ensuring only high performers are in such positions, reality suggests that individuals

are often hired into teams, managers inherit teams, and the removal of poor performers is seldom a quick decision. For these reasons, restructuring may not be as simple as the managerial interviews seem to imply and there are likely many real world situations where managers cannot totally remove their dependence on poor performers. Finally, dependence may not only affect the decision to initiate control, but also may affect ethical decisions in that process, as higher dependence led team leaders to choose secretive monitoring processes.

This research also contributes to the electronic monitoring literature. The majority of electronic monitoring research has failed to consider why managers engage in monitoring in the first place or to examine electronic monitoring as an outcome. This study is an important step in that direction. It demonstrates the complexity of the monitoring decision by showing that managers not only choose to electronically monitor, but they also must confront decisions about monitoring intensity and secrecy. This study also shows that situational and dispositional forces can shape those decisions.

The findings from this study also have implications for the trust and ethical decision-making literatures. Trust appears to be particularly important in virtual environments (Handy, 1995; Jarvenpaa & Leidner, 1999; Knights, Noble, Vurdubakis, & Willmott, 2001). This study implies that cognition-based trust will influence the electronic monitoring decisions of managers in those environments. We utilize future performance expectations as a proxy for cognition-based trust. However, future research would benefit by more directly incorporating trust as a proximal antecedent to control decisions. In addition, it has been shown that a manager's trustworthy behavior is likely to influence subordinate trust in the manager (Whitener et al., 1998). This research contributes to this line of research by identifying factors that influence a manager's decision to monitor secretly, a less trustworthy behavior, and suggests that such situations may lead managers to breaches of trust. Moreover, just as it was argued by Green and Welsh (1988) that control and restructuring are alternative mechanisms to reduce uncertainty of performance, trust is likely a viable substitute as well. In other words, control is not needed as long as there is trust (Luhmann, 1979).

Finally, although propensity to trust did not predict the initiation of monitoring, it did influence the ethical manner in which that monitoring was initiated. The decision to monitor was strongly influenced by situational factors (dependence, future performance expectations), suggesting that a "strong situation" can have a pervasive influence on control decisions, perhaps overriding dispositional differences (Beatty, Cleveland, & Murphy, 2001). The situation demands that the manager exert more control. Disposition, however, came into play when the team

leader considered whether to monitor secretly. This decision may have posed a greater ethical quandary for leaders. Here, the leader had more leeway and disposition affected the more personal decision to monitor secretly. The link found between propensity to trust and deceptive monitoring behavior confirms other work that argues that disposition is an important component in understanding ethical decisions (Trevino, 1986; Trevino et al., 2000). Organizations should recognize that managers who have lower levels of propensity to trust may be more likely to construct secretive monitoring regimes even though such monitoring can be detrimental.

Our managerial interviews also reveal additional motives as to why a manager might monitor secretly. For example, managers may wish to catch an abusive employee in the act. In addition, although monitoring can provide useful information to managers, employees might view monitoring as an indication of mistrust. By keeping monitoring secret, some managers believe they can avoid this controversy. Such a strategy is risky, however, because although employees may react negatively to monitoring, they are particularly averse to monitoring in secret as studies have found that discovery of electronic monitoring after the fact elicits stronger injustice and invasion of privacy judgments than when advanced notice is provided (Alge & Ballinger, 2001; Hovorka-Meade et al., 2002). Taken as a whole, these findings suggest that control, trust, and ethics are bound together in complex and interesting ways that deserve more research attention.

We recognize that our results should be interpreted with caution given this study was a 1-hour lab study involving students with limited history or prospect of future interaction. The findings may not generalize well to other settings. Nevertheless, the laboratory setting was chosen because it allowed us to experimentally examine in real time theoretical propositions about how these monitoring judgments are made. In addition, efforts were made to ensure as much realism in our simulation as possible. Team leaders had to communicate and receive information from subordinates, task assignments had a deadline, and rewards received were variable and dependent on team leaders' abilities to complete the assigned team tasks. Thus, we are hopeful that in the field, where situational forces and consequences are more potent, the effects found here might be even more pronounced.

Our supplemental interviews of managers provide initial evidence that the concepts studied in the lab should extend to the field. Nevertheless, the field interviews also identified some conditions that may limit our ability to generalize the findings from the lab to the field. One issue, in particular, that likely plays a role in the monitoring decision is accountability (Lerner & Tetlock, 1999). Managers can be accountable to

their organization (Is my unit producing?), but also to their team members that they lead (Am I treating them fairly, with dignity and respect?). Depending on the locus of one's perceived accountability (the organization or team members), one's motivation to monitor may change. Many virtual teams (as well as lab-created teams) are temporary in nature: they have limited history and limited futures. Thus, the locus of accountability in these teams might be different than in teams of longer duration. For managers in virtual or short-term teams, accountability to the organization may be more salient, as the long-term social costs of monitoring may be less severe. As a result, managers' motivations may be driven less by relational concerns and more by instrumental or self-interest reasons.

Alternatively, managers of standing teams are likely to have greater relational concerns. That is, they may feel more accountable to their team members. Under these conditions, there may be greater reluctance to monitor. Over two-thirds of the managers we interviewed, for example, indicated reservations to electronic monitoring because of relational concerns surrounding such issues as privacy, fairness, and trust. However, conclusions based on the field interviews are limited in that they were based on a small convenience sample of managers responding to hypothetical managerial situations. Thus, more field research is needed to understand the triggers for actual monitoring decisions.

Electronic monitoring research has typically examined reactions to monitoring applying microtheories including social facilitation (Aiello, 1993), fairness (Ambrose & Alder, 2000), personal control (Stanton & Barnes-Farrell, 1996), and privacy (Alge, 2001). Although theories of resource dependence have typically been applied to understand macro-level phenomena, Green and Welsh (1988) explicitly note that the control processes they model could apply to individuals. Moreover, incorporating relational concerns and accountability might further enhance our understanding of the control process, including its initiation and subsequent reactions.

Our call for integration of macro-micro perspectives also underscores limitations in Green and Welsh's (1988) model of control. In its present form, this model does not adequately conceptualize a number of intricacies evident in team relationships. Our findings suggest that consideration of individual difference variables, such as propensity to trust, would enrich our understanding of how managers decide to initiate control. Similarly, microrelational issues within teams, such as trust and relationship costs associated with control strategies, could be profitably integrated with Green and Welsh's views. Finally, social costs that might extend outside the dependency relationship, such as managerial reputation in the firm, are not well addressed. Although Green and Welsh provide useful concepts in understanding the initiation of control, such

elaborations of the framework should offer us a more complete understanding of how monitoring and control is managed in virtual teams.

In addition to social costs, there are costs associated with a leader's use of time required to process information for various levels of monitoring. As monitoring intensity increases, in addition to providing a more detailed view of employee behavior, a leader's cost in time to review and make sense of the data is going to increase. Nearly one out of three managers that we interviewed cited costs as a reason that might keep them from monitoring. These information processing costs are compounded when a leader has more than one subordinate to track.

Finally, several directions are evident for future research. First, we are encouraged that control theory appears to offer a fruitful perspective for increasing our understanding of the initiation of electronic monitoring. More empirical work is needed in this area. Second, the dual decisions of whether to monitor and whether to monitor secretly address a critical managerial issue that we are just beginning to understand. More research is needed to understand when and why managers might monitor in secret. To the extent that secret monitoring is unethical and detrimental, researchers also need to address how they can reduce this motive in managers. Finally, in this study, we focused on the team leader's actions. In naturalistic settings, subordinates are reacting to monitoring and control decisions over time, just as our team leaders reacted to the subordinates' actions. We kept subordinate reactions to monitoring and feedback constant across trials. It is possible that leaders might become frustrated when they realize that their monitoring and feedback efforts are having little effect on changing subordinate behavior. Future research needs to recognize this dynamic process and explore it more fully. Employees are likely to be averse to electronic monitoring and control (Zuboff, 1988), and they are particularly averse to it being done in secret. It is important to understand the conditions that motivate managers to initiate monitoring and control, how they initiate it, and how employees react to it.

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