
EMPLOYEE PERCEPTIONS AND SUPERVISORY BEHAVIORS
IN CLERICAL VDT WORK PERFORMED ON SYSTEMS THAT
ALLOW ELECTRONIC MONITORING

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PREFACE

One of OTA's principal concerns in this project is to obtain empirical data about how the potential monitoring capabilities of new office systems technology are, in fact, being taken up by management and reacted to by employees. OTA is also interested in how existing management and organizational psychology literature addresses the work-monitoring issue.

As part of the Statement of Work under our contract, the Educational Fund was to have Dr. Elaine J. Eisenman explore these questions, based on her doctoral dissertation field studies at five work sites. Her analysis is contained here as a separate document. It will also be quoted and used in the empirical and policy sections of the main Task 1 report.

Alan F. Westin

A review of the management and organizational psychology literatures indicates a clear gap in research on the impact of electronic monitoring on employee perceptions and behaviors. Indeed, the primary research interest has been on antecedents of employee health and sources of stress in the workplace. This research, (cf. Bickson & Gutek, 1983; Cohen, Smith, & Stammerjohn, 1983) however, has focused solely on the reported concerns of the worker, with virtually no attention paid to the supervisor in these settings. The present study focused on both the supervisor's role and on three factors which were believed to affect the employee's perception of both the supervisor's behavior and of computer-generated performance monitoring. These factors were identified as: 1) the monitoring capability available to the supervisor 2) the supervisor's utilization of that capability and 3) the employee's perception of the control mechanisms existing in the organization.

Rationale for Present Study

The research cited above has consistently found that the VDT workers report significantly greater closeness of supervision, increases in supervisory controls, and feelings of constant monitoring, than do non-VDT workers.

Yet, despite the general acceptance of the conclusions of the above research, it is characterized by several problems. First, for the most part this research treats the VDT, in and of itself, as the only independent variable. As a result, any differences noted between VDT and non-VDT workers are attributed to the impact of the VDT alone. This interpretation, however, which is essentially an acceptance of the notion of technological

determinism, is dangerously simplistic. To accept that the VDT causes worker complaints is to view the VDT as a "rational actor in its own right" (Sirbu, 1982, p. 10) rather than acknowledging that the VDT is merely a tool used to accomplish the routine technology which characterizes this type of clerical work. This viewpoint has also been voiced by Sauter and his associates (1983), who suggest that differences in employee perceptions of the psychosocial work environment do not prove that the VDT causes the problem. Instead, they suggest, that the VDT, considered by itself independent of other workplace changes that may result from its introduction, contributes little to the stress or lack of well-being of its users.

A second, related problem is that treating the VDT as the independent variable obscures the possibility that other factors in the work environment may contribute to the perceptions of the workers. A key factor in employee perceptions of the workplace may well be the supervisor. For it is the supervisor, who has long been identified as "critical to the quality of work life of the employee" (Strauss, 1977). Indeed, the perceptions of increased supervisory controls, constant monitoring and increased closeness of supervision, while linked to the use of the VDT, appear to more appropriately implicate the behaviors of the supervisor. Without research which focuses on the factors other than the VDT, however, it is not possible to determine if the supervisor makes use of the control potential made possible through the design of the system which supports the VDT, or if it is merely the employee's perception that this control and monitoring potential is fully exploited.

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Other factors may also influence employee perceptions. An historical consideration of the concerns of comparable clerical workers clearly demonstrates that neither the structure nor the nature of the present environment is unique. As noted earlier, the tasks performed by the clerical workers under focus are those characterized by a routine technology, the process of which clearly predates the introduction of the VDT. Routine technologies have long been associated with highly formalized bureaucratic structures (Hage & Aiken, 1969; Ford, 1979). For these reasons, it appears likely that the view of the VDT as the sole independent variable in the work environment of the VDT employee serves to severely limit the ability of researchers to fully understand the processes which underlie the present concerns of VDT workers. A consideration of the work environment, the control systems in place in this environment and the role of the supervisor would better clarify the factors which result in the current concerns of VDT workers.

Further, it appears that supervisors in highly routinized settings are more task and structure oriented (high in initiating structure) at the expense of employee-centeredness or consideration (Yukl, 1981; Katz and Kahn, 1950, 1978). It is highly possible, then, that many supervisory behaviors are redundant with the control mechanisms imposed by the task, the technological tools, and the bureaucratic structure which characterizes the environment. While this redundancy is not unique to the settings where VDTs are utilized, the VDT may well represent an additional form of control to the workers, and it is their perception of this form of control which results in their

current concerns.

The VDT, moreover, is distinct from prior forms of control in that it may be perceived as insuring constant monitoring and visibility of the worker. While some degree of visibility and monitoring falls within the normative expectations of employees, the perceptions of the capability of the VDT may well serve to exceed normative expectations. As Merton (1968) has observed, the use of mechanisms necessary to meet the functional

requirement of visibility is itself limited to the norms of the group, for if the authorities try to keep informed about the details of role performance to an extent that exceeds the normative expectations of members of the group, then this will be met with resistance or expressed opposition (p. 397).

For this reason, the extent of acceptable visibility or monitoring may well have a boundary above which the performance monitoring is perceived as unacceptable.

The importance of normative expectations about both monitoring and supervisory behaviors has also been suggested by Barnard (1938). He identified a "zone of indifference" whereby employees react to specific supervisory behaviors and actions only if the supervisor exceeds the tolerance limits customarily adopted by the employee. This possibility has also been noted by Dubin (1974) and Likert (1961) in their observation that employees hold expectations of appropriate levels of supervisory behaviors, and that behaviors in excess of these expectations will not be favorably viewed. Further, research by Kavanaugh (1972) serves to underscore the existence of employee expectations of the proper level of guidance and structuring to

be provided by the supervisor. If the amount of structuring remains at or just below the expected level, the employee does not feel imposed upon. If, however, the actual structuring exceeds the expectation, the employee would become angry and feel imposed upon. In this way, then, it appears likely that there exists differential thresholds for the perception of the violation of the proper amount of structuring. This likelihood would also extend to issues of extent of acceptable monitoring.

Consequently, a key factor in the development of the current concerns of VDT workers may well be that their threshold for optimum supervisory structuring has been exceeded. For the employee, the perception of supervisory behaviors under the design of the present technological systems may well be skewed by a combination of the redundance between control systems and supervisory behaviors, a mechanistic work environment, and the perception of control potential inherent in the VDT. The relative uniqueness of the VDT makes it a particularly salient and obtrusive form of control, especially in its perceived capacity to insure constant visibility of performance. Thus, the contextual, social, perceptual, and technical factors, taken together serve to completely exceed the employee's zone of indifference, and this process of exceeding the normative threshold can be viewed as leading to the consistently reported feelings of constant monitoring, increased supervisory controls and overly close supervision.

Hypotheses

There were two sets of hypotheses related to the anticipated differences between employee perception and supervisory role. The

first set predicted significant differences in perceptions of supervisory behaviors and formalization (the extent of rule observation and procedural regulations imposed by the organization) between the VDT and non-VDT conditions only. It was anticipated that employee perceptions would not accurately reflect the actual level of monitoring, but rather that the daily use of a VDT would result in the perception of constant monitoring-regardless of the actual monitoring which was performed.

The second set of hypotheses predicted that the extent of available monitoring capability would result in differences between supervisors for closeness of supervision and consideration, but not for initiating structure.

Method

Participants

Participating Organizations

The final sample consisted of six companies, all of whom have requested anonymity. There were three unionized companies represented in the sample.

Company and Site Descriptions

General Description:

In all sites the employees sat at their work stations in full view of their supervisor, whose desk was always at the front or side of the work group. In no site was the supervisor's desk in either a separate room or in a closed cubicle. At all times the supervisors were able to check on employee behaviors by simply looking up from their desk. This level of employee

visibility held regardless of the actual work station arrangement. In all but Companies B, C, and F the physical arrangement resembled a classroom, with the supervisor's desk at the front and the employees in rows in front of the desk. In Companies C and F the employees' desks were attached to one another, although separated by dividers to screen off voices while the employees talked on the telephones. The rows of desks flanked the supervisor's desk. In Company B, the desks were also attached and the supervisor's desk was located at the side of all the rows, allowing her to watch the employees actual hand movements.

Descriptions of the software capability for monitoring is provided in the next section entitled "Protocol for assignment to conditions". The actual manufacturer of the office system hardware was unavailable in most locations. For the most part, the specific software packages had been custom-designed for each company, further specifications regarding these programs were also unavailable.

Company A

Company A is a major insurance company with the home office in New England. Three sites from this company participated in the study.

Site 1: The employees were responsible for processing medical prescription claims, and used keypunch machines to accomplish this task. The employees in this site were assigned to the non-VDT condition.

Site 2: The employees were all health insurance claims

processors and were assigned to the moderate monitoring condition.

Site 3: There were two groups of employees at this site. The first group were text processors who used IBM electric typewriters to transcribe dictated information received from Field and Home Office Departments. These employees were assigned to the non-VDT condition.

The second group of employees were key-to-disc operators who were responsible for both keying and verifying insurance data. These employees performed their tasks on CRTs. This group of employees were assigned to the High Monitoring condition.

Company B: Company B is a major retail organization. The site chosen for participation was located in the greater New York area. This company was unionized, and the employees were represented by the Retail Workers Union. The employees in this site were engaged in either data entry or data collection work.

The data entry workers used VDTs to enter credit application information. These employees were assigned to the Low Monitoring condition. The data collection workers used VDTs in conjunction with telephones for such jobs as verification of new accounts, bill collection, credit authorization, and credit card inquiries. One group of the collection department used a computer-driven telephone system which automatically dialed numbers once the operator concluded each call.

Company C: Company C is a large public utility in New England. It is unionized and is represented by the Communication Workers Union. One site participated in this research. This site was of particular interest, as all the workers were in one room, with

half the workers using keypunch equipment, while the other workers used CRTs. Both groups entered billing information. All the employees, regardless of the type of equipment which they used were supervised by the same supervisor who sat at a desk in the front of the room. The keypunch operators were assigned to the non-VDT condition, while the CRT operators were assigned to the High Monitoring condition.

Company D: Company D is an information broker for the American Stock Exchange. The employees use VDTs to enter stock and commodities transaction information. This Company is unionized, and the employees are represented by the Professional Office Workers Union. The employees were assigned to the High Monitoring condition.

Company E: Company E is a large manufacturing company located in upstate New York. All the employees use VDTs for data entry, and they were assigned to the Low Monitoring Group.

Company F: Company F is a moderately sized market research company located in New York State. The employees are responsible for conducting telephone surveys for various advertising companies. All employees use VDTs to enter data. Although their supervisors cannot access their data screens, these employees were assigned to the Surveillance condition as the supervisors would monitor the actual telephone calls.

Table 1 depicts the numerical breakdown of research sites by number of supervisory and employee participants.

Table 1

Numbers of Employees and Supervisors Surveyed at Each Research Site

| Company | # Employees | # Supervisors | Span of Control |
|---------|-------------|---------------|-----------------|
| A | | | |
| site 1 | 26 | 3 | 8.6 |
| site 2 | 68 | 4 | 17 |
| site 3 | 43 | 4 | 10.75 |
| B* | 115 | 6 | 19.12 |
| C* | 22 | 2 | 11 |
| D* | 29 | 3 | 9.6 |
| E | 30 | 3 | 10 |
| F | 32 | 2 | 16 |
| | N=365 | N = 27 | Average= 13.2 |

Note: * signifies unionized companies

Organizational Participants

Supervisors

The supervisory participants were 27 first level supervisors of non-exempt clerical level employees. The majority of supervisors had been promoted to their present position from a position comparable to the group which they were now supervising. Of the 27 supervisors, only two were black and only three were male. The typical supervisor was a thirty-nine year old white woman who had been a supervisor for three years after having spent ten years with the company in a lower level position. She had an average of thirteen years of education. Table 2 presents a

profile of the supervisor.

Table 2

Demographic Profile of Supervisor

| Variable * | Mean | Minimum | Maximum |
|--------------------------|------|---------|---------|
| Age | 39.3 | 30.0 | 60.0 |
| Time in Present Position | 3.6 | 0.2 | 12.0 |
| Time in Present Company | 10.0 | 0.6 | 32.0 |
| Education | 13.2 | 12.0 | 16.0 |

* given in number of years

Employees

The employees were 365 non-exempt clerical workers. This group constitutes the greatest users of VDTs in terms of the number of hours per day that the VDT is used and for whom there is continuous recording of performance statistics by the computer (Westin, 1985). While the specific job tasks varied somewhat across job categories, the jobs are closely related through the techniques utilized. All job categories were characterized by minimal discretionary responsibility, standardized methods, and minimal task uncertainty, and thus can be classified as a routine technology. The job categories were:

1. Data Entry Operators (N= 169)

In general, the job description of data entry operators included the following elements: operates data entry keyboard

utilizing keypunch, verify, typewriter and/or key disc equipment for majority of work day, performs necessary checks to insure accuracy of all work performed, performs a variety of clerical functions as necessary.

2. Claims Processors (N= 68):

The job description of claims processors include the following elements: reviews claim forms, medical/dental bills and reports to determine nature of illness/injury; determines coverage using protocols set by computer data base, claims manuals and bulletins; uses VDT to add and obtain essential information, lists expenses and authorizes payment in accordance with guidelines; using established guidelines refers unusual or complicated claims to another person responsible for referrals.

3. Data Collectors (N= 128):

Employees comprising this condition were all involved in work which required the constant use of telephones throughout the day. There were three subgroups in this condition. One group used the telephone to ask predetermined questions of recipients. No discretion was allowed in either the form of the question or the wording of the written answer. The second subgroup's primary task was to phone delinquent credit card users, to inform them that their account was overdue, and to ask when they would begin to pay on the account. This information was then entered into the debtor's file through their VDT and a letter was automatically generated to the debtor confirming the conversation and the intent to pay. Here, too, no discretion as to judgements regarding reasons for the overdue bill were allowed. The third subgroup responded to the telephone inquiries of salespeople

regarding the credit card number of customers who wished to charge a purchase but did not have their card with them. This group also entered lost card information into the customer's file and into a company-wide alert system through their VDT.

Table 3 presents the numbers of employees and supervisors in each job category.

Table 3

Number of Employees and Supervisors Surveyed in Each Job Category

| Job Category | # Employees | # Supervisors |
|-------------------|-------------|---------------|
| Data Entry | 169 | 12 |
| Claims Processing | 68 | 4 |
| Data Collectors | 128 | 7 |

The typical employee was a white female who had held her present position for four years, had been with the company for six years, and has had 12.8 years of education. Table 4 presents the demographic information by job category.

A comparison between the supervisory and employee groups indicates that, as a group, the supervisors are older (39 versus 33 years), and have been with the present company longer (10 versus 6 years), but have held the present position for a time comparable to their employees (4 years) and have comparable amounts of education (13 versus 12.8 years).

Table 4

Employee Demographic Information By Job Category

I. Age

Overall Mean 33.0 years

| Group | Mean # years | Minimum # years | Maximum # years |
|-------------------|-----------------|--------------------|--------------------|
| Data Entry | 38.2 | 19 | 65 |
| Claims Processors | 28.5 | 18 | 57 |
| Data Collectors | 27.98 | 15 | 64 |

II. Time in Present Position

Overall Mean 4.2 years

| Group | Mean # years | Minimum # years | Maximum # years |
|-------------------|-----------------|--------------------|--------------------|
| Data Entry | 7.03 | 0.1 | 30 |
| Claims Processors | 1.80 | 0.1 | 8 |
| Data Collectors | 0.74 | 0.1 | 3 |

III. Time in Present Company

Overall Mean 6.3 years

| Group | Mean # years | Minimum # years | Maximum # years |
|-------------------|-----------------|--------------------|--------------------|
| Data Entry | 10.75 | 0.1 | 35 |
| Claims Processors | 3.67 | 0.1 | 15 |
| Data Collectors | 0.9 | 0.1 | 3 |

IV. Education

Overall Mean 13.2 years

| Group | Mean # years | Minimum # years | Maximum # years |
|-------------------|-----------------|--------------------|--------------------|
| Data Entry | 12.51 | 10 | 16 |
| Claims Processors | 13.01 | 12 | 16 |
| Data Collectors | 13.34 | 9 | 18 |

Protocol for Assignment to Conditions

Employees were divided into two major conditions, VDT and non-VDT. The non-VDT condition was used as a reference condition, and was comprised of data entry workers who did not use VDTs and for whom there was no computer-driven performance information available. In contrast, the VDT condition was comprised of data entry, data collection and claims processing workers. All employees in this condition used VDTs and were subject to computer-driven performance information.

The research on VDT workers has typically divided workers into two groups: VDT workers and non-VDT workers. Consequently, the original intent of the research had been to investigate differences in employee perceptions and supervisory behaviors based on the presence or absence of a computerized monitoring system. In the field, however, it became apparent that this simple distinction was inadequate. Instead, preliminary field visits indicated major differences between companies in the use of the monitoring capability of the computer system. Some companies had very sophisticated systems for generating extensive information about daily performance, some companies relied on the operators to record this information, and for other companies, while the system was capable of generating extensive statistics, the full capability was not necessarily used. Consequently, the original criteria for assignment for conditions was not used. In its place, the final protocol for assignment to conditions was based on the extent of utilized technology. Within the VDT condition, assignment to specific conditions was based on the actual level of monitoring of employee performance utilized by

the supervisor. In this way, monitoring capability was assessed according to two central factors: sophistication of the software installed in the computer system, and extent of collection of performance statistics. Monitoring capability was defined in terms of levels, with each level constituting a condition within the major VDT condition. The specific conditions were:

VDT Conditions

1) Surveillance (S₁): The supervisor accesses ongoing performance information through his terminal and/or telephone without the employees knowledge of the actual time when monitoring occurs.

2) High (HM): Extensive performance information (i.e. keystroke rate, number of explained/unexplained pauses, error rate, errors corrected and uncorrected, number of completed jobs) is available throughout the day, but the supervisor does not access ongoing information through his or her terminal.

3) Moderate (MM): Extensive summary performance information (i.e. number jobs completed, complexity of jobs, number errors, keystroke rate) is available on a daily basis only. There is no systems capability for accessing ongoing performance information.

4) Low (LM): Daily performance statistics are available but are limited to rate, number of completed jobs, and number of errors. There is no systems capability for accessing ongoing performance information.

5) Non-VDT: Employees use either keypunch machines or typewriters. There was no linkage between these types of

equipment and a central computer system. Consequently all performance information was based on checking completed output or on the employees themselves keeping records of their keystroke and error rates.

For example, a designation of Surveillance would be given if the computer system was capable of collecting ongoing performance information and it was technically possible for the supervisor to access this information without the employees' knowledge at any time during the day. If, however, the supervisor in this setting did not have his or her own terminal, and consequently was not able to access ongoing information without the employees knowledge, the condition designation would be High Monitoring. Condition assignment, then, was on both the performance information which was generated by the computer and indicated on a printout and the investigator's observation of the supervisor's potential monitoring capability based on that supervisor's reported utilization of the available technical equipment. Consequently, conditions were assigned after the site visit and data collection. Table 5 presents the numbers of employees and supervisors listed by condition and job category.

Table 5

Number of Employees and Supervisors Surveyed:
Listed by Condition and Job Category

| Condition | Job Category | # Employees | # Supervisors |
|------------------------------------|-------------------|-------------|---------------|
| Non-VDT | Data Entry | 41 | 6* |
| VDT Conditions Monitoring Level | | | |
| Low | Data Entry | 49 | 4 |
| Moderate | Claims Processors | 68 | 4 |
| High | Data Entry | 79 | 8* |
| Surveillance | Data Collectors | 128 | 7 |

* Two supervisors were responsible for the supervision of both a group of keypunch operators (MDE) and a group of VDT operators.

Section Three

Measures

Two sets of measures were utilized in this research. The employees were given a paper and pencil questionnaire which measured perceived formalization, initiating structure, consideration structure, and closeness of supervision. The supervisors were given a different form of the same questionnaire which allowed for self-report of their own methods. In addition, each supervisor was interviewed regarding their methods of supervision and their utilization of the computer system's monitoring capability. All questionnaires are included in the appendix.

Questionnaire Framework

The questionnaire was divided into three sections, with a total of forty-six items, and a demographic information page. In

the employee questionnaire, the first section focused on the employee's perception of their present job and their assesment of their supervisor's general style in terms of consideration and initiating structure. The second and third sections focused more specifically on the content and frequency of specific kinds of communication received from their supervisor, and the final section looked at the employees' view of the ways in which their supervisor spends his or her time during a typical week.

RESULTS

Content Analysis of Supervisor Interviews

Each supervisor was interviewed in an attempt to gain additional insight into their methods of supervision. Additionally, it was anticipated that these interviews would allow for a better understanding of exactly how much impact the ability to monitor computer-generated performance information has on the relationship between the supervisors and their employees. The interviews also provided the opportunity for unobtrusive methods of assessing the work environment and the nature of this relationship. This opportunity was possible as all interviews were carried out at the supervisor's desk during the work day. In this way, I was able to sit and observe for an extended period of time as the supervisor was frequently called away from her desk. In this way, the use of the interviews and unobtrusive observation can be viewed as providing convergent validation of the questionnaire results (Jick, 1983).

Descriptions of a Typical Day

First, a consideration of supervisor answers to the questions "Describe a typical day here" and "What are some of your daily headaches? How do you handle them?" serves as the basis for the supervisors' beliefs, which will be discussed in a later section, that the extent of daily workload demands eliminates the possibility of taking time to monitor the performance of their employees.

In response to the first question involving the typical day, there were few points of difference between the specific tasks required of the supervisors. Essentially, for all supervisors, the day was described as "a zoo" involving "constant movement". The primary responsibilities were to check the work load and set work priorities based on specific deadlines for each piece of work. Then, attendance was checked in order to determine individual workloads. Once this was completed, work assignments were made. In some settings assignment clerks or senior level workers were responsible for distributing assignments. The remainder of the day was spent making sure that deadlines were met, dealing with work and system problems, checking production sheets, and generally "trouble-shooting". Only the supervisors of the surveillance group included "monitoring" as a daily activity. In these settings, as noted in the introduction, monitoring took on a structural quality as daily monitoring was written into the job descriptions of both the supervisors and the employees. Yet, even in these settings, monitoring did not assume a high priority.

Daily Priorities

This set of questions focused on the most and least important parts of the supervisory job. Here, too, there were no major distinctions between conditions in the pattern of responses. As was anticipated, the most important part of the job is "getting the work done on time" or "maintaining the work flow", although several supervisors adapted this goal to be one of "getting the job done through your people" (a moderate monitoring supervisor) and "achieving results through people" (a surveillance supervisor). One high monitoring supervisor's response, while ostensibly in agreement with these two statements, provides a different twist to the goal. She answered, "keeping on top of the people, making sure they keep to the standards".

As noted above, the most frequent response to the "least important job aspect" question centered around such tasks as "paperwork", "answering memos", "written reports" or "checking time clock cards". One low monitoring supervisor noted that "checking performance stats, especially when we're real busy, is a stupid waste of time".

Utilization of Monitoring Capability

The question "how often do you collect performance information about your employees" was central to the present study. It was anticipated that this question would provide the most information regarding the use and potential impact of varied levels of monitoring capability. The responses to this question serve to confirm the lack of consistent relationship between monitoring capability and both employee and supervisor

perceptions. One extremely surprising finding was the fact that in many ways the supervisors are not fully utilizing the capability of the system. As one high monitoring supervisor stated " Oh, I could use 'op stat' [operator status] to look into

any of my operator's terminals and see what they're doing, but it takes too much time. It's easier to walk or glance around the room to see if they're working. In a place like this, its hard to pretend to be busy if you're not."

This viewpoint was echoed by another high monitoring supervisor who said "Yes, I get daily stats, but they're rarely used. I can tell if the work isn't done from the total department output. It's an issue of pulling your own weight. I have more pressing and important things to do than kill time checking output."

Similarly, a moderate monitoring supervisor explained, "It's just too much trouble to watch who's doing what. That alone could be a full time job for someone, but who needs it. I must rely on my people and assume that they're not abusing the system."

And, last, a surveillance supervisor observed, "I don't have the time and I don't think its necessary to constantly monitor calls. I do it every so often, but I really have more important things to do. Anyway, my desk is so close to my people, if there are any real problems I can hear them without listening in."

Of particular interest was the fact that the most frequently identified means for supervising the employees was the same methods identified by Katz and Kahn in the early 1950's: "roaming around" "looking around when I'm on the phone or talking to someone", or as one high monitoring supervisor remarked, "nothing special really, but the girls know I keep an eye out".

The lack of any perceived need for formal monitoring can also be seen in an example of the determination of performance statistics for a non-VDT site. Here the workers type insurance claim information onto forms from information which is given

through a dictaphone. On each typewriter there is a keystroke counter. After the completion of each form, the worker enters the number of keystrokes which were recorded on the counter and sets the counter back to zero. She then counts the errors and enters that number also. At the end of the day, the supervisor collects the hand-written sheets and sends them to data processing which computes the keystroke and error rate and sends back a printout listing these rates. The supervisor explained the system as "it's

an honor system. Once a month we do spot checks for errors and rates, but that's much too time consuming to do daily. The only thing that matters is that the work gets done."

A similar honor system occurred at another non-VDT site. Here the keypunch operators count the number of cards they have completed at the end of each day, and submit the number as well as the total time which they have worked. These numbers are then tabulated to determine the rate per hour for the worker. When asked if anyone ever tried to beat the system, the supervisors in both settings were quick to point out that it would not be possible on an ongoing basis. Although there were no daily checks, there were unannounced spot checks, where "the girls

never know who's going to be checked or when. They do know that if there's a big difference between what they've been reporting and what I find, there'll be hell to pay".

Thus, for two situations which appear, on the surface, to allow for far greater freedom and leeway than would be possible in VDT settings, the norms and continual expectation of being checked without prior warning serve to constrain behavior in much the same way as ongoing operator statistics.

The lack of reliance on computer-generated information is

perhaps best exemplified by the statement of a surveillance supervisor who said "Oh, yes, the computer collects more information that I could ever use". This sentiment was also apparent in the fact that in many of the high monitoring settings, supervisors did not have terminals on their desks. Thus, even though several of the systems in use allowed for surveillance, there was no way to take advantage of this capability. When one supervisor was asked about this omission, she replied "If I had a terminal, I'd have to get rid of my plants. That's how important it is to me. I don't have time to use it anyway!"

Views of Computer-Generated Performance Information

Supervisors were also asked about how they viewed the use of computer-generated performance information. Specifically, they were asked "Some people feel that when performance information is constantly recorded by a computer it may create lots of problems between the supervisor and the employees. Do you feel this is/could be a problem here?" The responses to this question also were consistent across conditions. There was general agreement that, whether the information is fully used or not, it is important to have "objective" information. One non-VDT supervisor, who had once worked in a computerized setting, observed, "that set-up is great. When you can actually see the work measures you have something tangible to talk about. Performance discussions and evaluations can't be taken personally. The information is all in black and white."

Another non-VDT supervisor, however, expressed the concern that "individual differences wouldn't be taken into account with a system like that. It would just mean more work."

All the other supervisors, however, agreed with the first cited respondent, with the majority noting the importance of how the information is used. For example, a low monitoring supervisor explained "It's a good idea as long as it's used fairly and not for constant monitoring. It might be a big threat for poor performers, but they could be helped to view it as a way to learn."

A second low monitoring supervisor observed "When we first got the system I felt like big brother watching all the time. Then I got used to it and so did the employees. You can't use it as a threat or punitively. You must say 'Aren't we lucky to have a system which lets us see improvements so easily'".

The importance of fairness was also echoed or implied by the other supervisors, irrespective of monitoring level. Examples of statements from the surveillance condition include:

"It all depends on how constructively its used. As long as there's a good relationship the monitoring aspect doesn't matter."

"There aren't any problems as long as there are no secrets. If the information is used immediately as a teaching tool its viewed as helpful. It's the supervisor's job to help the employee overcome the feeling of being beaten on."

"The real issue is how self conscious you feel when you know you're being monitored. With the old system the phone clicked when someone was listening in, that made everyone real nervous and self-conscious and angry. Now there's no click so you don't have to think about it and its accepted more easily."

"It's fine as long as it's above board."

Representative examples from the responses of high monitoring supervisors include: "It's not the stats that are the problem, the stats are just a convenient excuse for anger at management over pay and working conditions."

"Workers always compare salary and raises. With stats you can prove or disprove the typical complaint that I work harder but everyone else gets paid more money."

"The computer is rarely wrong. The employees feel safe that I can now justify complaints about unfair

workloads."

Last, representative responses from the moderate monitoring group include: "Everyone has bad days. With the computer I can easily determine if the day is an exception or a trend. Also I can determine the exact nature of the problem, and can teach based on some problem which the system has identified."

"It all depends on how it's presented. The system itself is fair, there's lots of protection built in. It allows for lots less subjectivity and as a result lots more fairness."

"With the system there's no surprises. Everyone knows where they stand. Employee ratings can be challenged for favoritism or being picked on."

Thus, the importance of fairness and the belief that the proper use of the system is for the benefit of the employee is a constantly recurring theme among the supervisors across all conditions. Unfortunately, despite the almost idealistic presentation of the benefits of these systems, very few supervisors used the performance information as a basis for ongoing training and feedback. As discussed earlier, in general, the actual monitoring of performance for actual use was virtually a visual monitoring, and the generated performance statistics were routinely filed away for annual performance reviews. The only company in which the statistics were used more often, was in Company A in the sites where a bonus program for exceeding the established standard was in effect.

Identification of Employee Concerns

The final question focused on employee concerns, and sought to determine if the extent of monitoring capability affected the supervisor's insight into the concerns of her employees. The question was "What are the main gripes or dissatisfactions of your employees? Do you agree that these are important issues?"

Here, too, with one exception, the supervisors in all conditions appeared highly sensitized to the concerns of their employees. Further, these identified concerns were comparable across conditions. The one exception was a supervisor from the surveillance condition who answered "Some people may feel degraded, but so what". This answer, however, was unusual in its lack of sensitivity and concern, and can not be viewed as representative of any other supervisors. The typical responses focused on the work environment, and, as such, reflect the concerns cited in the introduction of this paper. As a high monitoring supervisor observed, "the work itself is dull and boring, what else can you say, it's a day's pay, but it's too much work, too much pressure, and too little pay".

This theme was repeated by a majority of supervisors: "there's constant pressure to perform", "its monotonous", "too much job insecurity", "no career paths", "the room is disgusting" "the environment is fit for computers, not people - it's too cold and too noisy". The pay system was also viewed as a source of concern: because these workers are not salaried, " they have to decide if they can afford to take a lunch or bathroom break. They lose money if they do." A related problem was also identified as the fact that workers do not get paid during systems down time, as they are not logged in and working. A similar concern is the need for workers to account for "every second spent during the work day". In all cases, the supervisors agreed that these concerns were valid, and voiced dissatisfaction at not having the power to improve the conditions. Thus, with the exception of the first quoted supervisor, it appears that the supervisors are very

concerned and sensitized to the working conditions and problems of their employees. One reason for this high sensitivity, of course, may be the fact that, without exception, all the supervisors had been promoted to their present position from a clerical position.

Union vs. Non-Union Perceptions

The Unions have consistently held that the high degree of stress and health related problems which appear to characterize VDT clerical workers are largely caused by the lack of control over the work process and the greater degree of closeness in supervision which occurs through VDT monitoring. Further, they have indicated that the key complaints and concerns of employees are those which concern the degree of monitoring which occurs through the VDT. Indeed, given these stated concerns, it was anticipated that both the supervisors and employees who participated in the present study would be most vocal on the issue of monitoring. It was also also anticipated that there would be significant differences between both supervisory monitoring behaviors and employee-stated concerns in unionized vs. non-unionized companies. Such was not the case, however.

In general, there were few differences between the statements or monitoring behaviors of supervisors in union versus non-union companies. There was one key difference between unionized and non-unionized companies, however. This difference centered around the supervisor's perception of the usefulness of of the computer-generated performance information. As was discussed earlier, while neither group of supervisors professed

to use the information in a systematic or regular manner, the supervisors in unionized companies were much more vocal in their belief that the use of the information was not a priority. Moreover, this group of supervisors indicated that the collection and use of this type of information was essentially "worthless".

As one supervisor stated, "the only purpose that it serves is to protect me from a grievance action. Then I have proof that I'm right, because the numbers are all there. Otherwise the information just collects dust in a folder. It isn't used for anything since the union controls pay increases and promotions. If they don't care about performance, why should I?"

This observation was representative of the feelings of other supervisors in unionized companies, and was in sharp contrast to the supervisors in non-unionized companies who felt that if they had the time to use the information their employees could benefit.

A second distinction between unionized and non-unionized companies could be seen in the nature of employee responses to my presence. At the end of the period in which questionnaires were filled out, the employees were asked if they had any comments or questions. As noted above, it was expected that there would be many questions and comments regarding the monitoring behaviors of the supervisors. Interestingly, The only questions were from employees in the unionized companies. These questions, however, did not center on monitoring, as was anticipated, but rather were always related to health and stress issues, reflecting a high level of awareness of current legislative and health-related concerns. For example, these employees typically asked about my knowledge regarding the effect of VDTs on vision; another major concern was the effect on pregnancy and the fetus. Because the

employees appeared to view me as an expert on VDTs, I was asked for my opinion regarding the "truthfulness" of the information which they had received from their union. An aspect of this behavior which was particularly interesting was that only the unionized employees demonstrated this awareness and willingness to ask about these issues. Although there were occasional comments from the employees in non-unionized companies, their comments usually focused around the notion that the questionnaire did not ask for opinions on the monotony and boredom of the job.

Last, many employees made comments in a more or less bantering fashion while I reviewed the instructions for questionnaire completion. No comments, however, were made regarding the questions which related to monitoring. Instead, the comments further emphasized both groups inattention to issues of monitoring. Here, the majority of comments, from both unionized and non-unionized employees tended to center on the last page of the questionnaire. This page asked respondents to estimate how much time during the week their supervisor spend on eight different supervisory tasks. The scale for responses ranges from 1 (a minimum amount of time) through 7 (maximum amount of time). Typically, on this page, the employees would ask if it was possible to enter "'0' for doesn't work at all". At that point there would be a great deal of laughter and the employees would state their intention to answer in this way. They would then request that I show these results to their supervisor's "boss". Again, as was discussed regarding the supervisor's responses, the issue of the stress which has been alleged to stem from constant

monitoring was not vocalized as a major concern for the employees who participated in the present study.

As this finding was so unexpected, I contacted two management representatives from the participating unionized companies and one union representative in order to ask for their opinions as to the contrast between my findings and those consistently reported by the unions. There was a clear cleavage between the responses of the management representatives and those of the union. The management representatives both stated that my results were not unexpected- they both said essentially that they had always believed that the employee-union results were largely overblown and non-representative of what actually occurs. One manager focused on the use of supervisory time and confirmed that the job description of the supervisor is focused primarily on meeting work deadlines. He said that supervisors are not properly trained to supervise and that consequently it would not be expected that they would have any idea as to how to properly use the performance information - even if they did have the time to consider it. The only union representative that I was able to reach (Communication Workers Union) said that my results were totally at odds with everything that he has heard, and that he had a difficult time understanding how I could have had these results given the fact that "people in these jobs have lost total control over their jobs, and are literally dying from the stress from monitoring and other health and safety hazards". This representative suggested that the only possibility for my findings were that the locations I used were highly unusual, or that I did not ask the "right" questions.

In summary, the interviews with the supervisors served to confirm the lack of significance of monitoring capability on supervisory perceptions and behaviors. In the interviews there were no trends or patterns of responses that in any way paralleled the extent of the supervisor's monitoring capability. Instead, the comparability of perceptions and attitudes among supervisors of all conditions was confirmed.

These findings call to question the necessity of legislation which seeks to prohibit the collection of computer-generated performance information. Although the present study did not include employee interviews regarding monitoring and the collection of computer-generated performance information, the data from the questionnaires coupled with the relatively informal discussions which transpired both before and after the questionnaires were filled out, provides an important counterpoint to the widely accepted view that the issue of monitoring as a major source of workplace stress is both primary and all-pervasive for clerical VDT workers. It is here that the question of methodology and the presentation of questions becomes important. As noted earlier, the present study did not present the VDT as solely responsible for all the perceived stress in the workplace. Instead, the VDT and the issue of monitoring was viewed as but one piece of the total social and technical system. Perhaps the broadening of focus, and the lack of attempt to identify the VDT as the source of stress allowed for the employees to voice their own concerns without being specifically focused on researcher-identified concerns alone.

Quantitative Data

In general, there was only minimal support for the hypotheses of differences between the VDT and non-VDT conditions for both supervisors and employees. Additionally, there was no consistent pattern in the relationships between the extent of the supervisor's monitoring capability and employee perceptions. Instead, as was true for the interview data, support was found for the relative similarity in perceptions of both supervisory behaviors and formalization across all conditions. This pattern of results was also found for the one question which specifically asked about monitoring, "People here feel as though they are constantly being watched to see that they are working". There was no significant difference between conditions in the pattern of responses. This lack of significant difference was also found in a comparison of the unionized and non-unionized companies. In this comparison, however, there was a significant difference for the perception of formalization. Here, the employees in the unionized companies perceived less formalization or rule enforcement than did those employees in non-unionized companies. Despite the statistical significance of this difference, however, both mean scores were around the midpoint.

Table 6 presents a summary of the range of supervisory and employee scores according to monitoring levels for the variables under investigation. Here, too, the scores fell primarily in the moderate to low range for all constructs. The scale in this Table ranges from 1 to 5, with a score of 1 indicating the highest score and 5 indicating the lowest.

Table 6

Ranked Mean Scores For Each Variable:
Supervisors and Employees

| Monitoring Level | Variables | | | | | | | |
|--------------------------|-----------------------------|---|---------------|---|-------------------------|---|---------------|---|
| | Closeness of Supervision | | Consideration | | Initiating Structure | | Formalization | |
| | E | S | E | S | E | S | E | S |
| non-VDT | *5 | 2 | 2 | 5 | 2 | 5 | | 1 |
| VDT Conditions | | | | | | | | |
| Monitoring Levels | | | | | | | | |
| Low | 4 | 1 | 3 | 3 | 3 | 4 | | 3 |
| Moderate | 1 | 1 | 1 | 1 | 1 | 1 | | 4 |
| High | 3 | 4 | 5 | 4 | 5 | 3 | | 2 |
| Surveillance | 2 | 4 | 4 | 2 | 4 | 2 | | 5 |

* #1 is the highest ranking. i.e. 1= highest perceived closeness

Note: The ranked scores are based on relative scores within the actual range for each scale. The rankings do not indicate significant differences between conditions.

As is illustrated in Table 6, the only consistent pattern of scores is for the employees in the moderate monitoring condition. This pattern, however, highlights issues outside the realm of

monitoring capability. This condition was the only condition using a single site and a single job category - claims processors at Company A, Site 2. The claims processors are different from all other job categories in that the nature of their work, while providing the illusion of discretionary judgement, actually requires constant input from the supervisor regarding protocols for the awarding of claims. It is possible that the relatively high amount of interaction results in a difference in perception from the other conditions. Additionally, the fact that the site is unique makes it possible that the pattern of differences are also related to site management and culture.

Here, interview and observational data provide additional insight into the importance of the nature of particular management techniques. The supervisors of the employees in the moderate monitoring condition appeared, as a whole, more involved with their employees than did the supervisors in other sites and companies. While this level of involvement could not be identified solely through interview data, extended observation of both the setting and of the nature of supervisor-employee interactions did corroborate the distinctions between this site and the others. In three of the work groups the supervisors gave stickers (of the type given in grade school for good work) for high performance. Consequently the terminals were frequently decorated with the stickers, additionally, employees were allowed to have personal effects such as family pictures, children's artwork, etc. on their desks. Last, this site was the only site in which live plants were used to decorate the setting. These artifacts resulted in the physical setting having a more

personalized and less 'sterile' appearance than was typically found in other sites. Another difference, although it is reflective more of an individual supervisor's style, was that this particular supervisor held a monthly "stupidest error" contest where the employee with the "stupidest" error of the month was expected to buy drinks for the entire work group and the supervisor on the last Friday of the month.

These examples, while not of major significance, can be seen as examples of higher levels of "employee-orientation" than was apparent in any other site. Consequently, they can not be attributed to company differences, as there were other sites which did not appear as employee-sensitive as did the supervisors of this site. These non-VDT related factors serve to underscore the importance of looking beyond monitoring and into other task related factors in assessing employee perceptions.

Implications

The relatively moderate levels of mean perception scores, the lack of a strong relationship between monitoring capability and employee perception, and the relative underutilization of monitoring capability as expressed through the interviews, strongly suggest that, for the sites under focus, supervisory behaviors fall within the normative expectations of the employees and consequently VDTs are accepted and not viewed as overly intrusive.

Similarly, these findings highlight the role of the supervisor in determining the extent of usage of the available technology. The relative underutilization of the full capability

of the computer systems was a most surprising finding. While one reason for this may be the lack of time to do anything but meet daily workload demands, acceptance of this factor alone may be overly simplistic. Another more potent reason may have been provided by a supervisor who stated: "if there's too much automation, you might lose the need for the supervisor. That's why its so important to keep the human touch in there. I wouldn't want my job taken over by a machine." That supervisors frequently manifest their fears regarding job security through sabotage has been demonstrated by Walton (1975). It is possible that underutilization may represent a subtle form of sabotage, one precipitated by fears over job security issues. The issue of job security has been addressed in terms of the worker, but has not been typically viewed as a supervisory issue.

This pattern of findings also reinforces the importance of recognizing that computer-based performance monitoring is not solely responsible for the stated concerns of VDT clerical workers. Instead, as discussed earlier, the total work-place environment, and, perhaps, more significantly, the relationship between the supervisors and the employees are far more responsible for the worker's reaction to performance monitoring.

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