

AN OBSERVATIONAL ANALYSIS
OF SUPERVISORY BEHAVIOR

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AN OBSERVATIONAL ANALYSIS
OF SUPERVISORY BEHAVIOR

By
Charles Robert Gross

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Time sampling observations were made of the behavior (activity) of eighteen supervisors, at different supervisory levels, and several inventories of variables of interest were administered non-anonymously to the supervisors and 121 employees of one department of the Detroit Edison Company. The purpose of the study was to try out the time sampling method which would yield data on the behavior (activity) of supervisors, examine the reliabilities of the method and the inventories, and relate the time sampling observations of supervisory behavior to the other variables of interest (obtained from the inventories). Appropriate statistical procedures were followed on the obtained data to carry out the purpose of the study.

The findings indicated that employee perceptions of supervisory behavior, employee satisfactions with supervisory behavior, supervisory self-perceptions of supervisory behavior are not significantly related to observed supervisory behavior. Supervisory self-perceptions of supervisory behavior are not significantly related to employee perceptions of supervisory behavior. However, employee perceptions of supervisory behavior are significantly related to employee satisfactions with supervisory behavior. Old and new employees agree with each other in their perceptions of and satisfactions with supervisory behavior. Further, within employee work groups, employees tend to agree with each other with respect to both their perceptions of and satisfactions with supervisory behavior.

Both time sampling observations and the inventories were significantly and sufficiently reliable as useful measures of the variables of interest.

There are real intra-supervisory level differences in supervisory behavior within some subject (activity) categories. Within some other subject categories, no real differences were evidenced.

A preliminary study was conducted of employee and supervisory perceptions of supervisory behavior and employee satisfactions with supervisory behavior. Unfortunately, the obtained measures were not congruent with the measures of observed supervisory behavior. The preliminary study did tend to show the relationship between employee perceptions of supervisory behavior and employee satisfactions with supervisory behavior. Therefore, the inventories mentioned before were designed and the present study conducted.

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INTRODUCTION

INTRODUCTION

The general area of supervisory leadership in the industrial setting has received considerable attention by research workers for some time. The aim of such research has usually been to provide some sound, reliable and valid means for selecting better-qualified candidates for supervisory positions. The results of such research have made possible either the development of some predictor(s) to assess the supervisory potential of candidates, or the isolation and identification of some dimensions or variables of supervision significantly related to some criterion measure of supervisory success.

A variety of variable classes have been investigated in this kind of research. Leadership traits, one of the classes of variables investigated, at one time, have been the focus of research. The attempt has been made to discover specific traits that distinguish leaders from non-leaders. This approach has been disappointing, however; a set of leadership traits which seem essential and effective in one leadership situation or setting are often not essential or effective in other situations or settings. Also no one general trait of "leadership" has been identified. Similar results have been obtained in identifying leader personality variables related to

success. Often the two classes of variables have been inter-mixed and confounded; leadership traits have often been personality variables (26).

Much of the focus in identifying the variables which contribute to supervisory success is now directed at situational or functional variables. The successful supervisor or leader behaves in accordance with the specific demands that are made upon him by the group and/or organization or in the particular setting in which he is a leader. The principle criterion of leadership in this approach seems to be whether the leader influences the behavior of the "led" in his leadership role. This view of leadership is shared by many of the research workers in this area (Stogdill and Shartle (28), Knickerbocker (14), Likert (10), and others). Selection of supervisory candidates can be improved by selecting those candidates who will most likely satisfy the specific demands of the leadership setting. The quality of supervision can also be improved by training supervisors and supervisory candidates to realistically use leadership methods and techniques which will meet these specific demands, and thereby influence the behavior of the "led."

The present study is a part of a contemplated series of studies to investigate and explore the possibility of designing appropriate selection techniques and training methods for supervisors holding positions

above the foreman-level or first-line level (referred to in this study as "higher-level" supervisors). While much progress has been made at the foreman or first-line level, such as the work of Herbert H. Meyer's assessment of human relations aspects of work-group leadership (21), little attention has been focused on higher-level positions of supervision. This series of studies has been envisioned by the Detroit Edison Company and the Industrial Psychology division of the Psychology Department of Michigan State University. This first investigation, carried out by the writer, in co-operation with the Industrial Psychology division of the Employment Department of the Detroit Edison Company, while but a beginning of these studies, hopefully will yield results and implications for further research and study.

In considering the selection and training of the higher-level supervisor, it seemed necessary to first understand the nature of the supervisory positions themselves. The situational determinants or supervisory demands of the positions should be identified to gain insight into the selection and training problems. Further, it seemed possible that when one moved from first-line to higher-level supervisory positions, there might be important differences in the nature of the supervisory behavior at these levels which would make the selection or training problem unique at particular supervisory levels. The situational or job demands themselves

might be level determined, or peculiar to various supervisory levels.

The identification of these demands or situational variables was approached by an analysis of the time spent by supervisors in meeting the various supervisory job demands. This approach permitted an analysis of supervisory behavior, which was preferred to typical job description or an analysis of supervisory positions as characterized and reported by superiors (usually verbal rather than behavioral data).

The original and chief purpose of this study was to try out the efficiency of a method for determining the demands made on the time of supervisors. Several methods were considered (see Method section), but the method of behavioral time sampling or work sampling technique (an observational method) was selected for use, since it offered the greatest possibility of gathering the most useful data. Time sampling observations of supervisory behavior would be collected on a sample of supervisors which would yield data about the way in which supervisors meet the various job demands in terms of the distribution of their time.

If these supervisory demands can be identified in terms of observable behavior, it may then be possible to consider these demands in making selections for various supervisory positions at different levels.

It may also make possible improved insights and methods for supervisory training, in light of these supervisory demands and behaviors. This analysis should also provide information on the differences in supervisory behavior between supervisory levels.

If the method does provide reliable estimates of the distribution of time spent by supervisors in various behavior categories, the relationships of observed supervisory behavior to other variables would be of considerable interest. The relationships and inter-relationships of observed supervisory behavior and employee perceptions of supervisory behavior, employee satisfactions with supervisory behavior and the perceptions of the supervisor of his own behavior would yield useful data for this study and contribute to the literature. Since these relationships and inter-relationships have been little explored and/or reported in the literature (see Background section), methodology and a class of hypotheses for testing needed to be developed.

The plan of this study, therefore, was to measure the supervisory behavior of a sample of supervisors using time sampling observations of supervisory behavior and to relate these observations to the above mentioned variables. Appropriate methodology and measuring instruments were developed and used in the study.

BACKGROUND

BACKGROUND

A perusal of the literature was conducted to review recent publications on the analysis of supervisory behavior. Particularly of interest were objective methods of analysis that might be applied to supervisory behavior. Also of interest were studies relating employee and supervisory perceptions of supervisory behavior and attitudes and/or satisfaction of employees with supervision and measures of supervisory behaviors.

Under Army auspices, the Psychological Corporation carried out research relevant to the activities and behaviors of production supervisors(23). The research observer noted the behavior of the subject supervisor for two hour periods. After this direct observation, the observer dictated as many as possible of the behaviors and activities that he noted of the subject supervisor into recording equipment. Using this method, over 3,500 activities or behaviors were recorded. While this method does not provide for any measurement of the frequency or duration of time spent in various activities, it does yield information of value for an objective analysis of supervisory behavior. The use of a condensed list of supervisory activities, and the notion of recording an activity as to place of occurrence, contact, physical action and topic were utilized in this research.

Nadler utilized an occurrence study technique in observing activities of assistant foremen (22). Of particular interest is his method for determining the exact number of observations required to achieve a level of accuracy. Nadler suggests the solution of the standard error of percentages, equation, based upon an estimated percent of time devoted to smallest activity element.

The J. L. Hudson Company of Detroit, Michigan (8), made a study of floor supervisors' activities similar to Nadler's study, but employing Brisley's technique.

Brisley (7) presents an adequate discussion of the statistical basis of the work sampling technique, and gives several illustrations of its application to various human activity areas. Brisley notes that observations may be discontinued when repeated observations produce consistent results. This cut-off method was adopted for the present study of supervisory behavior.

Alderige (1) presents monographs for estimating the number of observations required for given confidence levels, and for control limits to determine variations in obtained data attributable to causes other than chance. They were not able to be utilized for this study, however.

Bolda, in an unpublished study (5), uses a method similar to that employed in this study for determining

the activities of production supervisors of the Cadillac Motor Car Company.

Beardsley (3) produces evidence that the data obtained from work sampling techniques varied only sevenths of a percent from data obtained by continuous time studies. Hence, it is concluded, that the ratio-delay method yields accurate data without the time and cost involved in continuous-type observational methods. Other methods of analysis for supervisory behavior were considered (2, 4, 6, 11, 15, 24, 30), but did not appear as useful methods for the purposes of this study as time sampling observations.

This writer could not find evidence of the use of objective methods of analysis for supervisory behavior between various supervisory levels.

Literature on the relationships and inter-relationships of variables such as employee perceptions of supervisory behavior, perception of supervisory behavior by the supervisor himself and employee satisfactions with supervisory behavior and observations of supervisory behavior is virtually non-existent. With the exception of the Stogdill and Shartle study discussed below, the writer could not find evidence of research relevant to an investigation of these relationships.

Stogdill and Shartle (27) report data concerning the relationship of perceptual estimates of the amount

of time spent in various kinds of work done by naval officers and actual recorded time (logged time of work performance kept by the naval officers for a three day period). The results suggested there was a fairly high degree of correspondence between the logged time and the estimated (perceptual) time for objectively observable performances (such as reading and writing reports, etc.). More subjective, less readily observable performances (such as reflection, etc.) were not as highly related to the logged performance. These results would seem to indicate the presence of relationship between self-perceptions of supervisory behavior and observed supervision behavior.

The writer could not find evidence of published studies relating employee perceptions of supervisory behavior to observed or recorded measures of supervisory behavior.

The importance of the supervisor as an influence on employee attitudes has long been noted. Kornhauser and Sharp (17) observed in 1932 that the character of supervision (where other variables were controlled) accounted for great differences in the attitudes of employees toward their jobs. Studies of the Survey Research Center, The University of Michigan, (29), have underscored the importance of the supervisor in the determination of employee attitudes. The job

satisfaction literature such as that summarized by Brayfield and Crockett (6) abounds with evidence of the supervisory determinants of employee job satisfaction.

No studies could be found, however, relating the attitudes and/or satisfactions of employees with their supervisors to observational measures of supervisory behavior.

HYPOTHESES

HYPOTHESES

TIME SAMPLING OBSERVATIONS OF SUPERVISORY BEHAVIOR:

1. The relationship between the observations of supervisory behavior of one observer and the observations of supervisory behavior of another independent observer will not be significantly other than zero; or: $r_{O_1 O_2} = 0$.

2. The relationship between observations of any category of supervisory behavior on one day by one observer and the observations of the same category of supervisory behavior on other days by the same observer will not be significantly other than zero; or: $r_{D_1 D_2} = 0$ (for O_1).

3. The relationship between observed supervisory behavior of one supervisory level and the observed supervisory behavior of other supervisory levels will not be significantly other than zero; or: $r_{SL_1 SL_2} = 0$.

RELATIONSHIPS BETWEEN TIME SAMPLING OBSERVATIONS OF SUPERVISORY BEHAVIOR AND OTHER VARIABLES:

4. The relationship between observations of supervisory behavior (A) and employee perceptions of supervisory behavior (B) will not be significantly other than zero; or: $r_{AB} = 0$.

5. The relationship between observations of supervisory behavior (A) and employee satisfactions with

supervisory behavior (C) will not be significantly other than zero; or: $r_{AC}=0$.

6. The relationship between observations of supervisory behavior (A) and supervisory perceptions of their own behavior (D) will not be significantly other than zero; or: $r_{AD}=0$.

7. The relationship between employee perceptions of supervisory behavior (B) and employee satisfactions with supervisory behavior (C) will not be significantly other than zero; or: $r_{BC}=0$.

8. The relationship between employee perceptions of supervisory behavior (B) and supervisory perceptions of their own behavior (D) will not be significantly other than zero; or: $r_{BD}=0$.

9. The relationship between perceptions of supervisory behavior of older (longer service) employees (B_1) and perceptions of supervisory behavior of newer (shorter service) employees (B_2) will not be significantly other than zero; or: $r_{B_1 B_2}=0$.

10. The relationship between satisfactions with supervisory behavior of older (longer service) employees (C_1) and satisfactions with supervisory behavior of newer (shorter service) employees (C_2) will not be significantly other than zero; or: $r_{C_1 C_2}=0$.

11. The perception of supervisory behavior of an employee within a work group (B_{E_1}) and perceptions of supervisory behavior of other employees within the work group (B_{E_n}) will not be significantly other than zero; or: $r_{B_{E_1} B_{E_n}} = 0$.

12. The relationship between satisfaction with supervisory behavior of an employee within a work group (C_{E_1}) and satisfactions with supervisory behavior of other employees within the work group (C_{E_n}) will not be significantly other than zero; or: $r_{C_{E_1} C_{E_n}} = 0$.

TIME SAMPLING METHOD

TIME SAMPLING METHOD

The first phase of investigating supervisory behavior is the selection of an appropriate method for use in the study. Several methods were considered: a) Critical Incident technique; b) Some form of supervisory analysis (similar to worker analysis); c) "Q" technique of Stephenson; d) Questionnaire method (such as the Ohio State Leadership studies' questionnaires and scales); e) tape and/or film recording of supervisory behavior; f) Sociometric technique (such as the Multi-Sociometric Scale); g) Some objectified observational technique; h) Ratio-Delay time sampling technique. The method of Ratio-Delay time sampling, an objectified observational method, was chosen for its promise of maximum yield of data with minimum cost and time as compared with other methods.

Ratio-Delay Method (Time Sampling)

The ratio-delay or work sampling or time sampling method is one that has its origin in industrial engineering problems of product quality (quality control) and machine operation (ratio-delay -- the ratio of various kinds of delays in machine operation to the total time). It has also been applied to human activity, and is usually referred to as ratio-delay method or work sampling. (It will be referred to as time sampling as well in this study.)

Ratio-delay is an instantaneous, randomized method of observation which permits generalizations to a total range of human activity. The method has the advantage of getting precise information on a given human activity with a minimum of time and cost as compared to continuous observation or a critical incident technique.

Two applications that have been made of the method may illustrate its advantages. A large metropolitan hospital studied the work loads and duties of their nurses. As a result of the study, the hospital was able to care for twice the number of patients using the same force of nurses, by assigning the high percentage of non-nursing work that was being done by nurses (as revealed through the study) to non-nursing employees. A manufacturing firm was able to reassign non-engineering tasks from their limited force of engineers to clerks, as a result of employing the ratio-delay method to study the activities of their engineers. Thus within a relatively short span of time and at low cost, important organizational changes could be carried out by this method, employing instantaneous, random observation.

The several phases of a ratio-delay method study are the following:

- 1) Orientation of the study to those responsible for its implications, and to those who will participate in the study.

- 2) Defining the problem and designing the study.
- 3) Selecting meaningful, appropriate and adequate categories that will be used in the observations.
- 4) Determining observer agreement or reliability for the selected categories.
- 5) Preparing an appropriate recording form.
- 6) Scheduling the observation -- randomizing of schedule and sample.
- 7) Carrying out the study; making the observations.
- 8) Checking the stability and consistency of observational results until a stable and consistent pattern of the data is arrived at, and there is a sufficient reduction in sampling error of data.
- 9) After these phases are completed, the research worker is able to analyze the data, relating it to other important variables of interest.

PROCEDURE

PROCEDURE

Subjects

The primary subjects in this study were eighteen supervisors: two third-line supervisors, one second-line supervisor, one supervisor on staff assignment, six first-line supervisors, six assistant supervisors and two work leaders in one department of the Detroit Edison Company. They were engaged in the supervision of technical, rather skilled, service work in the company. The number of employees supervised ranged from one to as many as over twenty-five. With the exception of three, all supervisors worked in one relatively compact area of the company. An examination of the personal data compiled on the supervisors reveals a wide range in the distribution of personal variables, such as age, education, etc., within the population of this study. Both sexes are represented in this population of supervisors.

Also included as subjects in this study were 121 employees of the various supervisors. Employees completed several inventories used in the study to measure variables of interest.

Supervisors and employees are each classified into two groups:

old = Holding the same supervisory position or employed in the same work group in July 1956 as in June 1955.
new = Holding other than the same supervisory position or employed in some other work group in July 1956 than in June 1955.

Appendix H shows the supervisor's code number, his supervisory level, and status (whether old or new) and the work group supervised.

Appendix J shows the number of employees (m) within each work group according to status (old or new).

Two employees (# 19 and 20) were promoted to supervisory positions since June 1955; therefore time sampling observations are not available for their supervisory behavior. They are included in some of the other analyses, however.

Two supervisors (# 11 and 16) left the company between June 1955 and July 1956 and some data are not available for them for certain analyses.

Other supervisors (# 4, 9, 15 and 17) were promoted to different supervisory positions between June 1955 and July 1956 so certain data are available for them for two analyses (of the two supervisory positions held during the course of this study).

No attempt is made to indicate (other than in Appendix J) the many changes within employee work groups between June 1955 and July 1956.

Behavioral Time Sampling

Categories for Observation:

Since the selection of meaningful, appropriate and adequate categories to be used in observation is extremely important for a ratio-delay or time sampling study, this was an initial phase of the study. It was decided, on the basis of experimental design, that the following information might be useful: the supervisor, time of observation, place observation occurred, the contact made by the supervisor with any other person during the observation, the supervisor's physical action at time of observation, the general subject of his activity at time of observation and the specific topic of his activity.

To arrive at the items making up each of these category areas, the following program was pursued. First, the writer was introduced to the nature of the departments, their operations, specific problems, etc., by each supervisor. Second, casual observation was made for several weeks of the supervisor, the employees and the department itself to develop categories. Third, a listing of possible categories was made by the writer from the casual observation and comments made by supervisors. Fourth, an interview

(or several) was held with each supervisor to get his impressions of, and suggestions for, the categories. The aim was to make them as meaningful (to the supervisors and writer), adequate (covering all phases of supervisory activity), and appropriate as possible. After this was done, the categories were coded and arranged into a standard form. The category coding system for time sampling observations is shown in Appendix A.

The Recording Form for Observations:

After the categories were completed, a recording form to be used in making the observations was devised, keeping in mind the statistical analyses of the data and the manner in which it would be handled. This recording form is shown in Appendix B.

Determining Observer Agreement or Reliability:

After several trial schedules or runs (a run or schedule is one round of all eighteen supervisors) had been made to acquaint and familiarize the observer with the nature and peculiarities of the observational method, it was then possible to measure the amount of agreement between two observers as a reliability measure.

The observers were the industrial psychologist of the company and the writer. Both observers participated in four runs during the first agreement or reliability check, and in four other runs in the second check. The

manner of observation was: a) both observers observed each supervisor at the same predetermined instant as timed by a stop-watch (such as 11:05 30"); b) each of the observers independently recorded the activity of the supervisor into the several categories; c) after each observation was completed and the recording made any special problems were discussed apparent in the observation, but the recording was not altered.

It should be noted that the order of supervisors to be observed was randomized for each run from a table of random numbers. The time of each observation was assumed to be random by the nature of the observational method itself; i.e., beginning of the schedules at different times, the unequal interval of times between each observation, and the variety and unequal nature of the supervisors' behaviors.

Recording Form When Supervisors Were Not Available:

A checklist was devised to determine the information necessary in the time sampling study when the supervisors were not available. Usually this situation arose when supervisors were phoning, or out of their office attending a meeting or engaged with other matters. The checklist is given in Appendix C. The supervisors in the study were co-operative and careful in completing the checklist so that on a later run it could be collected and the information recorded as on a typical observation. The

observer could usually quite easily code and record the information given; if not, the observer briefly questioned the supervisor to get more specific information so it could be coded and recorded.

Control Limits and Precision of Study:

It was decided not to arbitrarily estimate the number of observations needed for the study, since the time sampling method was being applied in a novel setting. That is, it would be difficult to set such an estimate because of the non-repetitive nature of the supervisors' behaviors.

Instead, the observations were to continue until sampling error fluctuations in the data reduced with cumulative observations over cumulative days. When it appeared that consistent and stable amounts of time spent in the various subject categories for all supervisors in the study were arrived at, the observations would be considered completed. That is, additional observations would not substantially alter the percentages of time spent by the supervisors in the several subject categories. Subject categories were used for this procedure since the percentages of time spent in these categories would be related to other variables. The data then could be analyzed and related to other variables at this cut-off day of observation (on the basis of stability and consistency).

Carrying Out the Observations:

Observations were then made of the supervisory behavior of the eighteen supervisors in each of the several categories. The observations were conducted over a period from March 14, 1955 to July 1, 1955. There were twenty-five days of observation in all. The observer made observations on the average of two days each week. Approximately three and one half runs (each run consisting of one observation of each of the eighteen supervisors) of observations were conducted each day. By the twenty-fifth day, the percentages of time spent by supervisors in each of the several subject (activity) categories appeared sufficiently stable and consistent to cease the observations. The total number of observations for all supervisors was 1558. The percentages of time spent by each supervisor in each of the several subject (activity) categories were based upon the total number of observations of each supervisor.

Supervisors # 6, 12, 18 of work group D were observed on a reduced schedule (about half the number of observations of other supervisors) because of their location away from the remainder of the department.

The Inventories

Employees completed two inventories in July 1956. The Supervisory Work Analysis Form measured the perceptions of employees of the amount of time spent by their supervisors on the several subject (activity) categories. Also completed was the Supervisory Satisfaction Form which

measured the satisfactions of employees with the time spent by their supervisors on the several subject (activity) categories. These inventories are shown in Appendices E and F. All employees (old and new) completed both inventories on their first-line and assistant supervisors. In certain work groups where there were supervisory changes since June 1955, old employees completed inventories on their old supervisor(s) as well.

Both inventories were constructed using the paired comparisons method. Each of the eight subject categories was paired with the other seven; employees circled the subject category which seemed most appropriate for the supervisor being considered for each inventory. The paired comparisons method was used instead of simple ranking because of its higher reliability. The pairs were randomized from a table of random order of pairs when each of eight objects is paired with the other seven.

Although the inventories were completed non-anonymously for purposes of the identification of groups for the analysis, this would not appear to be a limitation of these inventories. The nature of the inventory and the relatively high reliabilities within groups would discount this as a limitation.

All supervisors completed the Supervisory Work Analysis Form. It was used to measure supervisors perceptions

of the amount of time they spent on the several subject (activity) categories. These may be thought of as supervisor self-perceptions of supervisory behavior.

Statistical Analysis

The time sampling observations were analyzed in the following manner:

1. The agreement between two observers was obtained by the percentage of agreement method. This may be thought of as one measure of reliability for the time sampling observations.

2. All frequency data of the time sampling observations were converted into percentage data for the various categories for the several supervisors.

3. The cumulative percentages of time spent by the several supervisors for the several subject (activity) categories were computed for cumulative days of observation. The increasing stability and consistency of the data with cumulative days of observation may be thought of as another measure of the reliability of the observations.

4. The observed percentages of time spent by each of the several supervisors for the subject, place and contact categories was computed based on the total number of observations for each supervisor in each category.

(Note: This was not done for the physical action and

topic categories because of the low reliabilities of these categories and the smaller number of observations in each of these categories.) These percentages were then ranked for each supervisor for subject categories.

5. The mean observed percentages of time spent by each of the different supervisory levels (above first-line, first-line and below first-line) for the subject, place and contact categories was computed based on the total number of observations. This was also done for all supervisory levels taken together.

6. Significance of differences in mean observed percentages of time spent by different supervisory levels for the several subject (activity) categories was tested using Kruskal-Wallis H tests. If a significant H is obtained, the null hypothesis that the different supervisory levels are samples of a common population with a common mean observed percentage of time spent in any subject category is rejected. The inference that the supervisory levels do differ in this respect may be made (9).

The procedure for testing the relationships and interrelationships of the other variables to the time sampling observations was as follows:

7. The frequencies with which each subject category was chosen by each employee or supervisor on either of the two inventories (Supervisory Work Analysis and Supervisory Satisfaction Forms) were ranked.

8. The mean ranks for subject categories on each of the two inventories was obtained for employees of the several work groups with respect to both the first-line and assistant supervisor of each work group. This same procedure was followed for former (old) supervisors of any work group when a change of supervision had occurred between June 1955 and July 1956. This data was obtained for old and new employees of each work group.

9. Rank order correlation coefficients were computed between the ranks of any of the variables of interest to test the several hypotheses. These variables for which ranked data was obtained were:

- a. Supervisory Behavior (Time Sampling Observations for the Subject Categories)
- b. Employee Perceptions of Supervisory Behavior (Supervisory Work Analysis Form)
- c. Employee Satisfaction with Supervisory Behavior (Supervisory Satisfaction Form)
- d. Supervisors Perceptions of their Supervisory Behavior (Supervisory Work Analysis Form).

10. Measures of agreement for the mean ranks for subject categories on each of the two inventories for the various employee groups (old and new) of the several work groups with respect to both the first-line and assistant supervisor (both old and new) of each work group were computed. The measures used were the coefficient of

concordance (corrected for continuity), the mean value of the possible rank correlation coefficients and the reliability of the mean ranks (9 and 10).

PRELIMINARY STUDY

PRELIMINARY STUDY

In June 1955, a preliminary study of employee perceptions of supervisory behavior and employee satisfactions with supervisory behavior was conducted.

A seventy-one item questionnaire was administered to the 107 employees of the various supervisors. The questionnaire was a compilation of questions used by the Survey Research Center, University of Michigan, in their long-range program of assessing employee attitudes in various companies. The Survey Research Center has been active in this area in the Detroit Edison Company since 1948. The questions are of the Likert-scale type, and have been analyzed for reliability by the Survey Research Center group. Twelve of the questions concerned background data on the employees, twenty-four concerned the satisfaction of the employees with their first-line supervisor and their perceptions of his behavior, twenty-one asked the same questions about the assistant supervisor and eleven were other job satisfaction questions which were used as control questions. The questionnaires were administered anonymously, except that work groups of supervisors could be identified (the supervisor's and assistant supervisor's names were requested).

A similar questionnaire was also used to measure the supervisor's perception of his own behavior, his satisfaction

with his supervision, and other job satisfaction areas. Both questionnaires appear in Appendix G.

Unfortunately, these measures were not congruent with the time sampling observational data and the relationships of interest could not be measured. Therefore the two inventories discussed previously were designed.

Some results of these questionnaires used in the preliminary study are also presented in Appendix G in Tables XVIII - XXII. These results led to the specific interest in the relationship between employee perceptions of supervisory behavior and employee satisfactions with supervisory behavior. Such a relationship tended to be shown by the results of the preliminary study.

FINDINGS

FINDINGS

Table I shows percentages of agreement between two independent observers for time sampling observations of supervisory behavior. Two checks of observer agreement gave percentages of agreement of 82.5% and 83.0%. The percentages of agreement for the various categories are also shown for the first check of agreement.

Table II shows the percentages of time spent by all supervisors in each of the several subject (activity) categories. The increasing stability and consistency of the observations over time may be noted. Graphic representations (Figures I, II, and III in Appendix I) of cumulative percentages of time spent by all supervisors in subject categories show increasing stability and consistency of the various subject categories over time.

Table III shows the percentages of time spent by each supervisor for each subject category from the time sampling observations. (The supervisor's code number, supervisory level and work group supervised are given in Appendix H.)

Table IV shows the percentages of time spent by each supervisor for each place category from the time sampling observations.

Table V shows the percentages of time spent by each supervisor for each contact category from the time sampling observations.

Table VI shows the mean percentages of time spent by all supervisory levels and by each supervisory level (above the first-line, first-line, and below the first-line) for each subject category from the time sampling observations.

Table VII shows the mean percentages of time spent by all supervisory levels and by each supervisory level for each place category from the time sampling observations.

Table VIII shows the mean percentages of time spent by all supervisory levels and by each supervisory level for each contact category from the time sampling observations.

Table IX shows the significance of differences in mean observed percentages of time spent by different supervisory levels for each subject category (using Kruskal Wallis H test).

Table X shows rank order correlation coefficients between observed supervisory behavior and supervisory behavior as perceived by employees.

Table XI shows rank order correlation coefficients between observed supervisory behavior and employee satisfactions with supervisory behavior.

Table XII shows rank order correlation coefficients between observed supervisory behavior and supervisory behavior as perceived by the supervisor.

Table XIII shows rank order correlation coefficients between supervisory behavior as perceived by employees and employee satisfactions with supervisory behavior.

Table XIV shows rank order correlation coefficients between supervisory behavior as perceived by the supervisor and supervisory behavior as perceived by employees.

Table XV shows rank order correlation coefficients between the perceptions of supervisory behavior of older (longer service) employees and the perceptions of supervisory behavior of newer (shorter service) employees. Rank order correlation coefficients are also reported between the satisfactions with supervisory behavior of older and newer employees.

Table XVI shows measures of agreement among employees within work groups in their perceptions of supervisory behavior. Coefficients of concordance, mean values of the possible rank correlation coefficients, and the reliability of the mean ranks are reported. (The number of employees making judgments (m) and the number of behaviors ranked (n) for each work group are given in Appendix J.)

Table XVII shows measures of agreement among employees within work groups in their satisfactions with supervisory

behavior. Coefficients of concordance, mean values of the possible rank correlation coefficients, and the reliability of the mean ranks are reported.

TABLES

TABLE I

PERCENTAGES OF AGREEMENT BETWEEN OBSERVERS
FOR TIME SAMPLING OBSERVATIONS
OF SUPERVISORY BEHAVIOR

	Number of Observations	% of Agreement
First check	233	82.5%
Second check	138	83.0%
By Categories:		
Place	47	89%
Contact	47	91
Physical Action	47	74
Subject	46	83
Topic	46	74

TABLE II

CUMULATIVE PERCENTAGES OF TIME SPENT BY ALL SUPERVISORS
IN EACH OF THE SEVERAL SUBJECT (ACTIVITY) CATEGORIES
FOR CUMULATIVE DAYS OF OBSERVATION

Subject	Cumulative Days of Observation							
	1	5	10	15	20	23	24	25
A*	25.7	18.8	20.9	20.4	19.0	18.6	18.3	18.0
B	-	1.4	3.0	3.0	3.2	3.4	3.6	3.6
C	11.4	14.2	15.6	16.0	15.2	14.5	14.5	14.7
D	20.0	10.6	8.7	8.9	10.2	10.0	9.9	9.9
E	8.6	17.0	18.8	19.1	19.8	19.0	18.7	18.8
F	5.7	6.4	7.7	10.5	10.1	10.3	10.6	10.7
G	25.7	18.3	11.5	9.1	9.5	11.2	11.5	11.5
H	2.9	13.3	13.8	13.0	12.9	13.0	13.0	12.8
Number of Observations	53	263	596	959	1248	1440	1502	1558

* Key to symbols:

A Production
B Safety and Housekeeping
C Scheduling and Planning
D Service to Outside Department Contacts
E Employee Relations and Contacts
F Reports and Paperwork
G Meetings and Conferences
H Miscellaneous

TABLE III

OBSERVED PERCENTAGES OF TIME SPENT BY SUPERVISORS
FOR SUBJECT CATEGORIES

Supervisor	A*	B	C	D	E	F	G	H
1	-	2.5	3.7	1.2	8.6	40.7	19.8	23.5
2	1.0	5.15	6.2	5.15	9.3	33.0	36.1	4.1
3	5.4	1.1	22.8	9.8	14.1	10.9	30.5	5.4
4	1.3	-	44.7	23.7	-	5.3	19.7	5.3
5	7.5	5.4	3.2	22.6	16.1	11.8	20.4	12.9
6	18.7	4.2	10.4	4.2	16.7	16.7	2.0	27.1
7	4.2	4.2	19.8	5.2	20.8	14.6	8.3	22.9
8	17.2	8.0	17.2	9.2	18.4	2.3	11.5	16.1
9	5.4	4.3	23.6	9.7	33.3	2.2	12.9	8.6
10	10.8	-	26.5	6.0	30.1	9.6	9.6	7.3
11	44.6	7.3	4.8	12.0	10.8	7.3	2.4	10.8
12	25.5	10.6	19.2	8.5	6.4	10.6	-	19.2
13	24.7	-	7.0	23.5	7.0	10.6	1.2	25.9
14	28.3	2.1	18.5	18.5	16.3	7.6	-	8.7
15	20.0	6.25	13.75	1.25	48.75	1.25	2.5	6.25
16	37.8	-	15.6	4.4	22.2	2.2	4.4	13.3
17	60.0	2.1	5.3	-	17.9	2.1	-	12.6
18	27.5	1.95	1.95	3.9	47.1	3.9	-	13.7

* Key to symbols:

A Production
B Safety and Housekeeping
C Scheduling and Planning
D Service to Outside Department Contacts
E Employee Relations and Contacts
F Reports and Paperwork
G Meetings and Conferences
H Miscellaneous

TABLE IVOBSERVED PERCENTAGES OF TIME SPENT BY SUPERVISORS
FOR PLACE CATEGORIES

Supervisor	1*	2	3	4	5	6	7
1	76.5	-	2.5	1.2	2.5	9.9	7.4
2	41.2	-	7.2	7.2	8.2	5.2	31.0
3	-	43.5	13.0	8.7	7.6	1.1	26.1
4	-	59.2	2.6	5.3	6.6	5.3	21.0
5	-	33.3	31.2	5.4	1.1	1.1	27.9
6	-	60.4	27.1	-	2.1	-	10.4
7	-	62.5	11.4	4.2	4.2	-	17.7
8	-	30.7	18.2	3.4	13.6	8.0	26.1
9	-	36.8	30.5	5.3	7.4	5.3	14.7
10	-	37.3	31.3	-	13.3	3.6	14.5
11	-	8.4	72.3	-	3.6	1.2	14.5
12	-	69.1	11.9	-	7.1	-	11.9
13	-	70.0	6.7	-	4.4	2.2	16.7
14	-	61.9	15.2	1.2	3.3	10.8	7.6
15	-	22.5	66.25	1.25	8.75	-	1.25
16	-	37.9	40.0	4.4	8.9	4.4	4.4
17	-	1.0	91.8	-	2.1	-	4.2
18	-	19.6	23.5	-	15.7	-	41.2

* Key to symbols:

- 1 Office
- 2 Desk
- 3 Area
- 4 Another's Office
- 5 Another's Desk
- 6 Another's Area
- 7 Other

TABLE V
OBSERVED PERCENTAGES OF TIME SPENT BY SUPERVISORS
FOR CONTACT CATEGORIES

Supervisor	00*	01	02	03	04	05	08
1	64.2	-	1.2	1.2	18.5	13.6	1.2
2	30.9	5.2	4.1	6.2	23.7	16.5	13.4
3	18.5	5.4	-	13.0	31.5	8.7	22.8
4	25.0	9.2	14.5	7.9	14.5	22.4	6.6
5	32.3	8.6	20.4	7.5	7.5	7.5	16.1
6	56.2	10.4	2.1	4.2	16.7	2.1	8.3
7	41.7	16.7	8.3	7.3	13.5	3.1	9.4
8	21.6	12.5	12.5	11.4	25.0	5.7	11.4
9	19.1	30.9	4.8	10.7	26.2	8.3	-
10	37.4	25.3	3.6	9.6	16.9	2.4	4.8
11	57.8	18.1	7.2	-	3.6	4.8	8.4
12	59.5	9.5	2.4	14.3	4.8	4.8	4.8
13	24.4	28.9	13.3	5.6	3.3	6.7	17.8
14	31.5	19.6	27.2	4.3	6.5	7.6	3.3
15	21.25	53.75	3.75	13.75	3.75	-	3.75
16	40.0	24.4	6.7	17.8	4.4	-	6.7
17	65.9	20.2	1.1	4.3	4.3	-	4.3
18	43.1	45.1	2.0	3.9	-	-	5.9

* Key to symbols:

00 Alone
01 Own Employee
02 Another's Employee
03 Immediate Supervisor
04 Another Supervisor of Department
05 Another Supervisor
08 Other

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TABLE VI

MEAN OBSERVED PERCENTAGES OF TIME SPENT BY DIFFERENT
SUPERVISORY LEVELS FOR EACH OF THE SEVERAL
SUBJECT (ACTIVITY) CATEGORIES

Supervisory Level	A*	B	C	D	E	F	G	H
Above								
First-line	1.9	2.4	19.3	9.9	8.0	22.5	26.5	9.5
First-line	10.6	4.4	16.8	9.5	22.6	9.5	10.8	15.8
Below								
First-line	33.5	3.8	10.8	9.0	22.1	5.7	1.3	13.8
All Levels	18.9	3.6	14.7	9.4	19.1	10.7	10.1	13.5

* Key to symbols:

A	Production
B	Safety and Housekeeping
C	Scheduling and Planning
D	Service to Outside Department Contacts
E	Employee Relations and Contacts
F	Reports and Paperwork
G	Meetings and Conferences
H	Miscellaneous

TABLE VII

MEAN OBSERVED PERCENTAGES OF TIME SPENT BY DIFFERENT
SUPERVISORY LEVELS FOR EACH OF THE SEVERAL
PLACE CATEGORIES

Supervisory Level	1*	2	3	4	5	6	7
Above First-line	29.4	25.7	6.3	5.6	6.2	5.4	21.4
First-line	-	43.5	25.0	3.0	7.0	3.0	18.5
Below First-line	-	36.3	41.0	.9	6.7	2.3	12.7
All Levels	6.5	36.3	28.0	2.6	6.7	3.2	16.6

* Key to symbols:

- 1 Office
- 2 Desk
- 3 Area
- 4 Another's Office
- 5 Another's Desk
- 6 Another's Area
- 7 Other

1. Introduction

The purpose of this study is to investigate the effects of the proposed changes on the system. The study is divided into two main parts: a theoretical analysis and an empirical study. The theoretical analysis is based on the principles of system theory and the empirical study is based on the results of a series of experiments.

The first part of the study is a theoretical analysis of the system. This part is divided into two main sections: a description of the system and a description of the proposed changes.

The second part of the study is an empirical study of the system. This part is divided into two main sections: a description of the experimental setup and a description of the results of the experiments.

The third part of the study is a discussion of the results of the study. This part is divided into two main sections: a discussion of the theoretical results and a discussion of the empirical results.

The fourth part of the study is a conclusion. This part is divided into two main sections: a summary of the results of the study and a list of recommendations for further research.

The fifth part of the study is a list of references. This part is divided into two main sections: a list of references for the theoretical analysis and a list of references for the empirical study.

2. Theoretical Analysis

The theoretical analysis is based on the principles of system theory. The system is defined as a set of interacting components. The components are represented by nodes in a graph. The interactions between the components are represented by edges in the graph. The graph is used to analyze the system and to determine the effects of the proposed changes.

TABLE VIII

MEAN OBSERVED PERCENTAGES OF TIME SPENT BY DIFFERENT
SUPERVISORY LEVELS FOR EACH OF THE SEVERAL
CONTACT CATEGORIES

Supervisory Level	00*	01	02	03	04	05	08
Above							
First-line	34.7	5.0	5.0	7.1	22.0	15.3	11.0
First-line	34.7	17.4	8.6	8.5	17.6	4.9	8.3
Below							
First-line	42.9	27.4	8.0	8.0	3.8	3.0	6.9
All Levels	38.3	19.1	7.5	8.0	12.5	6.3	8.3

* Key to symbols:

00	Alone
01	Own Employee
02	Another's Employee
03	Immediate Supervisor
04	Another Supervisor of Department
05	Another Supervisor
08	Other

4. The fourth part of the document provides a summary of the key points discussed in the previous sections. It reiterates the importance of accurate record-keeping and the role of the auditor in the process. The document also provides a list of references for further information on record-keeping and auditing.

6. The sixth part of the document outlines the specific requirements for record-keeping. It states that all transactions must be recorded in a clear and concise manner, and that the records must be accessible to all authorized personnel. The document also requires that records be kept in a secure location and that they be protected from unauthorized access or destruction.

7. The seventh part of the document discusses the role of the auditor in the record-keeping process. It states that the auditor is responsible for verifying the accuracy and completeness of the records and for reporting any discrepancies to the appropriate authorities. The document also notes that the auditor should maintain a separate record of all findings and recommendations.

8. The eighth part of the document provides a summary of the key points discussed in the previous sections. It reiterates the importance of accurate record-keeping and the role of the auditor in the process. The document also provides a list of references for further information on record-keeping and auditing.

TABLE IX

SIGNIFICANCE OF DIFFERENCES IN MEAN OBSERVED PERCENTAGES
OF TIME SPENT BY DIFFERENT SUPERVISORY LEVELS FOR
THE SEVERAL SUBJECT (ACTIVITY) CATEGORIES
(USING KRUSKAL-WALLIS H TESTS)

Subject	H	Level of Significance
A*	14.22	.001
B	1.16	N.S.
C	1.84	N.S.
D	.28	N.S.
E	5.63	.10
F	5.20	.10
G	12.64	.01
H	2.98	N.S.

* Key to Symbols:

A Production
B Safety and Housekeeping
C Scheduling and Planning
D Service to Outside Department Contacts
E Employee Relations and Contacts
F Reports and Paperwork
G Meetings and Conferences
H Miscellaneous

TABLE X

RANK ORDER CORRELATION BETWEEN OBSERVED SUPERVISORY
BEHAVIOR AND SUPERVISORY BEHAVIOR
AS PERCEIVED BY EMPLOYEES

Work Group	Supervisory Level	Old Employees	L.S.*	New Employees	L.S.
B	Old Staff	.41	N.S.	-	-
C	First-line	.16	N.S.	.05	N.S.
C	Old Assistant	.49	N.S.	.70	.10
D	First-line	-	-	.17	N.S.
D	Assistant	-	-	.32	N.S.
E	First-line	.01	N.S.	-.01	N.S.
E	Assistant	.17	N.S.	.72	.10
F	First-line	.70	.10	-.09	N.S.
F	Assistant	.56	N.S.	.28	N.S.
G	Old First-line	-.07	N.S.	-	-
G	Old Assistant	.18	N.S.	-	-
H	First-line	.83	.05	.87	.05
H	Old Assistant	.30	N.S.	-	-

* Level of Significance

QUESTION 1

Consider the following two functions, $f(x)$ and $g(x)$, defined on the interval $[0, 1]$.

$f(x) = \begin{cases} x^2 & \text{if } 0 \leq x < 1 \\ 1 & \text{if } x = 1 \end{cases}$

$g(x) = \begin{cases} 1 & \text{if } 0 \leq x < 1 \\ x^2 & \text{if } x = 1 \end{cases}$

Answer the following questions:

(a) Is $f(x)$ continuous at $x = 1$? Justify your answer.

(b) Is $g(x)$ continuous at $x = 1$? Justify your answer.

(c) Is $f(x)$ continuous on the interval $[0, 1]$? Justify your answer.

(d) Is $g(x)$ continuous on the interval $[0, 1]$? Justify your answer.

(e) Is $f(x)$ differentiable at $x = 1$? Justify your answer.

(f) Is $g(x)$ differentiable at $x = 1$? Justify your answer.

(g) Is $f(x)$ differentiable on the interval $[0, 1]$? Justify your answer.

(h) Is $g(x)$ differentiable on the interval $[0, 1]$? Justify your answer.

(i) Is $f(x)$ differentiable at $x = 0$? Justify your answer.

(j) Is $g(x)$ differentiable at $x = 0$? Justify your answer.

(k) Is $f(x)$ differentiable at $x = 0$? Justify your answer.

(l) Is $g(x)$ differentiable at $x = 0$? Justify your answer.

(m) Is $f(x)$ differentiable at $x = 0$? Justify your answer.

(n) Is $g(x)$ differentiable at $x = 0$? Justify your answer.

(o) Is $f(x)$ differentiable at $x = 0$? Justify your answer.

(p) Is $g(x)$ differentiable at $x = 0$? Justify your answer.

TABLE XI

**RANK ORDER CORRELATION BETWEEN OBSERVED SUPERVISORY
BEHAVIOR AND EMPLOYEE SATISFACTIONS
WITH SUPERVISORY BEHAVIOR**

Work Group	Supervisory Level	Old Employees	L.S.*	New Employees	L.S.
B	Old Staff	.80	.05	-	-
C	First-line	0	N.S.	.35	N.S.
C	Old Assistant	.75	.05	.90	.01
D	First-line	-	-	.07	N.S.
D	Assistant	-	-	.21	N.S.
E	First-line	-.05	N.S.	-.09	N.S.
E	Assistant	.40	N.S.	.54	N.S.
F	First-line	.12	N.S.	-.02	N.S.
F	Assistant	.54	N.S.	.16	N.S.
G	Old First-line	.54	N.S.	-	-
G	Old Assistant	-.05	N.S.	-	-
H	First-line	.89	.01	.71	.10
H	Old Assistant	.38	N.S.	-	-

* Level of Significance

TABLE XII

RANK ORDER CORRELATION BETWEEN OBSERVED SUPERVISORY
BEHAVIOR AND SUPERVISORY BEHAVIOR AS PERCEIVED
BY THE SUPERVISOR

Work Group	Supervisory Level	Supervisor's Number	r'	Level of Significance
A	Third-line	1	.55	N.S.
A	Third-line	2	.86	.05
A	Second-line	3	.77	.05
B	Old Staff	4	.30	N.S.
C	First-line	5	-.10	N.S.
C	Work Leader	17	.66	.10
D	First-line	6	.64	N.S.
D	Assistant	12	.06	N.S.
E	First-line	7	.47	N.S.
E	Assistant	13	.63	N.S.
F	Assistant	14	.29	N.S.
G	Old First-line	9	.29	N.S.
G	Old Assistant	15	.50	N.S.
H	First-line	10	.46	N.S.

QUESTION 1

Consider the following two regression models, where y_i is the dependent variable and x_i is the independent variable:

Model 1: $y_i = \beta_0 + \beta_1 x_i + \epsilon_i$ Model 2: $y_i = \beta_0 + \beta_1 x_i + \beta_2 x_i^2 + \epsilon_i$

Assume that the error term ϵ_i is normally distributed with mean zero and constant variance σ^2 . The following table shows the results of the regression analysis for the two models.

Model	Variable	Parameter	Estimate	Standard Error	t-statistic	p-value
Model 1	y_i	β_0	1.5	0.5	3.0	0.002
		β_1	0.8	0.2	4.0	0.000
		ϵ_i	0.5	0.1	5.0	0.000
Model 2	y_i	β_0	1.0	0.4	2.5	0.010
		β_1	0.6	0.2	3.0	0.001
		β_2	0.1	0.05	2.0	0.040
Model 1	x_i	β_0	1.5	0.5	3.0	0.002
		β_1	0.8	0.2	4.0	0.000
		ϵ_i	0.5	0.1	5.0	0.000
Model 2	x_i	β_0	1.0	0.4	2.5	0.010
		β_1	0.6	0.2	3.0	0.001
		β_2	0.1	0.05	2.0	0.040

Based on the results of the regression analysis, answer the following questions:

TABLE XIII

**RANK ORDER CORRELATION BETWEEN SUPERVISORY BEHAVIOR
AS PERCEIVED BY EMPLOYEES AND EMPLOYEE
SATISFACTIONS WITH SUPERVISORY BEHAVIOR**

Work Group	Supervisory Level	Old Employees	L.S.*	New Employees	L.S.
B	Old Staff	.67	.10	-	-
B	New Staff	.80	.05	-	-
C	First-line	.89	.01	.18	N.S.
C	Old Assistant	.91	.01	.76	.05
C	New Assistant	.98	.01	.86	.05
D	First-line	-	-	.91	.01
D	Assistant	-	-	.95	.01
E	First-line	.94	.01	.98	.01
E	Assistant	.95	.01	.88	.01
F	First-line	.67	.10	.79	.05
F	Assistant	.91	.01	.93	.01
G	Old First-line	.38	N.S.	-	-
G	Old Assistant	.91	.01	-	-
G	New First-line	.99	.01	.74	.05
G	New Assistant	.78	.05	.33	N.S.
H	First-line	.86	.05	.94	.01
H	Old Assistant	.46	N.S.	-	-
H	New Assistant	.86	.05	.95	.01

* Level of Significance

TABLE XIV

RANK ORDER CORRELATION BETWEEN SUPERVISORY BEHAVIOR
AS PERCEIVED BY THE SUPERVISOR AND SUPERVISORY
BEHAVIOR AS PERCEIVED BY EMPLOYEES

Work Group	Supervisory Level	Supervisor's Number	Old Employees r^1	New Employees r^1
B	Old Staff	4	.78**	-
B	New Staff	9	.27	-
C	First-line	5	-.04	-.07
C	New Assistant	17	.45	.71*
D	First-line	6	-	.43
D	Assistant	12	-	.88***
E	First-line	7	.60	.81**
E	Assistant	13	.39	.68*
F	Assistant	14	.69*	.80**
G	Old First-line	9	.06	-
G	Old Assistant	15	.88***	-
G	New First-line	15	.62	.55
G	New Assistant	19	.76**	.88***
H	First-line	10	.51	.76**
H	New Assistant	20	-.21	.38

* Significantly other than zero at .10 level

** Significantly other than zero at .05 level

*** Significantly other than zero at .01 level

1. *Journal of the American Medical Association*, 1997; 277: 1033-1038.

TABLE XV

RANK ORDER CORRELATION BETWEEN OLD AND NEW EMPLOYEES
FOR PERCEPTIONS OF AND SATISFACTIONS WITH
SUPERVISORY BEHAVIOR

Work Group	Supervisory Level	Employee Perceptions	Employee Satisfaction
C	First-line	.89***	.13
C	Old Assistant	.62	.89***
C	New Assistant	.88***	.98***
E	First-line	.50	.65*
E	Assistant	.50	.91***
F	First-line	.45	.34
F	Assistant	.86**	.74**
G	New First-line	.90***	.85**
G	New Assistant	.47	.60
H	First-line	.90***	.83**
H	New Assistant	.67*	.74**

* Significantly other than zero at .10 level

** Significantly other than zero at .05 level

*** Significantly other than zero at .01 level

TABLE XVI

**MEASURES OF AGREEMENT AMONG EMPLOYEES IN
PERCEIVED SUPERVISORY BEHAVIOR**

Work Group	Supervisory Level	W_c^*		W_c		$\bar{r}^1$		r_{xx}^{11}	
		Old	L.S.	Old	L.S.	Old	New	Old	New
B	Old Staff	.81	.05	-	-	.62	-	.77	-
B	New Staff	.50	N.S.	-	-	.25	-	.50	-
C	First-line	.63	.01	.81	.01	.58	.75	.92	.92
C	Old Assistant	.31	.01	.66	.01	.21	.55	.68	.83
C	New Assistant	.54	.01	.69	.01	.47	.59	.88	.85
D	First-line	-	-	.51	.01	-	.49	-	.97
D	Assistant	-	-	.42	.01	-	.40	-	.95
E	First-line	.55	.01	.56	.01	.44	.52	.80	.92
E	Assistant	.40	.05	.56	.01	.25	.49	.63	.87
F	First-line	.56	.01	.74	.05	.47	.48	.84	.65
F	Assistant	.58	.01	.96	.01	.50	.92	.86	.96
G	Old First-line	.12	N.S.	-	-	.04	-	.33	-
G	Old Assistant	.47	.01	-	-	.42	-	.90	-
G	New First-line	.29	.01	.55	.01	.21	.48	.73	.87
G	New Assistant	.18	N.S.	.28	.05	.09	.16	.50	.57
H	First-line	.49	.01	.59	.01	.45	.51	.91	.89
H	Old Assistant	.19	.05	-	-	.11	-	.58	-
H	New Assistant	.30	.01	.62	.01	.24	.54	.79	.88

* Key to symbols:

W_c Coefficient of concordance (Corrected for continuity)

L.S. Level of Significance

$\bar{r}^1$ Mean value of the possible rank correlation coefficients

r_{xx}^{11} Reliability of the mean ranks

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TABLE XVII

MEASURES OF AGREEMENT AMONG EMPLOYEES IN SATISFACTIONS
WITH SUPERVISORY BEHAVIOR

Work Group	Supervisory Level	W_c^*		W_o		$\bar{r}^*$		r_{xx}^*	
		Old	L.S.	New	L.S.	Old	New	Old	New
B	Old Staff	.70	N.S.	-	-	.40	-	.57	-
B	New Staff	.56	N.S.	-	-	.34	-	.61	-
C	First-line	.30	.05	.22	N.S.	.20	-.04	.67	-.18
C	Old Assistant	.45	.01	.65	.01	.37	.53	.82	.82
C	New Assistant	.55	.01	.67	.01	.49	.56	.88	.84
D	First-line	-	-	.35	.01	-	.33	-	.93
D	Assistant	-	-	.42	.01	-	.40	-	.95
E	First-line	.53	.01	.53	.01	.41	.48	.78	.91
E	Assistant	.36	.05	.49	.01	.20	.41	.56	.83
F	First-line	.63	.01	.63	N.S.	.56	.26	.88	.41
F	Assistant	.65	.01	.84	.05	.58	.68	.89	.81
G	Old First-line	.08	N.S.	-	-	-.004	-	-.05	-
G	Old Assistant	.34	.01	-	-	.28	-	.82	-
G	New First-line	.22	.05	.10	N.S.	.13	-.05	.60	-.50
G	New Assistant	.09	N.S.	.16	N.S.	-.01	.02	-.12	.13
H	First-line	.43	.01	.71	.01	.38	.65	.89	.92
H	Old Assistant	.19	.05	-	-	.11	-	.58	-
H	New Assistant	.46	.01	.64	.01	.41	.57	.88	.89

* Key to symbols:

W_o Coefficient of concordance (Corrected for continuity)

L.S. Level of Significance

$\bar{r}^*$ Mean value of the possible rank correlation coefficients

r_{xx}^* Reliability of the mean ranks

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1. The first group of variables, *demographic*, includes age, sex, and marital status. The second group, *education*, includes years of schooling, high school graduation, and college graduation. The third group, *employment*, includes employment status, occupation, and industry. The fourth group, *income*, includes household income and personal income. The fifth group, *housing*, includes home ownership, home value, and home age. The sixth group, *transportation*, includes car ownership and car age. The seventh group, *leisure*, includes leisure time and leisure activities. The eighth group, *health*, includes health status and health insurance. The ninth group, *social*, includes social network and social support. The tenth group, *psychological*, includes psychological well-being and psychological distress. The eleventh group, *environmental*, includes environmental quality and environmental satisfaction. The twelfth group, *community*, includes community involvement and community satisfaction. The thirteenth group, *quality of life*, includes quality of life and life satisfaction. The fourteenth group, *well-being*, includes well-being and life satisfaction. The fifteenth group, *life satisfaction*, includes life satisfaction and life satisfaction. The sixteenth group, *life satisfaction*, includes life satisfaction and life satisfaction. The seventeenth group, *life satisfaction*, includes life satisfaction and life satisfaction. The eighteenth group, *life satisfaction*, includes life satisfaction and life satisfaction. The nineteenth group, *life satisfaction*, includes life satisfaction and life satisfaction. The twentieth group, *life satisfaction*, includes life satisfaction and life satisfaction.

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1. The first group of respondents (n = 10) was composed of students who were enrolled in the first semester of the undergraduate program in the Faculty of Education at the University of Lagos. They were selected through a purposive sampling technique to ensure that they had no prior knowledge of the research topic.

Figure 1 is a line graph illustrating the percentage of the total sample for various age groups across different years. The y-axis represents the percentage of the total sample, ranging from 0 to 100. The x-axis represents the years, with labels for 1980, 1990, 2000, 2010, and 2020. The age groups are listed on the right side of the graph: 0-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, and 75+.

The graph shows a general trend of decreasing percentages for younger age groups and increasing percentages for older age groups over time. For example, the 0-14 age group starts at approximately 15% in 1980 and decreases to about 10% by 2020. Conversely, the 75+ age group starts at approximately 5% in 1980 and increases to about 15% by 2020.

Age Group	1980	1990	2000	2010	2020
0-14	15	14	13	12	10
15-24	12	11	10	9	8
25-34	10	9	8	7	6
35-44	8	7	6	5	4
45-54	6	5	4	3	2
55-64	4	3	2	1	0
65-74	2	3	4	5	6
75+	5	6	7	8	15

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RESULTS

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TIME SAMPLING OBSERVATIONS OF SUPERVISORY BEHAVIOR:

1. The hypothesis that the relationship between the observations of supervisory behavior of one observer and the observations of supervisory behavior of another independent observer would not be significantly other than zero was untenable; or: $r_{O_1 O_2} \neq 0$. Percentages of agreement between two observers in two checks on agreement were 82.5% and 83.0%.

2. The hypothesis that the relationship between the observations of any category of supervisory behavior on one day by one observer and the observations of the same category of supervisory behavior on other days by the same observer would not be significantly other than zero was untenable; or: $r_{D_1 D_2} \neq 0$. Graphic representations of cumulative percentages of time spent for all subject categories show increasing stability and consistency with cumulative days of observation.

3. The hypothesis that the relationship between observed supervisory behavior of one supervisory level and the observed supervisory behavior of other supervisory levels would not be significantly other than zero was tenable for subject categories B, C, D and H; or: $r_{SL_1 SL_2} = 0$ (for B, C, D, H). The hypothesis was untenable

for subject categories A, E, F and G; or: $r_{SL_1 SL_2} \neq 0$ (for A, E, F and G). H tests demonstrated significant differences of mean observed percentages of time spent on subject categories A, E, F and G between supervisory levels.

RELATIONSHIPS BETWEEN TIME SAMPLING OBSERVATIONS OF SUPERVISORY BEHAVIOR AND OTHER VARIABLES:

4. The hypothesis that the relationship between observations of supervisory behavior (A) and employee perceptions of supervisory behavior (B) would not be significantly other than zero was tenable; or: $r_{AB}=0$. Although there were some significant relationships within some groups, there was not a consistent pattern of relationships over all groups.

5. The hypothesis that the relationship between observations of supervisory behavior (A) and employee satisfactions with supervisory behavior (C) would not be significantly other than zero was tenable; or: $r_{AC}=0$. Although there were some significant relationships within some groups, there was not a consistent pattern of relationships over all groups.

6. The hypothesis that the relationship between observations of supervisory behavior (A) and supervisory perceptions of their own behavior (D) would not be significantly other than zero was tenable; or: $r_{AD}=0$. Although there were some significant relationships within some

groups, there was not a consistent pattern of relationships over all groups.

7. The hypothesis that the relationship between employee perceptions of supervisory behavior (B) and employee satisfactions with supervisory behavior (C) would not be significantly other than zero was untenable; or: $r_{BC} \neq 0$. Although there were non-significant relationships within a few groups, there tended to be a consistent pattern of relationships over all groups.

8. The hypothesis that the relationship between employee perceptions of supervisory behavior (B) and supervisory perceptions of their own behavior (D) would not be significantly other than zero was tenable; or: $r_{BD} = 0$. Although there were some significant relationships within some groups, there was not a consistent pattern of relationships over all groups.

9. The hypothesis that the relationship between perceptions of supervisory behavior of older (longer service employees (B_1) and perceptions of supervisory behavior of newer (shorter service) employees (B_2) would not be significantly other than zero was untenable; or: $r_{B_1 B_2} \neq 0$. Although there were some non-significant relationships within some groups, there tended to be a consistent pattern of relationships over all groups.

10. The hypothesis that the relationship between satisfactions with supervisory behavior of older (longer

service) employees (C_1) and satisfactions with supervisory behavior of newer (shorter service) employees (C_2) would not be significantly other than zero was untenable; or: $r_{C_1 C_2} \neq 0$. Although there were some non-significant relationships within some groups, there tended to be a consistent pattern of relationships over groups.

11. The hypothesis that the relationship between perceptions of supervisory behavior of an employee within a work group (B_{E_1}) and perceptions of supervisory behavior of other employees within the work group (B_{E_n}) would not be significantly other than zero was untenable; or: $r_{B_{E_1} B_{E_n}} \neq 0$. Measures of agreement tend to show a consistent pattern of relationships over all groups.

12. The hypothesis that the relationship between satisfaction with supervisory behavior of an employee within a work group (C_{E_1}) and satisfactions with supervisory behavior of other employees within the work group (C_{E_n}) would not be significantly other than zero was untenable; or: $r_{C_{E_1} C_{E_n}} \neq 0$. Measures of agreement tend to show a consistent pattern of relationships over all groups.

CONCLUSIONS AND DISCUSSION

CONCLUSIONS AND DISCUSSION

The hypothesis that the relationship between the observations of supervisory behavior of one observer and the observations of supervisory behavior of another independent observer would not be significantly other than zero was rejected as untenable by the findings in this study; or: $r_{O_1 O_2} \neq 0$. The relatively high percentages of agreement obtained using time sampling observations of supervisory behavior tend to show this method is reliable (in terms of observer agreement). The lower percentages of agreement obtained for physical action and topic categories than those for other categories indicate that observers cannot achieve a high percentage of agreement in these categories either because the categories are ambiguous and difficult to make discriminations between or because an insufficient number of observations was made to obtain a reliable estimate of these categories.

The hypothesis that the relationship between the observations of any category of supervisory behavior on one day by one observer and the observations of the same category of supervisory behavior on other days by the same observer would not be significantly other than zero was rejected as untenable by the findings; or: $r_{D_1 D_2} \neq 0$. The stability and consistency of cumulative percentages of time spent by all supervisors in each of the several

subject (activity)=categories for cumulative days of observation tend to show that the time sampling method is reliable (in terms of the consistency and stability of obtained results).

The hypothesis that the relationship between observed supervisory behavior of one supervisory level and the observed supervisory behavior of other supervisory levels would not be significantly other than zero was accepted as tenable by the findings for subject categories B, C, D and H; or: $r_{SL_1 SL_2} = 0$ (for B, C, D, H). The hypothesis was rejected as untenable by the findings for subject categories A, E, F and G; or: $r_{SL_1 SL_2} \neq 0$ (for A, E, F, G). Significant differences of mean observed percentages of time spent on subject categories A, E, F and G between the different supervisory levels, as demonstrated by Kruskal-Wallis H tests, were obtained. This finding indicates that there are real intra-supervisory level differences in behavior (time spent) in categories A, E, F and G, but no real intra-supervisory level differences in behavior (time spent) in categories B, C, D and H.

The hypothesis that the relationship between observations of supervisory behavior (A) and employee perceptions of supervisory behavior (B) would not be significantly other than zero was accepted as tenable by the findings; or: $r_{AB} = 0$. A conclusion that can be drawn from this

finding is that employees do not perceive the behavior of supervisors in terms of what he does or in terms of the distribution of his time in the several subject (activity) categories. This conclusion would tend to be contrary to a logical or common-sense belief that employee perceptions of supervisory behavior are related to supervisory behavior.

The hypothesis that the relationship between observations of supervisory behavior (A) and employee satisfactions with supervisory behavior (C) would not be significantly other than zero was accepted as tenable by the findings; or: $r_{AC}=0$. That the satisfactions of employees with supervisory behavior are not in terms of what the supervisor does or in terms of the distribution of his time in the several subject (activity) categories can be concluded. This conclusion would tend to be contrary to a logical or common-sense belief that employee satisfactions with supervisory behavior are related to supervisory behavior.

The hypothesis that the relationship between observations of supervisory behavior (A) and supervisory perceptions of their own behavior (D) would not be significantly other than zero was accepted as tenable by the findings; or: $r_{AD}=0$. The conclusion can be drawn that supervisors' self-perceptions of their behavior are not related to their behavior, which would be contrary to the logical or common-sense belief that such a relationship does exist.

The hypothesis that the relationship between employee perceptions of supervisory behavior (B) and employee satisfactions with supervisory behavior (C) would not be significantly other than zero was rejected as untenable by the findings; or: $r_{BC} \neq 0$. Significant positive rank-order correlation coefficients were obtained in almost all groups between these two variables; in those groups where the finding was not upheld, it may be noted that low mean rank reliabilities of one or both measures existed. Perhaps more reliable measures might also have supported the finding. This finding leads to the conclusion that employee perceptions of supervisory behavior are related to (or in terms of) their satisfactions with supervisory behavior. This conclusion would appear to be of considerable consequence and will be discussed further later in this section.

The hypothesis that the relationship between employee perceptions of supervisory behavior (B) and supervisory perceptions of their own behavior (D) would not be significantly other than zero was accepted as tenable by the findings; or: $r_{BD} = 0$. The conclusion may be drawn that supervisory self-perceptions and employee perceptions of the same supervisory behavior are not related, which is again contrary to a common-sense, logical belief. The lack of relationship can be understood, however, since neither of the perceptions are related to the supervisory behavior itself (as observed).

The hypotheses that both the perceptions of supervisory behavior and satisfactions with supervisory behavior of old and new employees would not be related significantly other than zero was rejected as untenable by the findings; or: $r_{B_1 B_2} \neq 0$ and $r_{C_1 C_2} \neq 0$. The conclusion drawn is that relationships exist for both the perceptions of (between old and new employees) and satisfactions with (between old and new employees) supervisory behavior. This conclusion is of interest since one might expect time of employment under a supervisor to be a factor influencing the accuracy of both perceptions and satisfactions.

The hypotheses that both of the measures of the perceptions of supervisory behavior and satisfactions with supervisory behavior of an employee within a work group and these same measures of other employees within the work group would not be ^{related} significantly other than zero was rejected as untenable by the findings; or: $r_{B_{E_1} B_{E_2}} \neq 0$ and $r_{C_{E_1} C_{E_2}} \neq 0$. The significant measures of agreement which were obtained within most work groups lead to the conclusion that the inventories used were reliable measures of the variables being measured.

The absence of relationships between both employee and supervisory perceptions of supervisory behavior and observed supervisory behavior, the absence of relationships between employee satisfactions with supervisory behavior and observed supervisory behavior and the presence of relationship between employee perceptions of supervisory

behavior and employee satisfactions with supervisory behavior are of considerable interest. If employees and/or supervisors perceptions of supervisory behavior are not related to observed supervisory behavior, then much methodology which utilizes verbal or written estimates of supervisory behavior may be subject to further scrutiny. Job analysis and job evaluation procedures, in which reporting of activity is used, might also be re-examined. If employee perceptions of supervisory behavior ~~are~~ related to satisfactions with supervisory behavior, then sound and adequate training programs might be designed which consider this relationship. In human relations training, for example, an effort directed at changing employee perceptions of supervisory behavior might be as effective (in terms of attitude change) as changing the behavior of the supervisor. Other implications of this finding may be apparent to the reader.

The implications of the conclusions and findings of this study for research are obvious. The findings and conclusions should be tested with other samples of populations and/or in other industrial settings. If the findings and conclusions are upheld in such a study, progress may have been made in understanding some additional dynamic factors of the industrial environment.

COMMENTS

COMMENTS

An analysis of the relationships between employee satisfaction and their perceptions of the behavior (activities) of the supervisor and other relationships within work groups might have modified some of the conclusions reached as to the tenability of some of the hypotheses. Such an analysis is beyond the scope of this thesis, but should be noted in connection with possible interpretation of conclusions reached in this study.

Some justification should, perhaps be made for the limited size of the sample of supervisors used in this study. The entire department used in this study was chosen because it represented the largest number of supervisors and employees in any department in the company in a centralized location. Even within this department, however, there were some small n's at some supervisory levels. It was decided to proceed on this basis because this study was to be used to evaluate the time sampling method; hence the suggestion that inter-industry research be conducted to test the findings and conclusions of this study.

The time sampling method appears to be a useful method for this kind of research. One desirable improvement which might be made in future research would be the addition of some qualitative or interaction categories for observation, as well as the quantitative categories used. This could add to an understanding of the effect (if any) of supervisory behavior upon employee perceptions and satisfactions.

It was doubtful whether the assumption of normality of the distribution of the population with respect to any of the variables of interest could be made. Therefore non-parametric statistics (for which this assumption is not required) were used throughout the analysis. The use of non-parametric statistics was also desirable because of the small samples in some analyses. It is believed that all assumptions of the statistics used have been satisfied.

One additional comment should be made concerning the lack of correspondence of this data to the Shartle (27) data. Shartle found a significant relationship between the perceptions of performance (activity) of naval officers and logged time of their performance, using the Work Analysis Forms he developed. It should be noted that this relationship was for only a three-day period (not for some on-going behavior or performance as in this study), and that the logs were kept by the officers themselves (not independent observations of the behavior or performance as in this study). Shartle does state, however, that this relationship is no indication of the true validity of the Work Analysis Forms. No other validity information appears to be available, however. Indeed, one might speculate that validity would be lacking in this approach to measuring performance by the use of inventories from the findings of this study.

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APPENDICES

APPENDIX A

CATEGORY CODING SYSTEM FOR
TIME SAMPLING OBSERVATIONS

(Place, Contact, Physical Action Categories)

Place Categories

- 1 Office
- 2 Desk
- 3 Area
- 4 Another's Office
- 5 Another's Desk
- 6 Another's Area
- 7 Other

Contact Categories

- 00 Alone
- 01 Own employee
- 02 Another employee
- 03 Immediate supervisor
- 04 Another supervisor
in Dept.
- 05 Another supervisor
- 08 Other

Physical Action Categories

- | | |
|----------------------|----------------------|
| 00 Plans | 11 Picks up, obtains |
| 01 Talks | 12 Demonstrates |
| 02 Listens | 13 Explains |
| 03 Discusses | 14 Instructs |
| 04 Looks or observes | 15 Walks |
| 05 Inspects | 16 Manipulates |
| 06 Examines | 17 Computes |
| 07 Reads | 18 Files, Sorts |
| 08 Writes | 19 Meeting |
| 09 Phones | 20 Other |
| 10 Distributes | |

CATEGORY CODING SYSTEM FOR

TIME SAMPLING OBSERVATIONS

(Subject, Topic Categories)

Subject Categories

Topic Categories

A Production

- 1 Productive work
- 2 Special work problem
- 3 Checking work
- 4 Distributing & Collecting work
- 5 Miscellaneous

B Safety & Housekeeping

- 1 Safety activity
- 2 Housekeeping activity
- 3 Supply activity
- 4 Miscellaneous

C Scheduling & Planning

- 1 Scheduling of work
- 2 Follow-up work progress
- 3 Work routine planning
- 4 Rescheduling
- 5 Miscellaneous

**D Service to Outside
Dept. Contacts**

- 1 Requests for service
- 2 Inquiries on progress
- 3 Follow-up on service
- 4 Inquiries on usage, past service,
etc.
- 5 Change in routine
- 6 Request from outside co.
- 7 Request to another dept.
- 8 Request to outside co.
- 9 Miscellaneous

**E Employee Relations,
Contacts**

- 1 Work problem
- 2 Personal problem
- 3 Interviewing and hiring
- 4 Induction
- 5 Follow-up reports
- 6 Job instruction & training
- 7 General supervision
- 8 Miscellaneous

F Reports & Paper Work

- 1 Production statistics
- 2 Employee follow-up reports
- 3 Activity reporting
- 4 Reports for group meetings
- 5 Attendance, time & personnel
reports
- 6 Analysis of reports
- 7 Miscellaneous reports

(Subject, Topic Categories - cont.)

Subject Categories

Topic Categories

G Meetings and Conferences

- 1 Departmental meetings
- 2 Informational meetings
- 3 Work simplification meetings
- 4 Group meetings
- 5 Interdepartmental meetings
- 6 Informal meetings
- 7 Committee meetings
- 8 Conferences outside company
- 9 Miscellaneous meetings

H Miscellaneous

- 1 Vacation
- 2 Illness
- 3 Other absence
- 4 Coffee break
- 5 Lunch hour
- 6 Personal business
- 7 Outside company business
- 8 Professional Ass'n. activities
- 9 Miscellaneous

APPENDIX B

APPENDIX C

Since you were busy, I didn't want to disturb you. Would you please check below to complete my observation?

Supervisor _____ Phoning _____
Time _____ Meeting _____

With whom?

_____ Employe of my own group
_____ Some other employe
_____ My immediate supervisor
_____ Another supervisor in Accounting Services Department
_____ Another supervisor of different department
_____ My assistant supervisor
_____ My work leader
_____ Someone other than above (If so, please list below):

About what? (Please state in a brief sentence)

Thank you,

Chuck Gross

APPENDIX D

SUPERVISORY WORK ANALYSIS FORM

The Detroit Edison Company
Industrial Psychology Division

Name _____

Work Group _____

Supervisor _____

Were you working in this group in June 1955?
Yes or No (Circle One)

The purpose of this analysis is to determine the relative amount of ~~your supervisor's time~~ (or - your time) devoted to major supervisory responsibilities and activities. These major supervisory responsibilities and activities are:

1. PRODUCTION - Productive work, special work problem, checking work, distributing and collecting work, miscellaneous productive activity.
2. SAFETY AND HOUSEKEEPING - Safety activity, housekeeping activity, supply activity, miscellaneous safety and/or housekeeping activity.
3. SCHEDULING AND PLANNING - Scheduling of work, follow-up on work progress, work routine planning, rescheduling of work, miscellaneous scheduling and planning activity.
4. SERVICE TO OUTSIDE DEPARTMENT CONTACTS - Answering requests for service from outside department personnel, making inquiries on progress of service, follow-up on service, inquiries on usage or past service, making changes in routine to accomodate outside contacts, request from outside the Company, making a request to another department, making a request to another company, miscellaneous outside contact.
5. EMPLOYEE RELATIONS AND CONTACTS - Dealing with employee's work problem, dealing with personal problem of employee, interviewing and hiring, induction of new employee, making follow-up reports on employees, job instruction and training, general supervision, miscellaneous employee relations and contact activity.
6. REPORTS AND PAPERWORK - Production statistics reports, follow-up reports, reporting activities to supervision and management, attendance reports, employee time reports, personnel reports, analyzing reports, miscellaneous reports.
7. MEETINGS AND CONFERENCES - Departmental meetings, informal meetings, work simplification meetings, group meetings, inter-departmental meetings, informal meetings, committee meetings, conferences outside the Company, miscellaneous meetings and conferences.
8. MISCELLANEOUS - Coffee break, lunch period, personal business, outside company activities, professional association activities, other miscellaneous activities not covered above.

SUPERVISORY SATISFACTION FORM

Again, please consider your supervisor's entire range of duties from day to day
ing at least a month period.

For each pair of supervisory responsibilities and activities, circle the one for
ch you are more satisfied with the amount of time your supervisor spends on the activity.
this for every pair.

For example:

PRODUCTION or SCHEDULING & PLANNING

If you circled SCHEDULING & PLANNING (as in the example) this would indicate that
are more satisfied with the amount of time your supervisor spends on SCHEDULING & PLANNING
n you are with the (amount of) time spent on Production.

m more satisfied with the amount of time my supervisor spends on:

- | | |
|---|--|
| PRODUCTION or SAFETY & HOUSEKEEPING | 16. SCHEDULING & PLANNING or MISCELLANEOUS |
| SERVICE TO OUTSIDE or SAFETY &
DEPARTMENT CONTACTS HOUSEKEEPING | 17. SAFETY & HOUSEKEEPING or SCHEDULING &
PLANNING |
| REPORTS & PAPERWORK or SAFETY &
HOUSEKEEPING | 18. SAFETY & HOUSEKEEPING or EMPLOYE RELATIONS
& CONTACTS |
| MISCELLANEOUS or SAFETY & HOUSEKEEPING | 19. SAFETY & HOUSEKEEPING or MEETING &
CONFERENCES |
| SERVICE TO OUTSIDE or MISCELLANEOUS
DEPARTMENT CONTACTS | 20. MISCELLANEOUS or EMPLOYE RELATIONS &
CONTACTS |
| REPORTS & PAPERWORK or MISCELLANEOUS | 21. MISCELLANEOUS or MEETINGS & CONFERENCES |
| MISCELLANEOUS or PRODUCTION | 22. PRODUCTION or EMPLOYE RELATIONS &
CONTACTS |
| EMPLOYE RELATIONS or REPORTS & PAPERWORK
& CONTACTS | 23. MEETINGS & CONFERENCES or REPORTS &
PAPERWORK |
| EMPLOYE RELATIONS or MEETINGS &
& CONTACTS CONFERENCES | 24. PRODUCTION or SERVICE TO OUTSIDE
DEPARTMENT CONTACTS |
| MEETINGS & CONFERENCES or PRODUCTION | 25. REPORTS & PAPERWORK or SERVICE TO OUTSIDE
DEPARTMENT CONTACTS |
| SERVICE TO OUTSIDE or MEETINGS &
DEPARTMENT CONTACTS CONFERENCES EMPLOYE
RELATIONS & CONTACTS | 26. PRODUCTION or SCHEDULING & PLANNING |
| SERVICE TO OUTSIDE or MEETINGS &
DEPARTMENT CONTACTS CONFERENCES | 27. EMPLOYE RELATIONS & CONTACTS or SCHEDULING
& PLANNING |
| REPORT & PAPERWORK or PRODUCTION | 28. MEETINGS & CONFERENCES or SCHEDULING &
PLANNING |
| SCHEDULING & PLANNING or SERVICE TO
OUTSIDE DEPARTMENT CONTACTS | |
| SCHEDULING & PLANNING or MISCELLANEOUS,
REPORTS &
PAPERWORK | |

APPENDIX G

FORM 1

MICHIGAN STATE UNIVERSITY
DEPARTMENT OF PSYCHOLOGY
INDUSTRIAL PSYCHOLOGY DIVISION
East Lansing, Michigan

June 13, 1955

INSTRUCTIONS

1. Most of the questions can be answered by checking one of the answers (✓) listed under the question. If you do not find the exact answer that fits your case, check the one that comes closest to it. Or, if you wish to, write your own answer.
2. Please answer the questions in order. Do not skip about.
3. Please make use of the space at the end of the questionnaire to make as many additional comments as you wish.

Background Information

People differ in the way they feel and the ideas that they have. This may be because of the number of years they have worked, the amount of money they make, and the kind of job they have. To note these differences for purposes of this study on supervisory demands, we need to know a few basic facts about you.

THIS INFORMATION IS STRICTLY CONFIDENTIAL.

This information begins on next page.

1. Name of your department. _____
2. Name of your work group. _____
3. What is your sex? _____ Male _____ Female
4. Are you -
 _____ Single _____ Widow or widower
 _____ Married _____ Divorced or separated
5. How much schooling have you had? (Check the highest completed.)
 _____ Some grammar school
 _____ Completed grammar school
 _____ Some high school
 _____ Business or trade school plus some high school
 _____ Completed high school
 _____ Completed high school and business school
 _____ Some college
 _____ Completed college
6. What is your age? (write in) _____
7. How long have you been with the company? (write in) _____ years
8. How long have you worked with your present supervisor? _____ months _____ years
9. How many people are there in your work group? _____ number
10. What is your present job, grade or classification? (write in)

11. What are your weekly wages (before deductions)? _____
12. How many dependents do you have? _____
13. What is the name of your first-line supervisor? _____

The following questions are about this person.

14. How much interest does he take in your getting along on your job? (Check only one answer)

_____ Very little interest
_____ Some interest
_____ Fairly interested
_____ A good deal of interest
_____ Very much interest

15. How well do you know what he expects of you? (Check only one answer)

_____ Not well at all, I am never sure of what he expects of me.
_____ Not too well, I am generally not sure of what he expects of me.
_____ Sometimes I know what he expects of me and sometimes I don't know.
_____ Quite well, I am generally sure of what he expects of me.
_____ Very well, I am always sure of what he expects of me.

16. How much emphasis does your supervisor put on getting out the work? (Check one)

_____ A great deal of emphasis - he emphasizes this more than anything.
_____ Quite a bit of emphasis - he emphasizes this a lot.
_____ Some emphasis - it is one of the most important things about the job, but it is not the only one.
_____ Not too much emphasis - he feels that a good many other things are just as important.
_____ He doesn't put much emphasis on getting out a lot of work.

17. In what way does he supervise you and the people in your work group? (Check one answer for each line.)

This phrase	Often	Fairly Often	Occasionally	Once in a while	Very seldom
Arranging the work					
Seeing that the work is done properly					
Making work assignments					
Enforcing the rules					
Keeping the employees supplied with materials, etc.					
Hearing complaints and grievances					
Helping with work problems					
Keeping employees posted on how well they are doing					
Discussing personal matters with employees					
Making recommendations for promotions, transfers and pay increases					
Taking care of other personnel matters like time off, vacations, etc.					
Training new employees					
Training old employees for better jobs					
Discussing matters and providing information in group meetings					

18. How much time and effort does your supervisor in planning and scheduling the work for your work group? (Check one)

- _____ He spends a great deal of time planning and scheduling the work for my work group.
- _____ He spends considerable time planning and scheduling work for my work group.
- _____ He spends a little time planning and scheduling work for my work group.
- _____ He spends very little time planning and scheduling work for my work group.

19. How well does your supervisor do the technical requirements of his work - understanding the practical problems of the group's work, knowing how to do all the work done in your group, planning the work schedule, etc.?

☐ He handles the technical part of his job extremely well.

☐ Very well

☐ Fairly well

☐ Handles some of the technical parts of his job fairly well.

☐ He does not handle the technical part of his job at all well.

20. How well does your supervisor do the human relations side of his job - getting people to work well together, building a team, giving recognition for good work done, letting people know where they stand, etc? (Check one)

☐ He handles the human relations part of his job extremely well.

☐ Very well

☐ Fairly well

☐ Handles some of the human relations parts well, and others not so well.

☐ He does not handle the human relations part of his job at all well.

21. When was the last time he reviewed your work with you? (Check only one answer)

☐ Within the last three months

☐ Three to six months ago

☐ Six months to a year ago

☐ A year to two years ago

☐ More than two years ago

☐ Never has reviewed my work with me

22. How closely does your supervisor supervise your group? (Check one)

☐ He uses very general supervision; the group is definitely on its own.

☐ He uses fairly general supervision; the group is pretty much on its own.

☐ He uses a moderate amount of supervision.

☐ He uses fairly close supervision.

☐ He uses very close supervision.

23. How much help do you feel you get from him when you really need it?

_____ Never gives me any help when I really need it.

_____ Hardly ever gives me any help when I really need it.

_____ Is sometimes helpful when I really need it.

_____ Is usually helpful when I really need it.

_____ Always gives me all the help I really need.

24. From your dealings with your supervisor, how well would you say the following comments fit him?

This phrase	Fits him very well	Fits him fairly well	Doesn't fit him too well	Doesn't fit him at all
Considerate of our feelings				
Unnecessarily strict with us				
Reasonable in what he expects				
Is a "leader" of men				
Bossy				
Quick to criticize				
Is a "driver"				
Likeable				
Carries "weight" with his boss				
Willing to try out new ideas				
Too anxious to please his boss				

25. How often are there group meetings in which employees in your work group can discuss things with the supervisor? (Check only one answer)

_____ Often

_____ Occasionally

_____ Practically never

_____ Frequently

_____ Seldom

26. Do these group discussions do any good? (Check only one answer)

☐ Yes, he likes to get our ideas and tries to do something about them.

☐ No, not really, it's just talk.

☐ No, we don't get a real hearing from our own ideas.

☐ We never have group discussions.

27. How well do you know what he thinks about your work? (Check only one answer)

☐ I know very definitely what he thinks of my work.

☐ I have a good idea of what he thinks of my work.

☐ I have some idea of what he thinks of my work.

☐ I am not sure of what he really thinks of my work.

☐ I have very little idea of what he thinks of my work.

28. How good is he at handling people. (Check only one answer)

☐ Excellent

☐ Average

☐ Poor

☐ Good

☐ Fair

29. How free do you feel to discuss important things about your job with him?
(Check only one answer)

☐ Very free

☐ Quite free

☐ Not very free

☐ Not at all free

30. How free do you feel to discuss your personal problems with your supervisor?

☐ Very free

☐ Fairly free

☐ Not very free

☐ Not at all free

31. Do you feel that he will go to bat or stand up for you? (Check only one answer)

☐ Yes, definitely

☐ Probably will

☐ May or may not

☐ Probably won't

☐ No, he won't

32. Do you feel that he is fair in dealing with the people you work with?
(Check only one answer)

☐ Very fair

☐ Quite fair

☐ About average

☐ Rather unfair

☐ Very unfair

33. How does your supervisor usually treat employees with complaints?
(Check only one answer)

☐ Discourages complaints ☐ Neutral toward complaints
☐ Goes to bat for them

34. How reasonable is he in what he expects of you? (Check only one answer)

☐ Very reasonable ☐ Fairly reasonable ☐ About average
☐ Not very reasonable ☐ Quite reasonable

35. Does he pull for the Company or for the man? (check only one answer)

☐ He is usually pulling for the Company
☐ He is usually pulling for himself
☐ He is usually pulling for the men
☐ He is usually pulling both for the Company and the men

36. In general, do you feel your supervisor is getting better or worse as a supervisor? (Check one)

☐ Getting better as a supervisor ☐ Staying about the same
☐ Getting worse as a supervisor

37. Taking all things into consideration, how satisfied are you with your supervisor? (Check one)

☐ Very satisfied ☐ Fairly satisfied
☐ Neither satisfied nor dissatisfied
☐ Fairly dissatisfied ☐ Very dissatisfied

38. What is the name of your assistant supervisor? _____
The following questions are about this person.

39. How much interest does he take in your getting along on your job?
(Check only one answer)

☐ Very little interest ☐ Some interest ☐ Fairly interested
☐ A good deal of interest ☐ Very much interest

40. How well do you know what he expects of you? (Check only one answer)

☐ Not well at all, I am never sure of what he expects of me
☐ Not too well, I am generally not sure of what he expects of me

_____ Sometimes I know what he expects of me and sometimes I don't know

_____ Quite well, I am generally sure of what he expects of me

_____ Very well, I am always sure of what he expects of me

41. How much emphasis does your assistant supervisor put on getting out the work? (Check one)

_____ A great deal of emphasis - he emphasizes this more than anything.

_____ Quite a bit of emphasis - he emphasizes this a lot.

_____ Some emphasis - it is one of the most important things about the job, but it is not the only one.

_____ Not too much emphasis - he feels that a good many other things are just as important.

_____ He doesn't put much emphasis on getting out a lot of work.

42. In what way does he supervise you and the people in your work group? (Check one answer for each line.)

This phrase	Often	Fairly Often	Occasionally	Once in a while	Very seldom
Arranging the work					
Seeing that the work is done properly					
Making work assignments					
Enforcing the rules					
Keeping the employes supplies with materials, etc.					
Hearing complaints and grievances					
Helping with work problems					
Keeping employes posted on how well they are doing					
Discussing personal matters with employes					
Making recommendations for promotions, transfers and pay increases					
Taking care of other personnel matters like time off, vacations, etc.					
Training new employes					
Training old employes for better jobs					
Discussing matters and providing information in group meetings					

43. How much time and effort does your assistant supervisor in planning and scheduling the work for your work group? (Check one)

_____ He spends a great deal of time planning and scheduling the work for my work group.

_____ He spends considerable time planning and scheduling work for my work group.

_____ He spends a little time planning and scheduling work for my work group.

_____ He spends very little time planning and scheduling work for my work group.

44. How well does your assistant supervisor do the technical requirements of his work - understanding the practical problems of the group's work, knowing how to do all the work done in your group, planning the work schedule, etc.?

☐ He handles the technical part of his job extremely well

☐ Very well

☐ Fairly well

☐ Handles some of the technical parts of his job fairly well

☐ He does not handle the technical part of his job at all well

45. How well does your assistant supervisor do the human relations side of his job - getting people to work well together, building a team, giving recognition for good work done, letting people know where they stand, etc? (Check one)

☐ He handles the human relations part of his job extremely well.

☐ Very well

☐ Fairly well

☐ Handles some of the human relations parts well, and others not so well.

☐ He does not handle the human relations part of his job at all well.

46. How closely does your assistant supervisor supervise your group?
(Check only one)

☐ He uses very general supervision; the group is definitely on its own

☐ He uses fairly general supervision; the group is pretty much on its own.

☐ He uses a moderate amount of supervision.

☐ He uses fairly close supervision

☐ He uses very close supervision.

47. How much help do you feel you get from him when you really need it?

☐ Never gives me any help when I really need it.

☐ Hardly ever gives me any help when I really need it.

☐ Is sometimes helpful when I really need it

☐ Is usually helpful when I really need it.

☐ Always gives me all the help I really need.

48. From your dealings with your assistant supervisor, how well would you say the following comments fit him?

This phrase	Fits him very well	Fits him fairly well	Doesn't fit him too well	Doesn't fit him at all
Considerate of our feelings				
Unnecessarily strict with us				
Reasonable in what he expects				
Is a "leader" of men				
Bossy				
Quick to criticize				
Is a "driver"				
Likeable				
Carries "weight" with his boss				
Willing to try out new ideas				
Too anxious to please his boss				

49. How well do you know what he thinks about your work? (Check only one answer)

- ☐ I know very definitely what he thinks of my work.
☐ I have a good idea of what he thinks of my work.
☐ I have some idea of what he thinks of my work.
☐ I am not sure of what he really thinks of my work.
☐ I have very little idea of what he thinks of my work.

50. How good is he at handling people. (Check only one answer)

- ☐ Excellent ☐ Average ☐ Poor
☐ Good ☐ Fair

51. How free do you feel to discuss important things about your job with him?
(Check only one answer)

- ☐ Very free ☐ Quite free
☐ Not very free ☐ Not at all free

- [illegible]

59. Taking all things into consideration, how satisfied are you with your assistant supervisor? (Check one)

☐ Very satisfied ☐ Fairly dissatisfied
☐ Fairly satisfied ☐ Very dissatisfied
☐ Neither satisfied nor dissatisfied

60. How satisfied are you with the amount of information you get about what is going on in the Company? (Check one answer only)

☐ Very well satisfied ☐ Somewhat satisfied but could get more
☐ Fairly well satisfied ☐ Not very well satisfied

61. Now, considering you job as a whole, how well do you like it? (Check only one answer)

☐ I like it very much ☐ Don't like it too well
☐ Like it fairly well ☐ Don't like it at all
☐ Like some things about it, dislike others

62. How well do you feel your department is managed? (Check only one answer)

☐ Not managed well at all ☐ Fairly well managed
☐ Not managed very well ☐ Very well managed

63. How well do the people you work with help one another? (Check only one)

☐ When you need help it's difficult to get.
☐ You can usually get people to help if you ask them.
☐ When you need help people are there pitching in almost before you ask them.
☐ In my work it is not possible for anyone to help me.

64. How do you feel your group compares with other groups doing similar work in getting the job done? (Check only one)

☐ One of the best ☐ Above average
☐ Better than most ☐ A little below average
☐ A little above average ☐ One of the poorest
☐ In my job I do not work with any one group of people.

65. How do you feel your group compares with other groups when it comes to sticking together to get what the group wants or wants to do. (Check only one answer)

_____ One of the best groups at sticking together to get what the group wants.

_____ Better than most groups at sticking together to get what the group wants.

_____ About average group at sticking together to get what the group wants.

_____ Not as good as most groups at sticking together to get what the group wants.

_____ One of the poorest groups at sticking together to get what the group wants.

66. Do you feel that you are really a part of your work group? (Check only one)

_____ Yes, I feel I really belong.

_____ Yes, I feel I am included in most ways but not in all.

_____ Yes, I feel I am included in some ways but not in others.

_____ No, I don't feel I really belong.

_____ In my job I do not work with any one group of people.

67. How satisfied are you with your present wages? (Check only one answer)

_____ Completely satisfied	_____ Dissatisfied a little
_____ Very well satisfied	_____ Quite dissatisfied
_____ Fairly well satisfied	_____ Very dissatisfied
_____ Neither satisfied or dissatisfied	

68. How important do you feel the work you do is to the operation of The Detroit Edison Company? (Check only one answer)

_____ The Company could not run without the kind of work I am doing.

_____ The Company would have difficulty operating without the kind of work I am doing.

_____ The Company might have some difficulty operating without the kind of work I am doing.

_____ The Company would have little difficulty operating without the kind of work I am doing.

_____ The Company would have no difficulty operating without the kind of work I am doing.

69. In general, how do you feel about the working hours here at The Detroit Edison Company? (Check only one answer)

- ☐ I like them very much.
- ☐ I like them fairly well.
- ☐ I like some things about them, dislike others.
- ☐ I dislike them somewhat.
- ☐ I don't like them very much.

70. How do people you work with feel about working for The Detroit Edison? (Check only one)

- ☐ They really want people outside the Company to know they work here.
- ☐ They rather like to have people outside the Company know they work here.
- ☐ It doesn't really matter to them whether people know they work here.
- ☐ They don't like people to know they work for Detroit Edison.

71. Taking things as a whole, how satisfied are you? (Check only one answer)

- ☐ I'm very satisfied with the Company and my job and would not want to see them make any changes.
- ☐ I'm very satisfied but I know of some things that could be changed.
- ☐ I'm quite satisfied with the Company but there certainly are many things that could be changed.
- ☐ I'm not very satisfied but I can see no way things could be changed.
- ☐ I'm not satisfied and there are a great many things that could be changed.

PLEASE GO BACK OVER ALL THE PAGES TO BE SURE YOU DID NOT SKIP ANY OF THE QUESTIONS.

The rest of this page and the next page are for any other points you would like to make. We would appreciate your comments. Thank you for your cooperation.

June 13, 1955

MICHIGAN STATE UNIVERSITY
DEPARTMENT OF PSYCHOLOGY
INDUSTRIAL PSYCHOLOGY DIVISION
EAST LANSING, MICHIGAN

INSTRUCTIONS

1. Most of the questions can be answered by checking one of the answers (✓) listed under the question. If you do not find the exact answer that fits your case, check the one that comes closest to it. Or, if you wish to, write your own answer.
2. Please answer the questions in order. Do not skip about.
3. Please make use of the space at the end of the questionnaire to make as many additional comments as you wish.

BACKGROUND INFORMATION

People differ in the way they feel and the ideas that they have. This may be because of the number of years they have worked, the amount of money they make, and the kind of job they have. To note these differences for purposes of this study on supervisory demands, we need to know a few basic facts about you. THIS INFORMATION IS STRICTLY CONFIDENTIAL.

1. Name of your department

2. Name of work group you supervise

3. What is your supervisory title? (Write in)

4. What is your sex?
☐ Male
☐ Female
5. Are you
☐ Single
☐ Married
☐ Widow or widower
☐ Divorced or separated

6. How much schooling have you had? (Check the highest completed)

- ☐ Some grammar school
- ☐ Completed grammar school
- ☐ Some high school
- ☐ Business or trade school plus some high school
- ☐ Completed high school
- ☐ Completed high school and business school
- ☐ Some college
- ☐ Completed college

7. What is your age? (Write in) _____

8. How long have you been with the company? (Write in)

9. How long have you been a supervisor?

What other supervisory positions, other than present position, have you had?

10. How long have you held your present supervisory position?

11. About how many employees do you have reporting directly to you?

_____ number

12. How many supervisors, if any, do you have reporting directly to you?

_____ number

13. If you have any supervisory assistants, how long have they been assisting you?

_____ months _____ years

(List others below)

14. How long have you been under your present supervisor?

As a supervisor:

_____ months _____ years

As an employee:

_____ months _____ years

15. Taking all things into consideration, would you say your future in Detroit Edison looks better or worse than a few years ago? (Check one)

☐ My future with D.E. looks much better than a few years ago
☐ Somewhat better
☐ About the same as it did
☐ Somewhat worse
☒ My future with D.E. looks much worse than a few years ago

16. How well do your employees know what you expect of them? (Check one)

☐ They are never quite sure of what I expect of them
☐ They are not too sure of what I expect of them
☐ They have some idea of what I expect of them
☐ They are generally sure of what I expect of them
☒ They are quite sure of what I expect of them

17. How much attention do you give to training your employees? (Check one)

☐ I give a great deal of attention to training employees
☐ I give considerable attention to training employees
☐ I give some attention to training employees
☐ I give a little attention to training employees
☒ I give very little attention to training employees

18. How well do your employees know what you think of the work they do? (Check one)

☐ They know very definitely what I think of the work they do
☐ They have a good idea of what I think of the work they do
☐ They have some idea of what I think of the work they do
☐ They are not too sure of what I really think of the work they do
☒ They have very little idea of what I think of the work they do

19. How much emphasis do you put on getting out the work? (Check one)

☐ A great deal of emphasis, I emphasize this more than anything else
☐ Quite a bit of emphasis, I emphasize this a lot
☐ Some emphasis, it is one of the most important things about my job, but it is not the only one
☐ Not too much emphasis, I feel that a good many other things are just as important
☒ I don't pay much attention to production or getting out a lot of work

20. How much time and effort do you spend in planning and scheduling the work for your work group? (Check one)

☐ I spend a great deal of time planning and scheduling the work for my work group
☐ I spend considerable time planning and scheduling the work for my work group
☐ I spend some time planning and scheduling work for my work group
☐ I spend a little time planning and scheduling work for my work group
☒ I spend very little time planning and scheduling work for my work group

21. How do you feel about the amount of time you have to spend on personnel work in your job? (Check one)

- ☐ Would like to spend much more time on this
☐ Would like to spend a little more time on this
☐ Am spending about the right amount of time now
☐ Would like to spend a little less time on this
☐ Would like to spend much less time on this

22. Some supervisors feel that they are "in the middle" between workers and management. How does it work out in your case? (Check one)

- ☐ I do not feel I stand in the middle
☐ I have a slight feeling of standing in the middle
☐ I have a fairly definite feeling of standing in the middle
☐ I have a definite feeling of standing in the middle

23. In what ways do you supervise the people in your work group? (Check only one answer)

	(1) Often	(2) Fairly Often	(3) Occasionally	(4) Once in a while	(5) Very Seldom
Arranging the work					
Seeing that the work is done properly					
Making work assignments					
Enforcing the rules					
Keeping the employees supplied with materials, etc.					
Hearing complaints and grievances					
Helping with work problems					
Keeping employees posted on how well they are doing					
Keeping employees informed on what is happening in the Company					
Discussing personal matters with employees					
Making recommendations for promotions, transfers and pay increases					
Taking care of other personnel matters like time off, vacations, etc.					
Training new employees					
Training old employees for better jobs					
Discussing matters and providing information in group meetings					

24. Considering your group as a whole, do you have the kind of people who need to be closely supervised, or can they be put on their own? Do not consider new employees who are being trained. (Check one)

☐ They need very general supervision; my people are definitely on their own
☐ They need fairly general supervision; my people are pretty much on their own
☐ They need a moderate amount of supervision
☐ They need fairly close supervision
☐ They need very close supervision

25. How often do you get together with your employees as a group to discuss problems which concern both you and them? (Check one answer)

☐ Often
☐ Frequently
☐ Occasionally
☐ Seldom
☐ Practically never

26. How do you feel the group that works for you compares with other groups doing similar work in getting the job done? (Check one)

☐ One of the poorest
☐ Poorer than most
☐ A little below average
☐ About average
☐ A little above average
☐ Better than most
☐ One of the best

27. In general, how much do the people in your work group have to say about how things are done? (Check one)

☐ I give them a great deal of say in how things are done
☐ I give them quite a bit of say
☐ I give them some say
☐ I give them a little say
☐ I give them hardly any say at all in how things are done

28. How many of your employees would you say are satisfied with the company and their jobs as a whole? (Check only one answer)

☐ Almost none of them
☐ A quarter of them
☐ Half of them
☐ Three fourths of them
☐ Almost all of them

29. Taking all things into consideration now, how confident do you feel to handle your job as a supervisor? (Check one)

☐ Completely confident to handle my job as supervisor
☐ Very confident to handle my job
☐ Quite confident to handle my job
☐ Fairly confident to handle my job
☐ Not too confident to handle my job as supervisor

30. How good is your department head at handling people? (Check one)

- ☐ Poor
- ☐ Fair
- ☐ Average
- ☐ Good
- ☐ Excellent

31. Do you feel that your department head will go to bat or stand up for you?
(Check only one answer)

- ☐ No, he won't
- ☐ Probably won't
- ☐ May or may not
- ☐ Probably will
- ☐ Yes, definitely

32. How free do you feel to discuss important things about your job with your department head? (Check only one answer)

- ☐ Very free
- ☐ Fairly free
- ☐ Not very free
- ☐ Not at all free

33. How free do you feel to discuss personal problems with your department head?
(Check one)

- ☐ Not at all free
- ☐ Not very free
- ☐ Fairly free
- ☐ Very free

34. How sure are you of how you stand with your department head? (Check one)

- ☐ Very sure
- ☐ Fairly sure
- ☐ Not sure

35. How does your department head treat you when you have a complaint? (Check one)

- ☐ Discourages complaints
- ☐ Neutral toward complaints
- ☐ Goes to bat for me

36. Does your department head supervise you closely, or does he put you on your own?
(Check one)

- ☐ He uses very general supervision; I am definitely on my own
- ☐ Fairly general supervision; I am pretty much on my own
- ☐ A moderate amount of supervision
- ☐ Fairly close supervision
- ☐ He uses very close supervision; he doesn't put me on my own

37. How much attention does your department head give to developing you and other supervisors under him? (Check one)

☐ He gives a great deal of attention to developing us
☐ Considerable attention to this
☐ Some attention to this
☐ A little attention to this
☐ He gives very little attention to developing us

38. How much emphasis do you feel your department head puts on getting the work out? (Check one)

☐ A great deal of emphasis, he emphasizes this more than anything else
☐ Quite a bit of emphasis, he emphasizes this a lot
☐ Some emphasis, it is one of the most important things about the job, but it is not the only one
☐ Not too much emphasis, he feels that a good many other things are just as important
☐ He doesn't pay much attention to production or getting out a lot of work

39. Taking all things into consideration, how satisfied are you with your department head? (Check one)

☐ Very satisfied
☐ Fairly satisfied
☐ Neither satisfied nor dissatisfied
☐ Fairly dissatisfied
☐ Very dissatisfied

40. How good is your assistant department head at handling people? (Check one)

☐ Poor
☐ Fair
☐ Average
☐ Good
☐ Excellent

41. Do you feel that your assistant department head will go to bat or stand up for you? (Check only one answer)

☐ No, he won't
☐ Probably won't
☐ May or may not
☐ Probably will
☐ Yes, definitely

42. How free do you feel to discuss important things about your job with your assistant department head? (Check only one answer)

☐ Very free
☐ Fairly free
☐ Not very free
☐ Not at all free

43. How free do you feel to discuss personal problems with your assistant department head? (Check one)
- ☐ Not at all free
☐ Not very free
☐ Fairly free
☐ Very free
44. How sure are you of how you stand with your assistant department head? (Check one)
- ☐ Very sure
☐ Fairly sure
☐ Not sure
45. How does your assistant department head treat you when you have a complaint? (Check one)
- ☐ Discourages complaints
☐ Neutral toward complaints
☐ Goes to bat for me
46. Does your assistant department head supervise you closely, or does he put you on your own? (Check one)
- ☐ He uses very general supervision; I am definitely on my own
☐ Fairly general supervision; I am pretty much on my own
☐ A moderate amount of supervision
☐ Fairly close supervision
☐ He uses very close supervision; he doesn't put me on my own
47. How much attention does your assistant department head give to developing you and other supervisors under him? (Check one)
- ☐ He gives a great deal of attention to developing us
☐ Considerable attention to this
☐ Some attention to this
☐ A little attention to this
☐ He gives very little attention to developing us
48. How much emphasis do you feel your assistant department head puts on getting the work out (Check one)
- ☐ A great deal of emphasis, he emphasizes this more than anything else
☐ Quite a bit of emphasis, he emphasizes this a lot
☐ Some emphasis, it is one of the most important things about the job, but it is not the only one
☐ Not too much emphasis, he feels that a good many other things are just as important
☐ He doesn't pay much attention to production or getting out a lot of work

49. Taking all things into consideration, how satisfied are you with your assistant department head? (Check one)

- ☐ Very satisfied
- ☐ Fairly satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Fairly dissatisfied
- ☐ Very dissatisfied

50. Taking things as a whole, how satisfied are you? (Check one)

- ☐ I'm very satisfied with the company and my job and would not want to see them make any changes
- ☐ I'm very satisfied but I know of some things that could be changed
- ☐ I'm quite satisfied with the company but there certainly are many things that could be changed
- ☐ I'm not very satisfied but I can see no way things could be changed
- ☐ I'm not satisfied and there are a great many things that could be changed

This page is for any other points you would like to make.

We would like to have you sign your name so that we can be sure to match your questionnaire with those of your employees for some analyses. As in the past, none of the data will be reported in ways that will identify individual work groups or supervisors.

Your name _____

PLEASE GO BACK OVER ALL THE PAGES TO BE SURE YOU DID NOT SKIP ANY OF THE QUESTIONS.

TABLE XVIII

**χ^2 TEST FOR THE PRESENCE OR ABSENCE OF RELATIONSHIP
BETWEEN OBSERVED FIRST-LINE SUPERVISORY BEHAVIOR
AND EMPLOYEE PERCEPTIONS OF FIRST-LINE SUPERVISORY
BEHAVIOR TAKEN FROM EMPLOYEE ATTITUDE
QUESTIONNAIRE PERCEPTUAL ITEMS***

Item	Phrase	Category	χ^2	L.S.**	Direction
17	a	A	15.07	.01	P***
	b	A	19.93	.01	P
	c	A	8.90	.01	P
	e	C	.44	N.S.	
	d	A	7.43	.01	P
	e	B	8.19	.01	N****
	e	A	2.10	N.S.	
	f	E	.11	N.S.	
	g	E	.33	N.S.	
	g	A	17.77	.01	P
	h	E	1.09	N.S.	
	i	E	.01	N.S.	
	j	E	.99	N.S.	
	k	E	.06	N.S.	
	l	E	5.62	.02	P
	m	E	5.23	.02	P
	n	G	15.55	.01	N
18	-	C	.004	N.S.	

* Questions #17 and #18

** Level of Significance

*** Positive

**** Negative

TABLE XIX

**χ^2 TEST FOR THE PRESENCE OR ABSENCE OF RELATIONSHIP
BETWEEN OBSERVED ASSISTANT SUPERVISORY BEHAVIOR
AND EMPLOYEE PERCEPTIONS OF ASSISTANT SUPERVISORY
BEHAVIOR TAKEN FROM EMPLOYEE ATTITUDE
QUESTIONNAIRE PERCEPTUAL ITEMS***

Item	Phrase	Category	χ^2	L.S.**	Direction
42	a	A	13.91	.01	N***
	b	A	20.31	.01	N
	c	A	31.18	.01	N
	e	C	4.74	.05	N
	d	A	10.99	.01	N
	e	B	2.01	N.S.	
	e	A	2.01	N.S.	
	f	E	4.86	.05	N
	g	E	2.72	N.S.	
	g	A	14.92	.01	N
	h	E	8.88	.01	N
	i	E	2.90	N.S.	
	j	E	2.67	N.S.	
	k	E	.67	N.S.	
	l	E	.66	N.S.	
	m	E	.11	N.S.	
	n	G	13.49	.01	N
	-	C	1.60	N.S.	
43	-	C	1.60	N.S.	

* Questions #42 and #43

** Level of Significance

*** Negative

100

TABLE XX

MEAN OBSERVED PERCENTAGES OF TIME SPENT BY FIRST-LINE
AND ASSISTANT SUPERVISORS DICHOTOMIZED INTO GROUPS
HIGH AND LOW IN EMPLOYEE SATISFACTION

Supervisory Level	A*	B	C	D	E	F	G	H
<u>First-line</u>								
Employee Satisfaction								
High	11.2	2.8	18.9	5.1	22.5	13.6	6.6	19.1
Low	10.0	5.9	14.7	13.8	22.6	5.4	14.9	12.5
<u>Assistants</u>								
Employee Satisfaction								
High	26.2	4.2	14.9	16.8	9.9	9.6	4	17.9
Low	34.1	4.5	11.4	5.9	27.3	3.6	3.1	10.1

* Key to symbols:

- A Production
- B Safety and Housekeeping
- C Scheduling and Planning
- D Service to Outside Department Contacts
- E Employee Relations and Contacts
- F Reports and Paperwork
- G Meetings and Conferences
- H Miscellaneous

QUESTION

1. The following table shows the number of people who attended the 2010 World Cup in South Africa, by country and by gender.

Country	Male	Female
England	120	80
France	150	100
Germany	180	120
Italy	200	140
Spain	220	160
United States	250	180

2. The following table shows the number of people who attended the 2010 World Cup in South Africa, by country and by gender.

Country	Male	Female
England	120	80
France	150	100
Germany	180	120
Italy	200	140
Spain	220	160
United States	250	180

3. The following table shows the number of people who attended the 2010 World Cup in South Africa, by country and by gender.

Country	Male	Female
England	120	80
France	150	100
Germany	180	120
Italy	200	140
Spain	220	160
United States	250	180

4. The following table shows the number of people who attended the 2010 World Cup in South Africa, by country and by gender.

Country	Male	Female
England	120	80
France	150	100
Germany	180	120
Italy	200	140
Spain	220	160
United States	250	180

5. The following table shows the number of people who attended the 2010 World Cup in South Africa, by country and by gender.

TABLE XXI

RANK ORDER CORRELATION BETWEEN OBSERVED SUPERVISORY
BEHAVIOR OF SUPERVISORY LEVELS WITH HIGH
SATISFACTION EMPLOYEES AND OBSERVED
SUPERVISORY BEHAVIOR OF SUPERVISORY
LEVELS WITH LOW SATISFACTION
EMPLOYEES

Supervisory Level	r'_{lh} *	Level of Significance
First-line	.38	N.S.
Assistants	.76	.05

* Key to symbols:

r'_{lh} Rank correlation between low and high
employee satisfaction supervisors

TABLE XXII

LEVELS OF SIGNIFICANCE ARRIVED AT FROM χ^2 TEST FOR
PRESENCE OR ABSENCE OF RELATIONSHIP BETWEEN
EMPLOYEE ATTITUDE QUESTIONNAIRE SATISFACTION
ITEMS AND CRITERION QUESTION NUMBER 37
(GENERAL SATISFACTION WITH FIRST-LINE SUPERVISOR)

Item	L.S.*	Direction	Item	L.S.*	Direction
14	.001	P**	28	.001	P
15	.001	P	29	.10	P
16	N.S.		30	N.S.	
19	.001	P	31	.001	P
20	.001	P	32	.001	P
21	.01	P	33	.001	P
22	.05	P	34	.001	P
23	.001	P	35	.001	P
24 a	.001	P	36	.05	P
b	N.S.		60	.05	P
c	.01	P	61	N.S.	
d	.001	P	62	.001	P
e	.001	N***	63	.001	P
f	.001	N	64	N.S.	
g	.001	N	65	.01	P
h	.001	P	66	.001	P
i	.10	N	67	.001	P
j	N.S.		68	N.S.	
k	.001	N	69	N.S.	
25	.05	P	70	.01	P
26	.01	P	71	.05	P
27	N.S.				

* Level of Significance

** Positive

*** Negative

APPENDIX H

TABLE XXIII

SUPERVISOR'S NUMBER, LEVEL OF SUPERVISION
AND WORK GROUP

Number	Supervisory Level	Work Group
1	Third-line	A
2	Third-line	A
3	Second-line	A
4	Staff	B
5	First-line	C
6	First-line	D
7	First-line	E
8	First-line	F
9	First-line	G
10	First-line	H
11	Assistant	C
12	Assistant	D
13	Assistant	E
14	Assistant	F
15	Assistant	G
16	Assistant	H
17	Work Group Leader	C
18	Work Group Leader	D

Date		Description		Amount	
1900	Jan 1	Balance		100.00	
	Feb 1	Interest		1.00	
	Mar 1	Interest		1.00	
	Apr 1	Interest		1.00	
	May 1	Interest		1.00	
	Jun 1	Interest		1.00	
	Jul 1	Interest		1.00	
	Aug 1	Interest		1.00	
	Sep 1	Interest		1.00	
	Oct 1	Interest		1.00	
	Nov 1	Interest		1.00	
	Dec 1	Interest		1.00	
1901	Jan 1	Balance		100.00	
	Feb 1	Interest		1.00	
	Mar 1	Interest		1.00	
	Apr 1	Interest		1.00	
	May 1	Interest		1.00	
	Jun 1	Interest		1.00	
	Jul 1	Interest		1.00	
	Aug 1	Interest		1.00	
	Sep 1	Interest		1.00	
	Oct 1	Interest		1.00	
	Nov 1	Interest		1.00	
	Dec 1	Interest		1.00	
1902	Jan 1	Balance		100.00	
	Feb 1	Interest		1.00	
	Mar 1	Interest		1.00	
	Apr 1	Interest		1.00	
	May 1	Interest		1.00	
	Jun 1	Interest		1.00	
	Jul 1	Interest		1.00	
	Aug 1	Interest		1.00	
	Sep 1	Interest		1.00	
	Oct 1	Interest		1.00	
	Nov 1	Interest		1.00	
	Dec 1	Interest		1.00	
1903	Jan 1	Balance		100.00	
	Feb 1	Interest		1.00	
	Mar 1	Interest		1.00	
	Apr 1	Interest		1.00	
	May 1	Interest		1.00	
	Jun 1	Interest		1.00	
	Jul 1	Interest		1.00	
	Aug 1	Interest		1.00	
	Sep 1	Interest		1.00	
	Oct 1	Interest		1.00	
	Nov 1	Interest		1.00	
	Dec 1	Interest		1.00	
1904	Jan 1	Balance		100.00	
	Feb 1	Interest		1.00	
	Mar 1	Interest		1.00	
	Apr 1	Interest		1.00	
	May 1	Interest		1.00	
	Jun 1	Interest		1.00	
	Jul 1	Interest		1.00	
	Aug 1	Interest		1.00	
	Sep 1	Interest		1.00	
	Oct 1	Interest		1.00	
	Nov 1	Interest		1.00	
	Dec 1	Interest		1.00	
1905	Jan 1	Balance		100.00	
	Feb 1	Interest		1.00	
	Mar 1	Interest		1.00	
	Apr 1	Interest		1.00	
	May 1	Interest		1.00	
	Jun 1	Interest		1.00	
	Jul 1	Interest		1.00	
	Aug 1	Interest		1.00	
	Sep 1	Interest		1.00	
	Oct 1	Interest		1.00	
	Nov 1	Interest		1.00	
	Dec 1	Interest		1.00	

1906 Jan 1 Balance 100.00

APPENDIX I

EXPLANATION OF FIGURES I, II and III

Figures I, II and III show the observed percentages of time spent by all supervisors on the several subject (activity) categories. The cumulative percentages of time spent are plotted against the cumulative days of observation.

These percentages of time spent indicate the reduction in sampling error of the time sampling observations for the several subject categories. Fluctuations of the percentages are reduced with additional days of observation. This may be seen by the reduction (over time) of the curve indicating the cumulative percentages near the end of observation (particularly days 21-25) in terms of the curve's amplitude. Then, the stability of the observational percentages may be noted.

FIGURE I
Reduction in Sampling Error of Time Sampling Observations
for Subjects A, B, C (All Supervisors)

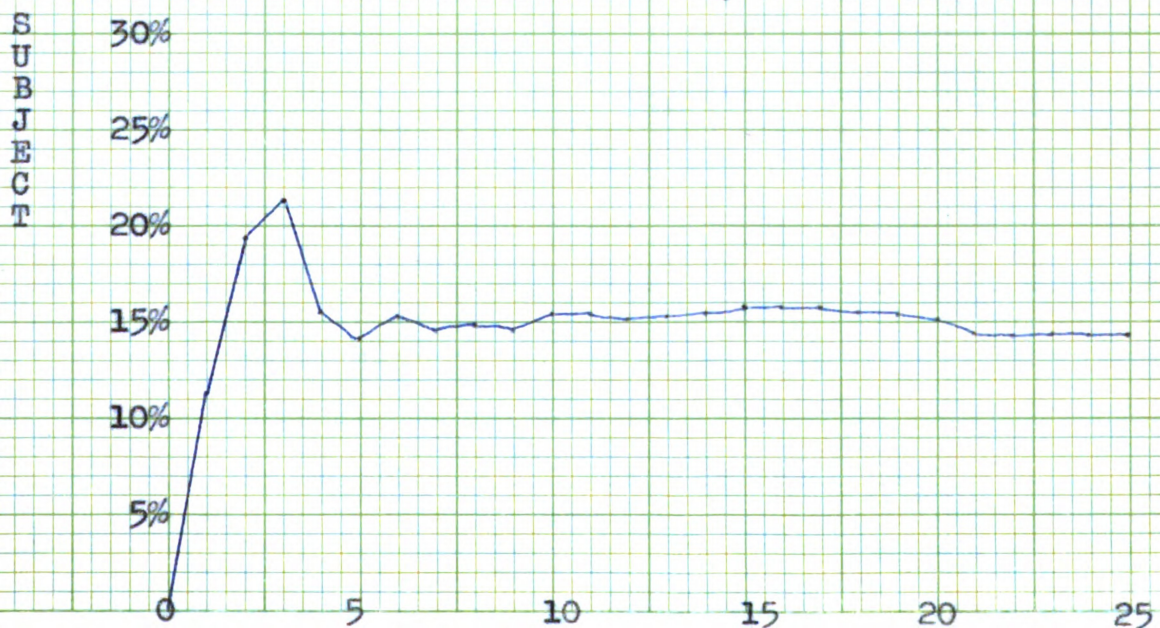
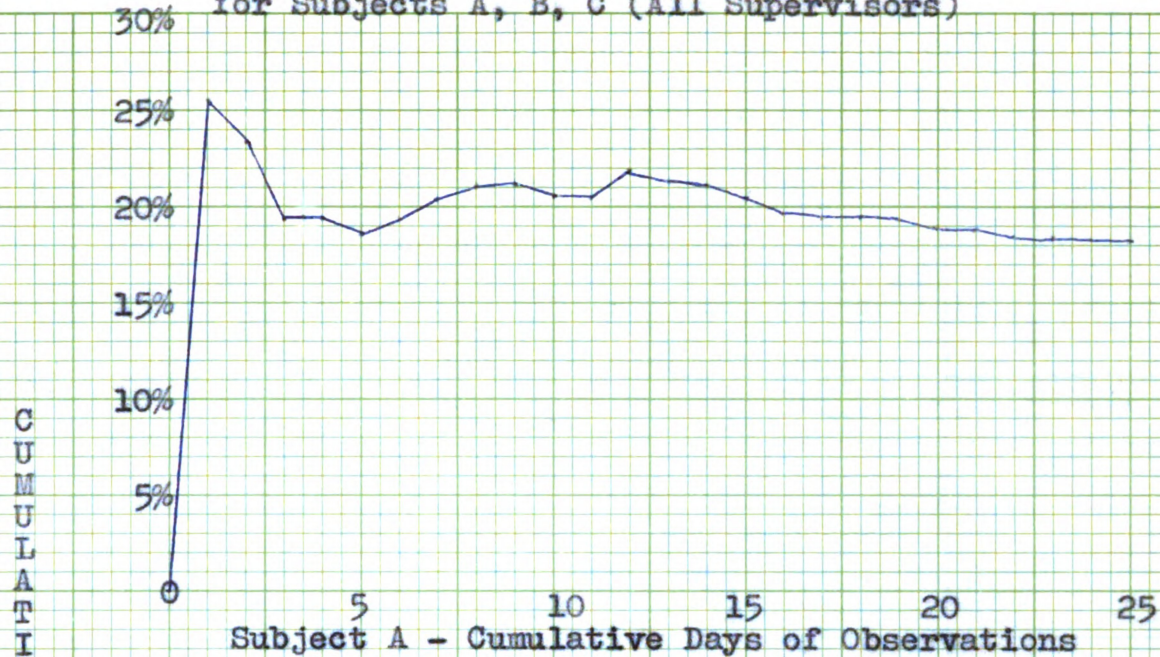
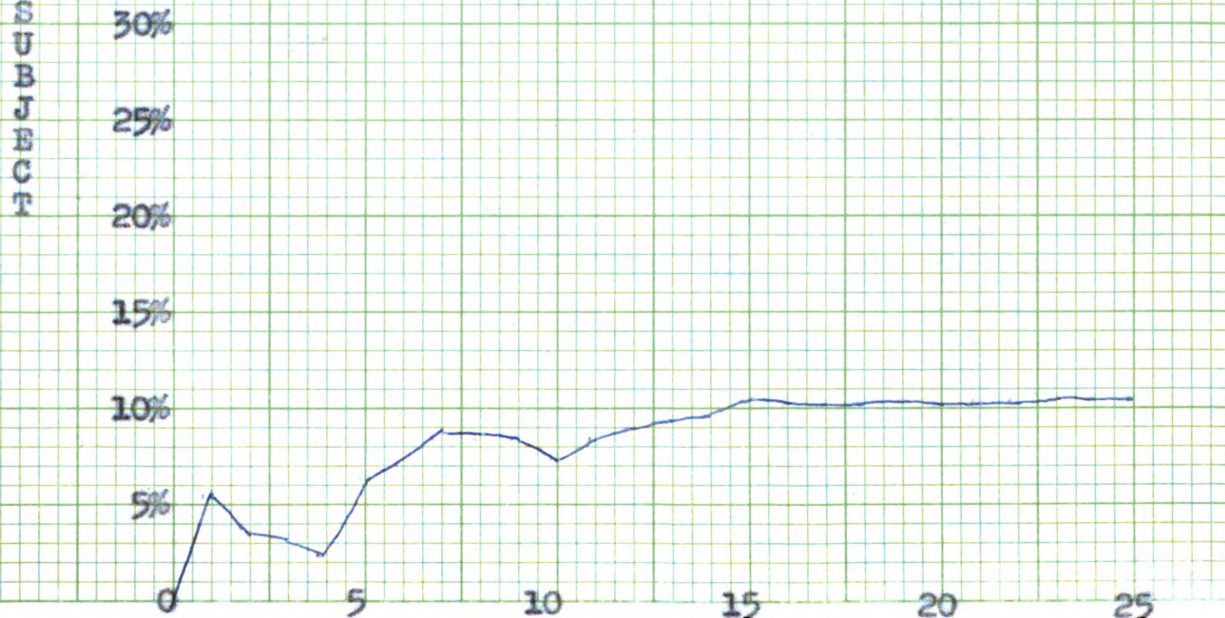
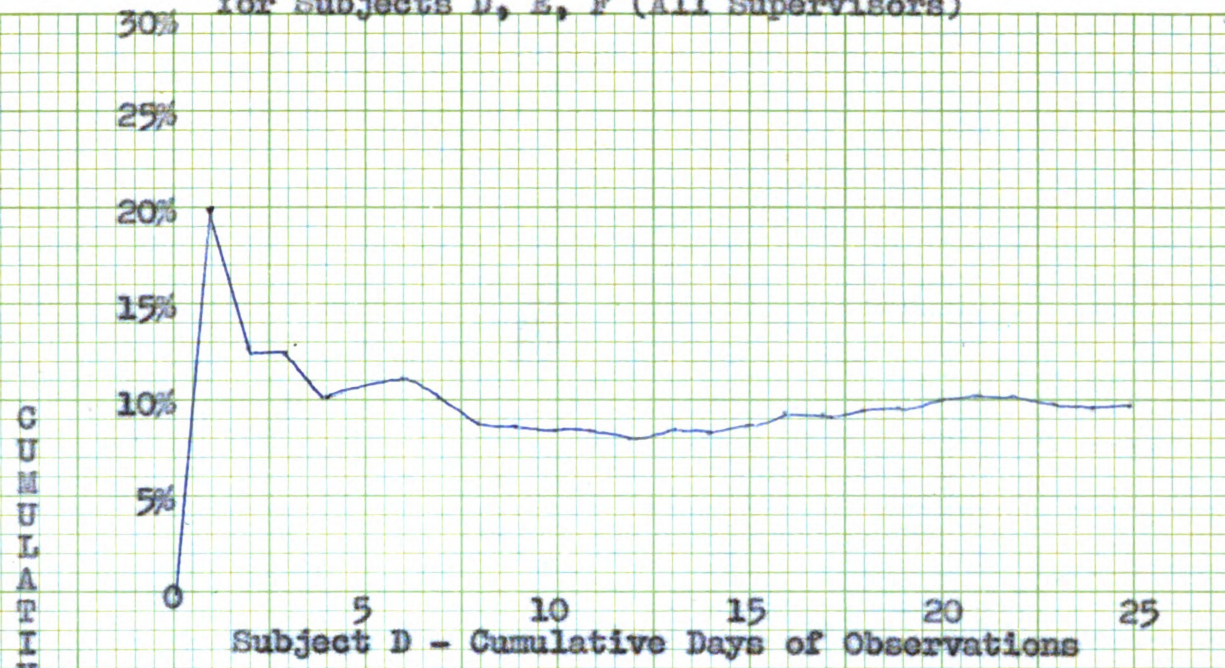


FIGURE II
Reduction in Sampling Error of Time Sampling Observations
for Subjects D, E, F (All Supervisors)



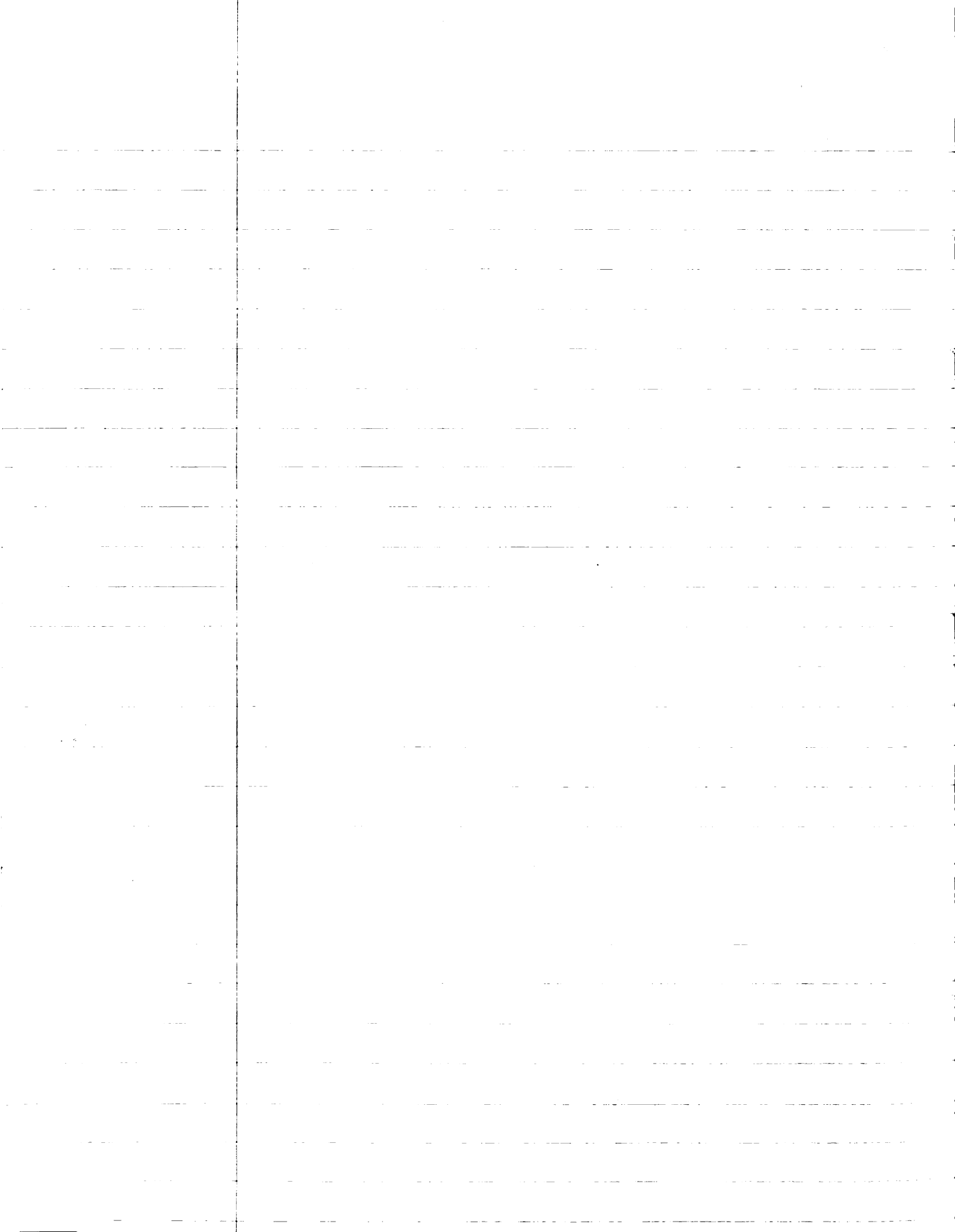
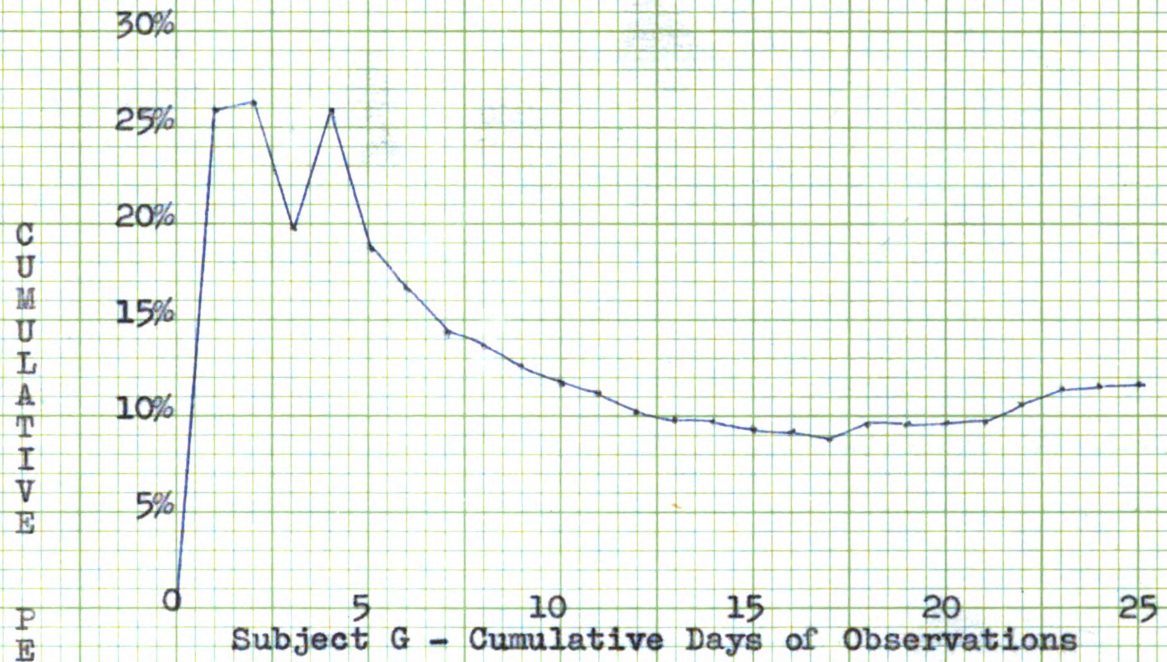
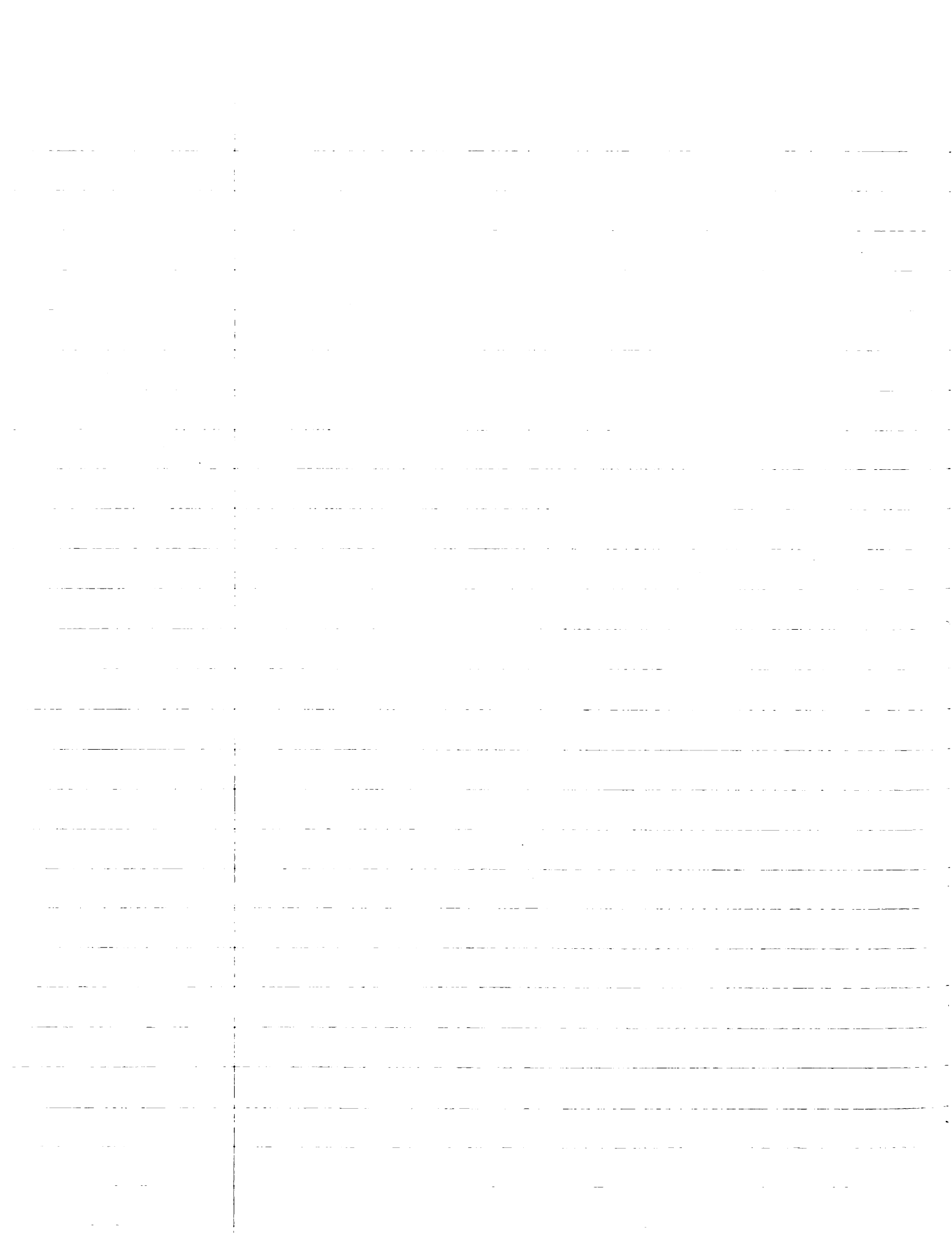


FIGURE III
Reduction in Sampling Error of Time Sampling Observations
for Subjects G, H (All Supervisors)





APPENDIX J

TABLE XXIV

NUMBER OF EMPLOYEES MAKING JUDGMENTS (m) AND NUMBER
OF CATEGORIES RANKED (n) FOR VARIOUS WORK GROUPS

Work Group	Supervisory Level	m Old Employees	m New Employees	n
B	Old Staff	2	-	8
B	New Staff	3	-	8
C	First-line	8	4	8
C	Old Assistant	8	4	8
C	New Assistant	8	4	8
D	First-line	-	29	8
D	Assistant	-	29	8
E	First-line	5	11	8
E	Assistant	5	7	8
F	First-line	6	2	8
F	Assistant	6	2	8
G	Old First-line	12	-	8
G	Old Assistant	12	-	8
G	New First-line	10	7	8
G	New Assistant	10	7	8
H	First-line	13	6	8
H	Old Assistant	11	-	8
H	New Assistant	12	6	8

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