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A STUDY OF THE RELATIONSHIP BETWEEN
CLERICAL PRODUCTIVITY AND CERTAIN
ITEMS OF PERSONNEL INFORMATION

by

Dale E. Garden

A Thesis

Presented to

the Graduate Faculty of the Department of Psychology
University of Omaha

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

June 1961

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

I. THE PROBLEM

Statement of the problem. Organizations of today that have large office staffs are properly concerned with the productivity of their clerical workers. One method of obtaining high level productivity is through the selection process. The purpose of this study is to determine if one or more of the following factors of personnel information will predict individual clerical productivity:

- A. Age.
- B. Number of years employed.
- C. Marital status.
- D. Existence of dependents.
- E. Educational level attained.
- F. ~~Employment test scores.~~

Importance of the study. The area of study is important because of the relative and absolute increase in numbers of clerical workers in the past few decades. Productivity of clerical workers has a great effect on total productivity and therefore on society's standard of living. Studies pointing

the way toward increased productivity are important and valuable. (This conclusion is based on the assumption that increased productivity and an increased standard of living are desirable. Although there may be a philosophical question involved, for the purposes of this study, it is ignored.)

In examining the literature in this general area, one is struck by the comparative absence of adequate criteria. In most studies, the criterion has been over-all performance rather than strictly productivity. Because job performance was usually measured by subjective appraisal, it lacked accuracy. Even less accurate was the practice of using length of training time as a criterion; the time required for a person to learn a job often bears little relation to his productivity on the job itself. An even more general criterion appeared in one study conducted in the depression years. In this study employment itself was equated with job success! ¹

Individual clerical productivity has not been used to any great extent as a criterion because there have been few

¹Dorothy M. Andrew and Donald G. Paterson, Measured Characteristics of Clerical Workers (Bulletins of the Employment Stabilization Research Institute, Minneapolis, Minnesota: The University of Minnesota Press, 1934).

accurate clerical productivity figures available. In this study individual productivity scores were available for normal day-by-day and month-by-month working situations. There were no artificial situations created. The scores were a part of a clerical production standards program at the combined home office of a health insurance company and a life insurance company, Mutual of Omaha and United of Omaha, respectively. The employees included in the study were only a fraction, approximately ten per cent, of all employees covered by the program. However, the employees selected worked in the areas having the most valid and reliable productivity scores over a period of years. The author's personal experience in working on this program for several years was instrumental in selecting these employees.

The importance of the correlations obtained in the study depends largely on the accuracy of the criterion, the individual productivity scores.

II. DEFINITIONS OF TERMS USED

Factor. In this study, a factor refers to any of the items of information about each individual which were used in an attempt to predict productivity.

Productivity. As used in this study, productivity is defined as the number of units of production per unit of time.

Productivity score. This refers to the numerical score which represents each employee's relative productivity. In the office studied, it is a major goal of the system of clerical production standards. To have available individual scores, the following steps are necessary:

- A. Timing is done on representative work and representative employees. This timing is done by skilled analysts and by individual employees using self-timing techniques controlled by the analyst. The timings are checked periodically by different analysts.
- B. A standard number of production units per hour is calculated as follows:

1.
$$\frac{\text{No. of minutes timed}}{\text{No. of units of work completed}} = \frac{\text{Average time per unit without allowances}}{\text{Standard time per unit of work}}$$
2.
$$\frac{\text{Average time per unit without allowances}}{\text{Allowance factor}} = \text{Standard time per unit of work}$$

$$3. \frac{\text{No. of minutes per hour}}{\text{Standard time per unit}} = \text{Standard no. of units per hour}$$

Example: 1. $\frac{900 \text{ minutes}}{100 \text{ units}} = 9 \text{ minutes per unit}$

2. $\frac{9 \text{ minutes per unit}}{0.90 \text{ factor}} = 10 \text{ minutes per unit}$

3. $\frac{60 \text{ minutes}}{10 \text{ minutes}} = 6 \text{ units per hour}$

C. Production and time records are established to enable an individual monthly productivity score to be calculated. A sample calculation of an individual productivity score from this information follows:

1. $\frac{\text{Production}}{\text{Standard per hour}} = \text{Expected man hours}$

2. $\frac{\text{Expected man hours}}{\text{Actual man hours}} = \text{Productivity score}$

Example: 1. $\frac{1020 \text{ units}}{6 \text{ units per hour}} = 170 \text{ expected hours}$

2. $\frac{170 \text{ man hours}}{160 \text{ actual hours}} = 106 \text{ productivity score}$

CHAPTER II

RELATED RESEARCH

I. CRITERIA AND HOMOGENEOUS GROUPS

Criteria problems. Edwin E. Ghiselli has reported that investigators "...have been more interested in predictors than criteria! We should regard job performance as a fertile field of study in and of itself."¹ In the words used earlier in this thesis study "...one is struck by the comparative absence of adequate criteria." Ghiselli, together with C. W. Brown, earlier reported "...low relationship exists between the validity of tests in the prediction of trainability and in the prediction of job proficiency....these results suggest that the abilities important for learning a job may differ markedly from those important in the maintenance of proficiency on the job."² Joseph Tiffin and Ernest J. McCormick also have raised the question of criterion validity and reliability, especially the subjective nature

¹Edwin E. Ghiselli, "The Placement of Workers: Concepts and Problems," Personnel Psychology, 9:1, Spring, 1956, p. 1.

²Edwin E. Ghiselli and Clarence W. Brown, "The Relationship Between the Predictive Power of Aptitude Tests for Trainability and for Job Proficiency," Journal of Applied Psychology, 36:6, December, 1952, p. 370.

of performance rating as opposed to the criterion objectivity needed.³

Homogeneous work groups. Ghiselli and Brown raised the criterion question as well as an additional question in a 1955 book.⁴ The additional question is the desirability of dividing clerical workers into groups with similar duties. The differentiation between the training criterion and the proficiency criterion and among the various groups is shown in a partial reproduction of their table as shown in Table I.

A book by Charles H. Lawshe, Jr., also divides clerical workers into different groups.⁵ His groups are: general clerks (filing, checking, tabulating, and other miscellaneous), typists, stenographers, and machine operators.

³Joseph Tiffin and Ernest J. McCormick, Industrial Psychology (fourth edition; Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1958), p. 32.

⁴Edwin E. Ghiselli and Clarence W. Brown, Personnel and Industrial Psychology (second edition; New York: McGraw-Hill Book Company, Inc., 1955), p. 219 and p. 229.

⁵Charles H. Lawshe, Jr., Principles of Personnel Testing (New York: McGraw-Hill Book Company, Inc., 1948), p. 151.

TABLE I
 AVERAGE VALIDITY COEFFICIENTS OF VARIOUS APTITUDE
 TESTS FOR JOBS IN THE CLERICAL OCCUPATIONS

Type of Test	General Clerks		Recording Clerks		Computing Clerks		Average: All Clerks	
	Training	Proficiency	Training	Proficiency	Training	Proficiency	Training	Proficiency
<u>Intellectual</u>								
Intelligence	.41	.38	.40	.25	.23	.16	.35	.26
Immediate memory		.29	.32	.36		.26		.30
Substitution	.21	.31	.24	.24	.34	.27	.26	.27
Arithmetic	.43	.39	.48	.06	.35	.27	.42	.24
Number comparison	.42	.24	.28	.29	.33	.33	.25	.29
Name comparison	.40	.27	.36	.34	.19	.34	.32	.32

Ghiselli and Brown's table and their comments, Tiffin and McCormick's questions, and Lawshe's conclusions all raise two questions indicating future profitable areas of study. The questions are: Should clerical workers be divided into more homogeneous work groups before study? Should more effort be placed on validating criteria before beginning study?

II. THE MINNESOTA STUDY

Background. One extensive study of clerical workers was done in the early 1930s by Dorothy M. Andrew.⁶ The basic tool used was the Minnesota Clerical Test. Before discussing the conclusions of Andrew's study, a few general comments seem advisable. Part of the study was based on a comparison of employed clerks with adult workers in general. Another part compared employed clerks with unemployed clerks. Criterion validity seems in doubt. The fact of unemployment may have been equated with job success by the general public in the

⁶Dorothy M. Andrew and Donald G. Paterson, Measured Characteristics of Clerical Workers (Bulletins of the Employment Stabilization Research Institute, Minneapolis, Minnesota: The University of Minnesota Press, 1934).

depression years of the 1930s, but now it certainly seems open to criticism for a study of this nature. Another possible criticism of her study (as well as this present thesis study) is the questionable use of measures of unique traits to predict a possible global ability.

Results. Some of the findings and conclusions of Andrew's study are as follows:

- A. There was only a slight positive relation between subjective supervisory ratings and clerical test scores. With the additional evidence given in the study, this tends to throw doubt on the validity of the supervisory ratings.
- B. Name and number checking were found in Andrew's study to be diagnostic of both filing and general clerical aptitude. In the present thesis study the predictor corresponding to Andrew's name and number checking is the clerical test score; the item corresponding to Andrew's general clerical aptitude is the total test score. On this point, to the extent the corresponding items are similar,

the two studies closely agree.

C. The following findings of Andrew's study also agree closely with the results of the present thesis study:

1. There is a slight negative relation between age and clerical test scores.
2. Twelfth grade education tends to appear best for clerical employees.
3. Verbal test scores and numerical test scores are not related.

Recognizing the difficulty in comparison because of the different criteria used, Andrew's study and the present thesis study appear to substantiate each other.

III. THE PRUDENTIAL STUDY

Background. A study of clerical productivity with a different approach was made for the Prudential Life Insurance Company by the Institute for Social Research of the University of Michigan.⁷ They studied the relationships among

⁷Milton M. Mandell, Recruiting and Selecting Office Employees (New York: American Management Association, 1956), p. 18, Citing Productivity, Supervision and Morale in an Office Situation, Part I, University of Michigan, 1953.

productivity, supervision, and morale. One conclusion was that only one basic worker attitude not related to supervision affected productivity--pride in the work group; however, their principal conclusions about differentiating factors concerned supervisory characteristics.

Results. The differentiating characteristics of supervisors with high productivity groups were found to be the following:

- A. They received general rather than close supervision from their superiors.
- B. They liked the amount of authority and responsibility they had in their jobs.
- C. They spent more time in supervision.
- D. They gave general rather than close supervision to their employees.
- E. They were employee oriented rather than production oriented.

These conclusions are open to question. Are they causes or effects? Specifically, exactly what does "employee oriented" mean? Does it mean, "All I have to do is look out

for their welfare and they will produce for me?" The addition to practical or theoretical knowledge by this study seems limited.

IV. THE HAWTHORNE STUDIES

Background. No discussion of worker productivity would be complete without a mention of the famous Hawthorne studies.⁸ The eventual elevation of human relations as the principal interest of these studies is a much different method of attack on productivity than the method of the present thesis study. The fact that one deals with industrial workers and one deals with clerical office workers is also different. However, in the general problem area of what makes some employees more productive than others, the two studies try to answer the same question.

⁸F. J. Roethlisberger and William J. Dickson, Management and the Worker (Cambridge, Massachusetts: Harvard University Press, 1939) and Henry A. Landsberger, Hawthorne Revisited (Ithaca, New York: Cornell University Press, 1958).

Results. The general conclusion of the Hawthorne studies was that the human relations aspect of the work situation is the key to improved productivity. (See later chapter, "Discussion.")

CHAPTER III

BACKGROUND OF THE STUDY AND THE TECHNIQUES USED

I. BACKGROUND OF THE STUDY

Study location. This study was conducted in the home office of two large insurance companies, Mutual of Omaha and United of Omaha. The productivity scores were taken from the records of the clerical standards program. The personnel data was taken from official personnel information.

Period selected for study. The period selected was the six months from January 1, 1959, through June 30, 1959. By averaging the six productivity scores for each employee studied, a more valid and reliable criterion measure was obtained.

Type of clerical jobs studied. Eight departments were represented with a variety of typing, recording, computing, and transcribing jobs involved. The areas were selected to represent a general cross section of clerical work. The only work areas chosen were those where retimings had confirmed original findings and a consistent, logical pattern of productivity scores was evident.

Employees included in the study. All continuous full time employees of the eight departments who were included in the standards program and who worked the full six months were studied. The total number of employees studied was 139.

II. TECHNIQUES USED

Adjusted productivity scores. As indicated previously, one productivity score was obtained for each employee by calculating the mean of each individual's monthly scores. The mean and the median of each department's set of individual scores were then calculated. Two new complete sets of adjusted scores were prepared, based respectively on the deviations from the departmental means and the departmental medians. The correlation between these two sets of adjusted scores was 0.99. The set of figures representing deviations from the means was selected as the basis for individual productivity.

Individual employee data. This information was taken from official personnel records as of June 30, 1959.

Following is an explanation of each set of factors used:

- A. Age was given in increments of one year from eighteen through forty-six.

- B. Number of years employed was given in increments of one year as of June 30, 1959, to the nearest year, from zero to ten. One score of over ten years was adjusted to ten.
- C. Marital status was given as unmarried, indicated by the numeral zero, and married, indicated by the numeral one. This information was as of June 30, 1959. Divorced persons were included in the unmarried group because of small number involved.
- D. The numeral zero was used to indicate those without dependents, and the numeral one was used for those with dependents. This information was as of June 30, 1959.
- E. Initially, the 139 employees were divided into three groups based on the level of education attained. These three groups were: (1) high school graduates, (2) those with one semester or more of business college, and (3) those with one semester or more of college. Both the mean of the productivity scores and the mean of the scores divided by departmental standard deviations were calculated for each of these three groups.

Because the results did not discriminate among the three groups, the 139 employees were subsequently divided into two groups, those with only a high school education, indicated by the numeral one, and those with more than a high school education, indicated by the numeral zero.

F. A set of test scores was obtained for 105 of the 139 employees included in the study. The test set was the Short Employment Tests published by the Psychological Corporation of New York, New York. The tests were constructed by George K. Bennett and Marjorie Gelink, copyrighted in 1951, and the norms were revised in 1956. The tests are entirely speed tests and are divided into these three parts:

1. Verbal - This was a vocabulary test of fifty words, each with one of four possible answers to be selected.
2. Numerical - This test gave ninety problems of basic addition, subtraction, multiplication, and division.
3. Clerical - An alphabetical list of names was given with the surname first followed by two

initials. Opposite each name was a five- or six-digit figure in dollars and cents. The problem was to check sixty names against the list. If the name was not on the list, one of four possible number codes was used; if it was on the list, a code was given indicating one of three dollar ranges.

The verbal test is designed to serve as a measure of vocabulary and a rough measure of intelligence. The numerical and clerical tests indicate the quantity of production that might be expected on like tasks. An example of one employee's test score follows:

	<u>Raw</u> <u>Scores</u>	<u>Percentile</u> <u>National Norms</u>	<u>Percentile</u> <u>Local Norms</u>
Verbal	11	12	17
Numerical	42	80	80
Clerical	35	75	83
Total	88	54	61

Correlations. All of the factor scores were correlated with the productivity scores. Then all factor scores were intercorrelated. All correlations were of the product moment variety.

CHAPTER IV

RESULTS AND VALUE OF THE STUDY

I. RESULTS OF THE STUDY

Correlations and regression equations. After the factor scores were correlated with the productivity scores and then intercorrelated (see Table II), the only statistics which appeared significant were the following:

<u>Factor Correlated with Productivity</u>	<u>Correlation</u>
Existence of dependents	.178
Clerical test score	.134
Educational level attained	.176

The intercorrelations of these factors were as follows:

<u>First Factor</u>	<u>Second Factor</u>	<u>Correlation</u>
Existence of dependents	Clerical raw score	-.013
Existence of dependents	Educational level attained	-.068
Clerical test score	Educational level attained	-.405

The results of the multiple correlation calculations and the regression equation calculations are given below:

TABLE II

INTERCORRELATIONS AMONG ALL PRODUCTIVITY AND FACTOR SCORES

Prod. Score	Exist. of Dep.	Educ. Level Attn'd	Age	No. of Yrs. Empl.	Marital Status	Cler. Test Score	Numer. Test Score	Verbal Test Score	Total Test Score
.178	.178	.176	-.062	.017	.138	.134	.078	.034	.120
.178		-.068	.520	-.034	.346	-.013	.047	.211	.141
.176	-.068		-.313	-.167	.003	-.405	-.448	-.273	-.554
-.062	.520	-.313		.372	.227	-.044	.016	.234	.125
.017	-.024	-.167	.372		-.070	-.019	-.168	-.196	-.279
.138	.346	.003	.227	-.070		.115	.126	-.017	.107
.134	-.013	-.405	-.044	-.219	.115		.244	.181	.552
.078	.047	-.448	.016	-.168	.126	.244		.038	.757
.054	.211	-.273	.234	-.196	-.017	.038			.619
.120	.141	-.554	.125	-.279	.107	.757		.619	

Prod. Score

Exist. of Dep.

Educ. Level Attn'd

Age

No. of Yrs. Empl.

Marital Status

Cler. Test Score

Numer. Test Score

Verbal Test Score

Total Test Score

A. Three predictors (1-existence of dependents, 2-clerical test score, and 3-educational level attained):

1. Multiple correlation: $R = .348$
2. Regression equation (the Z-scores are standard scores, e.g., Z_1 is the standard score for predictor one):

$$Z'_0 = .201Z_1 + .255Z_2 + .293Z_3$$

B. Two predictors (1-existence of dependents and 3-educational level attained):

1. Multiple correlation: $R = .259$
2. Regression equation:

$$Z'_0 = .191Z_1 + .189Z_3$$

II. VALUE OF THE STUDY

Three predictors. The multiple correlation figure of .348 for the three predictors (existence of dependents, clerical test score, and educational level attained) is significant at the one per cent level. The size of the correlation and the level of significance indicates a reliable but small aggregate gain over chance alone in predicting productivity.

Two predictors. Using two predictors (existence of dependents and educational level attained) gave a multiple

correlation figure of .259, which is significant at the five per cent level. This is a less reliable statistic which also represents a relatively small gain.

Practical value of the study. The practical value of the study, evaluated as a positive contribution, is obviously small. It tends to show that a small, even if reliable, increase in general clerical productivity can be expected by using the predictors studied. The value of this increase will depend on the selection ratio in any one situation. For a correlation figure of .35, the following results are obtained:⁹

<u>Proportion of Employees Considered Satisfactory</u>	<u>Selection Ratio</u>	<u>Proportion Selected Who Will Be Satisfactory</u>
.50	.30	.66
.50	.60	.59
.70	.30	.83
.70	.60	.78

This clearly shows that the smaller the selection ratio, the larger the gain. These are not large gains; but where many employees are hired, where the selection ratio is small and in the absence of better selection devices, the average

⁹Joseph Tiffen and Ernest J. McCormick, Industrial Psychology (fourth edition; Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1958), Taylor-Russell Tables, p. 552.

productivity increase for groups of employees could make the selection technique worth considering.

Theoretical value of the study. The value of the study lies chiefly in the additional evidence provided to confirm previously published studies. In the specific area of clerical productivity studies, the validity of this study should compare favorably because of the more valid and reliable productivity scores. It is unfortunate that no statistical evidence can be presented on the validity and reliability of these productivity scores. However, this lack should be partially offset by the author's personal experience together with the description of the checking and rechecking of the clerical standards in question. Also, the fact that only the most accurate ten per cent of all scores available were used can be considered as additional evidence.

An interesting aspect of the study was the predictors themselves. An employee who has an education above high school tends to be less productive. Those who are married, have dependents and a high clerical score, each tends to be more productive. These are slight tendencies, ranging from individual correlation figures of .134 to .178; but their direction agrees with previous studies and expert opinion.

Other correlations, age and education, $-.313$; years employed and clerical test score, $-.219$; raise such questions as: Is there a tendency to lose employees testing high? Do employees with more education stay longer? Since there is a relation between total test score and intelligence, do the companies tend to lose the more intelligent clerical employees? Is this favorable or unfavorable?

CHAPTER V

DISCUSSION

I. LESSONS OF THE THESIS STUDY

Evaluation. The value of this thesis study was principally in supplying more evidence to confirm previous work. Although the author believed his criterion was more valid than in most similar studies, the general pattern of results did not change. The only hope for substantial increase in productivity now seems to reside in a different approach to the problem.

Direction of future studies. In order to determine what form such an approach to the productivity problem might take, it seems wise to begin with a further examination of the history of the study of productivity. This inquiry can perhaps guide both our thinking and the planning of future studies.

II. HISTORY OF PRODUCTIVITY STUDY

Bases of study. The industrial psychologist has traditionally attempted to improve productivity in two ways: one, finding the best man for the job, which came about

through recognition of individual differences; two, trying to make the job fit any man or the average man, which came from the research of experimental psychology. This thesis study itself obviously falls into the first category. However, the clerical production standards program mentioned in the thesis study tends to fall into the second category.

Two areas may deserve more attention. They are: one, the organization of the work and, two, the organization of the employees to do the work, both as they affect groups of employees and individual employees, from the beginning employee to top management.

Scientific management. After the industrial revolution, the first breakthrough came with Frederick W. Taylor's scientific management. Up to his time, shortly after the turn of the century, work was considered work; and it was felt there was little that could be done about it. Taylor's methods of analyzing jobs and then synthesizing them into improved wholes, notwithstanding their impressive contribution, suffered from two flaws. One was that they necessarily tended to fit the newly synthesized job to the average man, thus largely ignoring individual differences. The second flaw was that the practitioners of his methods,

which includes most of the experimental psychologists as far back as Wundt, found it much easier to break the job down than to put it back together as an improved whole. Somehow the irrelevant conclusion that division of labor was the major key to productivity came to be generally accepted. Thus, too much work was reduced to component part jobs, thereby tending to reduce the worker to a machine. The resulting loss of identification with the whole reduced creative improvements possible by the individual employee. Because he could not see the whole, he resisted changes connected with the whole. However, in spite of its flaws and imperfect execution, Taylor's scientific management was a real step forward because its results clearly demonstrated that organization of the work could be changed to improve productivity.

Hawthorne studies and unionization. The next two important steps occurred about the same time. One was the effect of the famous Hawthorne studies and the other was a product of the rise of unionization. A good case can be made that both the Hawthorne study results and the rise of unionization were in large part a result of the workers' desire for status recognition. The manner in which scientific management was actually applied meant that the

identification of the worker with his union and a human relations approach by management gave him a compensatory increase in his status. The Hawthorne studies offered proof that properly applied human relations could improve productivity. Through the following years a flaw in the application of human relations appeared; supervisors tended to overemphasize the employee and forget the job. It was often found that the happy worker was not necessarily a productive worker. Also, management and researchers sometimes became infected with using human relations as merely a manipulative tool. When they went to this extreme, workers recognized that they were being manipulated and resented it. Therefore, the approach often backfired. At this point we had scientific management and human relations, both representing progress but with flaws in application.

The lost lesson of World War II. The next lesson was largely lost, both because it was not recognized and because it was difficult to figure out a transfer to a different incentive in peacetime. The lesson was the magnificent increase in productivity of workers, through their own efforts, during World War II. The workers could see and identify with the whole, the winning of the war. With entirely new

production problems, individual employees and groups of employees proved time and time again they could solve problems and improve productivity. Often there was no one else to do it; and because they had the incentive of the war effort, they responded magnificently in improving both work organization and organization of workers to do the work. Although ample proof was provided of the potential of the greatest resource of all, the human one, we failed to learn how to apply it in peacetime after the war. Instead, the lessons learned were largely confined to further applications of scientific management. One example was the training of workers. A group of psychologists, using scientific management principles, analyzed training methods, synthesized the best techniques into a step-by-step process which would fit all job training problems. In retrospect, we were not much further ahead after the war than before it; we missed capitalizing on its greatest lesson of the value of the human resource as applied to work itself.

III. THE FUTURE

The newest breakthrough--automation. The emphasis on the process given by automation opened up a new field of productivity progress. It can remove some of the flaws of both

scientific management and human relations. The emphasis in automation is where it should have been in all scientific management, on the synthesized whole. After knowing how to break a job down, we are learning how to put it back together.

In order to reap the fullest possible benefit from the process approach of automation, we must adjust our thinking in several areas. We must not let the man become subservient to the process. To the contrary, he should be elevated. The individual worker's job should be integrated into the process very carefully. It should be done so that the worker can easily see the whole process and act as a thinker and planner on his job. In short, he must be given the opportunity to improve not only his job but help improve the process. This is freeing, yet utilizing, the whole man.

Looking to the future. Notwithstanding the contributions to productivity possible from automation, this potential is small compared to the untapped resources of man himself. We need changes in thinking, attitudes, emphasis, direction, organization, and general plans of attack. We need to use, but also free ourselves from, the approaches of traditional scientific management and human relations.

An example of an attitude which needs changing is the idea that work is bad. This is so embedded in some of our thinking that it isn't even recognized. Work is neither bad nor good in itself. It is what we make it, how we organize it, what responsibilities it includes, and what attitudes we transmit to the worker about it--to mention a few attributes. In short, work can be good, especially when it is meaningful.

One way to make jobs meaningful is to have high standards of performance. Very seldom is a greater response received than sought. This must not be one-sided, however. The standards of performance must also be high for the supervisors, top management, and the company itself. Another method is to organize the job so that the worker has increased responsibility and control and is encouraged to participate in improvements in his and other jobs. These are examples of the very best type of human relations.

Contributions by psychologists. The psychologist should play a major role in bringing about changes such as these. As previously indicated, we need a different approach to selection problems than the type exemplified by this thesis study. We need more work which will prove the value of correct

placement. Psychologists should re-examine basic principles to see if the restrictions involved justify retaining them. Too often short run advantages gained by negative principles (e.g., work is bad) or incorrect principles (selection is more important than placement) aren't justified.

Finally, psychologists should assert themselves more and develop helpful research in the area of management. This implies study of the nature of individual managers, groups of workers under a manager, and the organization of employees as related to the work. It also implies study of leadership. Personal observations substantiate the conclusion that proper leadership can maintain high group productivity, even if the individuals in the group change. We have not identified these supervisory traits in such a way that they may be taught effectively. However, this does not negate the fact that these traits exist; many examples of effective leadership show that they do. In reviewing work in this area, one suspects that a more complete break with the Hawthorne study ideas might be desirable. We have work indicating that making workers happy does not necessarily increase production. We need a study rivaling the scope of the Hawthorne studies which

investigates means of using human relations principles to cause employees to understand, appreciate, and react favorably to the goals of their organization.

The changing world of automation provides a good climate in business and industry for new contributions to productivity by psychologists. The businessman is familiar with solving short run problems. Automation, with its capital expense of installation, is forcing him to think years ahead in the business sense. Now is the time for the psychologist, while helping solve short run personnel problems caused by automation, to encourage similar long run thinking in the application of personnel administration.

CHAPTER VI

SUMMARY AND CONCLUSIONS

I. SUMMARY

The thesis study. The purpose of the thesis study was to determine if certain common items of personnel information, e.g., age, education, experience, clerical test scores, etc., were correlated with clerical productivity. In a study of 139 clerical workers, a multiple correlation figure of .348 was found for three predictors, existence of dependents, clerical test score, and educational level attained. This figure of .348 is significant at the one per cent level. For the two predictors, existence of dependents and educational level attained, the correlation figure was .259 which is significant at the five per cent level. No other correlations appeared significant. In summary, the study tends to show little relation between clerical productivity and common items of personnel information.

Research and history. This study tends to confirm and agree with previous studies. Reviewing related research material and the history of productivity study reveals a lack of new approaches to the problem of increasing productivity.

II. CONCLUSIONS

Methods of study. This thesis study, which uses the same general method as its predecessors, has little new to offer, either in methods or results. In this study, as well as others, better differentiation of criteria and better synthesis into improved wholes is needed. The same reasoning is true for predicting factors. They must be put together into groups which more nearly represent the actual forces for or against high productivity in the work situation.

History of productivity study. History shows that we have been aided but also restricted by the principles of scientific management and human relations. This thesis study could be categorized as a scientific management approach. Other studies usually either use this approach or the human relations approach. It appears doubtful if anything basically new has been discovered about productivity for twenty-five or thirty years. It also appears doubtful if any new basic approaches to the problem have been developed during the same time. Therefore, the most valuable contribution to the study

of productivity would be a new and more fruitful basic approach.

The future. One new development offers an opportunity for new work. This is the effect of automation. The emphasis of automation is on the process, the whole, where it belongs. This period of change gives the psychologist a favorable climate in which to work. The time is right for fresh approaches to the study of placement, processes, leadership, management, and organization. These are the areas of interest and concern. The psychologist has a new chance in the world of automation to re-emphasize his greatest contribution to society--the reinforcement of the fact that the world's greatest resource is human ability.

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