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AN INVESTIGATION INTO THE VALIDITY OF THREE EMPLOYMENT TESTS OF A CLERICAL PERSONNEL SELECTION PROGRAM

by
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of the requirements for the degree of
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CHAPTER I

INTRODUCTION OF THE PROBLEM

This investigation is a validation study of three objective tests used in the Personnel Office of the University of Michigan. Specifically, this study will seek to discover if there are relationships between the General Clerical Test, a Typewriting proficiency test, a Shorthand proficiency test, and the job performance factors of Supervisors' Ratings, Salary Increases, and Work Sample Evaluations, and the extent and direction of these relationships.

A secondary objective is to discover if there are relationships between the non-test factors of Age and Education and the job performance factors, and the extent and direction of these relationships.

Background of the Problem

The selection of office employees is a complex act growing in importance because of the

a. changing nature of the qualities and competencies that office responsibilities demand,

b. increasing number of untrained persons and increasing number of office employees,

c. costs of selection errors.

Continued economic expansion, increased size of organizations, a greater emphasis on written reports and records, and a drastic decline in business profit margins have made revolutionary changes in the requirements of office jobs during recent years. Office jobs now include programming, electronic data processing, data-phoning, computing-typing, microfilming, teleprocessing, card punching and tabulating, dictating and recording, photocopying, and a multitude of electric, electronic, and high-speed mechanized operations in the office.

Electronic data processing has made it possible for companies to increase in production and size and to obtain volumes of statistical records and reports which they had never been able to prepare. Centralization and decentralization activities have produced changes in office work requirements with concentrated emphasis on integrated office systems, procedures and routines.

A second complicating factor results from the increasing numbers of office jobs which are to be

filled from an increasing number of job seekers who are not trained in skills necessary for the new office jobs. Automation has increased the demand for specialized occupations—in addition to stenographers, secretaries, typists, machine operators. The relatively unskilled jobs, such as file clerk, mail clerk or receptionist, have steadily declined in number since 1948.[1]

The office machine is placing a premium on skilled office workers with the demand for these skilled workers already exceeding the demand for unskilled workers. In practice, this means that more older women (over age 55) are being hired for the specialized jobs. It is significant that twice as many older women were hired in 1960 as in 1950.[2] The NOMA report shows the growth of the number of office machine operators was from 150,000 in 1950 to over 300,000 in 1960 and states that the employment of machine operators will continue to double every 10 years for the next few decades if trends continue as indicated.

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[1]National Office Management Association, "Clerical Employment Trends in the Office," A report prepared by the National Office Management Association (132 W. Chelten Ave., Philadelphia, Pa.: National Office Management Association, 1956), p. 6.

[2]Ibid., p. 7.

Advancements in mechanization of office work have not only refined business operations, but have added materially to the welfare of the office worker. To the extent that high-speed equipment has reduced the tedium of routine operations it has freed people for more involved and productive business studies and operations. This contributes to a more effective work force and creates wider employment opportunities. For instance, in 1950, according to U. S. Government statistics there were 6,894,374 Americans working in clerical, or similar, jobs.[1] By the end of August, 1961, business growth had swelled this clerical work force to 9,966,000, a 45 per cent employment rise during a period when great investments were being made in the mechanization of office procedures by business firms and when the total population was increased only 23 per cent.

It is estimated that in the period to 1970, there will be a further increase of 2.2 million clerical

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[1]U. S., Bureau of the Census, Statistical Abstract of the United States: 1960 (Washington: U. S. Government Printing Office), p. 219.

[2]U. S., Bureau of Labor Statistics, Employment and Earnings, VIII, No. 3 (September, 1961), p. 6.

workers, or over 20 per cent of the 1961 total. The expected total of 12 million clerical workers in 1970 will equal approximately 30 per cent of the white collar work force of 37 million people.[1] In June, 1961, an estimated 1,500,000 high school graduates sought jobs in industries, institutions, and government. While the nation's schools are graduating more students than before, clerical job opportunities are still increasing.

The University of Michigan reported a growth of ten per cent in 1960 over 1959 in the size of its office work force. Along with the growth of clerical positions there was at the University of Michigan an even greater growth in the number of applicants for clerical positions. From July 1, 1959, through June 30, 1960, 1,606 applicants were tested for clerical jobs representing an increase of 29.7 per cent over the previous year.

There are more people going to work than before. There is more mobility among the population causing people to leave old jobs and seek new ones. The problem

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[1]Arnold E. Keller, "Automation--the Job Maker," Management and Business Automation (The Office Appliance Co., 600 W. Jackson Blvd., Chicago 6), Vol. V, No. 4 (April, 1961), p. 15.

of personnel selection in the light of increased numbers of jobs and increased numbers of applicants, remains the same--the task is that of selecting the right man for the right job and the best job for the man. The human being is adaptable, but there are certain individual differences which make one person better suited for certain duties than another. The variations among employees are many, but those of greatest importance in job selection include differences in skills, experience, interests, learning ability, personality, and physical attributes. These individual differences play an important role in the staffing of office jobs, and it is the responsibility of the modern personnel official to identify and measure these differences.

A third reason for the growing importance of the selection of office employees is the cost of poor selection to the company and to the individuals involved. If the personnel official fails to identify and measure the applicant's aptitudes correctly, the result is a "bad guess" placement of an individual inadequate for the job in which he is placed. To the company, a "bad guess" placement may represent loss of large amounts of time and money. For example, The Merchants and

Manufacturers Association estimates that it costs business $480 each time it is necessary to replace a separatee and that 24 per cent of all office employees change their jobs annually.[1]

Danielson produces another statistic in revealing the cost of hiring an employee and keeping him for a period of time:

> If the person is 20 when he's hired and works until he's 65, he has spent 45 years with the company. If this person is paid an average of $6,000 a year over this 45-year period, you have paid this man $270,000, or over a quarter million dollars in direct pay. This is in addition to the fringe benefits he receives, which in many cases average as much as 50 to 60 cents an hour above direct pay. When they think in terms of a quarter of a million dollars, a lot of people suddenly realize, selecting the right man is a pretty important decision.[2]

Other results of poor selection are that if a worker does not fit into the job for which he is selected, he must be transferred to another job, trained, or released outright. Selection errors which remain undetected will usually produce an unhappy,

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[1]Merchants and Manufacturers Association, Labor Turnover: Causes, Costs, and Methods of Control (Los Angeles 14, California: 1959), p. 37.

[2]Lee E. Danielson, Good Selection--A Must (unpublished article, Bureau of Industrial Relations Library, University of Michigan), p. 1.

unproductive employee, insecure in a job which is either too tough for him or too easy for him. Excessive turnover of personnel with attendant high labor costs traceable to inefficient hiring methods and inefficient work of unqualified workers are some of the costs resulting from poor selection.

Serious as it is, the loss to an organization is not the only cost of poor selection. Failure of an employee has another cost--the cost to the employee himself. Often it is a shock to his morale, and a severe blow to the person's self-confidence. After such a shock, the person worries about his own adequacy; also, he has the anxiety of being unemployed and without income. He approaches the search for reemployment without confidence and with indecision and doubt as to fairness of employers. In some instances, a job failure is listed as a "black-mark" on his employment record.

Summarizing the preceding statements, personnel costs are mounting, and employment policies are committed to the conserving of human resources by finding talents and building employees rather than to impersonal tryouts and discard. In the face of these cost and policy trends, it is essential that employment officials

examine their selection techniques. Each year new knowledge about the aptitudes and motivations of people is brought to light. As research in human abilities continues, as more is learned about the essential elements of human productivity and stability, employment selection becomes increasingly important.

Selection Tools: Yesterday and Today

Specialized selection tools and instruments were not needed around the turn of the century. Companies were small. The boss handpicked his workers. He knew most of the applicants who came looking for work. The boss also had a long and intimate knowledge of the jobs to be filled. Personal experience had taught him what particular skills each job required. He knew the total job picture. This picture went beyond the manipulative skills and included the temperament of the other persons in the company--their willingness or lack of it to accept a novice, their customs of eating, the sports they liked. Because the manpower pool was geographically small and stable, he frequently knew the families of the applicants, where and in what conditions they lived, what groups they moved in, who

their friends were. The employer relied on observation of the individual's work, recommendations and personal judgment.

From the job seeker's viewpoint, the owner and his company were equally well known. The owner was in all probability an old resident of the town, a pillar of the church, a man of influence in local politics whose reputation for good or ill was common knowledge.

Today in 1961 the applicants usually don't know the personnel officials and the officials usually don't know the applicants. Expanding businesses require a manpower pool of larger geographic dimensions. The selecting process necessarily becomes more impersonal. Under these new conditions it becomes necessary to collect certain information about applicants and also about the available jobs. The employment official becomes a kind of double funnel. He receives man information from the applicant and job information from the department head or supervisor. The expansion of business forces employment specialists to become expert in a very restricted area of matching man information with job information.

The process of communicating these collections of information is necessarily selective. No employment

interview or application form of practical length can possibly include all information that years of training and experience accumulate. Neither can a job description encompass in reasonable space all of the aspects of the job that the job-holder knows. Hence, the employment specialists are necessarily working in a framework of selected information on both sides, and supplemental selection tools are necessary for the most effective selection and placement of employees. One of the new sources of information about candidates for employment, used by a growing number of organizations, is provided by objective tests.

Objective Testing as an Aid to Good Office Personnel Selection and Placement

Objective employment tests are simply another set of management tools. They have been used extensively in many organizations for screening candidates for entry jobs in offices and also for promotional opportunities to higher level and specialist positions. Studies have shown that objective tests are of most value in measuring certain abilities or aptitudes. Properly used, they can be of considerable value in increasing operational efficiency and can enable an

organization to lay the foundations for a competent and cooperative office work force whose high morale and efficiency may increase productivity and reduce costs. But it should be emphasized that objective tests do not, in themselves, provide an adequate basis for hiring. Their function is simply to furnish additional information

Objective tests measure only one factor or group of factors. They merely indicate what an applicant is potentially able to do, not whether he will do it. The latter point must be decided on the basis of other data from the application form, interview, physical examination, checking of references, and all other relevant information from available sources. As with the application form, objective tests serve as a further screening to determine that applicants have the minimum qualifications for success in the organization Objective tests may also be of considerable assistance in the proper placement of applicants found to be suitable for employment.

One of the major contributions of objective tests as aids to good office personnel selection and placement is that their scores can add objective data to the subjective data gathered in the interview and

from the application form. One person's opinions of another in the interview will involve some bias, unintentional or otherwise, and even if unbiased will tend to differ from the opinions of other observers. Employment tests provide one element of objectivity in the difficult business of evaluating people

An interviewer with good knowledge of test construction and scores will use the clues gained from the written test to further advantage in the interview and can make his interview more effective. Tests provide information for making selection decisions and this additional information should make the judgments more accurate; and to the extent that a testing program does provide information that helps in decision making, it can certainly be regarded as worthwhile. On the other hand, it should be borne in mind that tests are no more than aids to decision making. They are not decision makers themselves. Tests are refinable, and faults which they may have can be detected and minimized by studied use. Experience and experiment with an instrument can result in better adaptation to the company's particular needs.

Rice,[1] Daniels and Otis,[2] and Kerr and Martin[3] in their studies have demonstrated the inadequacy of obtaining information from only the application form and interview. These selection methods provide little factual data upon which to measure certain abilities and aptitudes. Among the characteristics difficult to assess accurately at the University of Michigan Personnel Office in the interview or by use of the application form are intellectual capacity; ability to work with figures and facts; ability to observe words and numbers; ability to grasp the meaning of words and symbols and to make correct decisions regarding the questions raised; ability to add, subtract, divide, and multiply, to spell correctly, to use a wide variety of English words and expressions correctly; and the ability to manipulate a typewriter and to transcribe shorthand notes. It is in measuring such abilities or

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[1]Walter V. Bingham and Bruce V. Moore, How to Interview (New York: Harper and Brothers, 1941), pp. 2-3, citing Stuart A. Rice, "Contagious Bias in the Interview."

[2]H. W. Daniels and J. L. Otis, "A Method for Analyzing Employment Interviews," Personnel Psychology, Vol. III (1950), pp. 425-444.

[3]Willard A. Kerr and H. L. Martin, "Prediction of Job Success from the Application Blank," Journal of Applied Psychology, Vol. 33, No. 5 (October, 1949), pp. 442-444.

aptitudes that tests are of much value in the University of Michigan employee selection program.

A second contribution of objective tests is that they lend themselves to mass-production methods of obtaining information for clerical workers, in that the tests can be used to screen a large number of applicants in a short time before extensive employment interviews and reference checks are conducted, and therefore will narrow the choice of applicants. Selection of employees is simplified by tests designed to measure special abilities or qualities that cannot otherwise be measured until the employee has spent several months on the job.

An objective test by its construction and scoring (use of standardized questions and standardized responses) makes a degree of reliability possible, and a reliable test will not vary from day to day or disagree with itself.

Reliable and valid objective tests are able to measure different human characteristics with varying degrees of accuracy. Certain physical characteristics such as height, weight, visual acuity, hearing and motor skills can be measured with a high degree of accuracy. A great deal of progress has been made in

measuring abilities, aptitudes and skills. The percentage of factors which are testable will vary with the job. In the clerical area most of the ability factors can be measured. An official can get an accurate picture of an applicant's mental ability, verbal ability, numerical ability, clerical aptitude (speed and accuracy in handling pencil-and-paper detail), the ability to work with figures and facts, and the applicant's typing and stenographic skills. These factors are important to varying degrees in different kinds of office positions.

Since an objective test presents a series of tasks to be performed under uniform conditions by each applicant, the personnel officials can compare directly the performance of any one candidate on these tasks with the performance of many others. This is one of the main contributions of objective tests, since this standardized procedure does not hold for the employment interview, application form, reference checks, or other means of evaluation.

An added advantage of objective tests is that they need not be limited to the pre-employment situation. Shortages in qualified manpower necessitate utilization of skills to the best advantage, so that tests may be

useful in promoting, transferring, and reclassifying employees.

Another feature of objective tests is that most tests can be easily administered and scored by a trained clerical employee, and then turned over to a trained employment official for interpretation.

In summarizing the above advantages, it can be said that objective employment tests have made significant contributions to the solution of employee selection, placement, and adjustment. Good tests, properly constructed and administered, and checked for reliability and validity, are designed to supplement, not supplant human judgment, and can help to reduce errors in hiring.

The Limitations of: A. Objective Tests
B. The Uses of Objective Tests

The personnel officer must know and respect the limitations of tests, and improper uses of them. Objective employment tests improperly constructed and used, can produce disastrous results for an organization and for persons being tested. Tests, in themselves, are not adequate to measure potential success on the job and cannot measure all the factors which must be considered when a selection or placement decision is

made. There are many important qualifications which can be evaluated only on the basis of past performance or from an evaluation of a man's education, special training, or demonstrated interests.

A. Among the major limitations of objective tests are:

1. Many factors that are important to successful performance on the job are as yet unmeasurable by objective tests. Objective test scores will not predict whether the applicant will come to work on time each day, whether he will assume responsibility, how well he will get along with his supervisors and co-workers, or whether he will move out of town next month. Objective tests cannot measure interests and personality characteristics, such as honesty, cooperation, ambition, and loyalty, which are usually important factors in determing job success.

2. Objective tests can never improve the quality of employees when supervisory practices and policies suppress talent, productiveness and initiative. If supervision unknowingly encourages mediocrity, absence of diagnostic testing methods will tend to perpetuate that same mediocrity. Testing of applicants, though necessary and useful for appraising skills, knowledge of dexterity, needs to be supplemented by new and

imaginative measures of social adaptability, attitudes and values appropriate to the work group to which they may be assigned. Testing methods, no matter how good, cannot make up for inadequate managerial and supervisory practices but may in fact hide the inadequate practices behind a facade of mediocre subordinates.

3. Tests are limited by their construction. Sometimes the test is not completely comprehensible to the person to whom it is administered. The persons may not know English well, or the directions may be confusing because they are not worded in simple language or the tests may use words that do not have the same meaning to all social groups. The test may be so constructed that it is possible for the applicant to fake or cheat on the test.

4. Some tests are difficult to score and may take an enormous amount of time for checking and administering.

It is important to recognize the major limitations of tests, but probably the most serious hazards to the effectiveness of a personnel testing program arise not from the inherent limitations of the tests themselves, but from their indiscriminate use by unqualified persons, particularly where their application is not justified.

B. Among the limitations in the uses of objective tests are:

1. Objective tests are often used without enough attention being given to job requirements. Unless there is an accurate "Man specification" for the position to be filled even the most reliable appraisal tools will be of little value in predicting success on the job. The specific key requirements for success on the job should be spelled out, and the test results should be interpreted in relation to these requirements. Objective test score information does not have general validity. It has value for predicting success in specific situations. The same ability or trait may be an asset in one position and a liability in another position.

2. Objective test results should be used as supplements to other appraisal sources and not used as the sole tool for selection. In order to insure that test findings are not given undue weight in arriving at personnel selection or placement decisions, a careful and thorough compilation of past performance records and other background appraisal information is required. A hazard in the use of test results is that some employment officials tend to attribute

arbitrarily too much significance to a test score; or may use the test score as a device to justify a decision based on another consideration.

3. Many organizations fail to explain the use of the testing program to the candidates to be evaluated and to the persons of the organization involved in the selection program. Each individual to be tested and each supervisor reviewing candidates should be given an explanation of the purposes of the testing program, the part which the tests might play in arriving at personnel decisions, and the potential value of the program to each one personally. A common error takes place when personnel officials fail to consider the emotional and motivational factors in the testing situation. The proper uses of a testing program include interpretation to the applicant of information obtained through other sources also, such as the interview, application form, experiences, training and references.

Temporary personal problems may result in a low score for an applicant which is not indicative of a person's real level of ability or his potential. He may be ill when he takes the test; he may be excessively

nervous or he may have family or other personal problems. Some applicants are opposed to tests in principle and may make no effort to reveal their highest ability.

4. Often the feed-back of test results is poorly handled resulting in harm to all parties concerned. Sometimes this feed-back is presented to the applicant by an untrained evaluator who because of lack of training and experience is unable to communicate the results in a professional manner. For instance, the releasing of exact test scores is not desirable. To those immediately concerned in the matter, a much better plan is to report test results in terms of percentiles with an explanation as to their meaning. It is of utmost importance that test scores or even generalized test ratings not be used to explain to an applicant why he is not going to be employed. The only exception is that applicants whose typing, stenographic, or machine-operating skills are below requirements can be told that fact and be advised to secure more training in these skills. The failure to report test results in terms of percentiles with an explanation to their meaning often results in unnecessary apprehension on the part of the applicant

regarding the unknown implications of the findings. Some firms do not make provision for reporting back to the candidate any of the results of his evaluation.

5. The use of test cut-off scores as a "screen" to eliminate those applicants with little chance of success on the job often eliminates potentially useful employees. This rigid use of the test is not favored in most companies, but some institutions find the cut-off method useful.

6. A further source of error which is important to consider when objective tests are used is the natural tendency to accept the numerical scores that tests yield as precise and exact measures. A score of 35 may mean that a man's true score is probably between approximately 30 and 40. This is important in examining the small differences in scores between candidates.

7. Some companies make the mistake of establishing a testing program by merely using a package of standardized tests. Tests which work well for one firm may be quite unsatisfactory in another situation. Every company has some characteristics which make it unique. Because of this uniqueness, the personnel testing requirements in one company are likely to be quite different than in other firms.

8 Another shortcoming in the use of objective tests applies to the use of tests that measure too limited a sample of ability and produce no spread of test scores and hence no differential measurement of ability.

9. Other faults occur when we use tests having low test-retest correlations indicating an inadequate degree of reliability; and using tests that have not been validated against the standard of job performance of the company's own experience.

10. Some objective tests may stress one or more aspects of the job to a degree that is out of proportion to their importance in the over-all job; while other tests may not be readily adapted to changes in job content but still used where their application is not justified.

In summary, the abuse and misuse of objective tests, even though the instances are infrequent, can result not only in costly selection errors, but also in considerable resentment on the part of the individuals involved and in misunderstandings of the objectives of personnel officials by persons to whom these examples of misuse spread. Tests are limited by their construction and purpose. The interviewer must be fully aware

that the scores are to be used as one more tool for the purpose of learning to know the applicant. And while there are inherent limitations in objective tests and in their use, the weakness of many personnel test programs arises not from these limitations but from confusion and misunderstanding as to the basic principles of employee selection and placement.

The writer has included a description of some of the contributions and limitations of objective tests so that when a reader looks at this study's information, he will be cognizant of the contributions and limitations of the tests being investigated. For instance, the reader should understand that the tests being investigated are not precise measures and the statistical procedures that have been applied cannot determine exact prediction.

Personnel Testing at The University of Michigan

Employment tests at the University of Michigan are of three types: The General Clerical Test, which examines the clerical potentialities of the prospect, a Typewriting proficiency test and a Shorthand proficiency test, which examine the acquired skills and knowledges of the applicant. The straight

proficiency tests measure the applicant's actual ability and skill in such office tasks as typing a manuscript and a letter, and transcribing shorthand notes on a typewriter. These production-type tests were developed at the University and serve in indicating the level of the applicant's accomplishment. The General Clerical Test, distributed by the Psychological Corporation, is a general and differentiating test for use in selecting all types of clerical personnel. Three kinds of ability important in office work are measured by the subscores. Parts I and II were constructed to test clerical speed and accuracy; Parts III, IV and V, numerical ability; Parts VI, VII, VIII, and IX, verbal ability. The total score is a measure of general mental ability, weighted in favor of the person who possesses office aptitudes or skills.

Scope of This Investigation

This investigation studies all Classification C-3 Secretaries (see page 85) selected between June 1, 1958 and September 30, 1959, at the University of Michigan Personnel Office. The employment tests used in selecting these secretaries were the General Clerical Test, a Typewriting proficiency test, and a

Shorthand proficiency test. One hundred sixty-five Classification C-3 Secretaries were hired out of a total of 1,776 applicants, and this represents a ratio of one person hired out of every ten applicants.

This investigation compares the employment test scores of 165 Classification C-3 Secretaries with job performance scores as measured by Supervisors' ratings, Salary Increases and Work Sample Evaluations. The ratings and salary increases are current and potential indexes of the productive usefulness of the worker to the University of Michigan. An additional proficiency measurement used in this investigation to measure job accomplishment is a Work Sample Evaluation.

Specifically, answers to the following questions have been sought in this investigation:

1. What are the relationships of the General Clerical Test, a Typewriting proficiency test, a Shorthand proficiency test with job performance as indicated by Supervisors' Ratings, Salary Increases and current work performance based on Work Samples?

2. What are the relationships of Age and Education of secretaries with Supervisors' Ratings, Salary Increases and current work performance based on Work Samples?

Importance of the Investigation

It is believed by the investigator that the comparison of aptitude and proficiency factors with the evaluations of job performance of office workers is of value for several reasons:

1. Since much of the office work being done today is of a clerical nature, validated tests to help in estimating the probabilities of success of clerical applicants are therefore among the most desired aids in employment offices.

2. The need to measure clerical aptitudes is evidenced by the fact that the number of people attracted toward clerical occupations is vastly greater than the number of opportunities.

3. Typewriting is a necessary skill for secretarial work. To discover a production work sample typewriting test that measures ability to do the kind of typing that is required in actual secretarial jobs will be an aid to job applicants and employment officials.

4. As indicated by personnel requisitions, 54 per cent of the Classification C-3 Secretaries' positions at the University of Michigan require the skill of shorthand and others suggest shorthand as a

desired skill; therefore, because of the demand for shorthand skill within the job classification of C-3 Secretary, it is essential to determine the proficiency qualifications of each applicant. A shorthand work-sample can aid in measuring these qualifications.

Statement of the Problem

The purpose of this study is to determine the extent to which the General Clerical Test, a Typewriting proficiency test, and a Shorthand proficiency test predict job performance.

For this study, a test will be defined as a sample of performance which is taken under standardized conditions. Such a sample, although relatively small, is very carefully selected to be representative of a broad area of performance. The test presents a series of tasks to be performed under uniform conditions by each applicant. Thus, the personnel officials can compare directly the performance of any one applicant on these tasks with the performance of many others.

Hypotheses

Basic to the plan of this study the investigator is testing seven hypotheses. These hypotheses are:

1. The General Clerical test scores will be positively correlated with Supervisors' Ratings, Salary Increases, and current work performance based on Work Samples.

2. The Typewriting proficiency test scores will be positively correlated with Supervisors' Ratings, Salary Increases, and current work performance based on Work Samples.

3. The Shorthand proficiency test scores will be positively correlated with Supervisors' Ratings, Salary Increases, and current work performance based on Work Samples.

4. The non-test factor, Age, will be positively correlated with Supervisors' Ratings, Salary Increases, and current work performance based on Work Samples.

5. The non-test factor, Education, will be positively correlated with Supervisors' Ratings, Salary Increases, and current work performance based on Work Samples.

6. The "technical-type" predictors: General Clerical Test's Clerical subtest, Typewriting Proficiency Test, and Shorthand Proficiency Test, will have larger correlations with the technical-type job performance criterion, Work Sample Evaluations, than the other predictors.

7. The "intelligence-type" predictors: General Clerical Test's Verbal subtest and Education, will have larger correlations with the intelligence-type job performance criteria, Supervisors' Ratings of Quality of Work, Intelligence, and Growth on the Job, than the other predictors.

Statistical Methods to be Used in this Validation Study

The methods to be used in studying the inter-relationships among the predictors and the criteria used in this study will be correlation and chi-square analyses. The correlation analysis will help to discover the correlations between the predictors and criteria, and the intercorrelations among the predictors and the intercorrelations among the criteria. It will also help to discover the linear combination of the independent variables and how good these relationships are To complete the investigation, multiple-correlation techniques will be used to develop equations for use in predicting job performance of the secretaries included in this study. Separate multiple-regression equations will be developed for each criterion. In addition, chi-square tables will be presented as supplementary presentations of evidence of relationships.

Organization of the Investigation

Chapter II will contain a review of research related to the present investigation. The procedures for collecting and analyzing the data are presented in Chapter III. Chapter IV describes the information obtained in the hiring process and the subsequent performance on the job. The relationship of information obtained in the hiring process and the subsequent performance on the job is presented in Chapter V, part I; and part II of Chapter V gives an analysis of data based on the Shorthand test sample only. A summary of the purpose of the investigation, conclusions, and recommendations is given in Chapter VI.

CHAPTER II

RESEARCH RELATED TO THE INVESTIGATION

The background, statement, scope, aims and importance of the present investigation have been presented in Chapter I. The purpose of this chapter is to review the research related to the present investigation. Since many of the studies reported in this chapter use supervisor's ratings as a criterion of job performance, a brief discussion of this measure of success will first be presented, followed by the related research classified under three headings: (1) studies related to the General Clerical Test, (2) studies related to typewriting proficiency tests, (3) studies related to shorthand proficiency tests.

The Use of Supervisor's Ratings as a Criterion of Job Performance

Rating scales, report cards, and evaluations appear in business, industry, school, and in government; and some are used as a substitute gauge of abilities for which no adequate objective tests are available.

In employment situations, ratings help in deciding questions of transfer and promotion, in discovering need for special training, in measuring progress in this training, and in passing upon recommendations at periods of salary readjustments.

Because supervisor's ratings are so frequently used for administrative evaluations in business, industry, schools, and in government, their limitations as a criterion in research should be borne in mind as these related studies are reported. The very fact that so many researchers fall back on ratings usually means that no better measure of the quality in question is available.

The merits of supervisor's ratings as a criterion of job performance are acknowledged by the writer to be broad enough for a separate study in itself; and, therefore, a lengthy discussion of the problems of rating employees and the methods to be used are considered outside the scope of this investigation. The fact that ratings have been used in similar studies will be pointed out and a description of the University of Michigan rating device, Progress Report, used in this study, will be discussed.

The problems in obtaining valid appraisals of an individual through ratings are of two main types. There are first the factors that limit the rater's willingness to rate honestly and conscientiously, in accordance with the instructions given to him; and secondly, the factors that limit his ability to rate consistently and correctly, even with the best of intentions.

Among the factors affecting a supervisor's willingness to rate conscientiously are his unwillingness to take the necessary time and his identification with the person being rated. Among the factors affecting his ability to rate accurately are the ambiguities of meaning of the dimension to be rated, the covertness of the trait being rated, opportunity to observe the person rated, a lack of a uniform standard of reference against which to appraise a person, specific rater biases and prejudices.

But in spite of their limitations, ratings are now and will continue to be used in a multitude of situations as a means of appraising our fellow human beings. We will continue to depend upon the judgments of people in evaluating others because these judgments

do make the decisions about who will be hired, who will be promoted, and who will be discharged.

Studies of the General Clerical Test

Related Study No. 1

In the manual for the General Clerical Test[1] there are summaries of several studies with office workers in different companies. One of these research studies was conducted by a large floor covering manufacturer and yielded the following correlations in comparing the GCT scores with job performance ratings after 18 months of employment: Clerical subtest, .45 (68 subjects); Numerical subtest, .22 (71 subjects); Verbal subtest, .42 (70 subjects); and total, .43 (73 subjects). With the exception of the Numerical subtest, the scores were effective in identifying large proportions of both the superior and inferior employees. This study was done at the company's home office and also showed that selective hiring of its clerical staff on the basis of the GCT can reduce failures in the first six months (Table I) and can increase the proportion of employees rated "good" after a year and a half on the job (Table II).

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[1]GCT Manual, page 6.

The same company studied GCT total scores in relation to "six-month" quits. The data for the 116 new employees are shown in Table I.

TABLE I

COMPARISON OF THE GENERAL CLERICAL TEST SCORES AND TENURE OF EMPLOYMENT

GCT	Gone in 6 months	Still employed	Total Group
High scores (130 or higher)	8 (13%)	54 (87%)	62 (100%)
Low scores (Below 130)	18 (33%)	36 (67%)	54 (100%)
Total Group	26 (22%)	90 (78%)	116 (100%)

Table I permits these observations:

1. Even in a short period as six months, 33 per cent of the low scorers had terminated before six months but only 13 per cent of the high scorers had left. Eighty-seven per cent of the high scoring cases survived six months of employment, but only 67 per cent of the low-scoring cases remained after six months.

2. Since the first six months are costly ones (recruiting, testing, hiring, placing, and training), anything which reduces the losses in this period is valuable.

This company hired 116 clerks without regard to GCT score and then had those 73 who still remained after one and one-half years rated by supervisors. What the company officials found is shown in the following table.

TABLE II

COMPARISON OF THE GENERAL CLERICAL TEST SCORES WITH SUBSEQUENT SUPERVISORY RATINGS

GCT	Rated Poor (below mean rating)	Rated Good (above mean rating)	Total Group
High total scores (130 or more)	10 (23%)	34 (77%)	44 (100%)
Low total scores (Below 130)	21 (72%)	8 (28%)	29 (100%)
Total Group	31 (42%)	42 (58%)	73 (100%)

r=.43

Table I permits these observations:

1. About 3 out of 4 high-scoring workers who remained ended with a good rating.

2. About 3 out of 4 low-scoring workers who remained ended with a poor rating.

3. If the company had rejected all applicants with scores of 130 or below, they would have lost a few good clerks (8 out of 29 were so rated). It would have

been more economical to have selected more high-scoring applicants because 3 out of 4 would have made good. Hiring 29 other applicants with scores of 130 or higher should yield about 22 good clerks. A little greater cost in the recruiting and hiring phases would be more than offset by the results. The reliability and validity of this study is limited because of the lack of information concerning the rating device and the raters involved in the appraisal.

Of interest to the present investigation is the conclusion that the GCT can aid in the selection of persons who tend to have longer job stability. Another worthwhile contribution to employment test validation is that ratings tend to agree with other evidences such as length of service and job stability.

Related Study No. 2

The Pennsylvania Company for Banking and Trusts made available to the American Bankers Association[1] a fairly comprehensive study involving the GCT and six other tests which dates back to 1944 but has not been published completely. The correlation between the test

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[1]American Bankers Association, Clerical Testing in Banks (New York: 1952), p. 48.

scores at the time of hiring and subsequent merit ratings shows that the GCT proved to be the most closely related to ratings of all tests used.

This bank was able to study the records of 120 women clerks and typists who had been given an extensive battery of tests at the time of employment. After a suitable period of work in their departments, they were rated on three traits: ability to grasp ideas, speed, and accuracy. A four point scale was used to indicate the different degrees of these qualities. Each employee was rated by a supervisor on this four point scale and also in a rank-order comparison with the other persons from the department in the research sample. The resulting ratings had adequate range and distribution to be satisfactory as criteria.

The coefficients of correlation between the predictor tests and the three ratings are shown in Table III.

The GCT total score had the highest correlation with the criteria of any of the seven tests. For the Pennsylvania Company, the Otis Test seems least useful of all the predictors used in its investigation.

TABLE III

COMPARISONS OF TEST SCORES AND RATINGS

	CRITERION RATINGS		
Predictor Tests	Speed	Accuracy	Ability to Grasp New Ideas
Minnesota - Numbers	.29	.36	.30
- Names	.38	.39	.45
- Combined	.38	.42	.43
Alpha Number Series	.28	.25	.39
Hay Name Finding	.37	.36	.39
GCT - Clerical	.46	.42	.46
- Numerical	.32	.39	.43
- Verbal	.38	.34	.49
- Total	.48	.46	.56
Otis - 20 Minutes	.17	.16	.38

All three criteria used in the bank's study are similarly utilized in the University of Michigan study. Speed is classified under "quantity of work," accuracy under "quality of work," and ability to grasp new ideas under "intelligence" on the University of Michigan Progress Report rating form. It would be expected that since the same test and the same criteria are used in both studies that the results from both investigations would be similar.

Related Study No. 3

A research study conducted by the personnel officials of the International Business Machines[1] sought to determine whether the Short Employment Tests (SET) were as discriminating as the GCT in selecting and classifying two groups of office workers with different educational backgrounds so that testing time could be reduced. The IBM Group II sample is similar to the present investigation in that it was composed of secretarial applicants. In the IBM research, Group I was composed of male and female clerical and other office applicants who were mainly high school graduates. This group was given the GCT and the vocabulary, numerical, and clerical subtests of the SET. Group II included male and female secretarial and stenographic applicants most of whom had business school or college training beyond high school. These applicants took the verbal section of the GCT and the verbal subtest of the SET.

For the clerical applicants the correlation (.87) between the GCT and the SET total scores indicated that

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[1] J. L. Hughes and W. J. McNamara, "Relationship of Short Employment Tests and General Clerical Tests," Personnel Psychology, Vol. VIII, No. 3 (Autumn, 1955) pp. 331-337.

the SET could satisfactorily replace the GCT in the selection procedure and reduce test administration time. For the secretarial and stenographic applicants, the correlation between the GCT-B (verbal) and SET verbal was .77. The GCT-B differentiated more finely throughout the entire score range among these better educated applicants than the SET verbal, which was too easy a test for this group. However, the SET verbal appeared to be useful as a rough screen for eliminating the poorest applicants. No validity data are reported. The study was made in 1954.

The value of the IBM study to the present research is questionable since no validation data are given. Of interest to the present study is the conclusion that the GCT-B (verbal subtest) differentiated more finely throughout the entire score range among the better educated applicants than the SET verbal. Since 26 per cent of the University of Michigan secretaries are college graduates, the Hughes-McNamara finding is of importance in considering the GCT as a test that yields a sufficient spread in the scores to make possible a differentiation between the applicants.

Other GCT Research Related to the Present Investigation

Besides administering the GCT to the 165 secretaries in the present study the writer also administered the GCT to 94 working secretaries enrolled in Certified Professional Examination Review classes sponsored by the National Secretaries' Association chapters in Detroit and Port Huron, Michigan, and the Jackson, Michigan, Public Schools Adult Education officials. Secretaries enrolled in these sample populations included both NSA members and non-members.

Since these two groups (University of Michigan/Detroit-Port Huron-Jackson) are in approximately the same ability and job classification levels it isn't surprising to find almost identical results in comparing their average scores on the GCT; what is surprising to the writer is to note the educational background difference in these two groups. Only two per cent of the Detroit-Port Huron-Jackson sample are university graduates, whereas 26 per cent of the University of Michigan sample are graduates of universities.

Table IV shows the mean scores and ranges for the Detroit-Port Huron-Jackson and University of Michigan samples.

TABLE IV

COMPARISON OF GCT TEST SCORES IN SOUTHERN MICHIGAN

GCT Test Part	Detroit-Port Huron Jackson secretaries*		University of Michigan secretaries**	
	Range	Mean	Range	Mean
Clerical	13-80	53.23	22-79	52.16
Numerical	6-53	32.55	10-54	32.44
Verbal	32-110	80.34	42-105	81.29
Total	71-222	166.55	82-232	165.92
*N=94	**N=165			

Since the GCT total correlated .75 with tests of Primary Mental Abilities - Form AH, and the GCT verbal subtest correlated .77 with the Otis - S-A tests of Mental Ability[1] it is the opinion of the writer that the GCT measures intelligence. If so, there is a supply of intelligence in Detroit, Port Huron, and Jackson, Michigan, offices that has not gone through college. The Detroit-Port Huron-Jackson sample had a lower "floor" for all subtests and the total test (13 versus 22, 6 versus 10, 32 versus 42, 71 versus 82)

[1]GCT Manual, page 9.

and a higher "ceiling" in the clerical and verbal subtests; while the University of Michigan sample had a higher ceiling in the numerical subtest and also in the total test.

As Table IV indicates, the average test scores of employees in these two samples are so small that it can be concluded that the University of Michigan Personnel officials are hiring secretaries at the same GCT mean scores as employment officials in other southern Michigan communities.

Another illustration involving GCT scores is a comparison of 211 successive female stenographic applicants to the General Motors Corporation Central Personnel Office in Detroit[1] and the 165 working secretaries in the present study shown in Table V.

The purpose in describing the test scores of these two distinctively different groups is to illustrate the danger in interpreting test results from unlike samples and the importance of basing test norms on relevant and meaningful groups. The GM sample had a higher "floor" in the numerical subtest and total test, and the U-M sample had higher "floors" in clerical and

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[1]GCT Manual, page 12.

verbal subtests and higher "ceilings" in all test parts. The standard deviations for the GM sample are about one-half to four points higher than those for the U-M sample.[1] There are little differences in the mean scores of the clerical and numerical subtests but a significant difference in the means of the verbal subtest and total score.

TABLE V

COMPARISON OF GCT TEST SCORES IN SOUTHEASTERN MICHIGAN

GCT Test Part	General Motors Steno Applicants*			University of Michigan Working Secretaries**		
	Range	Mean	S.D.	Range	Mean	S.D.
Clerical	19-77	50.63	12.82	22-79	52.16	11.78
Numerical	14-49	31.59	8.47	10-54	32.44	7.90
Verbal	36-102	73.40	14.73	42-105	81.29	12.60
Total	95-222	155.62	29.89	82-232	165.92	25.64

*N=211 **N=165

A third contrast between GCT scores as illustrated in Table VI shows the mean scores, ranges and standard deviations between 52 female Stenographers employed at

[1]GCT Manual, page 12.

Standard Oil Company of Ohio[1] and 165 University of Michigan secretaries.

The SOHIO and University of Michigan comparison is shown in order to emphasize the principle of using test scores in one job classification framework which is similar to another job classification framework. In both instances we are using samples of employed stenographic subjects.

TABLE VI

COMPARISON OF GCT TEST SCORES
IN SOUTHERN MICHIGAN AND NORTHERN OHIO

Test Part	Standard Oil of Ohio*			University of Michigan**		
	Range	Mean	S.D.	Range	Mean	S.D.
Clerical	28-78	54.27	12.72	22-79	52.16	11.78
Numerical	11-53	33.81	8.15	10-54	32.44	7.90
Verbal	52-102	80.12	12.35	42-105	81.29	12.60
Total	118-219	168.20	26.24	82-232	165.92	25.64
*N=52	**N=165					

Of all the GCT research reviewed by the writer the SOHIO sample had the highest means in the clerical and numerical subtests and total test; while the U-M

[1]Ibid, p. 16.

sample had the highest average in the verbal subtest. The U-M group had higher "ceilings" in all of the subtests, but these differences are too slight to be significant. The big difference in the scores of these two samples is in the lower "floors" of the U-M group. The U-M employment officials do not use a GCT test cut-off score in selecting secretaries which implies that some applicants scoring low in the GCT still can be hired if the applicant displays good typewriting and shorthand skills, and has the personal qualities necessary for employment.

Studies of Typewriting Proficiency Tests

A summary of related research reveals confusion as to aims and methodology involved in typewriting testing.

One group emphasizes straight copy timed writings, while another prefers production-type tests, while another may use variations of these methods of testing.

Production typewriting testing is diversified. One concept would measure production skill by requiring repetitive writings under time on one designated job (a business letter) and interpret production to mean repetitive performance on one highly specialized type

of job. A second point of view measures production skill by requiring typists under time to produce as many copies as possible of different jobs within specified job categories and interpret production to mean accumulated performance on varied rather than identical copy.

For both groups, over-all production skill has been determined by administering a series of tests in many problem areas.

Additional differences of opinion have developed concerning production typewriting tests in these four areas:

A. Content of the tests--restricted or comprehensive subject matter.

B. Length of time for the tests.

C. Production typewriting measurement--typing activities, non-typing activities (such as inserting paper, setting margins, erasing).

D. Method of stating results--rate per minute or unit completed figure.

Teachers and businessmen have raised questions concerning the extent of difference between production rates and rates attained on straight copy tests. Pre-employment emphasis has been primarily on key stroking

skill while acceptable on-the-job performance has emphasized production ability almost exclusively.

Related Study No. 4

West[1] wanted to determine the relationships between straight-copy typing skill and performance on job-like activities. The sample for the West study was composed of 66 college students who were registered in Typing III or IV for a 12 week quarter. Their range of straight copy speeds, 39 to 76 gwpm, characterizes a representative sample of typing students.

Straight-copy proficiency was the base to which performance on job-type activities was to be related. West's results show that whatever it takes to prepare real typing tasks correctly is not being measured by straight copy skill. However, he states that his hypothesis that straight copy proficiency has, in general, no relationship at all with the quality of work on job-type activities can not be rejected on the basis of the data which he gathered.

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[1]Leonard J. West, "Some Relationships Between Straight-Copy Typing Skill and Performance on Job-Type Activities," The Delta Pi Epsilon Journal, Volumne III, No. 1 (November, 1960), pp. 17-27.

To establish the straight copy speed base West administered two 10-minute timings on new copy each of 1.40 syllabic intensity. The job-type activities were incorporated in a 2-hour final examination given several days after the straight-copy timings.

The examination consisted of the following:

a. 30 minutes of ordinary business correspondence with envelopes

b. a letter with a 3-column listing with column headings

c. a 1-page manuscript with footnotes

d an unarranged table

e typing from rough draft copy containing unmarked errors

One carbon copy was made of all work. Each item of the final examination was run as a separate timed test. All of the work was scored individually for speed and accuracy (quality) utilizing an arbitrary set of penalties for various sorts of errors. The data in the following table (Table VII) tend to show it doesn't necessarily follow that the degree of skill will measure the effectiveness on the job.

West discovered that typing speed and quality are only moderately related.

TABLE VII

INTERCORRELATIONS BETWEEN STRAIGHT COPY SCORES AND QUALITY SCORES ON VARIOUS JOB-TYPE ACTIVITIES

(Decimal points omitted; N=66)

	Job-Type Activities					
Straight Copy	Simple Corre-spondence	Tabu-lation	Manu-script	Rough Draft	Letter With Tab.	Mean
Gross wpm	10	27	15	08	34	19
Errors	-06	-33	-12	-11	-29	-18
Net wpm	00	37	18	17	34	22

In Table VIII the correlation between speed and quality scores on various job-like activities are shown. The very low r of .21 for the rough draft typing would be expected. In West's subtest there were several errors in form and style which students had to locate for themselves. Presumably, many students blindly copied what they saw and inevitably finished earlier than some of those who took the time, either before or during the typing, to locate the parts of the copy requiring modification.

TABLE VIII

CORRELATION BETWEEN SPEED AND QUALITY SCORES ON VARIOUS JOB-TYPE ACTIVITIES

(Decimal points omitted: N=66)

Activity	r
Simple Correspondence	46
Tabulation	35
Manuscript	32
Rough Draft	21
Letter with Tabulation	57

West's conclusions, though directed to the training of students, bear the same implications for the testing and job-selection of students (applicants). The correlational data of his study show that sheer stroking speed accounts for only about a quarter of the factors that make up speed on what might be described as fairly difficult real jobs. Therefore, the implication for this investigation is if you want to test for job performance and success, then spend time on testing on job-type activities. The worksample test considered in this investigation is based on actual job activities taken from the offices of the University of Michigan.

The second conclusion which West reaches is that none of the three measures of straight copy performance employed (gross wpm, number of errors, net wpm) accounts for as much as five per cent of the factors that make the more important features of real-job performance, that is, quality. The implication here is self-evident. If you evaluate applicants on straight copy tests, then you are evaluating them on a basis that appears to have very little to do with performance on real jobs. The third conclusion stated by West is that there is neither any strong relationship between the various job-type activities nor between speed and quality on any given job-type activity.

Related Study No. 5

Crawford[1] demonstrated that those who spend all their training time at production typing do better at production typing than those who spend two-thirds of their time at straight skill building and one-third at production typing.

Crawford's sample consisted of students enrolled in Intermediate Typewriting at Indiana University. The

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[1]Thomas James Crawford, "The Effect of Emphasizing Production Typewriting Contrasted with Speed Typewriting in Developing Production Typewriting Ability" (unpublished doctoral dissertation, University of Pittsburgh, 1956).

control group had 37 subjects the first semester, 22 the second semester, and they were taught by the traditional methods with two-thirds of the time spent on speed and one-third on production. The experimental group was composed of three classes of 85 subjects the first semester and 82 the second semester, and was taught by an experimental method.

The problems included in Crawford's production tests represented a collection of actual business jobs, prepared by currently employed office typists. These problems indicated the kind of work commonly required by typists in modern business offices. Sixteen jobs were included in the production test. The test time was 120 minutes.

Production typewriting for Crawford's study included following directions, computing spacing needed for copy arrangement, machine adjustments, handling materials, preparing carbon copies (one of each problem), proofreading, correcting errors, and disposing of the finished product.

Crawford concluded that the experimental production groups in both semesters had significantly higher terminal production performance rates than the control (speed) groups. Students with initial tests

demonstrating high straight copy scores performed on production tests at very low levels.

The study by Crawford provides two helpful suggestions for the present investigation. Crawford's production problems taken from actual office jobs resemble the items used in the present investigation's proficiency tests. Crawford's definition of production typing as "basically business-type typewriting that should adhere to practices of business," gives recognition to the work sample tests used in the present study.

Related Study No. 6

Jurgensen[1] developed and validated the "Typing Ability Analysis" at the Kimberly-Clark Corporation. Jurgensen believed that an analysis of reasons for the failure to predict job success by means of customary straight-copy typing tests indicated that such tests did not emphasize sufficiently the major factors found in the industrial situation, such as the mechanics of handling paper, placement of paper, use of tools, and the non-mechanical aspects of the job which are the major factors

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[1]Clifford E. Jurgensen, "A Test for Selecting and Training Industrial Typists," Educational and Psychological Measurement, No. 4 (October, 1942), pp. 409-425.

in differentiating between successful and unsuccessful typists. Among the non-mechanical aspects which should be measured, according to Jurgensen, are included following instructions, noting and correcting errors, and the typing of diverse kinds of material rapidly, accurately and in good form.

Jurgensen's validation study of his "Typing Ability Analysis" production test is based on 67 employed typists in an industrial population. Typists were dichotomized on the basis of grade of job successfully filled, and validity determined by means of biserial coefficients. The p group consisted of 28 girls employed in Kimberly-Clark Corporation's home office or in positions of similar caliber in various mills of the corporation. The q group was composed of 39 girls employed in mill offices and mailing departments of the same corporation. All girls were engaged in work which was primarily typing.

The Jurgensen "Typing Ability Analysis" test consists of five parts, each being complete in itself. The first part is not scored, and consists of typing identification material such as name, address, and date. Part Two consists of approximately 150 words of a draft of an article to be typed. The work copy is in typed form, but contains thirty-five errors which are marked for

correction. Each error is accompanied by the correct form which is to be used. Part Three requires the tabulating of seven lines in three columns, together with appropriate column headings, title, etc. The fourth part consists of a letter ninety words in length. The letter is written in longhand and contains ten changes also made in longhand. Part Five requires alphabetizing and tabulating fifteen lines of authors' names, book titles, and publication dates, together with typing column headings and title.

All test parts contain instructions such as "make a carbon copy on yellow paper," etc. Failure to follow directions is penalized. Errors on the rough draft, tabulation, letter, and alphabetizing are classified according to whether they are scored as corrected, minor or gross errors.

The "Typing Ability Analysis" is a work-limit test, each girl being permitted to complete the test. The shortest testing time in 636 cases was 26 minutes, and the longest time was 120 minutes. The average (mean) time required by industrial applicants is 61 minutes, and by high school seniors is 78 minutes.

Validity coefficients for Jurgensen's study are given in Table IX.

TABLE IX

COMPARISONS BETWEEN TYPEWRITING SPEED, ACCURACY AND ERROR SCORES AND SUPERVISORY JUDGMENTS

(N=67, Employed Industrial Typists)

Score	Supervisory Ratings	Standard Error
Combined (Speed-accuracy)	.957	±.04
Time (Speed)	.796	±.08
Converted errors (accuracy)	.711	±.09
Raw errors	.659	±.10
Gross errors	.456	±.13
Minor errors	.555	±.12
Corrected errors	.334	±.14

Corrected errors are those which have been corrected by the typist by neat erasures. Minor errors are those which are correctible such as misspelled words or strike-overs. Gross errors are those which cannot be corrected unless the work is retyped such as failure to make a carbon copy or to tabulate the material. Raw errors' score was obtained by combining gross, minor and corrected errors. Time was considered in minutes, and corrected errors was an accuracy score.

Jurgensen's study is of value to the present investigation because of the similarity of procedures

used in both studies. In both investigations job analyses were inspected and conferences held with supervisors of office workers to determine the kinds of typing done, errors most often made, characteristics which differentiate between successful and unsuccessful typists. Supplementary data were secured in both investigations by inspection of the company's or university's files, and conferences with departmental secretaries and supervisors.

Jurgensen's comparison of groups such as industrial typists (high and low job classification), Civil Service applicants, high school seniors, to determine validity of his "Typing Ability Analysis" broadens his study's usefulness.

Studies Related to Shorthand Proficiency Tests

There has been very little research and experimentation in the use and value of shorthand proficiency tests as predictors of secretarial performance on the job.

In the past personnel officials based their selection decisions on such miscellaneous factors as age, education, and experience with personal opinion too frequently deciding the action. Then it became recognized that more objective data were needed on which to base such decisions. The early investigations considered the

selection and prediction of success for mastering stenography, and little was done in the prediction of job performance from test scores.

Related Study No. 7

A pioneer study was made by Bills[1] to determine the value of an intelligence test in predicting stenographic success on the job. Two different groups of professional stenographers were given Test VI, a general intelligence test of the Bureau of Personnel Research of Carnegie Institute of Technology. The first group consisted of 20 stenographers employed by a single firm. Before the test was given to this group, the stenographers were rated on their value to the firm by one executive who was in close contact with all of them.

Of these 20 stenographers, only one made a score below the critical score set for the students of stenography, i. e. 60, and she was rated lowest by the firm. Table X shows the test scores of the group and their ratings by the executive.

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[1]M. A. Bills, "A Test for Use in the Selection of Stenographers," The Journal of Applied Psychology, Vol. V, No. 1 (March, 1929), pp. 373-377.

The rank correlation is +.75. Length of service must have tended to play some part in the rating, which could partly account for the higher correlation.

TABLE X

COMPARISONS BETWEEN TEST SCORES AND SUPERVISORY RATINGS AND RANKINGS

Stenographer	Score in Test VI	Ranking	Value to firm rating by office manager
A	168	20	20
B	163	19	19
C	152	18	16
D	139	17	17
E	134	16	15
F	130	15	12
G	125	14	14
H	118	13	9
I	114	12	4
J	113	10.5	6
K	113	10.5	13
L	110	9	18
M	105	8	8
N	86	7	2
O	82	6	7
P	78	5	11
Q	76	4	10
R	72	3	3
S	61	2	5
T	52	1	1

A second group, consisting of 17 stenographers and eight secretaries employed by a different firm (in an entirely different line of business), were given the same test, Bureau Test VI. They were rated by an executive

who knew them all, but did not wish to rank them. He divided them into three groups: those who were "failing," those who were "getting by" and those who were "good." Three of the 17 were classed as "failures," four as "getting by" and eight as "good." Two had been with the company too short a time to be rated. All of the secretaries were classed as good. Table XI gives the ratings, scores, and positions of these stenographers.

TABLE XI

RELATION OF SCORE IN TEST VI TO ABILITY IN STENOGRAPHY

Rating	Score in Test VI	Position
Good	179	Secretary
Good	155	Secretary
Good	152	Secretary
Good	150	Secretary
Good	139	Secretary
Good	137	Secretary
Good	93	Secretary
Good	155	Stenographer
Good	129	Stenographer
Good	125	Stenographer
Good	117	Stenographer
Good	94	Stenographer
Good	91	Stenographer
Good	91	Stenographer
Good	78	Stenographer
Getting By	80	Stenographer
Getting By	72	Stenographer
Getting By	62	Stenographer
Getting By	46	Stenographer
Failing	74	Stenographer
Failing	73	Stenographer
Failing	42	Stenographer

The mean score for secretaries is 144, for stenographers rated good, 110, for stenographers rated as getting by, 65, and for those failing, 63. Only two made a score less than the critical score determined by Bills' previous experiment with business college secretarial students, and neither of these was rated good. The correlation with ratings was .92.

From the investigation as a whole, evidence is found that there is a positive relationship between mental alertness as indicated by Test VI and ability in stenographic work. The designation of a score of 60 in this test as a "critical score" for selecting stenographers is justified by the data secured from these groups.

In the selection of stenographic applicants, Bills' study showed positive relationships between intelligence and job performance ratings. It is the opinion of the present investigator that an intelligence test combined with a worksample shorthand test would have provided Bills with a better measure for the selection of secretaries than just the intelligence test she used. It is unfortunate that the number of subjects was small and that only one executive served as rater.

Related Study No. 8

Bird[1] analyzed the relationship between the test scores and personal data information of 100 stenographers with several indexes of work efficiency. The tests used by Bird were:

1. Otis Group Intelligence Scale, Self-administering. Higher Exam. Form A.

2. Thurstone Typing Test - Form A consists of three parts:

   a. Typewritten copy corrected by the author after his first writing is to be typewritten in its proper form, making any changes necessary.

   b. A number of items which are to be tabulated on a blank page provided for this purpose.

   c. A spelling test consisting of 50 words to be checked.

The score is given in terms of speed and accuracy. The author gives norms in the test but does not describe the group on which they were established.

3. Benge Stenogauge Test

   A. Dictation; a letter of several hundred words is dictated at the maximum rate of speed which the stenographer can take. The time required is noted in seconds.

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[1]Norma Bird, "Relationships Between Experience Factors, Test Scores and Efficiency; as Shown by a Study of Four Selected Groups of Women Office Workers," Archives of Psychology, ed. R. S. Woodworth, Vol. XIX, No. 126 (May, 1931), pp. 1-51.

b. Transcription; the time required by the candidate to transcribe these notes is also recorded in seconds. Transcription accuracy is a percentage figure obtained by dividing the number of words transcribed correctly by the number of words in the letter.

c. Spelling; the applicant is given a list of 50 words half of which are spelled correctly. The number of errors only is recorded.

To obtain the applicant's total score, the number of dictated words taken per minute, the number transcribed per minute, the percentage of the total transcribed correctly, and the percentage of the special list of 50 words checked correctly are added. The test requires about 15 minutes to perform.

Testing was done individually for the typing and Stenogauge tests. Otis was a group activity. Reference to "test" was avoided in the testing procedure. Instead the subject was asked to try a "small sample of work."

Additional predictors used by Bird were four non-test data factors: age, years of education, years of work experience, number of previous jobs. Information for the non-test factors was taken from the application form of each stenographer. The application form, or experience record, is a brief summary of the applicant's previous and present life experience. Bird wanted to discover what relationships existed between the personal factors and success in stenographic work.

The criterion of accomplishment chcsen and used as an efficiency index included the following:

1. Present salary
2. Number of months employed with the organization
3. Salary increase--the difference between original and present salary
4. Number of promotions
5. Ratings by superiors

Bird stated that the rating scale was less objective than other criteria used but that the combined judgments of supervisors would seem to indicate that the more successful groups of employees would be rated higher than their associates; and that if this measure (ratings) is combined with more objective factors it should not be omitted among the criteria.

The following relationships between experience factors, test scores, and efficiency were obtained.

TABLE XII

COEFFICIENTS OF CORRELATION BETWEEN SEVERAL TESTS AND SETS OF PERSONAL DATA AND VARIOUS INDICES OF EFFICIENCY FOR 100 STENOGRAPHERS

Variable	Present Salary	Salary In-crease	Months Em-ployed	Rat-ing	Number of Pro-motions	Com-posite R
Otis Test	.01	-.03	-.14	.33	-.02	.06
Benge Stenogauge Test:						
Time	-.57	-.35	-.30	-.28	-.30	
Accuracy	.33	-.05	-.08	.32	-.04	.53
Spelling	.25	.03	.02	.34	.02	
Age	.46	.36	.58	-.03	.17	.41
Years of Education	-.06	-.15	-.25	.09	-.11	-.16
Years of Experience	.35	-.01	.24	.01	-.01	.11
Number of previous jobs	.22	-.18	-.05	.13	-.21	

In general, the following conclusions appear to be supported by the correlations.

1. Otis Intelligence Test scores did not bear a significant relationship to salary, length of stay on the job or promotions, but did correspond slightly with ratings. As a general result, high Otis scores showed

little or no relationship to these efficiency factors, and in most cases, there was practically no correlation between them.

2. As low time and accuracy scores were desired on the Benge Stenogauge Test, high negative correlations showed this test to be one of the best of the proficiency type used. When correlations are negative, a low score on the test would measure high proficiency.

3. The correlation between the composite or criterion score and Stenogauge was .53, between composite and age, .41. Combining age and Stenogauge in a multiple correlation, the correlation was raised to .67. The intercorrelation between these two predictors was .0054, which implies that age and Stenogauge were contributing separately to the determination of the composite score. But it should be remembered that the composite r of .41 included a correlation of .58 between age and months employed, which to the present investigator makes this correlation questionable and the composite r unreliable, since age and tenure usually tend to correspond one with the other.

4. Age was related to salary paid and seemed to show a positive relationship with salary increase. In the case of these stenographers, older women were better

paid; received more salary increase, and tended to remain longer in their positions. Age corresponded more highly with the length of time an employee remained with the organization than with any other factor; and the present investigator questions Bird's use of two variables (age and tenure) so closely interrelated, which reduces the value of this portion of her research. Ratings and promotions did not seem to be affected by age. Salaries were influenced by the age factor, which would be expected, as the older workers had remained longer in their positions and hence would tend to receive more pay raises. These are conclusions that Bird discovered but it should be pointed out that these same conclusions might not hold true for other investigations.

5. Education showed a definitely negative relationship with the separate success factors. It would seem that employees were rated or promoted on other bases than education or training.

6. Previous experience was positively correlated with salary and length of employment. The stenographer's stability seemed to increase with her experience.

7. The number of previous jobs held by a stenographer before coming to the company increased the chances of her success as measured by present salary and supervisory ratings.

The results of Bird's study were mostly of a negative nature with the relationship between test scores and factors of the efficiency index practically neutral, with but a few significant correlations discovered. Different levels of clerical ability were distinguished such as file clerks, typists, ledger clerks, and stenographers. Different factors seemed to characterize successful clerks in these groups, although in general, intelligence scores had little direct relation to the success of the clerks. This did not mean that intelligence was not a factor to be taken into account in selection or promotion, together with other factors in the experience of the employee. Intelligence may not be of special advantage in the routine work of certain clerical occupations, but it is of vital use in the case of emergencies which may arise, in saving the time of executives, and is often as essential for entrance to the higher levels of occupations. The general intelligence test in employment work may be used to denote the level of accomplishment which workers are likely to sustain within a given occupation, to eliminate low grade workers from jobs where they would be incompetent, and to call attention of management to persons with exceptional ability.

Bird found that the Otis Intelligence Test's scores showed reliable differences between those stenographers rated highest and those rated lowest. Experience factors showed that age seemed to correspond to ratings only slightly, as did education, while work experience showed an inverse relationship. Efficiency index differences were reliable in the cases of present salary and salary increase. This might mean that ratings accompanied salaries in some cases, and length of employment corresponded to ratings to some degree, which points out the difficulty involved in using ratings as objective and reliable measures of success.

Related Study No. 9

Ohmann's validity study of 52 employed stenographers in the Cleveland office of the Standard Oil Company of Ohio is reported in the revised manual of the Seashore-Bennett Stenographic Proficiency Test.[1]

The Seashore-Bennett Stenographic Proficiency Test is a standard recorded stenographer work sample containing five letters dictated in 15 minutes including several minutes for instructions. The test is

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[1]The Seashore-Bennett Stenographic Proficiency Test Manual, (522 Fifth Avenue, New York 36, New York: The Psychological Corporation), p. 6.

phonographically recorded, including the instructions. The subject takes stenographic notes for five letters of increasing order of complexity dictated at increasing rates of speed. The subject then transcribes her own notes in the form of typewritten letters. No attempt is made to time this transcription.

Alternate methods of appraising the product are suggested. In the first, the letters are merely inspected for "mailability." In the second, each letter is awarded a point score according to the procedure described in the test manual.

Ohman discovered that this standard recorded stenographic worksample test correlated with job performance as measured by supervisors' ratings on a four-point scale as follows:

Rating		r
1.	Stenographic Ability	.61
2.	Typing Ability	.41
	1 and 2 combined	.58
3.	English Usage	.32
4.	General Clerical Ability	.20
	1, 2, 3, and 4 combined	.48
5.	Over-all Appraisal	.38
	1, 2, 3, 4, 5 combined	.49

The test mean score for this group of employed stenographers was 75.8, and the standard deviation was 16.1.

It will be noted that the Stenographic Proficiency Test correlated more highly with stenographic ability (.61) than with the over-all appraisal (.38). Seashore and Bennett report that this is to be expected and that the same result would probably be true with other groups as well.

The significant point in the Ohmann study is his finding of a higher correlation between the test and the rating of stenographic ability than with the test and the rating of over-all appraisal, typing ability, English usage, and general clerical ability. In the opinion of the writer, this indicates the limitation of any secretarial testing program which uses only one type of predictive device.

These findings indicate that the relationship of ratings with any one specific aspect of job performance may be expected to be higher than that of a composite subjective rating, and furthermore, the multiple correlation (.49) is somewhat higher than for the over-all rating (.38).

Research Related to the Non-test Factor of Age

Zaugg[1] discovered in investigating 184 employed secretaries who took the Certified Professional Secretary examination in 1959 that age and test scores correlated .21, which indicated a slight relationship between the two. Zaugg also discovered that age correlated .21 with employers' ratings of job performance.

In this chapter the author has considered studies related to the present investigation in the areas of: The General Clerical Test, Typewriting proficiency tests, and Shorthand proficiency tests. A number of pertinent studies were found in the first area, but relatively few in the last two areas.

Other studies investigated were those done by Cook[2] and Obermann.[3] There might be value in the Cook typewriting study conducted in Kansas City in 1945. It was reported by Lawshe, and it looks as though it is

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[1]Margaret D. Zaugg, "A Study to Determine the Validity of Part VI, Secretarial Procedures, of the Certified Professional Secretaries Examination" (unpublished doctoral dissertation, School of Education, University of Michigan), pp. 86-90.

[2]D. W. Cook, described by C. H. Lawshe, Jr., Principles of Personnel Testing (New York: McGraw Hill Book Company, 1948), pp. 154-155.

[3]C. E. Obermann, described by E. S. Blackstone and M. W. McLaughlin, Blackstone Stenographic Proficiency Tests. Stenography Test: Manual of Directions (Yonkers-on-Hudson, New York: World Book Company, 1932), pp. 1-9.

related to the present investigation; but since there are so many missing factors of explanation, its usefulness is limited.

Obermann's study was conducted in 1930 at the University of Iowa and reported by Blackstone and McLaughlin. Obermann wanted to determine the extent to which the Blackstone Stenographic Proficiency Tests corresponded with the ratings of employers, but his research has limitations because of the small number of stenographers in his sample and in his use of efficiency ratings as the sole criterion.

In Chapter III a description of the particular job investigated (C-3 Secretary), the subjects, the tests and non-test factors, and the criteria of job performance will be reported and discussed.

CHAPTER III

METHOD OF PROCEDURE

The design of this study is directed toward investigating the relationships between the scores of 165 secretaries on three employment tests and their subsequent job performance in the offices of the University of Michigan.

In order to conduct this investigation two kinds of data were needed: (1) Those independent predictive variables, test and non-test factors, which are relied upon to differentiate the better applicants from the poorer ones; and (2) Those dependent criteria measures studied as standards for gauging the work of the secretarial employees.

In order to obtain the data to find the relationships listed above it was necessary that the investigator take the following steps.

1. Identify the procedures, steps, or successive screens in the employment process at the University of Michigan.

2. Analyze the clerical job classifications, specifications, and requisitions for non-academic personnel at the University of Michigan

3. Investigate the clerical testing program at the University of Michigan.

A. The General Clerical Test

B. The Typewriting proficiency test

C. The Shorthand proficiency test

4. Select the time factor.

5. Select the subjects in the sample.

6. Gather the tests' scores and non-test data from employee s personnel folders.

7. Select the criteria of job performance.

A. Supervisors' ratings

B. Salary increases

C. Work sample evaluations

1. Development of error scores rating scale

8. Select method of validation.

The University of Michigan Employment Selection Procedures

The procedures, steps, or "screens" in the employment process at the University of Michigan include the following:

1. The applicant is received by the receptionist in the Personnel Office lobby in the Administration Building.

2. The applicant completes an appropriate employment application form. (Appendix A)

3. A pre-testing screening interview is given by the employment services manager or employment interviewer.

4. The applicant at this stage is rejected or assigned to a testing section.

5. The applicant takes designated employment tests. All applicants for office work take the General Clerical Test and a Typewriting test. Shorthand tests are also taken by those applying for secretarial and stenographic positions. (Appendix B)

6. A post-testing screening interview is given by an employment interviewer in the Employment Services Section. Tentative selection or rejection by the employment interviewer is made. If selected by the interviewer, the applicant is sent to a University department, school, or college for an employment interview. An introduction envelope, with the applicant's application form enclosed, accompanies the applicant. (Appendix C)

7. The applicant is accepted or rejected by the official who made the requisition.

A. If the applicant is accepted by the requisitioning official, the applicant returns to the Personnel Office for processing of records and induction. (Appendix C)

B. If the applicant is rejected by the requisitioning official, the applicant returns to the Employment Services Section for further instruction.

8. The new employee is placed on probation for six months, and induction is handled by the processing clerk in the Employment Services Section.

9. An orientation training program is conducted by the In-Service Training Section. If necessary, employee is assigned to In-Service Training classes.

10. At the end of the probationary period the employee has an interview with the supervisor, who files an evaluation and progress report. (Appendix D)

11. If the employee's work has been satisfactory, the supervisor and personnel department officials cooperatively approve a merit increase in salary and the employee is placed on the payroll as a permanent employee. (Appendix C)

12. If the employee's work has been unsatisfactory, he is not given a merit increase and may be transferred or discharged.

From these 12 procedures it can be seen that the University of Michigan uses three major devices in selecting new employees: (A) The employment application form, (B) Interviews (pre-testing, post-testing and final), (C) Employment Tests.

These twelve procedures are carried out by the staff of the non-academic personnel office, whose organization is shown in the illustration on page 83.

The Organization of the University of Michigan Non-Academic Personnel Office

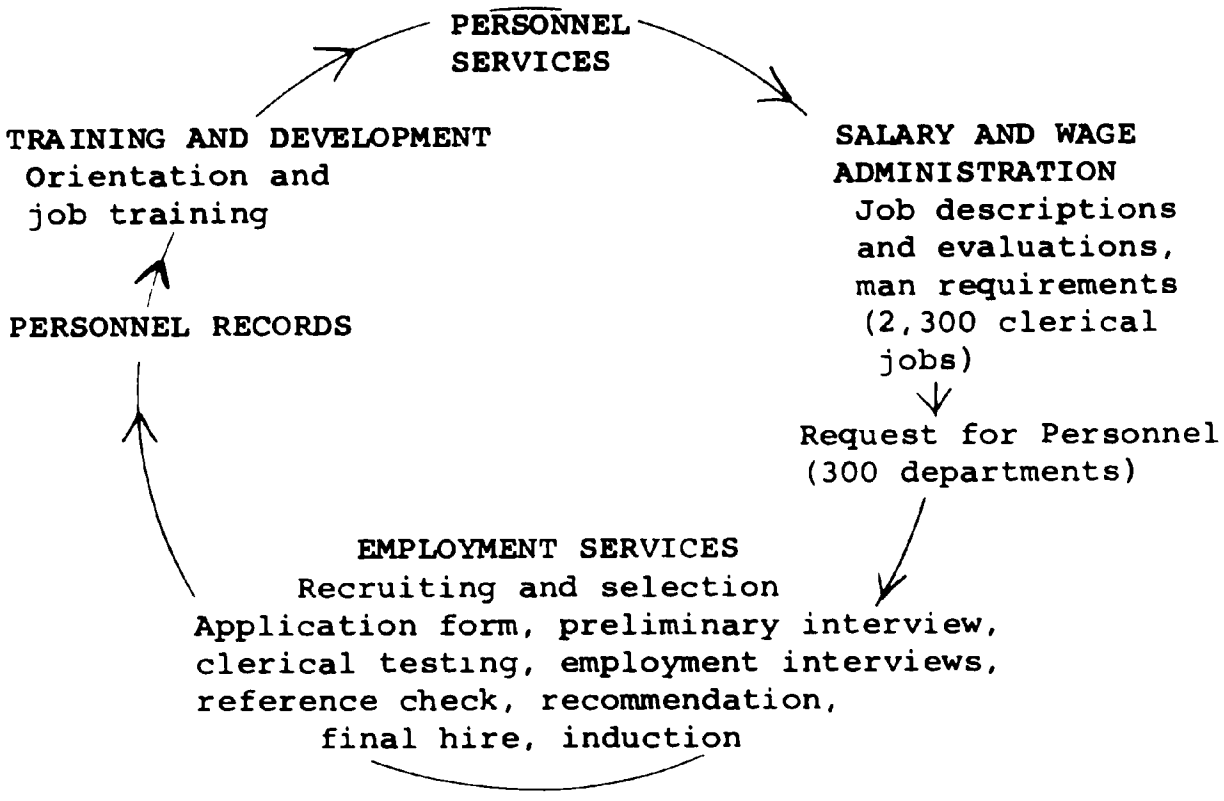
The chief administrator of the University of Michigan non-academic personnel office is the Personnel Officer. Under his leadership, five personnel functions are organized: Salary and Wage Administration, Employment Services, Personnel Records, Training and Development, and Personnel Services.

At the University of Michigan, employment selection is not considered the first nor last step in personnel administration. It is interlocked with the other functions. Danielson[1] states that selection should not be thought of in terms of a segregated area

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[1]Danielson, op. cit., p. 4

and distinct from the other phases of personnel administration, but as part of an integrated personnel picture. Starting at 1 o'clock in the illustration below, which is adapted from Danielson[1], the steps in the Personnel cycle are shown, indicating the procedures necessary for selecting the right person for the right job, and checking the results of the objectives assigned to the personnel office of the University of Michigan.



[1]Ibid.

Analysis of the Clerical Job Classification, C-3 Secretary

As the illustration on page 83 illustrates, the University of Michigan has approximately 2,300 office workers. These employees are assigned clerical job classifications, from C-1 to C-5, depending on the position they are occupying. The specifications of positions and duties to be performed must be known before the qualifications of applicants can be judged or the adequacy of the testing procedure can be evaluated.

To this end some form of classification, description and evaluation of office jobs is almost invariably part of the policies and procedures of every personnel office. There may be a variety of additional objectives that a given organization has in mind in establishing a job classification, job description, and job evaluation program as part of its total personnel administration function; but certainly the practice has as its most basic objectives the determination of what to look for in selecting new employees, and in determining equitable pay relationships and equitable internal measurement of job duties.

The importance of the job classifications, job descriptions, and job evaluations as aids in determining which clerical and proficiency tests will be included in

a selection battery cannot be overemphasized. Experience has shown that when a battery of tests is developed for use with given jobs in a particular office, psychological and physical requirements to be taken into account can be more specific to the particular situation.

At the University of Michigan there are five major clerical job classifications. These classifications are described in this study (Appendix E) in order to show the relationships among the requirements of related office jobs at the University, to show the characteristics that these jobs have in common, and especially to focus our attention on clerical classification, C-3 Secretary, with which this research is concerned.

For purposes of this study, the term C-3 Secretary includes those non-academic, i.e. nonteaching and nonprofessional, employees who work in administration, faculty, research and service offices, and whose jobs fit this description.

JOB DESCRIPTION OF SECRETARY C-3

Function of job

Under general supervision, to perform office work of above average difficulty involving stenography, typing and clerical duties

Characteristic Duties and Responsibilities

1. Takes dictation by shorthand or stenotype, and transcribes
2. Transcribes from dictation machine belts, discs, tapes, or cylinders
3. Types letters, manuscripts, reports, and other material
4. Types stencils, spirit process masters, and offset mats
5. Supervises a small group of stenographers, typists and clerks engaged in routine clerical operations
6. Performs related duties as assigned
7. Operates standard office machines and duplicating equipment

Supervision Received and Given

Received - oral and written instructions of a general nature from designated superiors

Given - supervision to employees of a lower classification

Minimum Acceptable Qualifications

1. Clerical and general office ability
2. Ability to take dictation at the rate of 80 words per minute, to transcribe the notes or to transcribe from dictation machine belts, discs, tapes, or cylinders at a rate of 40 net words per minute. (This qualification is waived for those positions not requiring these skills)
3. Ability to type from clear copy at a rate of 50 words (net) per minute
4. Desirable supervisory characteristics
5. High school education and/or experience sufficient to perform above duties and responsibilities

Promotional Line

From - Stenographer-Clerk (C-2) or Clerk Typist (C-2)

To - Secretary (C-4)

There are many published definitions of the term "secretary." Among the most frequently quoted are the definitions of the National Secretaries Association (International) and the Charters-Whitley study. The National Secretaries Association[1] describes a secretary in this way:

> A secretary is an executive assistant who works directly with rather than for an executive. A secretary works in a position of confidence. The secrets of the business are in her possession. A secretary can accept responsibility; she doesn't need direct supervision. A secretary knows how to work with people. One of her important functions is to help make necessary contacts between her employer and others. She is a good teamworker and knows how to enlist cooperation. A secretary understands the functions and organizational framework of business organizations and particularly of her employing company. Questions and problems of vital importance related to company planning and activities are frequently referred to her. A secretary understands the nature and significance of her employer's activities in carrying out the objectives of the company. She relieves her employer of interruptions and handles much routine work for him. A secretary has complete mastery of office skills.

The Charters-Whitley study, reported by Tonne,[2] discovered four major duties and traits of a secretary:

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[1]Calling Professional Secretaries (1103 Grand Avenue, Kansas City, Mo.: National Secretaries Association), p. 3.

[2]Herbert A. Tonne, Business Education--Basic Principles and Trends (New York: Gregg Publishing Company, 1939), p. 43.

ACCURACY, attention to details, gets exact information wanted; sees that every letter is perfect; **RESPONSIBLENESS**, does not have to be told everything, doesn't offer alibis, takes on duties without being told; **DEPENDABILITY**, completes work on time, is regular in attendance; **INTELLIGENCE**, grasps ideas easily, writes letters from an outline only, learns new jobs quickly.

Because the University of Michigan calls persons filling the position described on pages 85-86 as Secretaries C-3, the present investigator is therefore also describing them as Secretaries C-3.

Many studies in the business field have used the words "clerical" or "secretary" or "office worker" which are all inclusive terms. Conclusions have been drawn, in regard to office workers generally, based on unanalyzed studies of the work involved and hence inaccurate. The present study was based on a careful analysis of over 1,000 "Requests for Non-Academic Personnel," (Appendix C). These requisitions were analyzed and tabulated by the present investigator. These requisitions were written by department supervisors and were requests on the employment section of the personnel office to furnish the respective departments with office personnel. These job requisitions or job profiles involved the determination

of the qualifications required in the applicants for effective performance on the job. They are an attempt to break the job down into specific requirements set to the demands of the office.

The duties and requirements of the C-3 Secretary stated by the department supervisors on their requisitions for non-academic personnel are grouped in five main divisions and tabulated by the writer in a frequency count, with the most frequently requested requirements coming first in the lists:

A. Clerical

Filing; checking; arithmetical and statistical work; receptionist duties; maintain student, departmental, and fiscal records; processing duplicated materials; telephoning and directing calls; ordering supplies and managing their inventory; handling incoming and outgoing mail; processing purchasing, accounting, plant department, personnel, printing, research, applications, and budget forms; operating spirit, stencil, offset duplicating and photo copying machines; composition of letters and reports; interviewing and directing callers; arranging appointments; distributing registration materials; cataloguing; handling and balancing cash; depositing money at cashier's office; room scheduling; accepting work orders; manuscript preparation; coding; operating small switchboard; assembling admission files; making travel arrangements; arranging conferences; proof reading; billing; preparing departmental payroll; computing students' grade averages; tabulating questionnaires; budget accounting; keeping project accounts.

B. Typewriting

General, technical, and statistical typewriting of letters, memos, requisitions, stencils, masters, mats, rough drafts, charts, lists, examinations, bibliographies, transfer vouchers, reports, class notes, news releases, math equations, contracts, academic and non-academic personnel forms, medical case histories, Government and university forms, records of interviews, schedules, invoices, purchase orders, laboratory records, shop orders, syllabi, scientific papers, acknowledgements, publications, departmental payroll, research proposals, budgets, assignment sheets, notices, data from student records, data from patient records, research information.

C. Shorthand and Machine Transcription

Be able to write and transcribe shorthand; be able to transcribe from belt, disc, tape, and cylinder devices.

D. Personality

Mature; accurate; intelligent; good health; ability to meet and deal with students, faculty, and visitors; nice personality; ability to get along with others; alert; dependable; friendly; reliable; willing to work; cooperative; able to work on her own; responsible; versatile; competent; self-starter; courteous; efficiency; neat appearance; well-groomed; pleasant manner; able to fit in with present staff; interested in work; capable; adaptable; interested in foreign students or international affairs; able to work under pressure; aptitude for detailed work; conscientious; interested in organizing the new position; proficient; willingness to be extremely active; attractive girl; uses good judgment; graceful; tactful; able to deal with scholars; respect for confidential work; non-hyper-sensitive; punctual; even-tempered; high frustration tolerance; well-pleasing voice; careful worker; quick; has initiative; good conduct; willingness to learn; be able to handle interruptions pleasantly;

needs minimum of supervision; industrious; capable; understanding; particular almost to the point of extremity; poised; willingness to carry out minor office routines; successful in public relations; able to keep many ideas in mind simultaneously; not too timid; flexible to meet new situations; patience.

E. Other Requirements

Age factor (older person, someone over 21, 30-35, etc.); educational qualifications (college background, college graduate, high school graduate, etc.); experience qualifications (some administrative experience, some office experience, career type individual, previous knowledge of university helpful, at least one year of secretarial experience, etc.); able to plan and perform a wide range of duties; good vocabulary; good English composition; be well organized; familiarity with graphic arts; able to run an office and supervise others; ability to distinguish between routine and policy; knowledge of Spanish; knowledge of medical terms; know how to set priorities, knowledge of math symbols; arrange weekly coffee hours and other social events; take charge of testing procedures; checking tests; permanent resident; some college training in Zoology; must work in Bangkok, Thailand (S. E. Asian Regional English Project); able to use calculator; good executive ability; learn Dept. of Army regulations and procedures and administration pertaining to ROTC students; able to take dictation from several persons; knowledge of office procedures; be director's "right arm"; better than average; capable of advancement; married; ability to make decisions; knowledge of university policies; errands.

It is for job requirements such as are presented in these five lists that the employment selection tests are used insofar as they are available and supplemented for sections D and E by the interview, checking on references and application form.

The Scope and Purpose of the Clerical Testing Program at The University of Michigan

It was indicated in Chapter I that employment testing is growing as a personnel tool at The University of Michigan. The great majority of applicants for office positions are glad to go through the examination procedure. Many applicants accept the testing situation as an experience in which they can measure their own fitness for a job and welcome this help in determining their potentialities and in measuring their expertness in typewriting and stenography.

For clerical selection purposes the University of Michigan Personnel Office uses a battery of three employment tests: a standardized clerical aptitude test, a typewriting work sample test, and a shorthand work sample test. The latter two tests were designed by the University's personnel officials and use vocabulary that is commonly used in its departments.

The clerical test used is the General Clerical Test published by the Psychological Corporation. This test and the two work sample tests have been steadily used at the University since 1950. Over 12,000 job applicants have been screened by the General Clerical Test at the University Personnel Office. The GCT consists of nine

parts or subtests arranged in three groups: Clerical (checking and alphabetizing); Numerical (arithmetic computation, error location, and arithmetic reasoning); and Verbal (spelling, reading comprehension, vocabulary, and grammar).

The University of Michigan Personnel officials in 1950 chose the GCT as part of its employment testing program because it was a group of several tests and would give scores on such factors as checking and filing, numerical, and verbal, which to the officials seemed to be related to the competencies they were filling. The Personnel Officer and the Employment Interviewer recognized that the subscores would aid in studying the strengths and weaknesses of the applicant both in terms of what jobs needed to be filled and the optimum placement of each hired applicant. Furthermore, the GCT had obvious face validity. It seemed practical that applicants be measured on these skills and abilities. These tasks relate closely to the specifications on pages 89-91.

Proficiency Tests

Along with the GCT, the University of Michigan Personnel Office includes typewriting and shorthand

proficiency tests in its selection battery. These two work sample tests are constructed to measure the competence of applicants for secretarial positions; and permit an objective evaluation of how well an applicant demonstrates his abilities to perform the skills of typewriting and shorthand. These performance, or proficiency, tests seem not only to tap several different aspects of typewriting and shorthand skills but also provide for observation of exactly how an applicant goes about performing the work sample tasks.

The typewriting test provides in one instrument an over all appraisal of the proficiency of the applicant at several tasks typical of those a C-3 Secretary will have such as editing and proofreading a manuscript, preparing a statistical tabulation, centering headings and titles, arranging a footnote, composing and arranging a letter from written instructions and the erasing and correcting of errors. The typewriting test is required of all applicants for clerical positions. The Personnel Officer and Employment Interviewer selected the content for this locally devised work sample test (Appendix B) because they wanted the test materials to contain activities associated with the institution's office jobs. They wanted a test that was related to the production

situation, and wanted the applicant to perform job-like tasks rather than just to type from straight, narrative-style copy.

Part I of the typewriting test presents a 279-word rough draft of the beginning of a footnoted manuscript which includes the organization and tabulation of a three-columnar table with appropriate headings. It is required that all necessary format changes be made and that all errors, known and discovered by the applicant taking the test, be erased on all parts of the test, and it has the advantage of duplicating the actual job situation more closely than if it were a straight copy test. In Part II the applicant is given an opportunity to use his judgment in composing a business letter from given data. The applicant is asked to compose, organize, and typewrite the correspondence, erasing all errors and striving for accuracy in the content of the message. Each part has a point value of 50 points, making a total possible score of 100 points on the complete typewriting test.

Since July 1, 1955, the testing section supervisor has scored these typewriting proficiency tests on the basis of ratings and numerical scores as shown in

Table XIII. The following criteria are used in evaluating the typewriting proficiency test.

Typewriting Proficiency Test Scoring

Part I: Rough Draft of the Beginning of a Footnoted Manuscript - scoring value, 40 points

1. Gross Errors: Defined as those errors which cannot be corrected unless the work is retyped. Penalty - 2 points for each gross error.

    A. Manuscript not double spaced
    B. Table not single spaced
    C. Footnote not single spaced
    D. Omission or addition of word or phrase
    E. Did not make indicated change
    F. Incorrect paragraphing
    G. Table not tabulated
    H. Incorrect columnar headings
    I. Incorrect position and/or length of line separating manuscript and footnote
    J. Figures out of alignment
    K. Incorrect top and side margins of manuscript
    L. Omission of footnote numerical reference in heading of table and/or in footnote
    M. Inclusion of word "river" in body of table
    N. Inclusion of word "outflow" in body of table

2. Minor Errors: Defined as those errors which are correctible or which detract from the form, arrangement, or neatness of the finished work to the extent that the material is acceptable for use but is below the desired standard. Penalty - one point off for each minor error.

    A. Strikeover
    B. Misspelled word
    C. Title of manuscript or table not in caps
    D. Columnar headings not underlined
    E. Incorrect figure
    F. Incorrect spacing between manuscript dividing line and footnotes
    H. Incorrect centering of manuscript title or columnar headings
    I. Poor appearance

Part II: Letter Composition Test - scoring value, 40 points

1. Gross Errors: Defined as those errors which cannot be corrected unless the work is retyped. Penalty - 2 points for each gross error.

    A. Not on letterhead
    B. No date
    C. Incorrect date
    D. Omit word "enclosure"
    E. Less than three lines for signature
    F. Incorrect content because of not following directions
    G. Incomplete content because of not following directions
    H. Incorrect addressee (Adams for Baker)
    I. Incorrect salutation (Adams for Baker)
    J. Incorrect closing line (Baker for Adams)
    K. Incorrect closing line (General Motors for University of Michigan)
    L. Substituting University of Michigan for General Motors in inside address
    M. Substitution of word "dean" for "me" in body of letter
    N. Failure to mention "current year" graduating class

2. Minor Errors: Defined as those errors which are correctible or which detract from the form, arrangement, or neatness of the finished work to the extent that the material is acceptable for use but is below the desired standard. Penalty - one point for each minor error.

    A. Strikeover
    B. Misspelled word
    C. Error in punctuation
    D. Error in hyphenation
    E. Error in grammar
    F. Error in word usage
    G. Poor arrangement of any part of letter
    H. Poor judgment in composition
    I. Addition of irrelevant material
    J. No initials
    K. Poor appearance
    L. Double spacing of inside address

Time Score (Speed)

The time score (speed) for the typewriting proficiency test is based on the number of minutes required to complete the manuscript and letter test. Speed scoring is as follows:

Time	Speed Points
25 or less minutes	20
26-30 minutes	18
31-35 minutes	16
36-40 minutes	14
41-45 minutes	12
46-50 minutes	10

The speed score is added to the accuracy score for a combined speed-accuracy score.

Final tally:

Part I	40 possible accuracy score
Part II	40 possible accuracy score
Parts I and II	20 possible speed score
	100 possible combined speed-accuracy score

TABLE XIII

UNIVERSITY OF MICHIGAN

Personnel Office

Clerical Proficiency Data Sheet

Name _____
Last First Initial

Date _____

Time _____

Typewriting

Point score _____

Time _____minutes

Shorthand

Point score _____

Time _____minutes

Needs In-Service Training In

Letter Format _____

Manuscript Format _____

Capitalization _____

Punctuation _____

Grammar _____

Spelling _____

Erasures _____

Typing Mechanics _____

Remarks

Shorthand Proficiency Test

The shorthand proficiency test (Appendix B) is built on the assumption that a secretary must be able to take ordinary University dictation for reasonably long stretches of time and get out her notes promptly and acceptably. The stenography test is intended to insure that those secretaries hired will have the necessary dictation and transcription skills. The test consists of three types of appropriate dictation at three different levels of dictation difficulty. The abilities built into the test are those important in stenographic work.

The first part is a 122-word letter of medium length, dictated at 60 words per minute. It includes an insertion of a three-column table which must be organized in correct tabular form by the applicant. The letter is composed of terminology representative of the School of Business Administration, and the Admissions Office.

The second part is a 94-word University memo dictated at 80 words per minute with its content related to the University Libraries, and its vocabulary is of a more difficult nature than in the first letter.

The third part is a 113-word University letter dictated at 100 words per minute with its content representative of the materials in offices in the University Medical Center and the various student placement bureaus. A maximum time of 50 minutes is allowed for the transcription of these three dictations.

The qualities which enter into the grading of the shorthand test are the accuracy of the transcripts and the length of time taken for the transcriptions. All transcripts are accepted and graded. A typed transcript is required.

Scoring of Transcriptions

The transcripts are graded according to the following scoring system: two scores are obtained for each applicant taking the shorthand proficiency test. These are a transcription time score and a transcription accuracy score. The time score is secured by keeping a record of the time required by the applicant to transcribe the three letters. Time is calculated to the nearest minute. The transcription accuracy score is a percentage figure, obtained by dividing the number of words transcribed correctly in each letter by the number of words in each letter (122, 94, and 113 respectively).

To obtain the applicant's transcription accuracy score the three percentage figures are added together and divided by three. The percentage score is posted to the shorthand rating scale shown in Table XIII. The transcription time score is also posted to the rating scale.

All applicants for office positions indicating shorthand ability on the application form are encouraged to take the shorthand test. Some persons resist or decline but there is no compulsion to take the shorthand test. A Stenotype machine is available for those applicants trained to take machine dictation. One of the University's outlying personnel units, the University Medical Center, has an additional method of screening secretarial applicants with transcribing machines available for recorded work sample tests using medical terminology.

The University of Michigan Shorthand Proficiency test is described on pages 100-101. There are several shorthand tests published and available. The desirable features of these tests have been combined and incorporated in the University's test, such as Benge's Stenogauge[1] which is a stenographic work sample test that

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[1]G. K. Bennett and R. M. Cruikshank, A Summary of Clerical Tests (New York: The Psychological Corporation, 1949), p. 96.

includes dictation which presses the applicant slightly. The University's test includes three dictations of various speeds--one of which presses most candidates at 100 words per minute. The second part of the Benge examination is checking 50 words for inaccuracy in spelling. The University of Michigan test battery (GCT-V) also includes a spelling section of 50 words to be checked for inaccuracy. Both tests include transcriptions in the form of typewritten letters.

Features of the Blackstone Proficiency Tests[1] which are incorporated in the University of Michigan Shorthand Test include the measurement of various aspects of the knowledge of stenographic work and stenographic transcriptions such as grammar, spelling, punctuation, syllabification, and the typewriting of the dictations.

From the Stenographic Proficiency Test[2] the University of Michigan officials have adapted the method of appraising the product. Each transcribed letter is awarded an accuracy score. In both tests, typewriting,

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[1]Blackstone and McLaughlin, op. cit., pp. 1-9.

[2]H. G. Seashore and G. K. Bennett, The Seashore-Bennett Stenographic Proficiency Test: Manual (New York: The Psychological Corporation, 1946), pp. 2-6.

shorthand, and English errors are counted and penalized.

A desirable feature of the Richardson and Pedersen's SRA Dictation Skills test[1] which is included in the University of Michigan test is the fact that the various test letters are presented at increasing speeds with the first at 60 words per minute and others at 80 and 100 words per minute.

The Time Factor and the Sample

The sample for this study is restricted to 165 classification C-3 Secretary female employees tested and hired between June 1, 1958, and September 30, 1959, at the University of Michigan Personnel Office. For purposes of evaluating job performances of these subjects, the time factor was from December 1, 1958 to May 31, 1960. The 165 subjects were selected from a total of 1,776 applicants. The sample includes all of the C-3 Secretary applicants.hired during this 16-month period. This particular 16-month period was chosen for this investigation because it included two July 1 dates, in which no "across the board" pay

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[1]Bennett and Cruikshank, op. cit., p. 93.

increases were authorized, and in which therefore pay increases were given on the basis of merit. This investigation focuses attention on the C-3 Secretary, but a great many of the findings and recommendations are applicable to all office and clerical workers at the University. The writer, believing that the University of Michigan personnel testing program is a typical program similar to many in other organizations, and that its secretarial jobs are also similar to those in other organizations, thinks that the findings and recommendations can be useful in identifying successful or potentially successful office employees. It seems likely that some of the things being done in personnel research at the University of Michigan could apply to comparable organizations elsewhere.

Out of the total sample of 165 secretaries, 107 employees, or 65 per cent, were still employed at the University of Michigan at the cut-off date of this study, May 31, 1960; and 58 employees, or 35 per cent, had terminated their employment. All 58 separatees left voluntarily; none was terminated by the University officials.

The average age of the 165 secretaries in the total sample at the date of hire was twenty-three years.

The ages ranged from 17 years to 53 years. The average age of the 16 secretaries who received job classification promotions during the time of this study was 31.13 years and the average age of those secretaries who did not receive promotions was 22.13.

Sixty-three per cent of the subjects were married at the time of hire, thirty-three per cent were single, and four per cent were widowed, divorced or separated.

The education of the subjects ranged from an elementary school graduate to holders of Master of Arts degrees. The education background of the 165 secretaries is shown in Table XIV.

The following steps were taken in the selection of the subjects for the sample:

A. From the official hire form, "Notice of Employment," #7091 (Appendix C), a master list of 165 C-3 Secretary employees was made which included all C-3's hired during June 1, 1958 - September 30, 1959.

B. Two sub-sample groupings were made.

1. Current - 107 subjects, 65 per cent of the total sample

2. Resigned - 58 subjects, 35 per cent of the total sample

C. The amount of the annual salary for each secretary and any change in salary for any subjects were taken from form #7091 and form #7092 (Appendix C) and transferred to the master work sheet.

Gathering the Tests' Scores and Non-test Data from Employees' Personnel Folders

All of the 165 subjects in the sample had taken the GCT and the typewriting test, while 90 applicants, 54 per cent of the total sample had also taken the shorthand work sample test. The distributions of test performance scores are shown in Tables XV through XXI.

It will be noted that all levels of test performance are represented in all three test score distributions. For statistical purposes the writer assigned zero, "0", shorthand scores for those applicants who were hired as secretaries, but who did not qualify to take the shorthand test. The methods of transferring the non-test data found on the employment application form in each of the subject's personnel folders to the master work sheets were as follows.

A. Age

The actual age at the time of application was transferred, i.e., an age of 18 was transferred as 18.

TABLE XIV

EDUCATION OF SECRETARIES, C-3, HIRED BETWEEN JUNE 1, 1958, AND OCTOBER 1, 1959, AT THE UNIVERSITY OF MICHIGAN

Education	Current Sample N=107		Resigned Sample N=58		Total Sample N=165	
	No.	Per cent	No.	Per cent	No.	Per cent
M. A.	1	.93	2	3.44	3	1.82
B. A.	25	23.36	15	25.86	40	24.24
3 years university	9	8.41	3	5.17	12	7.27
2 years university	15	14.01	11	18.96	26	15.76
1 year university	13	12.14	8	13.79	21	12.73
high school graduate	43	40.18	19	32.75	62	37.58
elementary school graduate	1	.93	0	0	1	.61
Totals	107	99.96	58	99.97	165	100.01
also attended business college	17	15.88	9	15.51	26	15.76

B. Education background

The past educational experiences of the applicants were coded as follows:

Code	Education
1	High school graduate or less
2	High school graduate plus business school graduate
3	High school graduate plus 1 year of college
4	High school graduate plus 2 years of college
5	High school graduate plus 3 years of college
6	High school graduate plus baccalaureate degree
7	High school graduate, baccalaureate degree plus master's degree

The Criteria for Evaluating Job Performance

The criteria for evaluating job performance selected by the writer for this study are:

A. Supervisors' ratings

B. Salary increases

C. Work sample evaluations

These criteria of job performance are selected by the writer with an awareness of their strengths and faults and that other alternatives might be available. Some of the considerations that tipped the balance in favor of Supervisors' Ratings, administrative actions related to Salary Increases, and Work Sample Evaluations over such criteria as training grades, job stability or length of service, and rate of advancement are:

1. Supervisors' Ratings, Salary Increases and Work Samples can all be translated into quantitative terms in order that accurate comparisons can be made between the individuals, and in order that each individual's performance can be evaluated against common standards of performance.

2. These criteria represent measures of performance in limited samples of behavior (Work Samples) as well as summary evaluations based on an over-all record of the individual's job performance (Supervisors' Ratings and Salary Increases).

3. These measures of job performance are available and can be secured under representative and uniform conditions. The ratings and administrative actions related to salary increases are in written form and located in the Personnel Office files; and the work samples are available in the campus offices. It should be remembered that the Work Sample criterion, which is a longer, follow-up criterion, did entail a loss in the number of available subjects, 165 to 107, but still represents a moderately-sized sample.

The University of Michigan carries on a merit rating of office employees by means of a scale which rates employee progress under headings as personal

qualities, performance factors, intelligence, leadership, and capacity and ambition for future growth. (Appendix D)

The foremost aim of the Progress Report rating scale and Progress Report interview is to improve the employee's job performance. The ratings also play an important part in determining salary increases and promotions.

Conscientious and studious attention to the Progress Report and interview by the employer are sought for because they serve also to improve supervisory techniques and appraisals, better communication with employees, to better employee morale, to determine fitness of employee for continued employment, facilitate transfers, and develop employees in line with their interests.

The Progress Report evaluation rating at the University of Michigan is the only formal evaluation interview between a secretary and her supervisor. By taking such action the University of Michigan is one of the progressive organizations as indicated by the Bureau of National Affairs,[1] which surveyed 140

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[1]Bureau of National Affairs, Inc., "Job Evaluation," Survey No. 40, Personnel Policies Forum (December, 1956), p. 1.

companies in 1956 and discovered that 41 per cent, or 57 firms, carried on formal merit ratings of their employees.

The evaluation interview is held at the completion of the six-month probationary period of the new employee of the University of Michigan. To prompt the department supervisor to have this evaluation conference with his secretary, the personnel office sends a reminder to the supervisor at the appropriate time. It is the responsibility of the supervisor to begin the evaluation process, and he has the option of giving the employee an oral and written statement of his job performance. It is recognized that a supervisor's rating may vary from time to time, depending on various conditions and that he may be influenced in his rating by his general attitudes toward the person unless he is careful to guard against it.

As a criterion, supervisory judgments in the form of ratings are more frequently used in validation studies of employment tests than any other measure because ratings can usually be secured, and because supervisors are willing to appraise their employees. Our ratings at the University of Michigan are used for salary increases and other personnel purposes. The personnel

officials and department supervisors recognize that the ratings sometimes reflect other things besides performance such as department budget limitations and encouragement of an inter-departmental transfer.

The factors graded by the supervisors and included in this study were quality of work, quantity of work, intelligence (ability to learn new duties, initiative and originality, judgment and common sense), and capacity and ambition for future growth.

The ratings were coded as follows:

Poor	0
Fair	25
Good	50
Very Good	75
Excellent	100

One other official rating of an employee which is an action involving only the departmental supervisor is the terminal or "exit" rating of each employee. The "notice of separation" form, #7043 (Appendix C), was used in this study when the subject in the sample resigned before her scheduled progress report evaluation interview. Both the "notice of separation" and Progress Report form contain the same rating factors.

Salary Increases

The second dimension or standard which provided the framework for evaluation of job performance of this

study included administrative actions related to salary increases. Merit salary increases for secretaries are initially recommended or not recommended by the department heads to the personnel officer of the University. The latter official makes the final decision taking into cognizance budget allocations, budget balances, progress report ratings and the salary manager's analyses of the total salary administration program. In 1958-1959 all salary increases were merit increases since there were no general "across-the-board" increases during the period.

Table XXVII shows the frequency and distribution of salary increases which were given to the 165 secretaries. The average increase was $195.18. Seven per cent of the subjects received raises higher than $500 with 93 per cent achieving raises lower than $500. Thirty-six subjects, 22 per cent of the sample, received no raises during this period. Job classification changes for 16 subjects, 10 per cent of the sample, are reflected in these salaries. It is usual for salaries to be raised whenever an employee is given a higher job classification.

Work Sample Evaluations

The third criterion used to evaluate job performance and included in this study was that index known

as a work sample. Samples of the secretaries' job production were analyzed and rated.

For the purposes of this study, a work sample will be defined as a specimen of the work of a Secretary C-3. The work specimen was standardized in such a way that tasks were selected that were common to all Secretary C-3 positions.

The work samples were selected by the supervisor of the In-Service Training Program of the University of Michigan in cooperation with the supervisors of the 107 experienced employees in the current sample. The 58 subjects in the resigned sample were absent and no longer available to have current work sample evaluations made of their work.

The specimens selected for inspection were examples of tasks that we were looking for during the employment testing process. These tasks were related to shorthand transcription, typewriting, and clerical proficiencies. Among the specimens examined were transcriptions of letters, reports, or memoranda transcribed from written or machine shorthand; examples of typewritten manuscripts, statistical tables, reports, university requisitions and forms, cards, charts, graphs, and bibliographies.

Development of Work Sample Scoring

Two types of job specimens were inspected--original and carbon copies of work. Approximately 30 work specimens were inspected, analyzed, and scored for each subject. Conferences were held with the supervisors of the 107 secretaries to determine the kinds of specimens done, and the specimens were taken from the secretaries' out-baskets, the supervisors' files, and the secretaries' files. The job specimens were scored for errors, itemized, and tallied on the following scoring chart:

Work Sample Scoring Tally

	Perfect specimens no penalty	Corrected specimens penalty=1	Uncorrected specimens penalty=5
Tabulations			
Original Letters			
Carbon copies of letters			
Original memos			
Carbon copies of memos			
Reports			
Bibliographies			
Manuscripts			
Book lists			
University business forms			

The Work Sample Score was determined by subtracting the penalty score from 100. The work sample score was indicated on a 100 point scale as the following:

Excellent	Good	Fair	Poor	Unacceptable
100	75	50	25	0

Following the job specimen analyses and work sample evaluation, the subject's work sample score was posted to the master work sheet.

Select a Method of Validation

It is of utmost importance in any employment testing program to use only tests that have themselves been tested, or to make provision for testing tests before finally accepting them as valid devices for employee selection and placement. There are many ways to arrive at a judgment as to the validity of a test. For instance, the easiest, though perhaps not the least expensive, is to rely on the analysis of a consulting psychologist and to submit the test to him from time to time for reexamination and revision.

Two further methods are sometimes used. In the first place the organization inquires concerning the experience of other companies with tests given to their employees who do comparable work. In the second place members of a staff take a test, and the president of the firm rates the results upon his experience with the subjects; or the president accepts other pragmatic validations available to him.

Another method used in testing the tests is when the organization compares general experience or statistics before and after the installation of tests with respect to such matters as productivity, spoilage, absenteeism, accidents, grievances, and labor turnover.

The present investigator believes that there may be a wide margin of error in several of the above methods and that the following two methods may provide fairly reliable guides as to the validity of a test.

The most scientific and most expensive way is to give a test to a group of applicants and place all applicants (satisfactory and unsatisfactory) on jobs without the benefit of using the test scores. After a six-month or one-year period, correlate the results of the test scores with the work of the employees in the group. The work of the employees is gauged on the basis of one or more standards such as: quality of work, speed or quantity of work, attendance record, length of service, merit rating, promotion or advancement.

The method used by this investigation is often called the "follow-up" validation method. This method requires comparison of selection data with current performance of employed workers. This kind of after-the-fact selection study is less expensive than other methods,

and it leads to knowledge of what to look for in applicants yet to be screened. The selection data used were three tests (GCT, Typewriting and Shorthand) plus Age and Educational background factors. These measures were compared with the criteria of Supervisors' Ratings, Salary Increases, and Work Sample Evaluations. The present investigator believes that, if a test stands up under this type of validation, it will have even more predictive power than indicated by this group when it is used with a group of applicants. Consequently, if a test is shown to be valid on a group of workers, it means that it is capable of distinguishing varying amounts of ability through a somewhat restricted range; and inasmuch as the variations in ability will be greater among applicants, the test will have greater discriminatory power when used with them. If the test shows a low predictive power on a group of established workers, this is not a sure sign that it is worthless. Effectiveness of prediction is to be interpreted in terms of degree and not as an all-or-none phenomenon.

A description of the information obtained in the hiring process and the subsequent performance on the job for the 165 subjects in this investigation will be

presented in Chapter IV, and the relative accuracy of the predictors in differentiating the standards of job performance determined from statistical analysis will be described in Chapter V.

CHAPTER IV

DESCRIPTION OF INFORMATION OBTAINED IN HIRING PROCESS AND THE SUBSEQUENT PERFORMANCE ON THE JOB

Introduction

This part of the study is a description of the test scores, age, and educational background of 165 secretaries employed in offices of the University of Michigan; and a description of the evidences of job performance or criteria scores. These materials are presented in order to describe the information obtained in the hiring process for the subjects of this investigation and their subsequent performance on the job.

Since this study is an empirical test of a University personnel office, much of the emphasis is on the value of the information on which management, administrative, and counseling decisions are to be made. Insofar as factors involved would pertain to other organizations much of the data described may be useful for personnel and educational officials elsewhere.

The distributions and frequencies of scores are presented in the sequence in which they have been described in Chapter III.

The General Clerical Test Scores

The GCT results for each subject in the sample were obtained from the employee's employment folder in the files of the Records Section of the Personnel Office. The highest score possible on this test is 243 points. These points are divided as follows among the three subtests:

Part I	19	
Part II	61	
Subtotal C (Clerical Section)		80
Part III	20	
Part IV	20	
Part V	16	
Subtotal N (Numerical Section)		56
Part VI	29	
Part VII	14	
Part VIII	40	
Part IX	24	
Subtotal V (Verbal Section)		107
TOTAL		243

Table XV presents the distribution of GCT scores for the study sample. The raw scores ranged from a low of 82 to a high of 232, with 80 subjects scoring above the mean of 165.92, and 85 subjects scoring below the mean. The median score was 164 and the modal score was 150.

The 16 secretaries who received job classification promotions during the time of the present investigation

TABLE XV

DISTRIBUTION OF RAW SCORES ON THE GENERAL CLERICAL TEST FOR THE TOTAL SAMPLE*

Range and Scores	Frequency
221 - 232	1
211 - 220	6
201 - 210	10
191 - 200	13
181 - 190	18
171 - 180	21
161 - 170	19
151 - 160	32
141 - 150	17
131 - 140	15
121 - 130	9
111 - 120	3
101 - 110	0
91 - 100	0
81 - 90	1

*N=165
Mean, 165.92
S. D., 25.64

had a GCT range of 118-219, with a mean score of 173.1, which is 8 points higher than the mean score of 165.1, for the 149 secretaries who did not receive job classification promotions.

The clerical subtest of the GCT is based on speed and accuracy in routine clerical tasks. It consists of a name and number checking test and an alphabetizing-filing test. The highest score possible on this subtest is 80 points. Table XVI presents the distribution of the GCT clerical subtest scores for the study sample. The raw scores ranged from 22 to 79 with 77 subjects scoring above the mean score of 52.16, and 88 subjects scoring below the mean.

Among the clerical tasks most frequently performed by C-3 secretaries at the University of Michigan are filing, alphabetizing, checking names and records of students, faculty, and staff; telephoning; opening, sorting and handling mail; collating and stapling; coding; sorting; copying; posting; classifying and categorizing materials; filling in forms by hand and/or the typewriter. The description of the job, C-3 Secretary, is reviewed on pages 85-86.

The GCT numerical subtest score results from three kinds of numerical tasks which are generally met

TABLE XVI

DISTRIBUTION OF RAW SCORES ON THE GENERAL CLERICAL TEST CLERICAL SUBTEST FOR THE TOTAL SAMPLE*

Range and Scores	Frequency
76 - 79	4
71 - 75	8
66 - 70	16
61 - 65	13
56 - 60	20
51 - 55	24
46 - 50	29
41 - 46	23
36 - 40	18
31 - 35	6
26 - 30	2
21 - 25	2

*N=165
Mean, 52.16
S. D., 11.78

in clerical work and which are essential in some positions: arithmetic computation, error location and arithmetic reasoning.

Table XVII presents the distribution of the GCT numerical subtest scores for the study sample. The raw scores ranged from 10-54, with 83 subjects scoring above the mean score of 32.44, and 82 subjects scoring below the mean.

Among the numerical tasks most frequently performed by C-3 Secretaries at the University of Michigan are calculating requisitions, purchase orders, time cards, travel vouchers, departmental and research project budgets, tabulating and posting data in various record books, checking calculations, adding, subtracting, multiplying and dividing on machines.

The GCT Verbal subtest is a measure of language skills which are extremely important in secretarial positions and relevant in many others. It consists of tests of spelling, reading comprehension, vocabulary, and grammar.

Table XVIII presents the distribution of the GCT Verbal subtest scores for the study sample. The raw scores ranged from 42 to 105, with 85 subjects

TABLE XVII

DISTRIBUTION OF RAW SCORES ON THE GENERAL CLERICAL TEST NUMERICAL SUBTEST FOR THE TOTAL SAMPLE*

Range and Scores	Frequency
51 - 54	1
46 - 50	7
41 - 45	16
36 - 40	41
31 - 35	38
26 - 30	28
21 - 25	22
16 - 20	10
11 - 15	1
6 - 10	1

*N=165
Mean, 32.44
S. D., 7.90

TABLE XVIII

DISTRIBUTION OF RAW SCORES ON THE GENERAL CLERICAL TEST VERBAL SUBTEST FOR THE TOTAL SAMPLE*

Range and Scores	Frequency
101 - 105	11
96 - 100	13
91 - 95	14
86 - 90	28
81 - 85	24
76 - 80	28
71 - 75	14
66 - 70	11
61 - 65	15
56 - 60	3
51 - 55	2
46 - 50	1
41 - 45	1

*N=165
Mean, 81.29
S. D., 12.60

scoring above the mean score of 81.29, and 80 subjects scoring below the mean.

Among the verbal tasks most frequently performed by C-3 Secretaries at the University of Michigan are reception duties, telephoning; composing letters, memos and reports; reading and screening all types of written materials such as correspondence, bibliographies, class lists; proofreading; dictionary usage; taking and transcribing dictation fusing shorthand, grammar, spelling, and typewriting.

Percentile Norms

The most common method by which the test scores of an individual may be evaluated is through the use of percentile norms. To establish such norms for this study, the writer arranged the 165 GCT scores found in this investigation from the lowest to the highest and divided the 165 cases by 100, thus including approximately 2 cases at each percentile. He then found the test scores that corresponded to particular percentile values and made up the percentile table shown in Table XIX. Future applicants' scores may be compared to this standard.

In order to provide a frame within which this investigation's sample may be viewed and whose GCT scores

may be interpreted, Table XIX is presented, indicating what per cent of the group the individual raw scores surpassed. In the last analysis, the most meaningful norms are the local norms, those which are prepared by an employer for specific jobs within his own organization or by a counselor for his community. The University of Michigan Personnel officials have been using published norms of other organizations since 1950, but Table XIX may be used as a standard for interpretation of GCT scores established for employed secretaries in their own organization.

Typewriting Proficiency Test Scores

It is the desire of the employment officials of the University of Michigan to make their typewriting proficiency tests as predictive as possible of ultimate job performance. The typewriting test scores are used in differentiating between applicants who possess the requisite typewriting skill, and ranking the qualified applicants in order of ability from the highest to the lowest.

The frequency distribution of typewriting test scores is shown in Table XX. The raw scores range from 25 to 100, with the mean score, 69. One-hundred seven

TABLE XIX

PERCENTILE EQUIVALENTS FOR THE CLERICAL (C), NUMERICAL (N) AND VERBAL (V) SUBSCORES AND FOR THE TOTAL (T) SCORE OF THE GCT

PERCENTILE	C	N	V	T
99	79	54	105	232
95	72	45	101	209
90	69	42	98	202
85	67	41	96	197
80	64	39	90	190
75	61	38	88	185
70	59	37	87	181
65	57	36	86	178
60	55	35	84	173
55	54	34	83	169
50	51	33	82	164
45	49	32	81	159
40	48	31	79	157
35	47	30	77	154
30	45	29	76	152
25	44	27	72	150
20	43	25	71	145
15	40	24	66	139
10	37	23	63	136
5	35	19	61	125
1	22	10	42	82
N	165	165	165	165
Mean	52.16	32.44	81.29	165.92
S. D.	11.78	7.90	12.60	25.64

TABLE XX

DISTRIBUTION OF RAW SCORES ON THE TYPEWRITING PROFICIENCY TEST FOR THE TOTAL SAMPLE*

Range and Scores	Frequency
91 - 100	12
81 - 90	8
71 - 80	81
61 - 70	9
51 - 60	17
41 - 50	32
31 - 40	1
21 - 30	5
11 - 20	0
0 - 10	0

*N=165
Mean, 69.00
S. D., 15.76

subjects received scores higher than the mean score; while 58 subjects received scores below the mean score.

Shorthand Proficiency Test Scores

The shorthand proficiency test distribution scores are shown in Table XXI. The shorthand test is a short-cut method for the prediction of shorthand job performance and is a work sample involving competence in shorthand, typewriting, and business English.

Out of the total sample population of 165 subjects, 45 per cent, or 75 subjects did not attempt the shorthand test. For statistical purposes for this study, these persons were assigned zero scores on the shorthand test. On page 200 is a statistical analysis for a sample composed only of the shorthand test subjects which numbers 90 secretaries.

Non-test Data

As explained on pages 107-109 the variables, Age and Education, were included as non-test predictive data in this study. Age was assigned the exact value as stated on the application form, and the

TABLE XXI

DISTRIBUTION OF RAW SCORES ON THE SHORTHAND PROFICIENCY TEST FOR THE TOTAL SAMPLE*

Range and Scores	Frequency
91 - 100	6
81 - 90	2
71 - 80	32
61 - 70	3
51 - 60	2
41 - 50	27
31 - 40	5
21 - 30	12
11 - 20	0
0 - 10	76

*N = 165

75, or 45.45 per cent, did not take the shorthand test as part of the total battery and the writer arbitrarily assigned zero scores to this group. A special analysis for a shorthand sample composed of the 90 shorthand test subjects is shown on Page 200.

Mean, 33.09
S. D., 34.18

amount of education of each examinee was assigned a number value starting with a high school graduate receiving "one" and ranging up to a person with a Master's degree receiving "seven."

The average age of the subjects in the sample was 23 years. The ages ranged from 17 to 53, with a standard deviation from the mean of 6.6. The average age of the secretaries who received job classification promotions during the time of this investigation was 31.13 years. This compares to an average age of 22.13 for the secretaries who did not receive job promotions.

The second non-test factor, education background, was used as an independent variable in the present study so as to discover the predictive power of this factor in the selection process of secretaries. Because of its location in one of the largest university communities in the country, the University of Michigan is able to hire a larger number of college and university educated secretaries than most companies across the nation. On page 108 it was explained that 26 per cent of the sample had earned baccalaureate degrees. This can be compared to a 12 per cent figure found in Zaugg's study[1] covering

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[1]Zaugg, op. cit., p. 80.

a national group of secretaries taking the 1959 Certified Professional Secretary examination, sponsored by the Institute for Certifying Secretaries, a project of the National Secretaries' Association, International.

The mean educational background for the 165 secretaries in this study is 3.41, which when decoded, results in an education average of a high school graduate plus one and one-half years of college or university training for all subjects. The 16 secretaries who received job classification promotions during the time of this investigation average two and one-half years of university or college education compared to an average of one and one-half years for the 149 secretaries who did not receive promotions.

Composite of Independent Variables

In order to describe the subjects in this study as determined from the sample, Table XXII is presented. To the extent that other groups resemble this sample, the results are applicable.

Description of Criteria Scores

These predictive devices just described in this chapter are used in employment offices to select applicants who will later prove to be good employees.

TABLE XXII

CHART OF MEANS AND STANDARD DEVIATIONS
FOR THE INDEPENDENT VARIABLES
FOR 165 SECRETARIES

Variable	Mean	S.D.
GCT clerical subtest	52.16	11.78
GCT numerical subtest	32.44	7.90
GCT verbal subtest	81.29	12.60
GCT total	165.92	25.64
Typewriting proficiency test	69.00	15.76
Shorthand proficiency test	33.09	34.18
Age	23.00	6.61
Educational background	3.41	2.02

Their merits as employment techniques will be judged by how closely they correlate with available evidences of competence in subsequent office behavior. The evidences of competence or criteria used in this study follow, and are described in order to show the complexity of evaluating job performance. The following criteria serve as indicators or measurements of the essential tasks on the job for this study.

Supervisor's Rating Scores

Supervisors indicated on a progress report or termination report rating scale the performance of their employees in the study sample. The two performance factors graded were "quality of work" and "quantity of work."

The quality of "intelligence" and the employee's capacity and ambition for future growth were also graded.

A majority of the supervisors at the University of Michigan are professors in the academic offices and have had experiences and training in the grading of performance; and, therefore, it can be assumed that they are more alert to the problems of rating people and are likely to give consideration to it. The other supervisors are associated with medicine, research, science,

technology, and the business offices. An investigation of the validity of ratings is broad enough for a separate study. For this investigation it must be assumed that they are valid since they are the judgments on which employees are retained, promoted, or transferred.

The ratings were given numerical values as follows:

Excellent	=	100
Very Good	=	75
Good	=	50
Fair	=	25
Poor	=	0

Quality of Work Scores

The performance factor "quality of work" is described in the progress report (Appendix D) as follows:

"Consider such factors as accuracy, neatness, technical precision, and ability to organize and expedite work."

To further guide the rater in judging the employee, the progress report gives five degrees of evaluation on the rating scale. These degrees range from the lowest rating "work almost worthless," to the highest rating "outstanding in all respects."

The distribution of the quality of work ratings is shown in Table XXIII. One-hundred fifty-seven ratings out of the sample of 165 received "good, very good, or excellent" grades. These supervisory ratings indicate

TABLE XXIII

DISTRIBUTION OF THE SUPERVISORS' RATINGS OF SECRETARIES' QUALITY OF WORK PERFORMANCE*

Range and Ratings	Frequency
Excellent	26
Very Good	80
Good	51
Fair	7
Poor	1

*N=165
Mean, 68.64
S. D., 19.35

that, except for only eight employees, the supervisors and their staffs were favorably impressed with the quality of performance of the secretaries in their offices. The mean score of the ratings is 68.64, with 102 subjects scoring above the mean score, and 63 scoring below. The raw scores range from zero to 100.

Quantity of Work Scores

The University of Michigan progress report describes the factor of "quantity of work" as follows:

"Consider volume of work produced under normal conditions, disregard errors."

Again, each supervisor had the opportunity to rate the employee on a five-point rating scale. The lowest evaluation, "very slow worker," ranges to the highest category, "rapid worker." Table XXIV gives the distribution of rating scores.

Out of the total sample of 165 subjects, 159 were rated "good, very good or excellent." Only six subjects were rated "fair," and none was rated "poor."

The quantity of work scores ranged from 25-100, and the mean score was 72.21, with 112 subjects scoring above the mean and 53 below the mean.

TABLE XXIV

DISTRIBUTION OF THE SUPERVISORS' RATINGS OF SECRETARIES' QUANTITY OF WORK PERFORMANCE*

Range and Ratings	Frequency
Excellent	40
Very Good	73
Good	46
Fair	6
Poor	0

*N=165
Mean, 72.21
S. D., 20.12

Intelligence Factors' Scores

South[1] states that intelligence is generally considered to be the capacity of people to meet new situations quickly and successfully; the ability to sense a problem, to make an effort to solve the problem, and to judge ones attempted solution.

In the University of Michigan progress report, intelligence is summarized under three headings:

A. Ability to learn new duties

B. Initiative and originality

C. Judgment and common sense

The supervisors had a five-point rating scale to grade each of these factors describing "intelligence." The "intelligence" rating represents a composite of the three separate ratings; each given equal weight.

The distribution of intelligence ratings is shown in Table XXV. The scores range from 8-100 with the mean score, 68.70. There was a more nearly normal distribution for the intelligence ratings than for the others. This is probably due to the fact that the supervisors had three ratings to make, rather than just

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[1]Earl Bennett South, A Dictionary of Terms Used In Measurements and Guidance (New York: The Psychological Corporation, 1938), p. 43.

TABLE XXV

DISTRIBUTION OF THE SUPERVISORS' RATINGS OF SECRETARIES' INTELLIGENCE*

Range and Ratings	Frequency
Excellent (87.5-100)	25
Very Good (62.5-87.4)	80
Good (37.5-62.4)	45
Fair (12.5-37.4)	13
Poor (0-12.4)	2

*N = 165
Mean, 68.70
S. D., 18.59

one. Eighty-one subjects were rated above the mean score and 84 were given ratings below the mean. The ratings ranged from 8 to 100. Fourteen secretaries were given ratings of "100" in intelligence.

Capacity and Ambition for Future Growth Ratings

Potentiality for future advancement of a secretary, both in the department now employed and the University of Michigan, comes up for review in the progress report. A five-point scale has the following degrees of evaluation:

Going backward (Poor)
Questionable (Fair)
Has reached most suitable job (Good)
Should be considered for promotion in his department (Very Good)
Should be considered for promotion in the University (Excellent)

The ratings, shown in Table XXVI, when changed to numerical symbols, ranged from zero to 100, with a mean score of 67.21, which is the lowest mean score in any of the ratings made by the supervisors. Out of the total sample of 165 secretaries, 103 were rated above the mean score, and 62 were given ratings below the mean. Twenty-five secretaries were given ratings of 100, which indicates to the personnel officials that University supervisors feel that 25 secretaries perform well enough

TABLE XXVI

DISTRIBUTION OF THE SUPERVISORS' RATINGS OF SECRETARIES' FUTURE GROWTH POTENTIAL*

Range and Ratings	Frequency
Excellent	25
Very Good	78
Good	50
Fair	10
Poor	2

*N=165
Mean, 67.21
S. D., 21.00

to be transferred to positions demanding more responsibility than now being used, and can be used for "promotion from within" subjects. Only two secretaries out of 165 were rated as "going backward."

A Description of the Salary Increases for This Sample

Salary Increases are being used as a criterion in this study. This is not a common or universal practice. In fact, Cronbach[1] in listing criteria used in personnel research in 1946-47 does not even mention it as a criterion.

Cronbach discovered in reviewing studies reported in the Journal of Applied Psychology the following validating criteria and their frequency: ratings by instructor or superior (14), other test on same function (13), school or training grades (11), clinical diagnosis (5), laboratory or clinical measure of the same function (2), job turnover (2), objective measure of job performance (1), school examination (1), accident rate on job (1), interview with subject (1).

Other criteria which on occasion may be suitable are number of promotions within a given period of time,

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[1]Lee J. Cronbach, Essentials of Psychological Testing (New York: Harper and Brothers, 1949), p. 57.

job classification attained, and salary achieved after a given number of months.

More and more attention is being given in personnel offices to establishing criteria for evaluating performance on the job. This is particularly important for certain jobs where there are a great many patterns of responsibility differing from job to job, or from person to person.

The writer has included Salary Increases as an evaluative measurement of the work performance and indication of the success (or failure) of the 165 subjects in this sample because they reflect for each subject a composite of the number of promotions, job classification attained, and ratings of personnel officials and supervisors; and because they represent a quantitative score which provides another index or discrimination of differences in proficiency.

The administrative actions of the University of Michigan personnel officials in deciding to give increases in pay to secretaries because of competence in their job performance implies a rating; but these ratings differ from the others discussed in this study, however, in their immediate practical importance. Something is clearly being done on the basis of the rating. An

increase in the secretary's pay check is decided upon, and the investigator anticipates from this that the evaluation will be made more thoughtfully and conscientiously than when rating is merely an administrative chore. Relevant records and training grades are consulted, discussions and testimonies are assembled and weighed.

The Progress Report (Appendix D) has the scales for Supervisors' Ratings as well as a judgment for promotion and/or salary increases. This recommendation to salary has probably had more thought and attention than the earlier part of the report dealing with ratings of performance. Tables XXVII and XXVIII reflect some of the strong influences on salary increases at the University of Michigan such as job classification changes, tenure of secretaries, department and university budgets.

The term "salary increases" as used in this study is defined as all additions to the amount of salary assigned to each subject at the time of employment. The period, June 1, 1958--May 31, 1960, was chosen by the writer for salary increase consideration. This period permitted every subject an opportunity to

be employed for at least one progress report evaluation date resulting in one opportunity for a salary increase. There were no "across-the-board" salary increases during this period. The salary increases are administrative actions of the personnel officials in cooperation with department heads. The range and salary increases' distributions are shown in Tables XXVII and XXVIII. The range of the salary increases for the total sample was $0 (zero) to $1272. The average salary increase was $195.18.

TABLE XXVII

DISTRIBUTION OF SALARY INCREASES FOR TOTAL SAMPLE POPULATION*

$0-119	120-200	201-300	301-400	401-500	501-600	601-700	701-1272
$$$$$	$$$$$	$$$$$	$$$$$	$$$$$	$$$$$		$$$$$
$$$$$	$$$$$	$$$$$	$$$$$	$	$		$
$$$$$	$$$$$	$$$$$	$$$$$				
$$$$$	$$$$$	$$$$$	$$$$				
$$$$$	$$$$$						
$$$$$	$$$$$						
$$$$$	$$$$$						
$$	$$$$$						
	$$$$$						
	$$$$$						
	$$$$$						
	$$$$$						
	$$$$$						
	$						
37	71	20	19	6	6	0	6

$ = 1 subject Range = $0-$1272 (36.05% increase for highest in range)
Mean = $195.18
Total amount of salary increases = $32,204

Table XXVII indicates that 65.4 per cent of the sample received salary increases below $201 and that 7.2 per cent received salary increases over $500. Every secretary who was given a salary increase over $500 was also given a higher job classification. There were 16 secretaries who advanced from C-3's to C-4's, C-5's and administrative assistants. Thirty-six secretaries, 22 per cent of the sample, received zero ($0) salary increases. Thirty-four of these 36 persons who did not receive salary increases were secretaries in the resigned sample, while two secretaries from the current sample did not receive salary raises, which suggests that tenure tends to be reflected in the awarding of salary increases at the University of Michigan.

Table XXVIII describes the distribution of the Salary Increases at the time of the first opportunity (usually six months from date of hire) for the 107 secretaries in the current sample used in this investigation. Table XXVIII permits these observations.

1. About 50 per cent (53 secretaries) received the "regular" $120 Progress Report time (six months from date of hire) salary increase.
2. Thirty secretaries (28 per cent) received salary increases between $121-200.

3. Sixteen secretaries (15 per cent) received salary increases higher than $200.

4. The salary increase range was $0-$720.

5. Seven secretaries (3 shorthand writers and 4 typewriter shorthand writers) or 6.5 per cent, did not receive any salary increase at the time of their first opportunity.

Work Sample Evaluation Scores

Actual samples of work performance [illegible] the objective criterion of work proficiency [illegible] needed for the evaluation of the validity [illegible] measures, General Clerical test, typewriting and shorthand selection tests, age, and education [illegible] In using work samples as a basis for making [illegible] of the proficiency of the secretaries in the [illegible] group, care was exercised in using materials [illegible] tive of the secretarial jobs studied. [illegible] there was a description of the job classification Secretary C-3, and an analysis of over 1,000 requisitions. From these sources it was indicated the major duties and responsibilities were taken transcribing dictation by shorthand or transcription machine, and typing letters, manuscripts [illegible]

TABLE XXVIII

DISTRIBUTION OF SALARY INCREASES FOR CURRENT SAMPLE (107 SUBJECTS) AT THE TIME OF THE FIRST SALARY INCREASE OPPORTUNITY (SIX MONTHS AFTER DATE OF HIRE)

$0	1-119	120	121-200	201-300	301-400	401-500	501-600	601-700	701-800
$$$	$	$$$	$$$	$$$	$$	$$			$
$$$		$$$	$$$	$$$					
$		$$$	$$$	$$$					
		$$$	$$$	$$					
		$$$	$$$						
		$$$	$$$						
		$$$	$$$						
		$$$	$$$						
		$$$	$$$						
		$$$	$$$						
		$$$							
		$$$							
		$$$							
		$$$							
		$$$							
		$$$							
		$$							
	1	53	30	11	2	2	0	0	1

$ = 1 subject
Mean = $154.77
Range = $0 - $720

Total amount of salary increases at the time of the first opportunity for 107 secretaries=$16,568.

The average salary increase for the 61 shorthand writers in this sample was $156.82.
The average salary increase for the 46 non-shorthand writers in this sample was $152.22.

other material from rough draft or oral instructions. Since these are the most representative and important skills among the tasks contained in and related to this job, the types of work samples examined were University letters and memos, duplicated materials, typed tables of figures, completed University forms and typed manuscript copy. Approximately 30 specimens were examined for each subject in the current sample. On pages 115-116 a description of the work sample scoring system was given with error points being subtracted from 100 total points.

The 107 subjects currently employed were used as the group on which the data for this study were analyzed. The 58 resigned subjects were not included in this analysis since a broad sampling of their work was unavailable. It might have been possible to find a few carbon copies of letters in the files that were specimens of work completed by those persons in the resigned group; but the writer feels that these samples would have provided insufficient data on which a fair judgment could be made.

The work samples were examined and rated by a personnel training supervisor with the cooperation of the immediate supervisors in the offices of the

secretaries studied in this investigation. The secretaries were not involved in the selection of specimens for inspection. The supervisors, final decision makers as to the acceptability or non-acceptability of produced materials in their departments, assisted the personnel official in evaluating the work samples and in the computing of the quantitative score for each subject.

Table XXIX describes the distribution and frequency of the work sample scores for the current group of 107 secretaries. The scores for this criterion ranged from 25 to 100, with a mean score of 78.04. Fifty-three secretaries received scores above the mean, and 54 secretaries scored below the mean. Thirteen subjects or 12 per cent of the current sample received work sample ratings of 100.

Composite of Dependent Variables

In order to describe the subjects in this study as determined from the total sample, Table XXX is presented. To the extent that other groups resemble this sample, the results are applicable.

TABLE XXIX

DISTRIBUTION OF WORK SAMPLE SCORES FOR THE SECRETARIES IN THE CURRENT GROUP*

Range and Scores	Frequency
91 - 100	21
81 - 90	24
71 - 80	37
61 - 70	9
51 - 60	3
41 - 50	9
31 - 40	3
21 - 30	1
11 - 20	0
1 - 10	0

*N=107
Mean, 78.04
S. D., 16.33

TABLE XXX

CHART OF MEANS AND STANDARD DEVIATIONS FOR THE DEPENDENT VARIABLES FOR TOTAL SAMPLE*

Variable	Mean	S. D.
Supervisors' Rating-Quality of Work	68.64	19.35
Supervisors' Rating-Quantity of Work	72.21	20.12
Supervisors' Rating-Intelligence	68.70	18.59
Supervisors' Rating-Growth on Job	67.21	20.98
Administrative Actions (Salary Increases)	$195.18	$192.97
Work Sample Evaluations (107 subjects)	78.04	16.32

*N-165

CHAPTER V

PART I

RELATIONSHIP OF INFORMATION OBTAINED IN HIRING PROCESS AND THE SUBSEQUENT PERFORMANCE ON THE JOB

The purpose of this study has been to determine the relationships between the scores received by secretaries on three employment tests and

A. Ratings their supervisors made of their job performance

B. Administrative actions related to salary increases

C. Work sample evaluations made by their supervisors and the In-Service Training supervisor

Comparisons were made between the General Clerical Test, typewriting and shorthand proficiency tests and the criteria listed above.

In addition, analyses were made to determine the relationships between the age of the secretaries and the criteria, and their educational background and the criteria.

The writer recognizes that for an ideal analysis the sample would include all applicants rather than the select group hired. Since it is impossible to get measures of work success for those not hired, it would be necessary to hire all applicants for a given period. This is virtually impossible at the University of Michigan and at other organizations. The extent of the relationships of predictors to criteria and their value to the employer as presented in this chapter are thus probably underestimates of their actual value. If we had data on an unselected group and knew the proportion of secretaries that would be selected by qualifying scores of several tests, we could use Guilford's[1] Table to find the new success ratio after selection; and therefore, the improvement in success ratio due to the use of the tests; but this cannot be done for this investigation since we have a pre-selected and restricted group.

Correlations Between Predictors and Criteria

Correlation coefficients are used as a measure of the relationship between predictors and criteria and are presented in Table XXXI. Their statistical

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[1]J. P. Guilford, Fundamental Statistics in Psychology and Education, 3rd Edition (New York: McGraw-Hill Book Company, 1956), pp. 379-386.

significance is also indicated. Analyses of the data in Table XXXI are described in this chapter. The materials are presented in this order:

1. Coefficients of Correlation between Predictors and Criteria
2. Multiple Correlation
3. Intercorrelations of Predictors and Criteria
4. Regression Equations
5. Analysis of Predictors
6. Analysis of Criteria
7. Further Tests of Significance
8. Comparison of Results of Related Research with Present Study
9. Analysis of Data Based on Shorthand Test Sample Only:
    a. Coefficients of Coefficients of Correlation between Predictors and Criteria
    b. Intercorrelations of Predictors and Criteria
    c. Analysis of Predictors
    d. Analysis of Criteria
    e. Further Test of Significance

Conclusions drawn from Table XXXI are presented in Chapter VI.

In previewing Table XXXI, it will be noted that there are 48 single order correlations, 6 multiple correlations, 6 means of rating correlations, and 6 means of all correlations. Testing these single order and multiple correlations for significance, it is discovered that there are 11 correlations significant at the 1 per cent level and 8 correlations significant at the 5 per cent level, and all 6 multiple correlations are significant at the 1 per cent level.

It will be noted that correlations significant at the 1 per cent level are designated by two asterisks(**). These correlations are: GCT Clerical and Work Samples; GCT Verbal and Quality of Work, Growth on the Job, and Work Samples; GCT Total and Work Samples; Typewriting Test and Work Samples; Shorthand Test and Work Samples; Age and Salary Increases; Education and Quality of Work, Intelligence and Growth on the Job. Those correlations significant at the 5 per cent level are designated by one asterisk (*). These correlations are: GCT Numerical and Work Samples; GCT Verbal and Quantity of Work, and Intelligence; GCT Total and Quality of Work, Quantity of Work, Intelligence, and Growth on the Job; Typewriting Test and Quantity of Work.

The means of rating correlations and of all correlations are arithmetical means and are based on the arithmetical average of the r's of the eight predictors and four supervisory ratings' criteria, and the six criteria used in this study. The arithmetical means are presented to give a picture of the agreement of each predictor with the criteria as a composite and to make Table XXXI easier to understand. The averages were secured by squaring each coefficient of correlation, finding the mean, and finding the square root of the mean.

Multiple Correlation

How much can the University of Michigan gain in predictability by using all or some of the six tests and the two non-test data variables? For this result the writer has computed the multiple correlation. Multiple correlation is a measure of the accuracy of prediction of the criterion by several independent variables. The last line of Table XXXI gives the combination of independent variables which we can say at the 90 per cent confidence level contribute to the multiple correlation with each criterion. The contribution which the other variables make in this sample

TABLE XXXI

COEFFICIENTS OF CORRELATION BETWEEN PREDICTORS AND CRITERIA
Total Sample - 165 Subjects

	Criteria							
Predictors	Supervisor Rating, Quality of Work	Supervisor Rating, Quantity of Work	Supervisor Rating, Intelligence	Supervisor Rating, Growth On Job	Means of Rating Correlations	Salary Increases	Work Sample Evaluations[1]	Means of all Correlations
1. GCT Clerical	.085	.122	.147	.125	.122	.082	.353**	.178
2. GCT Numerical	.018	.058	.036	.074	.051	.047	.211*	.098
3. GCT Verbal	.220**	.170*	.164*	.208**	.196	.050	.315**	.207
4. GCT Total	.155*	.160*	.169*	.185*	.168	.079	380**	.209
5. Typewriting	.139	.170*	.145	.146	.150	.087	.492**	.238
6. Shorthand	.060	.130	-.006	.094	.066	.068	.276**	.136
7. Age	.073	.019	.055	-.023	.048	.243**	.108	.115
8. Education	.264**	.112	.280**	.224**	.230	.029	.071	.190
9. Multiple Correlation	.295**	.243**	.280**	.262**	.271	.269**	.535**	.330
Multiple Correlation provided by	(3,8)	(3,5,6,8)	(8)	(6,8)		(7,6,1)	(4,5)	

*Significant at the 5% level **Significant at the 1% level [1]107 Subjects

6. Includes 75 zero shorthand scores

may be due to sampling variation and may not indicate an increase in predictability for the population. Line 9 of Table XXXI shows the multiple correlation coefficients for these combinations and will be discussed on page 179.

All six multiple R's computed in this investigation are statistically significant at the 1 per cent level. The statistical formula used to compute the significance of multiple R was

$$F = \left(\frac{R^2}{1-R^2}\right)\left(\frac{N-P-1}{P}\right)$$

R = multiple correlation
P = number of independent variables
N = sample size

The degrees of freedom for F are P and N-P-1.

Intercorrelations of Predictors

The extent to which a prediction from several tests and non-test data is superior to that from a single test or non-test factor depends on the degree to which each variable measures abilities different from the other variables. The increase in a multiple correlation over a correlation with a single variable depends on the intercorrelations of these variables as

well as the correlation of each with the criteria. Intercorrelations of the predictors are shown in Table XXXII.

Certain agreements are highly understandable. For instance, the GCT subtests indicate some overlap with the GCT Total; this is to be expected since the subtests make up the total. There is most in common between the Typewriting and Shorthand tests, and this is to be expected since the Shorthand transcription test is composed of typewriting and shorthand. The typewriting test is significantly correlated with the GCT Clerical subtest and the GCT Total, but the correlations are not high. The Education variable is most highly correlated with the GCT Verbal subtest, and followed by the GCT Total, the GCT Clerical subtest, and Age; but none of these correlations is very high. It is interesting to note that the correlation of Education and GCT Verbal is higher than Education and GCT Total, indicating that GCT Numerical and GCT Clerical subtests are depressing the total correlation.

The multiple correlation technique makes use of these relationships in selecting the best set of predicting variables. The best sets of predicting variables

TABLE XXXII

INTERCORRELATIONS OF THE EIGHT INDEPENDENT VARIABLES

Total Sample = 165 Subjects

Test and Non-test Variables	Intercorrelations							
	1	2	3	4	5	6	7	8
1. GCT Clerical	1.000	.461**	.450**	.823**	.314**	.096	.007	.205**
2. GCT Numerical		1.000	.388**	.712**	.143	.009	.031	.113
3. GCT Verbal			1.000	.818**	.191*	.023	.151	.377**
4. GCT Total				1.000	.284**	.060	.086	.313**
5. Typewriting					1.000	.364**	.005	.148
6. Shorthand						1.000	-.096	-.178
7. Age							1.000	.200**
8. Education								1.000

6. Shorthand: includes zero scores for 75 subjects

* Significant at the 5% level

** Significant at the 1% level

for this study were indicated at the bottom of Table XXXI and the regression equations using these predictors are indicated in Table XXXIV.

Intercorrelations of Criteria

Intercorrelations of the criteria are shown in Table XXXIII. All of the criteria, except Salary Increases, have rather high correspondence with each other. The Intelligence-type factors: ratings of Intelligence, Quality of Work, and Growth on the Job had the most in common with r's of .801, .761, and .763 respectively. The writer believes that these high relationships of supervisory ratings may be due either to the "Halo" or generalizing effect or common basis (all three measuring the same). If the former is the case, a supervisor tends to think well of a secretary in one quality, he tends to think well of her in other qualities; or if he thinks low of her in one quality, he tends to think low of the secretary in other qualities.

All six criteria illustrated in Table XXXIII are a type of rating. Quality of Work, Quantity of Work, Intelligence, and Growth on the Job, are "clear-cut" ratings reported on the University of Michigan Progress

Report. Since Salary Increases are tied in with the Supervisory Ratings on the Progress Report, or with annual merit increases, they are indirectly a form of rating. The only difference is that an amount of money is attached to the rating, and it is a combined judgment or group rating with the departmental supervisor joining with the Personnel Officials in making the decision to give or not to give a salary raise. The low intercorrelation of Salary Increases with the Supervisors' Ratings and Work Samples may be due to the uniqueness of this criterion. It is the only measure of job performance that receives a monetary reward as part of its evaluation.

The Work Sample Evaluations are also ratings. The only difference is that the Work Sample Evaluations were made jointly by a Personnel Training Official and the supervisors. An additional difference is that there was more objectivity in the Work Sample appraisals, since errors on office production specimens were counted and calculated.

The writer believes that another reason for the large intercorrelations among the criteria is in the Progress Report Form itself. He believes that there are too many performance and non-performance factors to be

TABLE XXXIII

INTERCORRELATIONS OF THE SIX CRITERIA

Total Sample = 165 Subjects

*Work Sample Evaluations = 107 Subjects

Criteria	Intercorrelations					
	1	2	3	4	5	6
1. Quality of Work	1.000					
2. Quantity of Work	.641**	1.000				
3. Intelligence	.801**	.633**	1.000			
4. Growth on the Job	.761**	.544**	.763**	1.000		
5. Salary Increases	.130	.088	.196*	.068	1.000	
6. Work Sample Evaluations	.508**	.493**	.573**	.456**	.189	1.000

* Significance at the 5 per cent level
** Significance at the 1 per cent level

considered on this one form; and that the items themselves are not discrete enough to permit differentiation among them. For instance, in examining the 165 Progress Report Forms used in this study, it is clearly recognizable that a single evaluation of Quality of Work measures performance as well as the rating of three evidences of Intelligence (see page 143) indicated in Table XXXI with multiple r's of .295 and .280 respectively and the mean ratings shown in Table XXX of 68.6 and 68.7 respectively.

Regression Equations

Table XXXIV presents the regression equations for prediction for each multiple correlation shown in Table XXXI. These equations show which test or non-test data the employment section of the University of Michigan Personnel Office can use and how much weight the officials should give to each predictor. The employment officials may base their decisions on the objective empirical evidence from this investigation, and supplement their subjective evidence acquired in the employment interviews and from other selection devices such as the application form.

The employment section officials should consider that these regression equations may be distorted since

all subjects were preselected by devices discussed in Chapter III. The equations for a sample of "all applicants" would be slightly different; how much different, we do not know.

Analysis of Predictors

The following results analyzed from Table XXXI are true for the sample tested. The predictors are: GCT Clerical, Numerical, and Verbal subtests, GCT Total, Typewriting and Shorthand Proficiency Tests, Age, and Education, and are shown in Table XXXI. These results will consider basic relationships; and supplementary remarks will be made by the writer when he feels it is helpful for understanding.

1. The GCT Clerical subtest correlated significantly with only one criterion, Work Sample Evaluations, with an r of .353. This agreement is better understood when we examine the content of the GCT Clerical subtest with its technical checking, inspection, and alphabetizing skills; and the Work Samples which required precise checking and inspection of their content before mailing, duplicating, or filing.

2. The GCT Numerical subtest does not correlate significantly with any of the criteria except Work

TABLE XXXIV

REGRESSION EQUATIONS FOR PREDICTION OF MULTIPLE R's SHOWN IN TABLE XXX I

Criterion (Predicted y) and Equation

Quality of work: $y = 2.03x_8 + .216x_3 + 44.2$

Quantity of work: $y = .228x_3 + .183x_5 + 41.02$

Intelligence: $y = 2.58x_8 + 59.9$

Growth on Job: $y = .085x_6 + 2.57x_8 + 55.6$

Salary Increases: $y = 7.09x_7 + 32.0$

Work Sample Evaluations: $y = .146x_4 + .440x_5 + 23.0$

x_1 = GCT Clerical subtest

x_2 = GCT Numerical subtest

x_3 = GCT Verbal subtest

x_4 = GCT Total

x_5 = Typewriting test

x_6 = Shorthand test

x_7 = Age

x_8 = Education

Samples, where the r is .211. Correlations with the other criteria are almost zero. This finding is not unusual with the Numerical subtest score resulting from three kinds of numerical tasks (arithmetic computation, error finding, arithmetic reasoning) which are generally met in clerical and bookkeeping work, and not found as often in secretarial work, where language skills blend with motor skills for most of the work.

3. The GCT Verbal subtest is significantly related to most of the criteria (5 out of 6), but the correlations are not very high. Only the correlation of Verbal with Work Samples (.315) is over .300. The GCT Verbal subtest is a measure of language skills which are extremely important in the production of letters, memos, reports, course outlines, requisitions, and manuscripts--specimens included in the Work Sample Evaluations. This finding shows that there was a tendency for higher Work Sample Evaluations scores to be associated with higher GCT Verbal scores.

4. The GCT Total has correlations which are similar to, but slightly less than, those for the GCT Verbal except for the criterion Work Sample with which it is more highly correlated than the Verbal subtest. The correlation with Work Sample, .380, is the highest correlation

for the GCT Total. This finding demonstrates that the GCT Total score, usually considered an estimate of clerical ability in general, does seem to discriminate fairly well among secretaries, and appears to be somewhat more useful in measuring employee proficiency of actual work samples than ratings. It should be remembered that the rating coefficients of correlation are diluted by being based on many departments with all the attendant difficulties of securing comparable ratings of 165 different raters.

5. The Typewriting proficiency test has a high correlation, .492, with the Work Sample criterion; but the Typewriting test itself is a work sample, so this relationship is understandable. The Typewriting test and the subsequent work samples, by their very nature, are measures of proficiency in the operation of the typewriter with the verbal skills of language usage. The Typewriting test possesses what is usually called "face validity," or an obvious relevance to the task for which it is used, and it also possesses predictive validity of a moderate degree as indicated by this empirical study based on data for 165 secretaries in the total sample and 107 secretaries in the current sample on which the work sample data were found.

6. The Shorthand proficiency test has very little relationship with the criteria, except with the Work Sample, and even that correlation is below .300. The Shorthand test is a fusion of shorthand, typewriting, and business English and is in itself a work sample. It should be remembered in inspecting the analysis of the Shorthand test predictor in Table XXXI that these correlations are based on the total sample of 165 secretaries, 75 of which did not take the Shorthand test. In an analysis of the shorthand sample discussed in Table XXXIX, it is shown that the Shorthand test correlates more highly with ratings of Quality of Work, Quantity of Work, Intelligence, Salary Increases, and Work Sample Evaluations, than the Shorthand test did for the total sample, when zero scores were assigned the non-shorthand writers.

The data in Table XXXIX show the Shorthand test sample, 90 secretaries, having slightly higher correlations between the Shorthand test scores and 5 out of 6 criteria, than for the total sample. The mean of all correlations for the Shorthand test sample is .190, compared to the mean of all correlations for the total sample of .136. This low relationship of the Shorthand test with the criteria, was substantiated when it was

indicated on page 209 that only 7 out of the 16 secretaries who received job classification promotions during the period of this study had taken the Shorthand test at the time of hiring, which indicates that shorthand writing is not always necessary in order to get a higher job classification.

One positive finding for the 90 shorthand writers is in the area of salary increases. The 90 secretaries who did take the Shorthand proficiency test did receive larger salary increases than the 75 secretaries who do not write shorthand. The shorthand subjects averaged $210.29 while the "non-stenos" averaged $187.84 for total pay raises. These total salary increases can be compared to "first-opportunity" increases of $156.82 for the shorthand writers as against $152.22 for the non-shorthand writers.

The coefficients of correlation of the Shorthand test with the criteria as described in Tables XXXI and XXXIX, however, are practically negligible, outside of one significant relationship, .276, with Work Samples, and two significant r's, .337 and .217, with Work Samples and Quantity of Work.

These three significant relationships seem usual when one reviews the content of the Shorthand test and

the Work Sample Evaluations, and the definition of quantity of work rating. All of these measures represent volume of work, and production standards are used as guides for scoring.

The question arises, why didn't the Shorthand test have more predictive power in this investigation? The writer believes that this is the result of the type of work environment and the type of office supervisor found in a University setting where this study was conducted. Since the ratings correlated lowest of all the criteria with the Shorthand test, it seems as if the "professor-supervisor" does not give the importance to shorthand as other skills, and he would just as soon use a dictating machine as dictate to a shorthand writer. This is substantiated when it is recalled that 46 per cent of the offices having C-3 secretaries do not require shorthand as a prerequisite skill for hiring.

7. The non-test factor of Age predicted nothing except salary increases. The correlation of .243 shown in Table XXXI between Age and salaries is confirmed by the fact that the 16 secretaries who received job classification promotions had an average age of 31.13 years, while the secretaries who did not receive promotions to

higher job classifications had an average age of 22.13, and it is the job classification promotions that have the highest salary increases.

Since Age correlates very little with supervisory ratings, with the means of rating correlations .048 as shown in Table XXXI but has a slightly higher relationship (.243) with salary increases, and since it was shown that Age was a factor of those secretaries who received higher job classification, it is suggested that Age must represent a characteristic that is valued, but is not measured in the ratings' criteria used in this study. It seems that maturity of judgment, evidence of past experiences coming forth, evidence of stability and tenure on past jobs, are factors that supervisors and personnel officials consider when salary raises are given.

8 Education was related more to supervisory ratings than to the other criteria. It is indicated in Table XXXI that 3 out of the 4 correlations between Education and ratings are significant at the one per cent level. This relationship could be due to the ability of the secretaries (26 per cent are university graduates) to converse intelligently with the supervisors and the members of the academic staff, and may indicate that

the academic supervisors are impressed with the educational background of their secretaries. The 16 secretaries who received promotions to a higher job classification during the time of this investigation had an average of two and one-half years of university training, while the secretaries who did not receive job classification promotions averaged one and one-half years of university training.

9. The multiple correlations shown in line 9 of Table XXXI are all significant at the 1 per cent level with correlations ranging from .243 for predictors and quantity of work to a high of .535 for predictors with Work Samples; but the maximum gain over the highest single predictor is only .073(quality of work and verbal subtest). The average gain for the multiple correlation is only .035, which is not very much. The best single predictor in each instance is nearly as good as any combination of predictors.

10. An average, or mean, of correlation coefficients does not have the precise mathematical interpretation of degree of relationship that an ordinary coefficient does. However, it can be used to give a general idea of the agreement of each predictor with the criteria as a whole. Using this as a standard, we see from the last

column of Table XXXI that Typewriting, GCT Total, and GCT Verbal are the best predictors in general and that GCT Numerical and Age are the poorest predictors. The averages were secured by squaring the coefficients of correlations, finding the means, and then finding the square root of the means.

Analysis of Criteria

The following results analyzed from Table XXXI are true for the sample tested. It will be remembered that the criteria are: Supervisors' Ratings of Quality of Work, Quantity of Work, Intelligence, and Growth on the Job; Salary Increases; and Work Sample Evaluations. These criteria are shown in Table XXXI.

1. The criterion, Supervisors' Ratings of Quality of Work, is predicted best by Education, .264, and nearly as well by the GCT Verbal subtest, .220.

Quality of Work is defined on the University of Michigan Progress Report form as "accuracy, neatness, technical precision, and ability to organize and expedite work." Since accuracy, and organizational ability are closely related to intelligence factors, it seems reasonable that intelligence-type tests and non-test factors would have some predictive power for this

criterion. Higher education implies intelligence and the GCT Verbal subtest scores have been found to have high relationship (.77 and .73)[1] with scores on tests of mental abilities, thus confirming the hypothesis in Chapter I that intelligence-type predictors would retain some significance for the intelligence-type criteria. The content of the GCT Verbal subtest (spelling, reading, vocabulary, and grammar) is related to materials found on many intelligence tests.

2. Quantity of Work is best predicted by the Type-writing test and Verbal subtest, with an r of .170, significant at the 5 per cent level. This relationship seems understandable when we consider that the Type-writing test, a 50-minute, volume-production test bears relationship to the volume of work produced on the job; and furthermore, the abilities to spell accurately, read and comprehend materials rapidly, understand vocabulary so that one does not need to refer to a dictionary or Thesaurus repeatedly, and have a feeling for and knowledge of correct grammar (all measures included in the GCT Verbal subtest), can save the secretary much time, permitting her to produce a greater volume of work.

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[1]GCT Manual, page 9.

3. Supervisors' Ratings of Intelligence are best predicted by Education. Table XXXI indicates an r of .280 for these two variables. This could be due to the wider scope of general knowledge which educated secretaries have at their command. This finding is supported by the data to appear in Table XXXVII.

Using a chi square test to determine whether or not a significant relationship exists between Intelligence ratings and Education, we will find chi square to be 17.11, which is larger than the 5.59 necessary for significance at the 5 per cent level for 2 degrees of freedom. This value even exceeds 9.21 which is required for significance at the 1 per cent level. This value of chi square indicates that this sample's frequency distribution disproves the null hypothesis of no relationship and that a relationship exists in reality. It suggests that secretaries who had higher Education scores tended to have higher Intelligence ratings and those with lower Education scores tended to have lower Intelligence ratings.

The next significant relationship with the Rating of Intelligence shown in Table XXXI is the GCT Verbal subtest, with an r of .184. This agreement

seems logical since the GCT Verbal subtest is composed of materials usually found on intelligence tests. The Verbal subtest is an omnibus language skills test and the various parts include spelling, reading, vocabulary, and grammar. The present investigator believes that of the four separate parts of the Verbal subscore, that the Vocabulary test comes the closest to measuring intelligence.

4. Table XXXI shows that the criterion, Growth on the Job, is best predicted by Education with an r of .224, and the Verbal subtest is the next best predictor, with an r of .208. Both correlations are significant at the 1 per cent level. These relationships imply that the criterion of Growth on the Job is related to intelligence-type factors and that the secretaries in this sample had the ability to adapt to new situations in the office, to make correct decisions, to solve problems, and to be mature in dealing with people.

As indicated on the Progress Report rating form (Appendix D) "Capacity and Ambition for Future Growth' uses the word "promotion" in its two highest rating categories. The moderate correspondence between Education and Growth on the Job is supported when it is known that the 16 secretaries who received

job classification promotions had an average education score of two and one-half years of university training while the secretaries who did not receive job promotions had an average of one and one-half years of university training, which shows the impact that Education has on "Growth on the Job" ratings in the offices of the University of Michigan.

5. Table XXXI shows that Salary Increases are best predicted by Age. Nothing else is even close. The correlation of .242 is generated by the fact that the 16 secretaries who received job classification promotions resulting in large salary increases had a higher average age than the secretaries who did not receive promotions (31.13 years versus 22.13). Since the data in Table XXXVIII confirms the data described in Table XXXI concerning the low relationship of the GCT Total with salary raises, it is interesting to speculate to see just why the predictors used in this study (outside of Age) failed to show much relationship with raises in pay. It seems to the present investigator that such factors as department and University budgets, personality of the secretaries, higher (than many Ann Arbor firms) starting salaries for secretaries at the University of Michigan, the dependence for funds on

the State of Michigan Legislature, and inadequate Salary and Wage Administration policies (in 1958-59), were "behind-the-scenes" reasons for this low relationship.

6. It was shown in Table XXXI that the Work Sample Evaluations are predicted best from the Typewriting test, which is in itself a work sample. It was also indicated that the Work Sample criterion had the highest validity for this investigation. It has the largest correlations (5 significant at the 1 per cent level, 1 significant at the 5 per cent level) with the employment tests and the largest single correlation coefficient (.492) in Table XXXI. Its correlations with the non-test factors of Age and Education, however, are low.

It will be remembered that the Work Sample Evaluations consisted of 30 typewritten evidences of work performance such as letters, memos, reports, etc., analyzed by a personnel training official and assisted by the department supervisors. The training official made the final scoring for each appraisal. One type of score was obtained for each group of 30 specimens. This was a qualitative score of actual production of office work. The accuracy score was fundamental,

with an error-checking chart used for each secretary's Work Sample Evaluation. A certain consistency of inspection was given to the Work Samples, since the judging was done by the same training official. Since accuracy was found to be high in most instances, it appears that the University of Michigan supervisors tend to emphasize accuracy in the production of outgoing and internal communications; and, also, that the secretaries studied in this sample are able to produce work that passes the inspection of an outside consultant. This is confirmed when we remember that only 4 of the 107 secretaries studied in this part of the investigation had Work Sample scores below 50, and the mean score was 78.04.

7. Grouping the criteria in Table XXXI according to their best predictors, we have the following results:

A. Work Sample Evaluations and Quantity of Work correlate most highly with employment test predictors, especially with Typewriting and GCT Total and GCT Verbal.

B. Supervisors' ratings of Quality of Work, Intelligence, and Growth on the Job have their highest correlations with Education and next highest with GCT Verbal.

C. The remaining criterion, Salary Increases, correlates best with Age.

Further Tests of Significance

In addition to the correlations between predictors and criteria described in Table XXXI, the following tests of significance substantiate the association of four typical relationships discovered in Table XXXI, so selected because they represent two moderately high relationships and two low relationships taken from Table XXXI.

Table XXXV shows the actual and expected frequencies of Supervisors' Ratings of Quality of Work and the GCT Numerical subtest scores.

Inspection of the data in Table XXXV indicates that the actual and expected frequencies differ very little in size. The chi square value of .50 with two degrees of freedom is considerably smaller than the 5 per cent value necessary for significance which is 5.99; however, chi square of .50 for this sample is far from significant and indicates that the results for these two distributions (Quality of Work and GCT Numerical) can be accounted for on chance variation.

TABLE XXXV

SUPERVISORS' RATINGS OF QUALITY OF WORK AND GENERAL CLERICAL TEST'S NUMERICAL SUBTEST SCORES OF 165 SECRETARIES

Scores	Ratings			
	0-62.4	62.5-87.4	87.5-100	Totals
High GCT-N 33 & Above	29.679 (f_e) 31 (f_o)	40.242 (f_e) 38 (f_o)	13.079 (f_e) 14 (f_o)	83
Low GCT-N 32 & Below	29.32 (f_e) 28 (f_o)	39.758 (f_e) 42 (f_o)	12.921 (f_e) 12 (f_o)	82
Totals	59	80	26	165

f_e expected frequency

f_o observed frequency

$$x^2 = \sum \left[\frac{(fo-fe)^2}{fe} \right] = .500$$

Table XXXVI confirms the fact that the correlation of .220 shown in Table XXXI between the GCT Verbal subtest and supervisors' ratings of quality of work was generated by the ends of the distributions. Seventeen secretaries with high test scores received the highest ratings and 32 low test subjects received the low ratings, indicating that the ratings discriminate at the tails of the distributions. Table XXXVI also reveals the fact that the supervisors doing the ratings tend to place their evaluations of subordinates in the central portion of the rating scale, with nearly 50 per cent of the sample in the middle portion. This condition may be due to "average" workers being rated or lack of discrimination by the raters.

Inspection of Table XXXVI indicates a chi-square value of 2.87, which again is not statistically significant; but Table XXXVI does show a small relationship for this sample, just as the correlation of .220 in Table XXXI showed a slight correpondence between GCT Verbal subtest and quality of work ratings.

One of the highest correlations (.280) shown in Table XXXI is between the non-test factor, Education, and Supervisors' ratings of Intelligence. Inspection of Table XXXVII shows a chi-square value of 17.11 between

TABLE XXXVI

SUPERVISORS' RATINGS OF QUALITY OF WORK AND GENERAL CLERICAL TEST'S VERBAL SUBTEST SCORES OF 165 SECRETARIES

Scores	Ratings			
	0-62.4	62.5-87.4	87.5-100	Totals
High GCT-V 82 & Above	30.39 (f_e) 27 (f_o)	41.21 (f_e) 41 (f_o)	13.33 (f_e) 17 (f_o)	85
Low GCT-V 81 & Below	28.61 (f_e) 32 (f_o)	38.79 (f_e) 39 (f_o)	12.68 (f_e) 9 (f_o)	80
Totals	59	80	26	165

$x^2 = 2.87$

these two variables, which is higher than the chi-square value of 5.99 necessary for significance. This indicates that the two distributions have relationship. This correspondence is confirmed when the two ends of the distributions are examined. Once again the ratings discriminate very well at the tails of the distributions but are concentrated in the central portion of the rating scale, with 80 subjects so classified. Table XXXVII also suggests the tendency of academic supervisors to rate more-educated persons higher than less-educated persons.

TABLE XXXVII

SUPERVISORS' RATINGS OF INTELLIGENCE AND NON-TEST FACTOR OF EDUCATION OF 165 SECRETARIES

Education	Ratings 0-62.4	62.5-87.4	87.5-100	Totals
High - 1½ or more years	29.455(f_e) 18(f_o)	39.273(f_e) 44(f_o)	12.272(f_e) 19(f_o)	81
Low - less than 1½ years	30.545(f_e) 42(f_o)	40.727(f_e) 36(f_o)	12.727(f_e) 6(f_o)	84
Totals	60	80	25	165

$x^2 = 17.11$

Table XXXI indicated that, outside of Age, none of the predictors had much relationship with Salary Increases, when salary increases were defined as all additions to the amount of salary assigned to each subject at the time of employment. Table XXXVIII is included in this study to show the relationship of GCT Total scores and the salary increases given to the 107 current sample secretaries at the time of their first pay increase opportunity.

TABLE XXXVIII

SALARY INCREASES (FIRST OPPORTUNITY) AND GENERAL CLERICAL TEST TOTAL SCORES FOR 107 SECRETARIES

Scores	Ratings			
	$0-$120	$121-$199	$200-$1272	Totals
High GCT-T 166 & Above	30.79(f_e) 29(f_o)	13.63(f_e) 13(f_o)	9.49(f_e) 12(f_o)	54
Low GCT-T 165 & Below	30.21(f_e) 32(f_o)	13.37(f_e) 14(f_o)	9.51(f_e) 7(f_o)	53
Totals	61	27	19	107

$x^2 = 1.595$

Evidence from Table XXXVIII indicates the 12 persons with high GCT Total scores receive higher pay raises and 7 low scoring test subjects receive high pay raises; and more secretaries (32 versus 29) who score lower GCT Total scores also receive lower salary raises. The middle classification of salary increases was very close to the expected frequency for the high and low test scorers. The chi-square value of 1.59 for these two distributions is much lower than the required value of 5.99 needed for significance at the five per cent level.

In examining the data in Table XXXVIII, other influences appear to be present when salary increases are awarded. The writer suggests that these other factors influencing salary raises are budget limitations, changes in job classification, tenure, prestige of the office, and personal qualities of the secretaries being reviewed.

Comparison of Results of Related Research with Present Study

The present study's results related to the GCT and job performance support slightly the .40 to .50 correlations found in the floor covering manufacturer

and the Pennsylvania Company studies previously reported for these same variables. The present investigation's r's are not large enough to make successful performance predictable for the high-scoring secretarial applicants or failure predictable for the low-scoring applicants as individuals, but the r's are good as predictors of group averages. They are, however, in the expected direction as hypothesized, although by no means as high as correlation coefficients obtained in the other studies reported. The fact that all r's between the GCT and the work sample evaluations for the sample tested are found to be significant (average r of .315) indicates that the GCT is helpful in selecting the persons who satisfactorily perform in typewriting, transcribing, and producing the work specimens. It was previously shown that the GCT Total score mean for the 16 secretaries who received promotions of job classifications was 173.1 compared to the mean score of 165.1 for the persons who were not promoted, which supports the fact that the GCT Total scores and promotions are somewhat related for the sample studied in this investigation.

The present investigation's findings of the value of a Typewriting proficiency test in predicting

the work performance of 165 secretaries confirm Jurgensen's[1] discoveries. The highest mean of all correlations between predictors and criteria for this study was the Typewriting test with criteria mean of .238. The highest single order correlation found was the Typewriting test with the Work Sample criterion, .492. This supports Jurgensen's findings when he discovered an average correlation of .638 between a typewriting proficiency test and supervisory ratings of job performance of 67 employed industrial typists. It also supports the findings of Crawford[2] and West[3] who discovered that if you want to test for job performance and success, then spend time on testing on job-type production typewriting, which the present investigation's typewriting test is composed of.

The present investigator's correlations related to a shorthand proficiency test's ability to predict job performance are lower than (except in the prediction of work sample evaluations) the correlations of Bird[4] and Ohmann.[5]

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[1]Jurgensen, op. cit., p. 57.

[2]Crawford, op. cit., p. 55.

[3]West, op. cit., p. 51.

[4]Bird, op. cit., p. 69.

[5]Ohmann, op. cit., p. 74.

Bird used the Stenogauge Test and Ohmann used the Stenographic Proficiency Test in discovering relationships of .53 and .38 respectively between shorthand tests and ratings of job performance. The present investigation discovered an average correlation of .136 between a shorthand test and job performance for the total sample and an average of .190 for a special investigation of the shorthand sample. The fact that only seven out of the 16 secretaries receiving job promotions during the time of this investigation took the shorthand test at the time of job application, indicates that the skill of shorthand is not always a deciding factor in job advancement at the University of Michigan.

The non-test factor, Age, was found to predict nothing except Salary Increases for the sample studied which confirms the findings of Bird.[1] The present study's average correlation of .048 compares to Bird's -.03 between Age and ratings. The present study's correlations are slightly lower than the relationships found by Zaugg[2] between Age and job performance. The present

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[1]Bird, op. cit., p. 69.

[2]Zaugg, op. cit., p. 76.

study's mean of all correlations between these two variables is .115, which is slightly below Zaugg's correlation of .21 between Age and job performance.

On page 106 it was shown that the average age of the 16 secretaries who received job classification promotions was 31.1 compared to an average age of 22.1 for the secretaries who were not promoted during the time of this investigation, which indicates some relationship between Age and job promotions for the sample studied.

The present study was also concerned with obtaining a measure of the relationship between the educational background of 165 secretaries and the criteria of Supervisors' Ratings, Salary Increases, and Work Sample Evaluations. The correlations of the present study are different from the correlations found in Bird's[1] study. The present study revealed a slight positive relationship (average r of .190) between Education and the criteria, while Bird discovered a negative relationship (composite r of -.16) with the separate success factors and Education. The present study's average correlation of .230 for ratings and Education compares to an r of .09 found in the Bird study, which was the only positive r found

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[1]Bird, op. cit., p. 69.

by Bird for Education. The test for the differences in the average correlations of the Bird and the present studies is significant at the 5 per cent level. The differences in the sets of correlations could be due to the contrasting work situations. Education seems to be valued at an institution of higher learning and the tasks involved in educational offices tend toward research, medicine, dentistry, law, and other professional areas; and may differ somewhat from the industrial office environment, used in the Bird study.

On page 136 it was shown that the average amount of Education was two and one-half years of university training for the 16 secretaries who received job classification promotions during the time of this investigation, while the persons who did not receive promotions had an average of one and one-half years of university training, which indicates some relationship between educational background and job classification promotions for the sample studied in this investigation.

PART II

ANALYSIS OF DATA BASED ON SHORTHAND TEST SAMPLE ONLY

In Appendix B there is a description and example of the Shorthand test used in the University of Michigan employment test battery. This is a proficiency test that measures secretarial [illegible] skills directly. The purpose of this test is to select individuals who are qualified to perform shorthand transcription immediately in a given situation. The personnel officials constructed this test which closely simulates tasks in the University offices.

Up to this point in the analysis of the data in this study, the group under consideration has consisted of all subjects in the sample, numbering 165. In this section the writer is going to analyze the relationships between the predictors and the criteria for the Shorthand test group only. This sample consists of 90 subjects. Comparison of the correlations of test scores with criteria scores in Table XXXIX indicates higher correlations for this sample than for the total sample of 165 subjects which included both non-shorthand

TABLE XXXIX

COEFFICIENTS OF CORRELATION BETWEEN PREDICTORS AND CRITERIA
Shorthand Test Sample - 90 Subjects

Predictors	Criteria: Supervisor Rating, Quality of Work	Supervisor Rating, Quantity of Work	Supervisor Rating, Intelligence	Supervisor Rating, Growth On Job	Means of Rating Correlations	Salary Increases	Work Sample Evaluations[1]	Means of all Correlations
1. GCT Clerical	.074	.240*	.144	.100	.153	-.036	.378**	.199
2. GCT Numerical	.127	.248*	.166	.192	.188	-.147	.274*	.199
3. GCT Verbal	.363**	.316**	.337**	.348**	.341	.041	.368**	.317
4. GCT Total	.255**	.353**	.286**	.281**	.296	-.041	.449**	.304
5. Typewriting	.174	.222*	.192	.140	.184	.051	.483**	.249
6. Shorthand	.141	.217*	.111	.092	.148	.122	.337**	.190
7. Age	.194	.184	.185	.094	.169	.238*	.077	.172
8. Education	.380**	.155	.344**	.302**	.307	.016	.166	.260
9. Multiple Correlation	.443**	.437**	.441**	.390**	.428	.286*	.575**	.437
Multiple correlation provided by	(8,3)	(4,7,6,2)	(8,3,5)	(3,8)		(7,2,6)	(5,4)	

*Significant at the 5% level
**Significant at the 1% level
[1]61 Subjects

and shorthand test subjects. The shorthand sample had higher average test scores than the total sample.[1] The writer believes that the sub-sample (shorthand writers) did better than the total sample because the sub-sample had more homogeneity of population and jobs. Since they do more secretarial processes, the "image" of secretary is more clearly representative in the 90 stenos and it is appropriate that they received higher job performance scores. It seems that the office supervisors would resent losing a good shorthand writer and therefore are willing to pay her more money to keep her. Shorthand writers each received $22.45 more than non-stenos. (See page 176).

Correlation Between Predictors

To discover whether the predictors are measuring the same or different abilities, the writer found the correlations between them and they are illustrated in Table XXXX. The Typewriting test shows much overlap with the Shorthand test with a correlation of .723, which is easily understandable when we inspect the skills used in these proficiency tests. The shorthand test is composed of the fusion of typewriting, business English,

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[1]See Appendix F which presents the means and standard deviations of the independent variables for the shorthand sample.

TABLE XXXX

INTERCORRELATIONS OF THE EIGHT INDEPENDENT VARIABLES

Shorthand Test Sample = 90 Subjects

Test and Non-test Variables	Intercorrelations							
	1	2	3	4	5	6	7	8
1. GCT Clerical	1.000	.402**	.435**	.832**	.220*	.129	-.062	.057
2. GCT Numerical		1.000	.296**	.666*	.114	-.055	-.135	.132
3. GCT Verbal			1.000	.784**	.073	.167	.219*	.408**
4. GCT Total				1.000	.181	.127	.026	.260*
5. Typewriting					1.000	.723**	.005	.004
6. Shorthand						1.000	.031	.014
7. Age							1.000	.380**
8. Education								1.000

* Significant at the 5% level

** Significant at the 1% level

and shorthand. Again, the GCT subtests have much in common with the GCT total, and this is to be expected, since the subtests make up the total. Low correlations were found between the Shorthand test scores and the GCT and its subtests' scores. It is of interest to discover in Table XXXX that again the correlation of Education and GCT Verbal is higher than Education and GCT Total, indicating for a second time in this investigation, that GCT Numerical and GCT Clerical subtests are depressing the Total correlation.

Intercorrelations of Criteria

Intercorrelations of the six criteria for the Shorthand sample are shown in Table XXXXI. Again, as with the Total sample, all of the criteria, except Salary Increases, have much in common with ten correlations significant at the 1 per cent level and two significant at the 5 per cent level. The writer believes that the high correspondence among the criteria for the shorthand sample is again due to the fact that all criteria are a form of rating with the judgments of the supervisors and personnel officials resulting in generalized ratings and because of the non-discreteness of the items themselves. The definitions of the various

TABLE XXXXI

INTERCORRELATIONS OF THE SIX CRITERIA

SHORTHAND SAMPLE = 90 SUBJECTS
*WORK SAMPLE EVALUATIONS = 61 SUBJECTS

Criteria	Intercorrelations					
	1	2	3	4	5	6
1. Quality of Work	1.000					
2. Quantity of Work	.568**	1.000				
3. Intelligence	.823**	.615**	1.000			
4. Growth on the Job	.807**	.512**	.793**	1.000		
5. Salary Increases	.244*	.185	.261*	.169	1.000	
6. Work Sample Evaluations*	.436**	.481**	.621**	.469**	.025	1.000

* Significant at the 5% level

** Significant at the 1% level

factors listed on the Progress Report can be interpreted in several ways, resulting in confusion, misunderstanding, and lack of discrimination by many supervisors.

Analysis of Predictors

The following results analyzed from Table XXXIX are true for the shorthand sample tested.

1. The GCT Clerical subtest correlated significantly with the two criteria, Supervisors' Ratings of Quantity of Work and Work Sample Evaluations, with r's of .240 and .378 respectively.

2. The GCT Numerical subtest also correlated significantly with Quantity of Work Ratings and Work Sample Evaluations, but none of the r's reach .300.

3. The GCT Verbal subtest is again significantly related to most criteria (five out of six), and all of the significant correlations are over .300. The GCT Verbal has the highest mean of all correlations with the criteria, .317, and had an average relationship of .341 with the Supervisory Ratings' criteria.

4. The GCT Total is significantly related to most criteria (five out of six) and had one correlation of .449 with the Work Samples, which is the highest correlation for any GCT subtest or Total score with any criterion for this investigation.

5. The Typewriting proficiency test has the highest correlation .483, of any predictor with the criteria. This significant relationship is with the Work Sample criterion. The Typewriting test itself is a work sample, so this relationship is somewhat implied. The correlations of the Typewriting test with the Supervisory Ratings criteria are not very high, averaging only .184.

6. The Shorthand proficiency test again showed very little relationship with the criteria, except with the Work Samples, where an r of .337 was reached. Even though this sample of secretaries is composed of only those subjects who took the shorthand test, the data show only two significant correlations between the Shorthand test and the criteria. One interpretation made by the investigator here is that even though 54 per cent of the departmental supervisors request secretaries who can write shorthand, the skill is not as frequently used in the University offices as the original demand indicates. This hunch is confirmed by the fact that only seven of the 16 secretaries who received job classification promotions during the time of this investigation took the Shorthand test at the time of job application.

7. The non-test factor of Age had a higher correlational average with the criteria for the Shorthand sample investigation than for the Total sample (.172 versus .115), and again had a significant correlation, .238, with Salary Increases. The actual average age of the Shorthand sample subjects (see Appendix F) is slightly lower than the average age of the subjects in the total sample, 22.28 years versus 23 years.

8. Education was again related more to Supervisory Ratings (three of four significant) than to the other criteria. All three significant correlations between Education and ratings are above .300.

9. The multiple correlations for the Shorthand sample investigation are all significant; but the maximum gain over the highest single predictor was only .097 (Education and supervisory ratings of intelligence). The average gain for the multiple correlations was only .071, which is not very much. The best single predictor is nearly as good as the combination of predictors for most criteria.

10. Using the arithmetic mean of correlation coefficients (last column of Table XXXIX) as a standard, we see that GCT Verbal, GCT Total, Education, and Typewriting are the best predictors in general and that GCT Numerical, GCT

Clerical, Age, and Shorthand are the poorest predictors. These averages were secured by squaring the coefficients of correlations, finding the means, and then finding the square root of the means.

Analysis of Criteria

The following results analyzed from Table XXXIX are true for the Shorthand sample tested.

1. The criterion, Supervisors' Ratings of Quality of Work, is again predicted best by Education, .380, and nearly as well as GCT Verbal. These two relationships are significant at the one per cent level.

2. Quantity of Work is best predicted by the GCT Total and GCT Verbal, with both correlations over .300 and significant at the 1 per cent level. The Quantity of Work criterion has the most number of significant correlations with the predictors of any of the Supervisory Ratings, with six out of eight showing significance.

3. Supervisors' Ratings of Intelligence are again best predicted by Education, .344, and nearly as well by the GCT Verbal subtest, .337. None of the other correlations reach .300. As mentioned in an earlier section, these are both intelligence-type factors and are naturally related to the ability to learn while in the

job situation. It is interesting to compare the Quantity of Work with the other three supervisory ratings. The other three ratings would seem by their nature to be most correlated with the intelligence-type factors, as indeed they are. In predicting Quantity of Work, however, the other two subtests (Clerical and Numerical) and the Typewriting and Shorthand tests, all measures of skill, are more important and Education is less important.

4. Growth on the Job is predicted best by GCT Verbal, .348, and the next best predictor is Education, .302.

5. Salary increases are predicted best by Age, .238. All other correlations are near zero. The .238 relationship is sustained when we examine the fact that the average age of the seven secretaries in the shorthand sample who received job classification promotions, and thus large salary increases, is 34.4, thirteen years higher than the average age, 21.3, of the 83 non-promoted persons in the shorthand sample.

6. The Work Sample Evaluations are predicted best by the Typewriting test, and the GCT Total. The GCT subtests and the Shorthand test also correlate fairly well. This criterion has the largest correlations of

all criteria with the employment tests and the largest single correlation in Table XXXIX. Its correlations with the non-test factors of Age and Education, however, are low. Six out of the eight single correlations of the Work Sample criterion with the predictors have significant relationships.

7. Grouping the criteria according to their best predictors, we have the following results:

A. Supervisors' Ratings of Quality of Work, Intelligence, and Growth on the Job are best predicted by Education and the Verbal subtest, with GCT Total as the third best predictor.

B. Supervisors' Ratings of Quantity of Work are best predicted by GCT Total and GCT Verbal.

C. Salary Increases are best predicted by Age. All other correlations are near zero.

D. Work Sample Evaluations are best predicted by the Typewriting test and the GCT Total, with the Clerical and Verbal subtests, and the Shorthand test, having the next best correlations. This was the easiest criterion to predict from the employment tests.

Further Test of Significance

The following test of significance substantiates the association of the typical relationship discovered

in Table XXXIX between Salary Increases and the GCT Total Scores. In Table XXXXII the Salary Increases given to the 61 secretaries in the current group of the shorthand sample at the time of their first opportunity (usually six months after date of hire) for a pay raise are compared with the General Clerical Test Total scores. Using the chi square test to determine whether or not a significant relationship exists, we find chi square to be 1.95, which is smaller than the value of 5.99 necessary for significance for 2 degrees of freedom. This value of chi square indicates that the sample's frequency distribution does not disprove the null hypothesis of no relationship. Table XXXXII does show a small relationship for those secretaries receiving salary increases of more than $120. It also shows that at the lower range of the salary raises ($0-120) there is a heavy concentration of secretaries (nearly 60 per cent) with the test scores unable to discriminate among the salary increases at the lower tail of the salary distribution. In the center category of the salaries ($121-$199) there is a slight reversal of expected relationships.

TABLE XXXXII

SALARY INCREASES (FIRST OPPORTUNITY) AND GENERAL CLERICAL TEST TOTAL SCORES FOR 61 SECRETARIES IN THE CURRENT GROUP OF THE SHORTHAND SAMPLE

SCORES	SALARY INCREASES			
	$0-$120	$121-$199	$200-$1272	Totals
HIGH GCT-T 166 & Above	17.70 (f_e) 18 (f_o)	6.89 (f_e) 5 (f_o)	5.41 (f_e) 7 (f_o)	30
LOW GCT-T 165 & Below	18.30 (f_e) 18 (f_o)	7.11 (f_e) 9 (f_o)	5.59 (f_e) 4 (f_o)	31
TOTALS	36	14	11	61

$x^2 = 1.95$

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Problem

This study analyzed the scores on several tests and personal information used in selecting office workers at the University of Michigan and compared the various data with several indexes of present and potential performance for 165 employed women secretaries. The purpose was to determine the abilities of the several variables as selectors of competent employees.

The Method

The factors whose potential influence was investigated were the General Clerical Test Total score, the GCT Clerical subtest score, the GCT Numerical subtest score, the GCT Verbal subtest score, the University of Michigan Personnel Office's Typewriting work sample test score, the University of Michigan Personnel Office's Shorthand work sample test score and the personal factors of Age and Education.

The criteria were Supervisory Ratings of Quality of Work, Quantity of Work, Intelligence, and Future Growth; administrative actions related to Salary Increases; and current Work Sample Evaluations.

The subjects of this investigation were 165 secretaries classified C-3 who were hired between June 1, 1958 and September 30, 1959 at the University of Michigan, Ann Arbor, Michigan. This sample included all of the C-3 secretaries hired during this 16-month period.

A special investigation was made of a sample population composed of only those secretaries who had taken the Shorthand work sample test at the time of hire. This sample has been named the "shorthand sample." This special shorthand sample consisted of a population of 90 persons.

The methods used in studying the inter-relationships among the eight predictors, or independent variables, and the six response, or dependent variables, were correlation and chi-square analyses. The correlation analysis was useful in discovering the correlations between the predictors and the criteria, and the inter-correlations among the criteria. It was also useful in discovering the linear combination of the independent

variables which best explains the data on each of the dependent variables and how good these relationships are. To complete the investigation, multiple correlation techniques were used to develop equations for use in predicting work performance of the secretaries studied. Separate multiple-regression equations were developed for each criterion. Chi-square Tables were used as supplementary presentations of some of the evidences of relationships. The conclusions are presented in this order:

1. Conclusions about the General Clerical Test.
2. Conclusions about the Typewriting and Shorthand Proficiency Tests.
3. Conclusions about the Non-test Data: Age and Education.
4. Conclusions about Supervisors' Ratings.
5. Conclusions about Salary Increases.
6. Conclusions about Work Sample Evaluations.

The conclusions are followed by the recommendations.

Conclusions About the General Clerical Test

1. From the available empirical evidence shown in the results in Chapter V it would appear that the General Clerical Test Verbal subtest is moderately predictive

of successful performance on the job. It may be said that the subtest has this major value:

a. The General Clerical Test Verbal subtest, as shown by correlation analysis in Table XXXI with 5 out of 6 correlations significantly related with the criteria and with the second highest average of all correlations, has definite value in the selection of secretaries in the offices of the University of Michigan and should have a central part in the selection of office workers.

b. The relationship between GCT-V and the criteria shown in Table XXXI demonstrates the kind of work in the academic offices of the University which consists of professional (medical, dental, legal), technical and scientific (engineering, natural and social sciences), and public service (journalism, public administration, public health) areas; and reflects to some extent the personal characteristics of the professors and scientists themselves. The writer speculates that because most of these academicians, scholars, and researchers are holders of doctors and specialized degrees they place considerable value on language skills. Language skills such as spelling, reading, vocabulary, and grammar are all measured by

the General Clerical Test Verbal subtest and they seem to be abilities that are valued by the professors and scientists at the University of Michigan (Finding 3, page 173).

2. The results in Tables XXX and XXXIV indicate the General Clerical Test Numerical subtest (arithmetic computation, error location, and arithmetic reasoning) had the least significant relationship with the criteria of any of the subtests. Five out of six r's are less than .10 in Table XXXI and the chi square value of .50 between GCT-N and Quality of Work shown in Table XXXV is much smaller than the value of 5.99 necessary for significance at the 5 per cent level for 2 degrees of freedom.

The practical conclusion from these tests of significance is that the job performance prediction for secretaries at the University of Michigan would almost be as good without the Numerical subtest as with it. It definitely would be more economical in time spent, since it takes approximately 30 minutes to administer and score the Numerical subtest, which compares to about 20 minutes for the Verbal subtest. As far as face validity is concerned, the Numerical subtest

appears to be more closely related to bookkeeping, payroll, and accounting skills (Finding 2, page 171).

Analysis by types of position might show high relationship to certain offices, such as some business offices, and those in the fields of science, mathematics, and business administration. The present investigator feels the GCT-N should not be dropped from the test battery at the University of Michigan and should be used with all applicants seeking accounting, purchasing, payroll, research, plant department, and tabulating department and computer center positions.

Conclusion about the Typewriting and Shorthand Proficiency Tests

1. The findings in Chapter V indicate the usefulness of the Typewriting and Shorthand Proficiency tests in selecting secretaries at the University of Michigan. Correlational analysis in Table XXXI shows that the 50-minute production type Typewriting test of job-like activities and the Shorthand test (a 50-minute transcription production of 3 dictations at varied rates of speed) proved to be predictive of the criterion of success, Work Sample Evaluations, with significant relationships of .492 and .276 respectively.

This conclusion is supported by examination of the work sample criterion and the predictors. The proficiency tests and Work Samples by their very nature, are measures of proficiency of operation of motor-type activities and include insertion of paper; setting margins; centering titles and columnar headings; tabulating names and numbers; checking and erasing errors; typewriting from printed copy or from shorthand notes or from belts, discs, or tapes; manipulating a transcribing machine, using a dictionary and reference materials (Findings 5 and 6, pages 174-175).

Conclusions about the Non-test Data: Age and Education

1. It was discovered in Table XXXI that Age related very little with Supervisors' Ratings, but had the highest correlation (.243) of any of the predictors with Salary Increases. It can be inferred that Age with its past experiences and training is a personal factor that is esteemed when salary increases are given. This relationship may be due to the incentives that older secretaries bring to their jobs. Such motives as: "This is my career;" "I need to work to support my family;" "I'll be efficient because efficiency and accuracy may bring me more money in my pay check;" "I want to do well because the University has a good

retirement program." These are some of the reasons why older persons bring stability and maturity to the office environment, which are recognized when salary raises are awarded.

This conclusion is upheld when it is recalled that the average age of the 16 secretaries who received promotions in job classifications was 31 years while the average age of the secretaries who did not receive promotions was 22 years.

The low correlation of Age with Ratings and Work Samples but high correlation with Salary Increases may indicate that there are asset qualities other than the predictors forecast; such as maturity, experience, training, which make for quick recognition and appreciation. On the other hand it may also indicate that Salary Increases in some cases are influenced by other considerations other than job performance (Finding 7, page 177).

2. It is clear from Tables XXXI and XXXVII that the supervisors of secretaries at the University of Michigan value Education very highly. In examining Table XXXI certain trends can be noted. Three out of four correlations between Education and Supervisors' Ratings are significant at the 1 per cent level. This agreement is substantiated in Table XXXVII where we find a

chi-square value of 17.11, which is highly significant at the 1 per cent level for 2 degrees of freedom, between Education and ratings of Intelligence. This evidence is sufficient to indicate that the tendency to have more Education is related to the higher ratings of Intelligence.

Since Education is best related with the more general qualities of Intelligence, Quality of Work, and Growth on the Job, it seems that many office tasks in the University of Michigan offices demand secretaries with some education at the collegiate level. It seems that there is a body of content in University offices in which professional, scientific, technical, theoretical, and intellectual terms and materials are used and it is of greatest importance that secretaries understand these terms and materials in order to carry out the work assignments given by the professors and scientists. It may be that the highly educated secretary serves in a more professional manner for the academic supervisor-professor because she (the secretary) is able to communicate on a more mature, intellectual level with her supervisor, faculty members, and university students. Even in the skills area such as in the typewriting of complex statistical formulas

in an office like the Statistical Laboratory, it would be necessary for a secretary to have had some college mathematics in order to produce the specialized materials accurately and in good form (Finding 8, page 178).

Conclusions About Supervisors' Ratings

1. Data in Table XXXI show that Education had a mean of rating correlation of .230 with the four supervisory ratings used in this study. No other predictor had a mean of .20, which indicates that the Supervisors' Ratings of secretaries correlate most with Education and are not as easy to predict by employment tests as the Work Sample Evaluations. The average correlation of employment tests with Work Samples is .338, while the average of rating correlations with the tests is only .129.

The present investigator believes the low relationship of .129 between ratings and employment tests may be due to the structure of the omnibus format of the Progress Report form. For instance, the Progress Report form has 13 scales for the grading of personal qualities, performance factors, intelligence, leadership, and future growth; 6 spaces for answers to the questions:

"How can the employee be made more effective on his present job?", 2 spaces for General Remarks, 4 spaces for comments about the interview, making a total of 25 separate items to be evaluated. The writer feels that the form is lengthy and time consuming. As a result, this may effect the accuracy of the ratings (Findings 1, 2, 3, 4, pages 171-173).

Conclusion about Salary Increases

1. Table XXXI indicates that the only predictor used in this investigation able to moderately forecast salary increases is Age, with a correlation of .243 significant at the one per cent level. This relationship is probably due to the amount of work experience that older persons accumulate over a number of years on the jobs they have had before coming to the University of Michigan to work as secretaries. Because this investigation extended over a two-year period (June 1, 1958 - May 31, 1960) the writer believes that this is a "short-run" period for certain predictors such as employment tests to estimate future salary increases of secretaries; and that it is during the "short-run" period that Age (co-related with experience) would have the greatest impact on supervisors and personnel officials responsible for recommending or not recommending salary raises.

Older persons also bring to the office scene a certain poise and confidence that younger persons sometimes have not had the time to acquire, so this impresses the supervisor and he compensates the secretary with pay raises.

It will be remembered that the 16 persons who received the job classification promotions (the largest salary increases) had an average age of 31.13 years while the persons not receiving job classification promotions had an average age of 22.13 which confirms the conclusion that the more experienced secretary will most likely adapt more quickly to the work environment than the less experienced secretary in the "short-run" period (Findings 7 and 8, pages 177, 178).

Conclusion about Work Sample Evaluations

1. The data in Table XXXI indicated that the Work Sample Evaluations were the most valid criterion predicted by the employment tests, with every correlation and the multiple correlation significant. The individual r's ranged from .211 (GCT-C and Work Samples) to .492 (Typewriting test and Work Samples) and the multiple R was .535 provided by the Typewriting Test and GCT Total. Besides having the highest correlations with the

employment tests for any criterion in this study, the Work Sample Evaluations had the highest mean for any of the criteria where the scale was 0-100. The average of the Work Samples was 78.04, followed by the Supervisors' Ratings of Quantity of Work 72.21, Intelligence 68.70, Quality of Work 68.64, and Growth on the Job 67.21. These results lead the investigator to speculate that in the selection of secretaries at the University of Michigan the major goal is to select a person who can and will do the technical production of letters, reports, manuscripts, requisitions, bibliographies, class lists, and research data.

Recommendations

On the basis of the results evidenced in this study the recommendations for improvement and further research given below seem justified.

Recommendation 1

Further research should be made in the analysis of the requirements of the secretarial jobs at the University of Michigan to identify those that call for specific qualities; for instance, high verbal skills, mathematical aptitude, routine skills, etc., which would make it possible to place persons with special strengths in positions where they could better serve the interests both of themselves and the University.

Recommendation 2

Since the Supervisors' ratings now used at the University of Michigan serve several important purposes such as indicators of current job progress, as instruments proposing for consideration employee training needs, and as recommendations for salary

increases, job transfer, or job promotion, it is recommended: that special training be given to the office supervisors by the Personnel training officials in "Progress Reporting" and interviewing techniques, in order to insure the maximum value from the rating procedures for the employee, the supervisor, and the University. A bonus reward that could come from this appraisal training procedure is that a more accurate assessment of the selection devices as they are now being used may be obtained.

It is further recommended that research be conducted to determine ways of increasing the usefulness of the Progress Report of the University of Michigan by particularly studying the attitudes of raters, employees, and personnel officials toward this evaluation device, and determining if subsequent periodic evaluations should be made of the office employees beycnd the present Progress Report (six months after hire) interview and review. Additional appraisals might be made at the end of one, two, and five years after the date of hire.

Recommendation 3

Since the test scores, in themselves, are of little significance as indicators of salary increases

at the University of Michigan, it is recommended that further research be made by the Personnel Officials in the area of salaries and the bases on which salaries are raised or not raised. Since the tests correlated more highly with supervisors' ratings than with salaries, the question is raised as to why--on what bases were salary increases recommended? It is suggested that other factors come into play when salary raises are suggested, such as personality, age, experience, labor market, and budget of the department.

These three remaining recommendations pertain to further studies which seem called for.

Recommendation 4

Since the nature of secretarial work is such that personality factors, inherent in the performance of office duties, must be considered if any true evaluation is to be made of a secretary's performance of her duties, it is recommended that a comparison be made of the ratings of Personality factors for the 165 secretaries in this sample and their test and non-test scores. This information is already available on the Progress Reports in the files of the Personnel Office of the University of Michigan.

Recommendation 5

Since the test and non-test scores are of only moderate significance as indicators of job performance, it is recommended: that the University of Michigan Personnel officials and employment leaders of other firms conduct validation studies of the other selection devices now being used--the employment interview and the employment application form. Other research studies suggested are in the areas of In-Service Training of clerical employees, office supervisory training, job tenure, job turnover, number of promotions within a given time, and job classification attained.

It is further recommended that techniques for providing better criteria and means of measuring successful job performance of secretaries and other employees at the University of Michigan and elsewhere should be developed and tested.

Recommendation 6

Since the business students in our schools today become the applicants for employment tomorrow, it is recommended: that business teachers investigate and assist their students in understanding the employee selection devices and the standards for

evaluating job performance in the offices in the communities and regions where their students will be making job applications.

It is further recommended that research be done to compare the values of business teachers and the values of personnel officials as to the strengths and limitations of the selection devices and standards of job performance currently in use in the employment process.

Recommendation 7

From this investigation the writer has gained insights into the validity of certain employment tests and certain non-test factors as predictors of supervisory ratings, administrative actions related to salary increases, and work sample evaluations. The predictors demonstrated moderate functional relationships with important behaviors outside of the employment test situation and the criteria rest on a variety of methods of sampling of job performance.

The writer feels that the findings and conclusions are realistic and practical and that they shed light on the usefulness of tests and non-test factors in the selection of secretaries. Since much secretarial work in the offices of the University of

Michigan is similar to that in many other kinds of offices, it seems reasonable that the validity data found in this study probably will be applicable to other situations.

This investigation constitutes a demonstration of the evidence that employment test scores are only a small part of the total job application process and that the employment application form and interview elicit certain required facts from the applicant and help to appraise important personal characteristics. The study supports the fact that personnel selection and placement decisions must be made with considerable care.

The writer believes that further investigations will make considerable progress in the application of tests and related systematic procedures in evaluating candidates for responsible positions. Thus we can continue our progress in the development of improved methods of insuring that each individual is placed in a position for which he is well qualified and in which he can make the maximum contribution to the success of the organization in which he is employed and to himself.

APPENDIXES

APPENDIX A

THE UNIVERSITY OF MICHIGAN
APPLICATION FOR EMPLOYMENT

TYPE OR WRITE LEGIBLY. GIVE ALL INFORMATION REQUESTED. WHERE NOT APPLICABLE (N.A.), SO STATE

THE UNIVERSITY OF MICHIGAN

APPLICATION FOR EMPLOYMENT

NAME ☐ MR. ☐ MRS. ☐ MISS _____ (LAST) _____ (FIRST) _____ (MIDDLE) DATE _____ 19__

PRESENT ADDRESS _____ TELEPHONE _____

PERMANENT ADDRESS _____ TELEPHONE _____

HOW LONG AT PERMANENT ADDRESS? _____ SOCIAL SECURITY NUMBER _____

WHAT KIND OF WORK ARE YOU APPLYING FOR? LIST CHOICE 1. _____ ☐ FULL TIME ☐ PERMANENT

2. _____ ☐ PART TIME ☐ TEMPORARY

HOW LONG DO YOU PLAN TO WORK HERE? _____ HOW SOON WILL YOU BE AVAILABLE? _____

PERSONAL

☐ SINGLE ☐ WIDOW ☐ SEPARATED ☐ MARRIED ☐ WIDOWER ☐ DIVORCED

AGE	BIRTH DATE	NUMBER OF DEPENDENTS	HEIGHT	WEIGHT	COLOR OF EYES	COLOR OF HAIR

NAME OF PERSON TO BE NOTIFIED IN EMERGENCY _____ ADDRESS _____ TELEPHONE _____

HAVE YOU HAD ANY SERIOUS ILLNESSES OR OPERATIONS IN THE PAST 5 YEARS? _____ IF SO, DESCRIBE _____

DO YOU HAVE ANY PHYSICAL DEFECTS (I.E., SKIN DISEASE, BACK INJURY, HERNIA, ETC.)? _____ IF SO, DESCRIBE _____

ARE YOU A U.S. CITIZEN? _____

HAVE YOU EVER BEEN ARRESTED FOR OTHER THAN A MINOR TRAFFIC VIOLATION? _____ IF SO, GIVE DATE, PLACE, CHARGE, AND DISPOSITION _____

HAVE YOU EVER REPORTED ANY OCCUPATIONAL INJURY OR DISEASE TO ANY OF YOUR FORMER EMPLOYERS OR RECEIVED A COMPENSATION CHECK FOR SUCH INJURY OR DISEASE? _____ IF SO, DESCRIBE _____

EDUCATION

TYPE OF SCHOOL	NAME AND LOCATION OF SCHOOL	YEARS FROM	YEARS TO	GRADUATE	COURSES SPECIALIZED IN	AVERAGE GRADE
ELEMENTARY						
HIGH SCHOOL						
COLLEGE						
TRADE SCHOOL						
BUSINESS COLLEGE						
OTHER (GIVE TYPE)						

LANGUAGES STUDIED: _____

LIST ALL MATHEMATICS, ENGINEERING OR SCIENCE COURSES YOU HAVE TAKEN AT A COLLEGE LEVEL _____

ARE YOU NOW A STUDENT AT THIS UNIVERSITY? _____ WHAT SCHOOL OR COLLEGE? _____

☐ GRADUATE ☐ UNDERGRADUATE ☐ SPECIAL MAJOR SUBJECT _____ WHEN DEGREE IS EXPECTED _____

FAMILY HISTORY

YOUR HUSBAND'S OR WIFE'S NAME	ADDRESS — STREET, CITY, STATE
YOUR HUSBAND'S OR WIFE'S OCCUPATION	NO. OF CHILDREN / LIST AGES OF CHILDREN
YOUR FATHER'S NAME	ADDRESS — STREET, CITY, STATE
YOUR MOTHER'S NAME	ADDRESS — STREET, CITY, STATE

HAVE YOU PREVIOUSLY APPLIED AT THE UNIVERSITY? IF SO, WHERE AND WHEN _____

HAVE YOU EVER BEEN EMPLOYED BY THE UNIVERSITY? IF SO, WHERE AND WHEN _____

LIST ALL RELATIVES NOW EMPLOYED BY THE UNIVERSITY _____ (NAME) _____ (DEPT.) _____ (NAME) _____ (DEPT.)

Form 7581 7-61 15M S 76528

SKILLS AND ABILITIES

PLEASE INDICATE ANY PROFESSIONAL, CRAFT, TRADE, OFFICE OR OTHER SKILLS, AND ABILITIES POSSESSED BY YOU (I.E., TYPING, SHORTHAND, OFFICE MACHINES)

SKILL	LENGTH AND KIND OF TRAINING	YEARS OF EXPERIENCE

PREVIOUS EMPLOYMENT

LIST ALL EMPLOYMENT — MOST RECENT FIRST (INDICATE IF PART TIME)

NAME AND ADDRESS OF EMPLOYER — DATE MO. — YR.

NAME — FROM — TITLE OF JOB — DUTIES

ADDRESS — TO

NAME OF SUPERVISOR — FINAL SALARY — REASON FOR LEAVING

NAME — FROM — TITLE OF JOB — DUTIES

ADDRESS — TO

NAME OF SUPERVISOR — FINAL SALARY — REASON FOR LEAVING

NAME — FROM — TITLE OF JOB — DUTIES

ADDRESS — TO

NAME OF SUPERVISOR — FINAL SALARY — REASON FOR LEAVING

NAME — FROM — TITLE OF JOB — DUTIES

ADDRESS — TO

NAME OF SUPERVISOR — FINAL SALARY — REASON FOR LEAVING

U.S. MILITARY SERVICE RECORD

DATES: FROM TO | BRANCH | RANK | TYPE OF DISCHARGE

DRAFT STATUS | RESERVE STATUS

PERSONAL REFERENCES (LIST 2 — NOT RELATIVES OR FORMER EMPLOYERS)

NAME	BUSINESS OR HOME ADDRESS	PHONE (IF KNOWN)	OCCUPATION

I UNDERSTAND THAT MISREPRESENTATION OF ANY STATEMENT ON THIS APPLICATION OR SUPPLEMENTAL FORM IS CAUSE FOR CANCELLATION OF MY APPLICATION AND SUFFICIENT CAUSE FOR DISMISSAL IF EMPLOYED. IF EMPLOYED I AGREE TO ABIDE BY ALL UNIVERSITY RULES AND REGULATIONS.

_____
(SIGNATURE)

* APPLICANT NOT TO FILL IN BELOW THIS LINE *

EMPLOYEE OATH

STATE OF _____
COUNTY OF _____ } SS.

I DO SOLEMNLY SWEAR (OR AFFIRM) THAT I WILL SUPPORT THE CONSTITUTION OF THE UNITED STATES OF AMERICA AND THE CONSTITUTION OF THE STATE OF MICHIGAN, AND THAT I WILL FAITHFULLY DISCHARGE THE DUTIES OF MY POSITION, ACCORDING TO THE BEST OF MY ABILITY.

(SIGNATURE) _____

SUBSCRIBED AND SWORN TO BEFORE ME THIS _____ DAY OF

_____, 19____.

_____
(NOTARY PUBLIC)

_____ COUNTY, _____ STATE

MY COMMISSION EXPIRES _____

INTERVIEWED BY:

DATE:

INTERVIEWER'S COMMENTS:

POSITIONS PROMOTABLE TO:

(IF HIRED) _____

APPENDIX B

EMPLOYMENT TESTS USED AT THE UNIVERSITY OF MICHIGAN

The General Clerical Test (Source)
A Typewriting Proficiency Test
A Shorthand Proficiency Test

The General Clerical Test

can be obtained from:

The Psychological Corporation

304 East 45th Street

New York 17, New York

DIRECTIONS FOR THE TYPING TEST

Accuracy. We are more interested in determining the neatness and workmanship you display in setting up these exercises and the accuracy with which you type them than we are in your typing speed. You will have adequate time to complete the test if you operate a typewriter with reasonable skill.

Corrections. The standard of typing accuracy is mailability. Be sure to proofread your work carefully. When you make an error, move the carriage as far to the left as possible so that gritty particles will not fall into the machine, erase neatly, and make the correction. Erasers are furnished.

Warm-up. The typing test consists of two parts and a warm-up exercise. The warm-up is designed to help you become familiar with your machine and to relax for the test. You need not hand in this material. If the typewriter is not satisfactory, move to another machine if one is available. Be sure to use a backing sheet for all practice and typing.

Part I. Part I is a rough draft of the beginning of a footnoted manuscript. In typing the final copy, use 1½-inch side and bottom margins, double space the main body of the text, indent paragraphs five spaces, and make all necessary changes. Type only the first page of the manuscript.

Part II. Part II is a composition test. Read the explanation carefully and do exactly what is called for. It is not necessary to add anything beyond the usual requirements of a good business letter.

WARM-UP MATERIAL

Is There a Special Clerical Aptitude?

A commonly used classification of clerical jobs describes three phases of clerical work: doing the work, checking it, and supervising it. Job analysis has shown that these are levels as well as types and that each of these levels of clerical work requires the making of more decisions than the level immediately below it. But planning and decision-making imply intelligence, aptitude for abstract thinking, a requirement by no means confined to clerical work. This being the case, one might well ask whether there is actually such a thing as clerical aptitude. Material discussed in the chapter on intelligence shows that general intelligence is indeed a factor in success in clerical work, the minimum desirable I.Q. being 95 or 100, and the minimum requirements rising with the level of responsibility. When promotability is a factor to be considered in the counseling or selection of potential clerical workers, intelligence should be heavily weighted; when, on the other hand, success in a routine clerical job is in question, intelligence exceeding the minimum requirement is all that is needed, other factors then being the decisive ones.

PART I
THE MODERN WORLD AND ITS ECONOMIC FORCES

Every civilization has had a world of its own, a world that embraced all the ~~land~~ water and ~~water~~ land known to the men who belonged to it. Our present world ~~frontiers have been widening since our civilization began until today the world~~ is almost as broad as our planet, and expansion beyond it is in the offing. ~~Since~~ The earth is the stage upon which the drama of mankind is enacted, ~~we shall begin with~~ A brief description of it in its relation to the distribution, character, and activities of man follows. Ranking first among the rivers of the world in the economic importance of their drainage basins are the Mississippi with its tributaries and the St. Lawrence river in combination with the Great Lakes, The Amazon, La Plata, and Parana, with their tributaries, are important in South America.

TABLE I

full caps Length and Drainage basins of the Principal Rivers in South America

Put in 3 columns under headings

River	Outflow	Length in Miles
Orinoco River,	outflow: Atlantic Ocean,	1,700 miles
Maderia River,	outflow: Amazon River,	2,000 miles
Amazon River,	outflow: Atlantic Ocean,	3,900 miles
Japura River,	outflow: Amazon River,	1,500 miles
Rio Negro "	" " "	1,400 "
La Plata River,	Outflow: Atlantic ~~River~~ Ocean,	2,300 miles
Uruguay River,	outflow: La Plata River,	1,000 "
Parana River,	" Atlantic Ocean,	2,940 "
Paraguay "	" Parana River,	1,500 miles
San Francisco River,	outflow: Atlantic Ocean,	1,800 miles
Pilcomayo River,	outflow: Paraguay River,	1,000 miles

leave 1½ spaces between headings and 1st line

1. W.S. Woytinsky and E.S. Woytinsky, World Population and Production, New York: The Twentieth Century Fund, 1953, p. 19.

Inland waters have always been a major factor in the economic life of peoples. They not only supply water and influence climate, but also serve as carriers of commerce, vital links between a settlement and the wider world. River valleys attract population, and many are among the most densely settled areas of the world. Yet they seldom form a demarcation between races; they usually mark only artificial frontiers.

PART II

Mr. Carl E. Baker of General Motors Corporation, 3044 West Grand Boulevard, Detroit 2, Michigan, has written to Dr. A.G. Adams, Dean of the Medical School, requesting a list of the current year's Medical School graduates who might be interested in entering the field of industrial medicine.

Assume that the list has been prepared and is to be enclosed. Prepare the covering letter. Explain that:

1. Check marks have been placed before the names of the graduates who have high priority because of superior scholastic records or because they are personally known by the dean to be interested.

2. Names of graduates who are least likely to be interested or who are less well qualified have been crossed out.

3. The remaining names may include many good prospects for careers in industrial medicine.

THE UNIVERSITY OF MICHIGAN

SHORTHAND PROFICIENCY TEST

SHORTHAND PROFICIENCY TEST

Mr. John Palmer (spell P-a-l-m-e-r)
2020 (two oh two oh) East Forest Avenue
Cleveland 23, Ohio

(do not dictate courtesy title)

/In examining your records, we find that you need only three more hours of an elective to complete your bachelor 20 of business administration degree.

You lack, however, the following prescribed courses to complete 40 the requirements for a certificate for teaching general business: 54

(At this point insert the hectographed material. Set it up in three columns under the headings of Education Course Number, Title, and Credit Hours. Then add this final sentence.)

If you have any other questions about your degree or certificate requirements, be sure to write us.

Very truly yours 20

60 wpm
1' 20"

TO: R. A. Johnson

FROM: J. J. Smith

SUBJECT: Progress of the Library Committee's Reports

I have already given the book entitled Business Review for Professional Secretaries a preliminary 15
examination. Now, as soon as the other book arrives, I shall set to work in earnest in reviewing them 30
and shall duplicate and circulate my criticisms to the group prior to the terminal meeting. The enclosed revised draft 45 of our report to the dean purports to be a summary of the members' responses to requests for analyses 60 of the over-all problem.

Encl.

80 wpm
1' 10"

Martha Watts, (spell W-a-t-t-s) Supervisor of Nurses
Chicago Health Department
346 Main Street
Chicago 12, Illinois

Dear Miss Watts:

Miss Jane Watkins has applied for admission to the School of Public Health to study for a master's 12 degree in public h alth.

We should appreciate a frank statement of your estimate of her ability to 24 do graduate work and of her potentialities for a position as a supervisor, director, 36 or teacher of public health nursing.

Essential qualifications are good physical health, emotional 48 stability, common sense, and interest in and ability to work with people. Initiative, 60 resourcefulness, imagination, and qualities of leadership are also important. She must, of course, be 12 a competent professional nurse.

Very truly yours 18

100 wpm
1' 18"

(material to be inserted in letter #1)

Education A1, History of Education in the United States, 2 credit hours

or

Education A25, Philosophy of Education, 2 credit hours

or

Education A30, Educational Sociology, 2 credit hours

and

Education B75, Problems of the Beginning Teacher, 2 credit hours

Education C1, Educational Psychology, 3 credit hours

Education D100, Directed Teaching 5 credit hours

Education D112, Methods in Major Subject, 3 credit hours

Total of 15 credit hours

APPENDIX C

THE UNIVERSITY OF MICHIGAN
NON-ACADEMIC PERSONNEL OFFICE FORMS:

"Request for Non-Academic Personnel"
"Notice of Employment"
"Notice of Employee Change"
"Notice of Separation"
The University of Michigan Employment
Services Introduction Envelope

UNIVERSITY OF MICHIGAN

REQUEST FOR NON-ACADEMIC PERSONNEL

BUSINESS OFFICE
NON-ACADEMIC PERSONNEL OFFICE

Date Issued .....

PLEASE EMPLOY FOR

Required by Date .....

.....DEPT.

Correct Title
of Position .....

Full time ..... Perm. ..... Temp. .....
Part time ..... Perm. ..... Temp. .....

Salary ..... per year
..... per month
..... per hour

Account Paid From .....

Replacing .....

Resigned ..... Date Res. .....
Transferred ..... Date Trans. .....

Requirements of Position (please be specific) .....

.....

.....

Remarks .....

.....

.....

.....

Requested by .....
Telephone .....

Approved by .....
PERSONNEL OFFICER

Approved by .....
DEPARTMENT HEAD
(see other side)

Form 5197 ML

Employee's Copy

THE UNIVERSITY OF MICHIGAN
PERSONNEL OFFICE
NOTICE OF EMPLOYMENT

PAYROLL CODE

NAME _____ (LAST), MISS, MRS., MR. _____ (FIRST) (MIDDLE) DATE _____

ADDRESS _____ TELE. _____

SCHOOL, COLLEGE, OR DIVISION _____

DEPARTMENT _____

CLASSIFICATION _____

EMPLOYMENT BASIS:

- ☐ 12 MONTHS
- ☐ 10 MONTHS
- ☐ MONTHLY
- ☐ HOURLY
- ☐ PERIOD
- ☐ TEMPORARY
- ☐ PERMANENT

COMPENSATION:

MONTHLY $_____

HOURLY $_____

PERIOD $_____

ANNUAL EQUIVALENT $_____

EFFECTIVE DATE _____ A.M. P.M.

ENDING DATE (IF PERIOD EMPLOY.) _____

BIRTH DATE _____

ACCOUNT PAID FROM _____

REMARKS _____

SOCIAL SEC. NO. _____

_____ DEPARTMENT HEAD

_____ PERSONNEL OFFICE

DATE ELIGIBLE FOR E. R. F. _____ FOR GROUP LIFE INS. _____

REHIRE? _____ DATE OF ORIGINAL EMPLOY. _____ _____ REPLACING _____

SALARY BUDGET $_____

SPECIAL APPROP. _____

C. S. C. A. _____

TRUST FUND _____

TOTAL—FISCAL YEAR $_____

ALIEN

- ☐ RESIDENT
- ☐ NON-RESIDENT

- ☐ TRANSFERRED
- ☐ RESIGNED
- ☐ PROMOTED
- ☐ DECEASED
- ☐ ON LEAVE

DATE _____ A.M. P.M.
(PAID THROUGH)

Form 7091 12-61 1M S 79799

UNIVERSITY OF MICHIGAN
PERSONNEL OFFICE
NOTICE OF EMPLOYEE CHANGE

Employee Copy

TYPE OF CHANGE

- ☐ REAPPOINTMENT
- ☐ RATE CHANGE
- ☐ CLASSIFICATION CHANGE
- ☐ TRANSFER
- ☐ LV. OF ABSENCE
- ☐ LV. EXTENSION
- ☐ SICK LV. WITHOUT PAY
- ☐ VACATION WITHOUT PAY
- ☐ OTHER DEDUCTION
- ☐ ADDRESS CHANGE
- ☐ NAME CHANGE

SOC. SEC. NO. _____

☐ MISS ☐ MRS. ☐ MR.

NAME _____ LAST _____ FIRST _____ MIDDLE

TELEPHONE _____

PRESENT DATE _____

EFFECTIVE DATE _____

BIRTH DATE _____

ADDRESS _____

SCHOOL, COLLEGE, OR DIVISION _____ (LIST SOURCE OF SALARY)

DEPARTMENT OR TRUST FUND _____

PRESENT CLASSIFICATION _____

CHANGE CLASSIFICATION TO _____

ACCOUNT _____

EMPLOYMENT BASIS

- ☐ 12 MONTHS ☐ MONTHLY ☐ TEMPORARY
- ☐ 10 MONTHS ☐ HOURLY ☐ PERMANENT
- ☐ 9 MONTHS ☐ PERIOD

RATE OF PAY	PRESENT	CHANGE TO
MONTHLY	$_____	$_____
HOURLY	$_____	$_____
PERIOD	$_____	$_____
ANNUAL EQ.	$_____	$_____

EXPIRATION DATE _____

DEDUCTION TO BE MADE

_____ FROM CHECK OF _____ FOR NO. OF DAYS _____ TAKEN DURING

REMARKS (FORMER NAME, ADDRESS, EMPLOYMENT BASIS; SOURCE OF ADDITIONAL SALARY, ETC.):

_____ DEPARTMENT HEAD

_____ PERSONNEL OFFICE

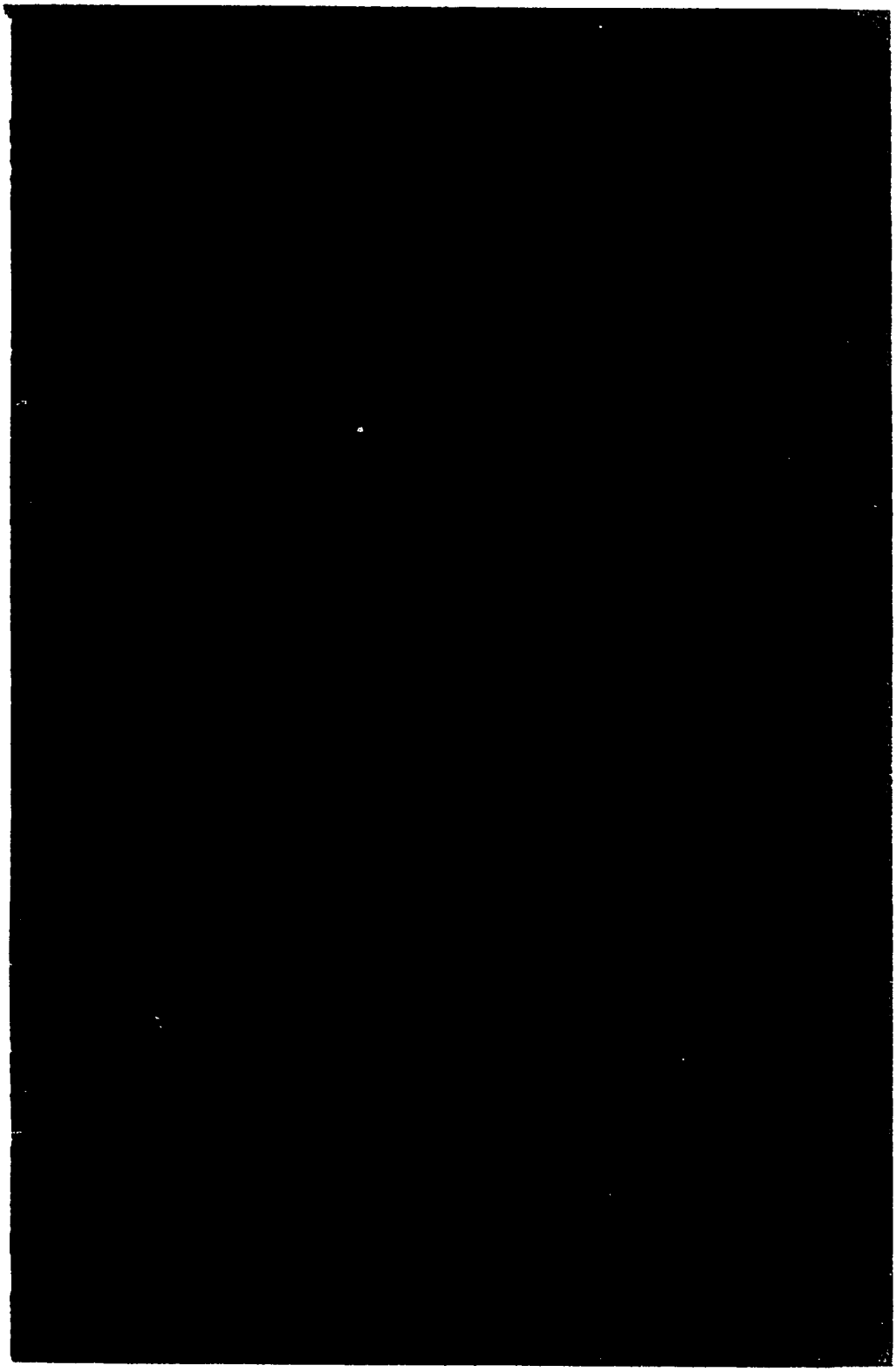
REPLACING _____

DATE PAID THROUGH _____

☐ TRANSFER ☐ PROMOTION ☐ LEAVE ☐ NEW POSITION

☐ RESIGNATION ☐ DECEASED ☐ OPEN POSITION

Form 7092rev.



THE UNIVERSITY OF MICHIGAN
PERSONNEL OFFICE
1020 Administration Bldg.
Extension 2005

This will introduce _____
who is interested in a position with your department.

PLEASE RETURN THE ENCLOSED MATERIAL TO THE PERSONNEL OFFICE WITH THE APPLICANT AND NOTIFY US AS SOON AS POSSIBLE REGARDING YOUR DECISION.

Robert K. Richards, Manager
Employment Services

APPENDIX D

PROGRESS REPORT FORM OF THE UNIVERSITY OF MICHIGAN NON-ACADEMIC PERSONNEL OFFICE

PROGRESS REPORT

OF

_____

THE UNIVERSITY OF MICHIGAN

PERIOD COVERED

_____

MONTH AND YEAR TO MONTH AND YEAR

_____ _____

DEPARTMENT POSITION

GRADING OF
PERSONAL QUALITIES—PERFORMANCE FACTORS—INTELLIGENCE—LEADERSHIP

Make an honest judgment of the qualities of this person for the entire period of this review and not on the basis of isolated incidents alone. Consider each of the twelve factors separately. Place a check (✓) in the square which most nearly expresses your judgment on each quality. The descriptive elements shown under each of the 12 major factors are provided for the rater's guidance. They are to be considered in composite form and not evaluated separately.

PERSONAL QUALITIES

1. PERSONALITY Consider the effect of his appearance, way of acting, and his disposition upon people. Be careful not to over-emphasize first impressions.	☐ Poor. At Constant Disadvantage	☐ Unfavorable Impression	☐ Nothing Outstanding	☐ Favorable Impression	☐ Exceptionally Pleasing Personality. Decided Asset
2. ABILITY TO GET ALONG WITH OTHERS Consider such factors as friendliness, cooperativeness, tact, self-control, and acceptance by others.	☐ Always Antagonizes	☐ Tends To Irritate	☐ Satisfactory	☐ Gains By His Understanding of Others	☐ Gets Utmost Cooperation From Others
3. LOYALTY AND SINCERITY Consider such factors as attitude toward job, associates, superiors and University.	☐ Undesirable	☐ Questionable	☐ Satisfactory. No Reason to Criticize	☐ Superior	☐ Outstanding in All Respects

PERFORMANCE FACTORS

1. KNOWLEDGE ESSENTIAL TO JOB Consider such factors as vocational skill, technical knowledge, and general background in own and related fields.	☐ Insufficient	☐ Bare Minimum	☐ Satisfactory Knowledge of Job	☐ More Than Normal Requirements	☐ Outstanding in all Respects
2. QUALITY OF WORK Consider such factors as accuracy, neatness, technical precision, and ability to organize and expedite work.	☐ Work Almost Worthless	☐ Inferior Quality. Frequent Errors	☐ Acceptable Quality. Normal Accuracy	☐ Superior Quality. Very Few Errors	☐ Outstanding in all Respects
3. QUANTITY OF WORK Consider volume of work produced under normal conditions, disregard errors.	☐ Very Slow Worker	☐ Volume Below Average	☐ Average	☐ Volume Above Average	☐ Rapid Worker
4. INDUSTRY AND DEPENDABILITY Consider the manner in which he applies himself to his work, if he does his job on time, and the amount of supervision and direction required.	☐ Neglects Work. Needs Constant Supervision	☐ Work Habits Irregular. Needs Considerable Supervision	☐ Conscientious But Needs Average Supervision	☐ Superior. Only Occasional Supervision Needed	☐ Justifies Utmost Confidence. Minimum Supervision Required

INTELLIGENCE

1. ABILITY TO LEARN NEW DUTIES Consider first, his mental ability in mastering new routine, grasping explanations, and his ability to retain this knowledge. Then consider the speed with which he learns and the amount of instruction necessary for you to give him in teaching him new duties.	☐ Very Limited Capacity to Learn	☐ Grasps New Ideas Slowly but Retains	☐ Normal Ability and Speed in Grasping New Ideas	☐ Learns Fast. Retains Well	☐ Unusually Quick and Complete Comprehension
2. INITIATIVE AND ORIGINALITY Consider his ability to think along original lines, to find new ways of doing things, to find a solution to problems, etc., and how often suggestions are made for improvements.	☐ None	☐ Rarely Shows Any	☐ Occasionally Shows Initiative. Some Original Thinking	☐ Frequent Constructive Contributions	☐ Highly Original. Initiates Valuable Ideas
3. JUDGMENT AND COMMON SENSE Consider his ability to make sound decisions, especially in the absence of detailed instructions or in emergency situations.	☐ Judgment Cannot Be Relied Upon	☐ Frequently Shows Poor Judgment	☐ Average Judgment and Common Sense	☐ Judgment Sound and Logical	☐ Outstanding. Thinks Quickly and Logically At All Times

LEADERSHIP (Only those who have supervisory responsibilities should be rated on the following factors.)

1. CAPACITY TO INFLUENCE AND INSPIRE Consider such factors as enthusiasm, energy, assurance and persuasive ability.	☐ Practically None	☐ Insufficient Force to Have Significant Influence	☐ Satisfactory Drive and Persuasiveness	☐ Above Average Ability to Influence and Inspire	☐ Outstanding. An Inspiring Forceful Leader
2. ABILITY TO ORGANIZE AND DIRECT WORK Consider the ability to plan, to delegate responsibility wisely, to exercise sufficient checks and controls, and to get things done in the face of obstacles and difficulties.	☐ Insufficient. Poor Organizer and Administrator	☐ Meets No More Than Minimum Requirements As Supervisor	☐ Satisfactory in Organizing and Directing Work	☐ Superior. Has Efficient, Smooth-Running Organization	☐ Unusually Successful, Efficient, Capable Administrator

HOW CAN THE EMPLOYEE BE MADE MORE EFFECTIVE ON HIS PRESENT JOB?

Employee should be given additional instruction on .....

Employee should be given additional experience on such jobs as .....

Employee should study such subjects as .....

Employee should change his attitude as follows: .....

There is nothing more that I can do for him because .....

Remarks: .....

.....

CAPACITY AND AMBITION FOR FUTURE GROWTH

Review all factors that you have previously considered and judge his capacity for future advancement both in the department and in the University.

☐ Going Backward	☐ Questionable	☐ Has Reached Most Suitable Job	☐ Should Be Considered For Promotion in His Dept.	☐ Should Be Considered For Promotion in the University

GENERAL REMARKS:

Include in your remarks the employee's strong points and the points on which further improvement could be obtained. Also list positions on which he has proved satisfactory and those on which he did not reach expectations.

.....

.....

.....

This review was shown to the employee on .....

This review was discussed with the employee on .....

His reactions were .....

.....

.....

.....

.....

This review was not shown to the employee because .....

.....

.....

.....

.....

Record prepared by .....

GENERAL REMARKS:

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Record reviewed by .....

Date: .....

PERSONNEL OFFICE RECORD

APPENDIX E

THE UNIVERSITY OF MICHIGAN JOB DESCRIPTIONS FOR:

C-1 Clerk
C-2 Typist-clerk
C-3 Secretary
C-4 Secretary
C-5 Administrative Secretary

The University of Michigan
Personnel Office

C-1 Clerk

Function:

To maintain records and accounts or rearrange goods and materials.

Description:

The CLERK checks applications, vouchers, and other forms for accuracy and completeness. She fills in data on standard office forms, reports, correspondence, or other records. She files and rearranges materials, following prescribed alphabetical, chronological, or numerical sequences. She sorts questionnaires, applications, and other forms into specific categories. She opens, sorts, and distributes mail, or other office supplies. She folds, stuffs, seals and stamps outgoing mail. She fills approved stockroom requisitions and maintains the stockroom. She operates office machines and equipment. She answers the telephone, makes routine inventories of equipment, materials and supplies.

The University of Michigan
Personnel Office

C-2 Typist Clerk

Function:

To improve the appearance of written matter by use of the typewriter.

Description:

The TYPIST-CLERK types letters, memoranda, reports, statements, and other material from copy, rough draft, or dictating machine. Following established procedures, fills in on a typewriter various data on vouchers, purchase orders, requisitions, applications, and other forms, such data being taken from media on which the necessary information is clearly indicated or is obvious. She types multi-columnar tabulations of statistical data either from rough copy or from a limited number of designated source documents.

She cuts mimeograph and other stencils. She transcribes dictating machine cylinders. She may operate a graphotype, alphabetical key punch or other office appliances not requiring significant previous training other than in typing.

She sorts and files documents and records according to predetermined classifications. She checks records and papers for clerical and arithmetical accuracy, completeness, and for compliance with a few clearly established standards or procedures. She makes entries of designated or obvious information on control records of various types. She receives, sorts and distributes incoming and outgoing mail. She runs errands as required.

She acts as receptionist or gives information of a routine nature to the public.

The University of Michigan
Personnel Office

C-3 Secretary

Function of job

Under general supervision, to perform office work of above average difficulty involving stenography, typing and clerical duties

Characteristic Duties and Responsibilities

1. Takes and transcribes dictation by shorthand or stenotype
2. Transcribes from dictation machine belts, discs, tapes, or cylinders
3. Types letters, manuscripts, reports, and other material
4. Types stencils, spirit process masters, and offset mats
5. Supervises a small group of stenographers, typists and clerks engaged in routine clerical operations
6. Performs related duties as assigned
7. Operates standard office machines and duplicating equipment

Supervision Received and Given

Received: Oral and written instructions of a general nature from designated superiors
Given: Supervision to employees of a lower classification

Minimum Acceptable Qualifications

1. Clerical and general office ability
2. Ability to take dictation at the rate of 80 net words per minute, and to transcribe the notes or to transcribe from dictation machine belts, discs, tapes, or cylinders at a rate of 40 net words per minute. (This qualification is waived for those positions not requiring these skills)
3. Ability to type from clear copy at a rate of 50 net words per minute
4. Desirable supervisory characteristics
5. High school education and/or experience sufficient to perform above duties and responsibilities

Promotional Line

From Stenographer-Clerk (C-2) or Clerk Typist (C-2)
To Secretary (C-4)

The University of Michigan
Personnel Office

C-4 Secretary

Function:

To establish and maintain a clerical function.

Description:

The SECRETARY takes and transcribes dictation consisting of letters, articles, memoranda and speeches. She answers the telephone and interviews callers. She arranges appointments with superiors or provides callers with required information.

She composes correspondence independently on routine matters and in other matters in accordance with instructions of the superior. She edits, for grammatical construction and usage and diction, reports, letters and memoranda. She prepares instructional bulletins or memoranda. She conducts routine transactions with other departments of the University and with the public. She compiles data for administrative reports and other purposes, using prescribed sources. She prepares complex work sheets and tables and makes varied arithmetical computations on materials assembled.

She codes, classifies, files and directs the filing of all materials in a large and complex filing system. She sorts and routes mail. She keeps personnel, financial, statistical, inventory and other records. She develops office forms and procedures. She receives and records in-coming monies. She maintains moderately complex departmental budgetary and financial records and prepares payrolls and personnel transaction forms.

She supervises and directs the flow of work in a small clerical unit. She instructs subordinate employees as to work procedures. She reports to and confers with superior on personnel problems of the unit.

She performs related work as required.

The SECRETARY posts information from such media as time reports, material consumption reports, performance reports, applications, requisitions, and many other media. The posting

Description: (Con't)

is made to control records or statements of various types including rosters, card records, journals, ledgers, or summary statements, and is made under conditions in which the correct posting is not always apparent from the media involved and requires knowledge of specific rules and regulations and the use and purpose of the media worked with in order that the posting may be properly performed.

She makes final checks, usually with the necessity for assuming personal responsibility for the accuracy of records and reports of many varieties or reconciles one form of media with another.

She receives applications, petitions, or other documents and checks for compliance with requirements as to form and content, and for completeness. Such checking requires independent decision as to whether the documents comply with provisions of applicable rules, regulations, policies and schedules, and sometimes involves the study of such sources before judgment can be rendered.

She gives out information at a public counter or over a telephone relative to course requirements, University procedures and activities when judgment and study of such sources as those described above are involved in answering questions of fact.

The University of Michigan
Personnel Office

C-5 Administrative Secretary

Function:

To establish and maintain a clerical function as an agent for an individual or organization.

Description:

The ADMINISTRATIVE SECRETARY arranges appointments for a superior. She gathers material on assigned subjects for use by the superior in the preparation of reports, speeches, or articles and, in this connection may perform library research of a difficult nature. She signs routine forms and correspondence for the superior. She answers the telephone and interviews office callers. She takes and transcribes dictation consisting of letters, reports, articles, memoranda, and speeches, much of which is highly confidential.

She conducts correspondence and negotiations according to general instructions of a superior on the more routine phases of the administrative work of the office. She prepares budget estimates and may prepare statements of personnel and equipment needs from material presented by section heads.

She drafts annual reports of the activities of the department or division from reports submitted by heads of units. She edits special reports prepared by others. She reads and routes incoming correspondence. She reads outgoing correspondence and refers to a superior those which involve important or unusual question of policy interpretation. She examines the minutes of meetings of boards and committees and refers to a superior those matters on which administrative action is required. She follows up on assignments made to employees of the division and advises superior of the various actions taken.

APPENDIX F

MEANS AND STANDARD DEVIATIONS FOR THE INDEPENDENT AND DEPENDENT VARIABLES FOR THE SHORTHAND SAMPLE

MEANS AND STANDARD DEVIATIONS
FOR THE INDEPENDENT VARIABLES
FOR THE SHORTHAND SAMPLE*

Variable	Mean	S.D.
GCT Clerical subtest	52.80	11.49
GCT Numerical subtest	32.64	7.57
GCT Verbal subtest	80.94	10.93
GCT Total	166.47	23.18
Typewriting proficiency test	70.83	16.01
Shorthand proficiency test	60.67	21.47
Age	22.28	6.66
Educational Background**	3.03	2.00

*N = 90

** Equivalent to high school graduate with one year of higher education at a college or university

MEANS AND STANDARD DEVIATIONS
FOR THE DEPENDENT VARIABLES
FOR THE SHORTHAND SAMPLE*

Variable	Mean	S.D.
Supervisors' ratings, quality of work	68.78	21.66
Supervisors' ratings, quantity of work	73.28	21.28
Supervisors' ratings, intelligence	67.83	19.26
Supervisors' ratings, growth on the job	68.50	22.80
Administrative actions (salary increases)	$201.29	172.69
Work sample evaluations (61 subjects)	80.75	14.78

*N = 90

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