THE USE OF A MODIFIED RATIO-DELAY METHOD TO TRAIN FOOD SERVICE SUPERVISORS

By

MAXINE DOLORES SCHUMACHER

Bachelor of Science

Fort Hays Kansas State College

Hays, Kansas

1954

Submitted to the faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
May, 1966

THE USE OF A MODIFIED RATIO-DELAY METHOD TO TRAIN FOOD SERVICE SUPERVISORS

Thesis Approved

Mary E. Leidigh
Thesis Adviser

Helen F. Barbour

Dean of the Graduate College

ACKNOWLEDGEMENT

Sincere appreciation is expressed by the author to Miss Mary E. Leidigh, Associate Professor of Food, Nutrition and Institution Administration and Director of Food Service Administrative Internship, Oklahoma State University for invaluable guidance, suggestions and encouragement. Gratitude to Dr. Helen F. Barbour, Head of Food, Nutrition and Institution Administration Department, Oklahoma State University for support and encouragement and to Dr. Harry Brobst, Head of Tests and Measurement Department for guidance and access to available test and measurement instruments. Sincere thanks to Mrs. Mary C. Zahasky, Director of Department of Dietetics and Therapeutic Internship at the University of Oklahoma Medical Center for permission to complete this research in the Department of Dietetics at the Medical Center and for cooperation through to completion. Appreciation is expressed to the Food Service Supervisors at the University of Oklahoma Medical Center, Mrs. Buena Grady, Mrs. Mary Richardson, Mrs. Clara Richard, Mr. Doyle Pigg, Mrs. Essie Stamps, Mrs. Sadie Jenkins, Mrs. Marion Berry and Mrs. Betty Mims for their cooperation and participation in this research.

TABLE OF CONTENTS

LIST OF PLATES

LIST OF CHARTS

LIST OF FIGURES

CHAPTER I

STATEMENT OF THE PROBLEM

The author's interest in the observational abilities of food service supervisors was piqued while a staff member of the University of Oklahoma Medical Center. The positions held by the author at the Center were Methods Improvement Dietitian and Administrative Dietitian. This interest in observational abilities became more pronounced when, as Administrative Dietitian, direct responsibility was assumed for the actions of the food service supervisors. It was observed that the supervisors were consistently having trouble developing a sensitivity to the sights and sounds of the operation. Also these supervisors generally were unable to relate the operation's sights and sounds to visualizing the work performance of employees they were supervising. Each supervisor observed and realized that employees were present in the area. However, the supervisor had difficulty seeing the employee as "working" or "idle," and the relationship of this activity to optimum production.

This project will try to determine and measure the observational level of the food service supervisor. In order to accomplish this, consideration will be given to formulating, selecting or adapting a test or tests, either oral or written. Such a test will be administered to help determine the supervisors' observational levels. A research

period of fifteen days using a modified ratio-delay method will be utilized and a follow-up period will be designated for retesting to determine possible changes in the food service supervisor's observational level.

For this research an institution will be located which employs food service supervisors in sufficient number to select a sample group. It is hoped that interest is prevalent for improving the supervisor's observational technique and that membership in the Hospital, Institutional, and Educational Food Service Society* is stressed. The food service supervisors chosen from this institution are to be members of the HIEFSS. Selection of the supervisors is to be made on the basis of availability (approximately five weeks), need for continued growth, the individual's cooperativeness and furthering of supervisory experience.

---

*Hereinafter known as the HIEFSS

CHAPTER II

REVIEW OF THE LITERATURE

Position of Food Service Supervisor

The position of Food Service Supervisor has been born of great need within the last twenty years. As stated in a 1965 report (1) the need for delegation of duties to non-professional personnel was recognized by The American Dietetic Association in 1943. Today, as the American Dietetic Association report (1) continues, the duties which belong to the food service supervisor have been differentiated, and a job description which conforms to current practice is available.

Some variation in the name and roll for such supervisory employees became evident upon review of the literature by the author. McFadden and Hart (2) cited the national Labor-Management Relations Act and in substance define a supervisor as an individual having authority, in the interest of the employer. This person may hire, transfer, suspend, lay-off, recall, promote, discharge, assign, reward or discipline other employees or may have responsibility to recommend action. The exercise of such authority is not merely routine or clerical but requires the use of independent judgment. All supervisors carry out similar duties, but the degree of responsibility can vary. The same American Dietetic Association report (1) has made recommendations for titles of supervisory employees in small institutions (25 beds or less). When the person in charge is responsible for actual food preparation, the title

should be "cook-manager" rather than "food service supervisor."

Cushman and Cushman (3) in 1947 said that supervision is an art, because skill is required to become a first class supervisor. Skill is the practice of any art, whether it be the art of supervision or the art of playing the violin and can be acquired only by long hard practice. It is probably no exaggeration to state that a great many, probably a majority, of all the supervisors now on the job learned to perform their supervisory functions the hard way - by the trial and error method.

A second report from the American Dietetic Association (4) suggests that the role of the food service supervisor may include many and varied duties and responsibilities, such as:

1. Consulting with the dietitian (full-or part-time, or dietary consultant) regarding operating problems, patient food service and therapeutic diets.
2. Orientating, training, supervising and evaluating new personnel.
3. Training, supervising and evaluating other personnel.
4. Instructing employees in use, care and maintenance of equipment.
5. Preparing work and time schedules for food service employees.
6. Supervision of sanitation and housekeeping procedures.
7. Maintaining safety standards.

Responsibilities in the area of administration.

1. Assisting in ordering food supplies.
2. Receiving deliveries and checking receipts against specifications and orders.
3. Maintaining or improving standards of food preparation and service.
4. Supervising activities of work areas, including cafeterias, dining rooms, and the dishwashing room.
5. Assisting in the standardization of recipes and supervising their use.

Responsibilities in the area of patient food service.

1. Writing modified menus according to patterns established by

the dietitians or dietary consultants.
2. Supervising serving units or central tray service.
3. Contacting patients daily who are receiving routine diets and/or selective menus.

The Cook-Manager

1. Planning menus consistent with current nutritional principles and within budgetary limitations.
2. Scheduling, training and evaluating food service personnel.
3. Developing specifications for food supplies and purchasing them.

To enable personnel to perform the many and varied responsibilities of the food service supervisor, specific training courses are being offered and the "hard way by the trial and error method," as stated by Cushman and Cushman (3), is becoming more obsolete. The American Dietetic Association report (1) states that most of the training courses offered for food service supervisors are included as adult education programs in vocational high schools, although an increasing number of junior colleges have two-year courses in food administration leading to an associate degree. At least one course is known where adult education is providing additional preparatory training to the food service supervisor so that greater assistance may be given to the therapeutic dietitian. In-service training programs have been instituted, also, in a number of large institutions and such programs are encouraged and recognized as acceptable avenues of training.

Michigan State University offers a ten-week residence study course for food service supervisors (1). The Pennsylvania State University conducts a correspondence course for food service supervisors as does The American Dietetic Association. The latter course, the report stated (1), is an outgrowth of the research work done under three successive grants from the Kellogg Foundation from 1959 through 1963. The

American Dietetic Association course, as finalized, involves not only the preparation of lessons which the trainee sends to the Course Director for grading and evaluation, but has the personalized help of "preceptors," who are selected professional dietitians. Concurrent employment in a food service department is an eligibility requirement for participation in this course. Furthermore, a unique feature of the curriculum is a laboratory session of at least two days, in which students are brought together as a group for supplementary work.

In view of the appreciable number of food service supervisors trained in recognized courses The American Dietetic Association asked a committee to investigate the possibility of a national organization. The following year (1959) this special committee was charged with considering the possibility of establishing such an organization. Margaret L. Ross, chairman of this committee, reported that a constitution for an organization to be known as "Hospital, Institution, and Educational Food Service Society," had been accepted and chartered in the State of Illinois (1). This organization has come to be known as the "HIEFSS." Membership in the HIEFSS is open to all food service supervisors who complete the training program requirements.

Qualities which promise success as food service supervisors are not restricted to persons of a particular age group. They are found in relatively young adults and in those who are considerably older. For this reason, no specific age limits have been indicated. Supervisors should have good health, good judgment, a liking for people and a sense of humor. They should possess the quality of leadership that invites active cooperation and inspires harmonious working relation-

ships.

This person may supervise those who prepare and serve food and beverages in such a way as to:

1. schedule work and hours for personnel,
2. maintain established standards of sanitation, safety and housekeeping,
3. maintain records, including food cost, meal census and personnel records,
4. follow through on routine daily food purchasing procedures,
5. perform other duties which may be delegated by the person to whom the food service supervisor is responsible.

In a small organization a food service supervisor may perform all of the duties listed above with the guidance of a dietary consultant and/or a shared dietitian. In addition, the supervisor may perform other duties, such as the planning of menus and routine modified diets and the purchasing and controlling of food and supplies (5). In a large organization, however, a food service supervisor usually is responsible for supervisory duties in only one specific work area as delegated by the director of the department of dietetics, who is a professionally qualified dietitian (5).

Also it is important for the food service supervisor to realize the value of obtaining new knowledge and refining old skills. In connection with this Phillips and Foster (6) state that the individual must first perceive how continued learning will be useful in attaining goals and satisfying desires. An axiom of education states "that the learner who becomes an active participant in the learning process takes a greater interest."

Food service supervisors frequently observe without seeing or understanding what is being done or are unable to evaluate whether the employee is at productive work or idle. How does a supervisor deter-

mine how well subordinates are performing their work? Frazier (7) suggests one way is to compare employees' actual performance with predetermined work standards.

In every work standard, two factors are present; these are quantity and quality. A quantitative work standard will contain several elements. For example:

1. a unit of work,
2. specified method,
3. specified equipment,
4. specified conditions of work,
5. an employee with the skill and aptitude for the job,
6. a management's decision on the rate of work performance and
7. a time factor, with consideration for the degree of exertion necessary.

Any job will have all these quantitative factors involved, although not specifically labeled or easily distinguished.

A qualitative work standard, on the other hand, contains a degree of:

1. competence,
2. accuracy and
3. precision.

Frazier (7) indicates that the work standard cannot be merely quantitative or merely qualitative but both factors must be present.

Aspects of Work Simplification

Another way to help the supervisor obtain a measure of the area's activity is to be the observer in a work sampling study as stated by Heiland and Richardson (8). Work sampling methods are used in the field of work simplification.

According to Zinck (9) a key to learning work simplification is

to realize the tremendous waste of physical effort and the monetary expense added to the production of a product. This effort should be realized wherever and whenever possible for every act in carrying out the job functions. The manager, the foremen and the employee, each in his own sphere of influence, must realize this and be spurred by a mental revolution. Zinck believes this mental revolution of the supervisor is a mental shift from seeing a man walking or a hand moving as something necessary to get the job done, to seeing a man walking or a hand moving as a costly use of time, which adds only cost to the production. The supervisor (9) after purposeful thought and observation of an employee has the mental shift to "do something about it." Now even the mere act of recording in writing what is actually being done, will of itself, bring ideas for improvement to the supervisor's mind.

According to John R. Johanson (10) work simplification is more than a phase, a system, a course or a program. It is a philosophy and technique for accomplishing improvement which may be obtained through people. Work simplification is based on the assumption that further improvement is always possible and that this can be attained by those motivated to expend the necessary time and effort.

The broad subject of Work Simplification uses specific procedures for analyzing work situations. These procedures include the headings of Work Sampling, Ratio-Delay, Snap-Reading or Random Observations.

Work Sampling, as stated by Barnes (11), covers three main uses:

1. Ratio-Delay which measures the activities and delays of men or machines and determines the percentage of the day that a man is working or not working.
2. Performance Sampling which measures working time and non-working time of a person on a manual task, and

establishes a performance index or performance level for the person during working time.

3. Work Measurement which measures a manual task, that is, establishes a time standard for an operation.

Snap-Reading, which basically means the same thing as Work Sampling or Spot Sampling, was discussed in an article by P. Cordier (12). Snap-Reading describes a procedure used in France to cover the Anglo-American words, such as Work Sampling, Spot Sampling and the Ratio-Delay Method. The Snap-Reading method described by Cordier consists essentially in replacing continuous observations at a work place or group of work places by a number of observations taken in as short a time as possible. The number of observations needed is figured mathematically.

Wilks (13) writes of a procedure called Random Observation. Preliminary work is outlined to determine the elemental breakdown of the job and includes the selection of random numbers (which will determine the times of observation). In Wilks' application an eight hour production study was completed. If the operator was working, a performance rating factor was given; if not working, the reason why was ascertained. When the required number of observations had been taken, the results were tabulated. Then a percentage breakdown and also the percentage of incidental work was obtained. An accuracy of five per cent was considered sufficient for this study.

Barnes (14) refers to work sampling as employing a random sampling theory similar to that used in quality control. This method consists of selecting samples at random from a large group and, when a sufficient number of samples has been selected, a prediction is made for

the whole group. The work sampling procedure in its simplest form consists of making observations at random intervals of one or more operators or machines and noting whether they are working or idle. If the operator and machine is working, a tally mark under "working" is made; if idle, a mark under "idle" is made. The percentage of the day that the worker is idle is the ratio of the number of idle tallies to the total number of idle and working tally marks. For example for a total of 40 observations with four idle times and 36 working times, 10% idle time (4 ÷ 40 x 100 = 10%) and 90% working time (36 ÷ 40 x 100 = 90%) is noted. If the study covers one operation for an eight hour day (480 minutes), then results will show "operation idle" 10% or 48 minutes of the day (480 x 0.10 = 48) and "operation working" 90% or 432 minutes (480 x 0.90 = 432).

Essential in work sampling techniques are the use of random observations of workers performing job duties. To Schwetter and Davis (15) this means that there should be no apparent order for the observations, so that any one observation will be independent of the others. Each work sampling observation lasts only a fraction of a minute, with an instant for notation. The total time for making all the observations may encompass a longer time period than that used in customary job analysis.

Observation

Amiss and Sutton (16) believe that knowledge is gained to a large degree through observation. The definition of "observation" is that it is a combination of the ability to see what is looked at accurately

and the possession of the memory to recall what has been observed. All observation requires some degree of concentration. In most cases observational abilities are vague and wanting in fullness of detail and precision. Things possessing distinctive characteristics may be observed and recognized by a brief glance. This type of glance is the sort of observation made by the majority of people. Good observation must be accurate and free from error. The ability to make careful and detailed observations can be developed and improved by constant practice.

Accuracy of observation is required because it is the foundation of dependability (16). Lack of reliable information, or inaccurate observations, is very apt to show up in mistaken beliefs and opinions. These mistaken beliefs and opinions may be adapted by the supervisor from others without seeking to make proper substantiation by personal observations and reflections. Accurate thinking is based on facts rather than emotions. It is known that strong emotions may bring about a considerable divergence in statements from actual reality and lack of accuracy may lead to looseness in judgment. From the viewpoint of the supervisor, accurate observation should be developed so it becomes a habit.

Schwetter and Davis (15) have suggested that in order to make observations employee duties be identified and outlined. A period of three weeks was proposed for such a study. Eleven observations per day were indicated (15) as the maximum number by an observer, since other duties also must be performed. To obtain the observation times the observer develops a series of random times from tables of random

numbers. The random times selected designate when the observations will be made and eliminate the possibility of bias on the observer's part in selecting the time to make observations. These selected numbers are converted to time values by ignoring any digits in the table of random numbers from 60 to 99 and using only digits from 00 to 59. For example, if the numbers selected were two or 55, these will be prefixed to the starting work hour as follows 6:02 or 7:55. This procedure is continued by prefixing each hour to a random number through to the closing work hour of the day. A set of random numbers is selected for each day of the time study. These random times then are used to make the observations each day. The observation forms used during this procedure are designed to permit the observer without hesitation to instantly record what has been observed.

A critical point to remember, Close (17) stresses, is that observational readings should be defined and when the observer arrives at that point the activity of person and machine should be noted immediately. Each operation of "working" or "idle" should be given an equal chance of being observed and noted.

Vroom (18) raises the question of whether, with all of the suggestions for obtaining new knowledge and refining old skills, it is reasonable to suppose that any real change in behavior or personality of an individual takes place in a few weeks. Psychologists say, according to Vroom, that people do change continuously but that this change is the result of a gradual process of accretion. Or, conversely, it may be a gradual sloughing off of old ideas and concepts. Seldom though, can people expect to change the basic personality

structure, which is the core of behavior. A pattern of ego defenses is built in depth which is termed our "self." In a complete individual this pattern cannot change too radically.

Therefore, managers must accept themselves, Vroom (18) feels, and accept too, the personal failings and foibles of their subordinates. Furthermore, managers must be understanding and supportive of human weakness, because this is in the best interest of individual growth and development and promotes the proper "climate" for the release of human capabilities.

Testing for Observation Abilities

To determine the ability of the food service supervisor to perform observational work a test may be used. According to Noll (19) the first step in planning such a test, or measuring instrument, is to decide what goals or objectives to measure. Having defined the objectives the next step is to decide what type of test will best accomplish this purpose. Noll says that the objectives and the measurements should complement each other. The only way to determine to what extent the objectives of instruction have been attained is to use a measuring instrument. Otherwise the extent of progress made is a matter of subjective opinion or conjecture. According to Arny (20) subjective measurement may not furnish accurate information because the results may be misinterpreted or influenced by personal bias. Wallace (21) indicates that tests, although admittedly imperfect, are better than subjective methods of appraising human abilities. In practice, Noll (19) states, it is customary to begin by canvassing the

instructional material and activities as related to the educational objectives to be measured by the test.

Before and during the test session rapport - a feeling of calm, comfort and confidence to the persons involved - is extremely important. Memmers and Gace (22) state that the absence of rapport may mean nervousness and inefficiency on the part of the pupil. Brown (23) states the reliability of a test is higher when the directions are clear and adequate. These directions should explain "what" is to be done, "how" the answer is to be recorded and "where" it is to be placed as, for example, on an answer sheet. Summarizing the test is always a crucial step according to Furst (24). The test summation should, in brief, do the least amount of violence to the answers and yet permit the kinds of interpretations desired.

According to Furst (24) a test-retest pattern may be used to assess permanent changes and/or establish the reliability of the test. For retest the same instrument is administered a second time to the group after an interval of a few or several days.

Summary of Literature

The position and role of the food service supervisor is one of responsibility for and to other human beings. From the literature it would appear possible to test and train the supervisor to visualize the work performance of the employee. Also the food service supervisor may be made more aware of the "operation" through accurate observation.

CHAPTER III

METHODS AND PROCEDURES

As Administrative Dietitian at the University of Oklahoma Medical Center, it was observed that food service supervisors were consistently having trouble developing a sensitivity to the sights and sounds of the operation. Also these supervisors were unable to relate the operation's sights and sounds to visualizing the work performance of employees. Each supervisor observed and realized that employees were present in the designated area. However, the supervisor had difficulty seeing the employee as "working" or "idle" and the relationship of this activity to optimum production.

This project will try to determine and measure the observational level of the food service supervisor. In order to accomplish this, consideration will be given to formulating, selecting or adapting a test or tests, either oral or written. Then such a test will be administered to determine each supervisor's observational level. A research period of fifteen days using a modified ratio-delay method will be utilized. A follow up period will be designated for retesting to determine any changes in the observational level.

Selection of Tests

Dr. Harry Brobst, Head of Tests and Measurement Department at

Oklahoma State University, was consulted on the type of test to use in this research. Dr. Brobst stated that a test for this type of measurement had not been utilized before and that a specific test was not available. It was mutually agreed that a test using pictures would be more valid considering the level of formal education and length of time that some of the food service supervisors had been out of school. A review of perception or inspection (aptitude) tests, which would come the nearest to measuring an observation level, was conducted. Dr. Brobst also suggested a review of the Flanagan Aptitude Classification Test Series*, as an inspection test based on the use of pictures is included in this particular test series.

The review of various tests indicated only one other perception-inspection test using pictures and, as the F.A.C.T. on Inspection, form 1A, was readily available it was selected for use. Also while reviewing the materials a test on Judgment and Comprehension, form 8 A, from the F.A.C.T. series, was found and discussed with Dr. Brobst.

Location of Research

For this research the author was interested in locating an institution that stressed membership in the HIEFSS for food service supervisors. Because of avid interest manifested by the dietetic staff to improve the supervisory techniques, the University of Oklahoma Medical Center was considered as an institution which could lend itself to this research.

---

*Hereinafter known as the F.A.C.T.

Therefore the next step was to contact the University of Oklahoma Medical Center. An invitation to participate in this research was sent to Mrs. Mary C. Zahasky, Director, Department of Dietetics. Mrs. Zahasky enthusiastically accepted the opportunity for the department and food service supervisors to participate.

The organizational structure of the Department of Dietetics at the Medical Center is divided into four service divisions 1) Patient Food Service, 2) Cafeteria, 3) Main Kitchen and 4) Children's Patient Food Service plus two supportive divisions, Methods Improvement and In-Service Education. There are positions for 112 full time employees, 18 food service supervisors (ten of whom are members of HIEFSS) and 13 staff dietitians. Mrs. Zahasky indicated that numerous staff dietitians are employed to maintain an extensive inter-and intra-departmental teaching program plus a dietetic internship.

When a food service employee at the University of Oklahoma Medical Center is promoted, or an individual (from outside the organization) is hired for a supervisory position, each is enrolled in the in-service education program. These courses, taught by the Department of Dietetics, are designed to meet the education requirements of HIEFSS and the needs of the University of Oklahoma Medical Center. Obtaining membership in HIEFSS is encouraged for each food service supervisor.

Orientation of Dietitians

All staff dietitians to be concerned with this research were invited to an orientation, during which an explanation of the problem, the objective and an outline of procedure was presented. It was ex-

plained to the dietitians that the problem to be studied is the apparent trouble food service supervisors have in visualizing the work performance of employees. These supervisors see the employee as "working" or "idle" and do not realize fully the relationship of these activities to optimum production. Also indications were that the food service supervisor had difficulty in developing a sensitivity to the process of supervisory observation in specific areas of responsibilities. Therefore, the objective set for this research will be to try to make the food service supervisor aware of his or her level of observation in specific areas of responsibilities.

The author suggested a total of eight food service supervisors be selected, two from each of the four service areas, by the dietitians in charge. The supervisors chosen should be members of the HIEFSS. Selection is to be made on the basis of availability (approximately five weeks), need for continued growth, the individual's cooperativeness and furthering of supervisory experience. Adherence to the qualifications set forth were stressed and cooperation of the dietetic staff was encouraged.

Further explanation to the dietitians emphasized that this research is to be divided into three phases; preliminary, modified ratio-delay method and a retest. One day before the modified ratio-delay method is to be begun the preliminary phase of administering tests and showing slides will be conducted. After using the modified ratio-delay method for fifteen days, another day will be used to retest and view additional slides.

During the preliminary period the first step will be to admin-

ister the F.A.C.T. on Judgment and Comprehension, form 8 A (Appendix A) to the supervisors. Then illustrations of a series of five 35 mm colored slides (Figures 1 - 5) to be presented to the food service supervisors showing employees in actual work situations will be shown the dietitians. The slides of actual work situations were taken by the author while doing a special project as Methods Improvement Dietitian. Upon viewing the pictures the supervisors will be asked to mark an observation card (Chart I p. 23) with a "W" if the picture shows the employee working or an "I" if the employee is idle. The decision of "working" or "idle" when viewing each slide will be based on the supervisor's judgment. Discussion following each slide will be guided to help the supervisor realize what has been observed. To complete the preliminary phase a F.A.C.T. on Inspection, form 1 A (Appendix B) will be administered.

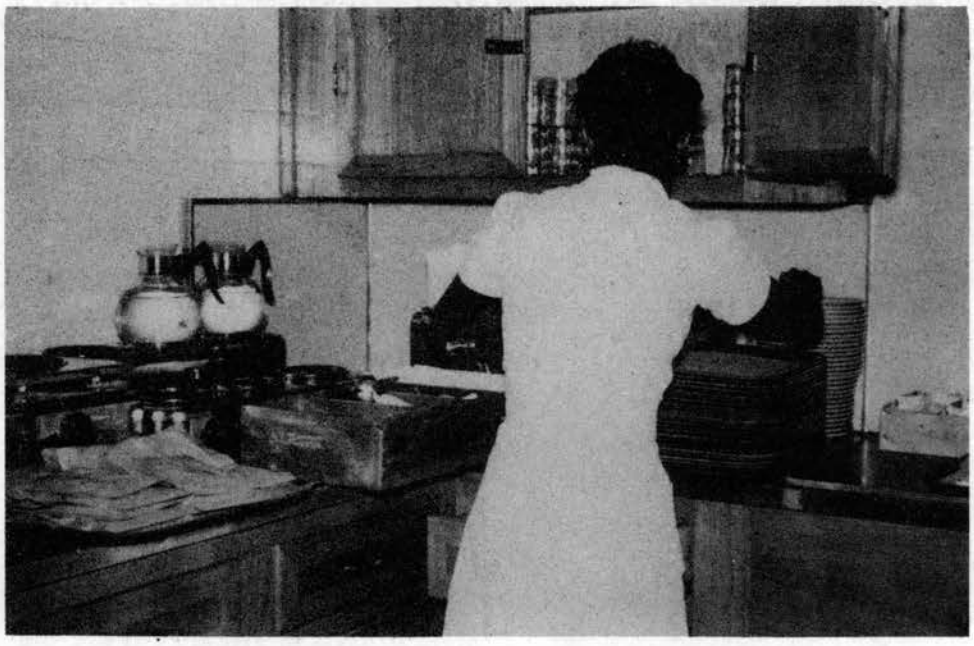


Figure 1. Assembling a Patient's Tray.

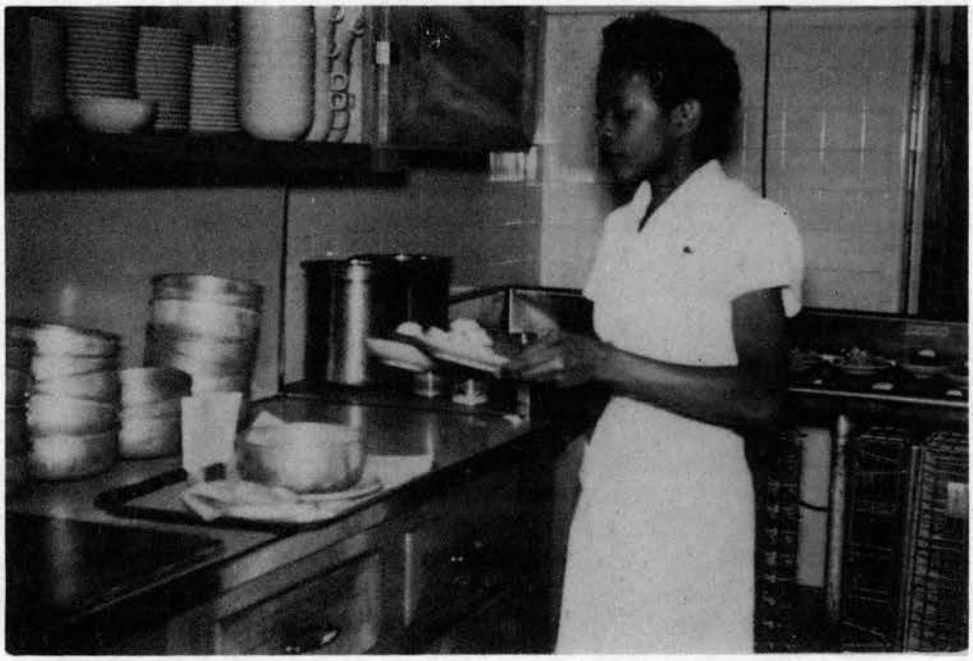


Figure 2. Putting Salad and Dessert on Patient's Tray.

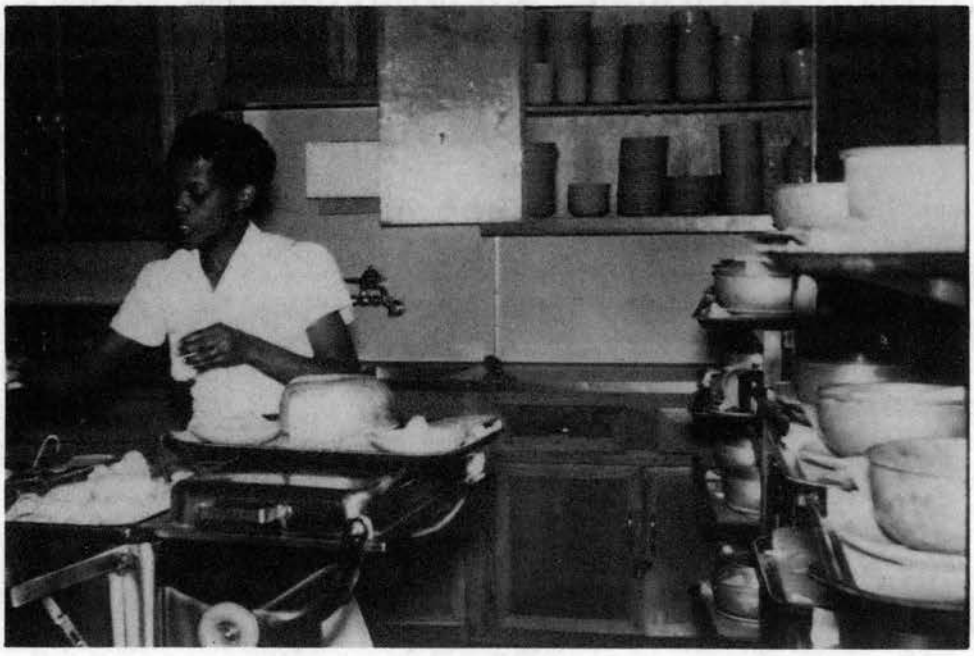


Figure 3. Putting Beverage on Patient's Tray.

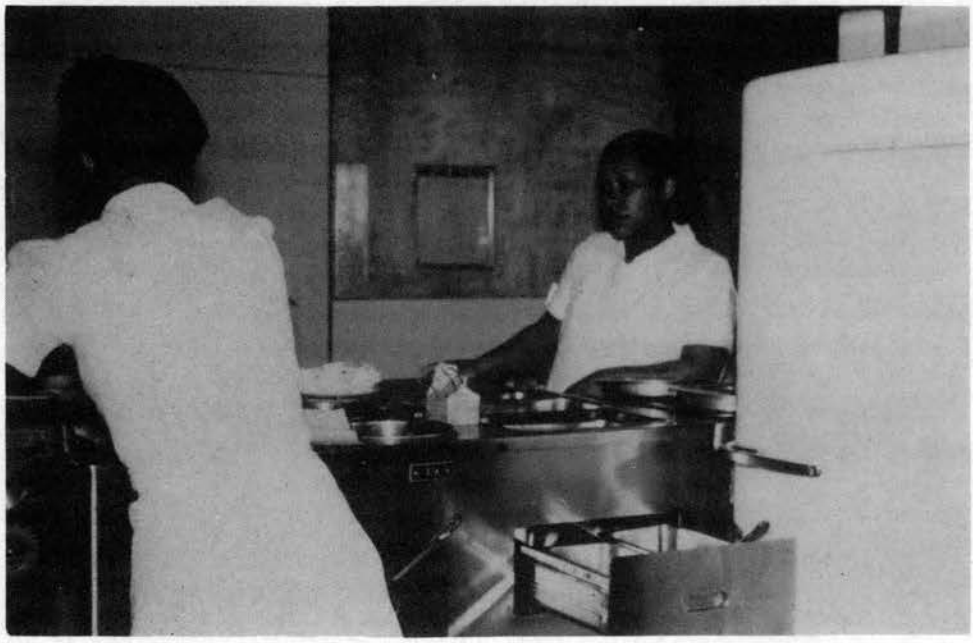


Figure 4. Putting Hot Food on Patient's Tray.
(One person idle)

Figure 5. Final Arrangement of Dishes on Tray.
(Both working)

The second phase of this research (modified ratio-delay) will have the food service supervisor use a set of fifteen observation cards. The explanation to the dietitians will indicate that filling out these cards will help show a conscious act of observation on the part of the supervisor.

Each of the observation cards will have a column for area of supervision, random times when the observations of employees are to be made and blank squares, which are to be marked with a "W" if the employee is working and an "I" if the employee is idle. (See p. 23 Chart I).

CHART I

Example of Observation Card

Area	Observation Card Name Time							
	6:34	7:11	8:49	9:11	10:06	11:39	12:09	1:16
Early Pastry Cook Day Pastry Cook	W	W	W W					
Early Salad Cook	W	I	W					
Early Meat Cook	W	W	W					

The numbers used to chose the random times of observation will be taken from a statistical table of random numbers selected by a random process suggested by Schwetter and Davis (13). Two digits will be noted between 00 and 59 pertaining to the 60 minutes in the hour and numbers from 60 to 99 will be discarded. To the two digit numbers

the work schedule hours of the supervisor will be added, which will give random times thus avoiding biased observations (See p. 13 Review of Literature). To cover the ratio-delay method phase five sets of eight random numbers will be drawn and rotated by weeks. The first set of random numbers will be put on the first observation card, the second set on the second card and so forth through the fifth card (a work week of 5 days). Then the second week the second set of numbers will be recorded on the sixth card and so on (See p. 24 Chart II). The third set of numbers will be recorded on the eleventh card and the fourth set on the twelfth card and so forth through the fifteenth card.

CHART II

Rotation of Random Number Sets

	1st set	2nd set	3rd set	4th set	5th set
1st week	$1_{(1)}$	2	3	4	5
2nd week	$2_{(6)}$	3	4	5	1
3rd week	$3_{(11)}$	4	5	1	2

While this phase is in progress, weekly checks will be made by the author with each supervisor. Any individual problems or comments on the use of the observation card will be discussed at this time.

The third phase of this research to be explained will be to re-test each food service supervisor on the F.A.C.T. on Inspection, form 1 A. Also another series of twenty 35 mm colored slides (Figures 6 -

17) (Plates I - VIII) will be shown and observation cards will be marked in the same manner as stated before. Again discussion will follow the viewing of each slide. These slides will be additional ones taken by the author while doing a special project as Methods Improvement Dietitian and from the slide files in the Food, Nutrition and Institution Administration office at Oklahoma State University.

After this thorough orientation of the dietitians at the University of Oklahoma Medical Center discussion and questions will be invited. The methods delineated to the dietitians will be the procedure followed in conducting the research.

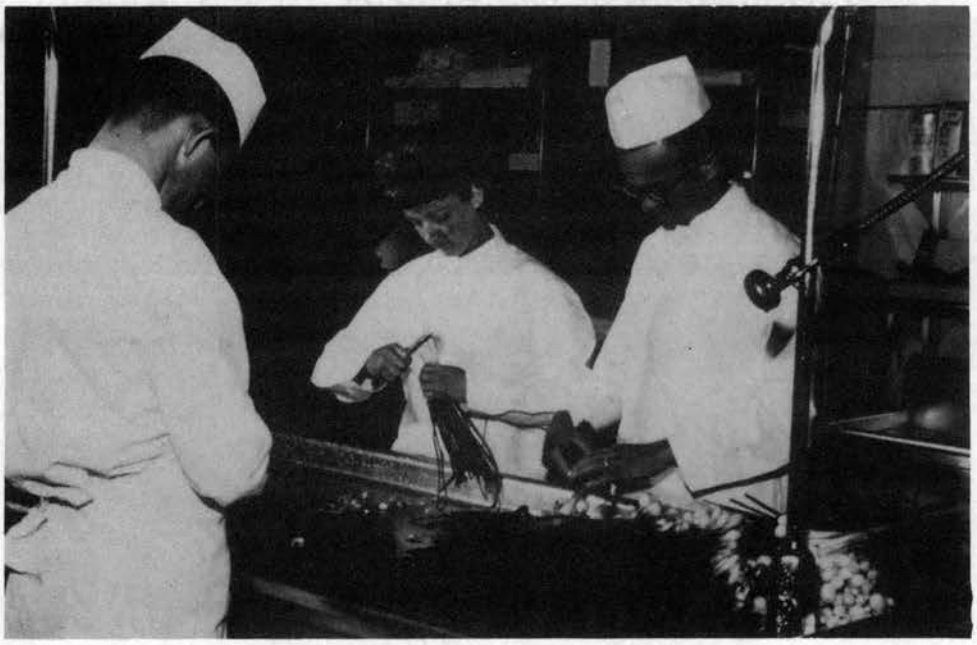


Figure 6. Cleaning Onions.

Figure 7. Tasting Chili.
(One person idle)

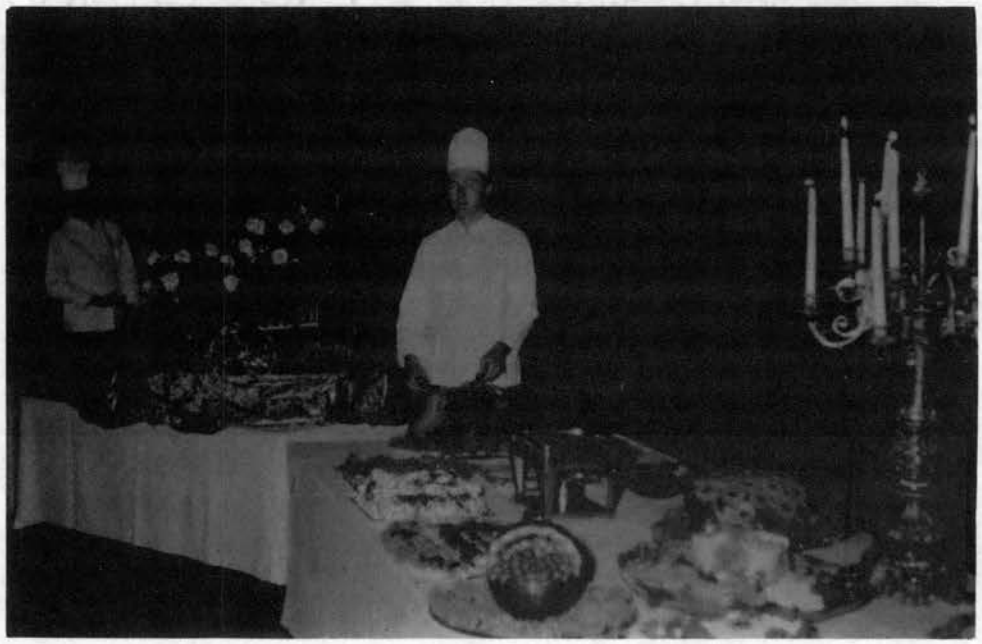


Figure 8. Carving at a Buffet Table.

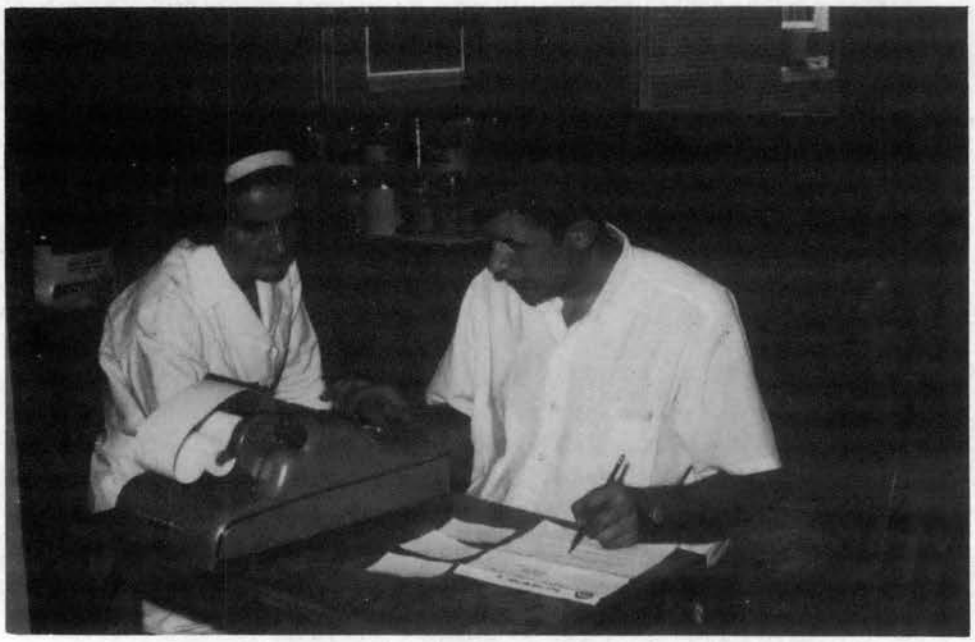


Figure 9. Adding up Receipts.
(One person idle)

Figure 10. Passing Trays on Assembly Line.

Figure 11. Putting Hot Food on Plate.

Figure 12. Gathering Hot Food Covers.

Figure 13. Disassembling Trays.

Figure 14. Trimming Meat.
(One person idle)

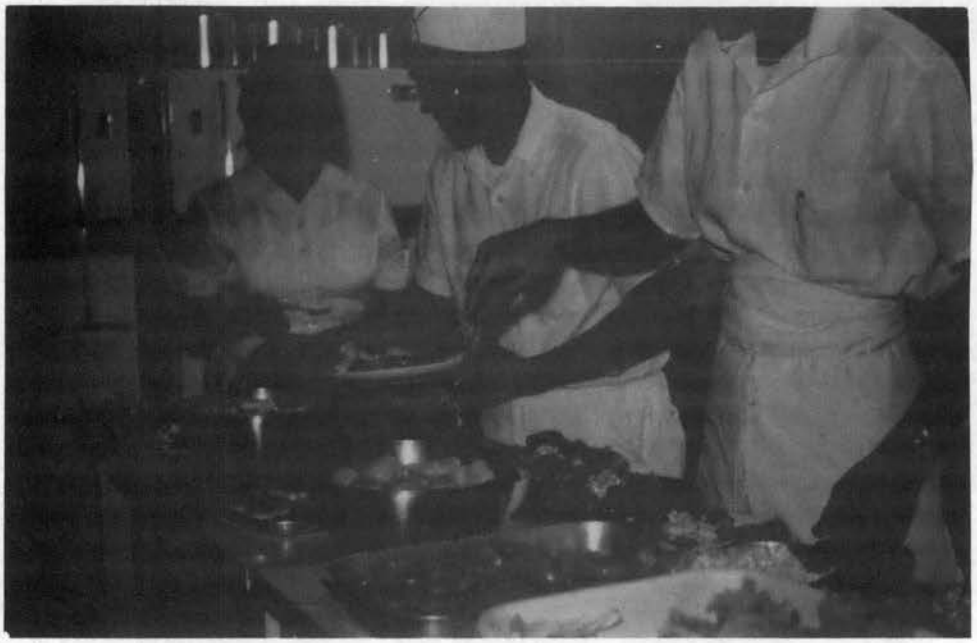


Figure 15. Dishing up Fruit Platter.
(One person idle)

Figure 16. Carving Meat.

Figure 17. Dishing up Cold Plate

Plate I

Cafeteria Salad Line Service

Plate II

Decorating Cakes

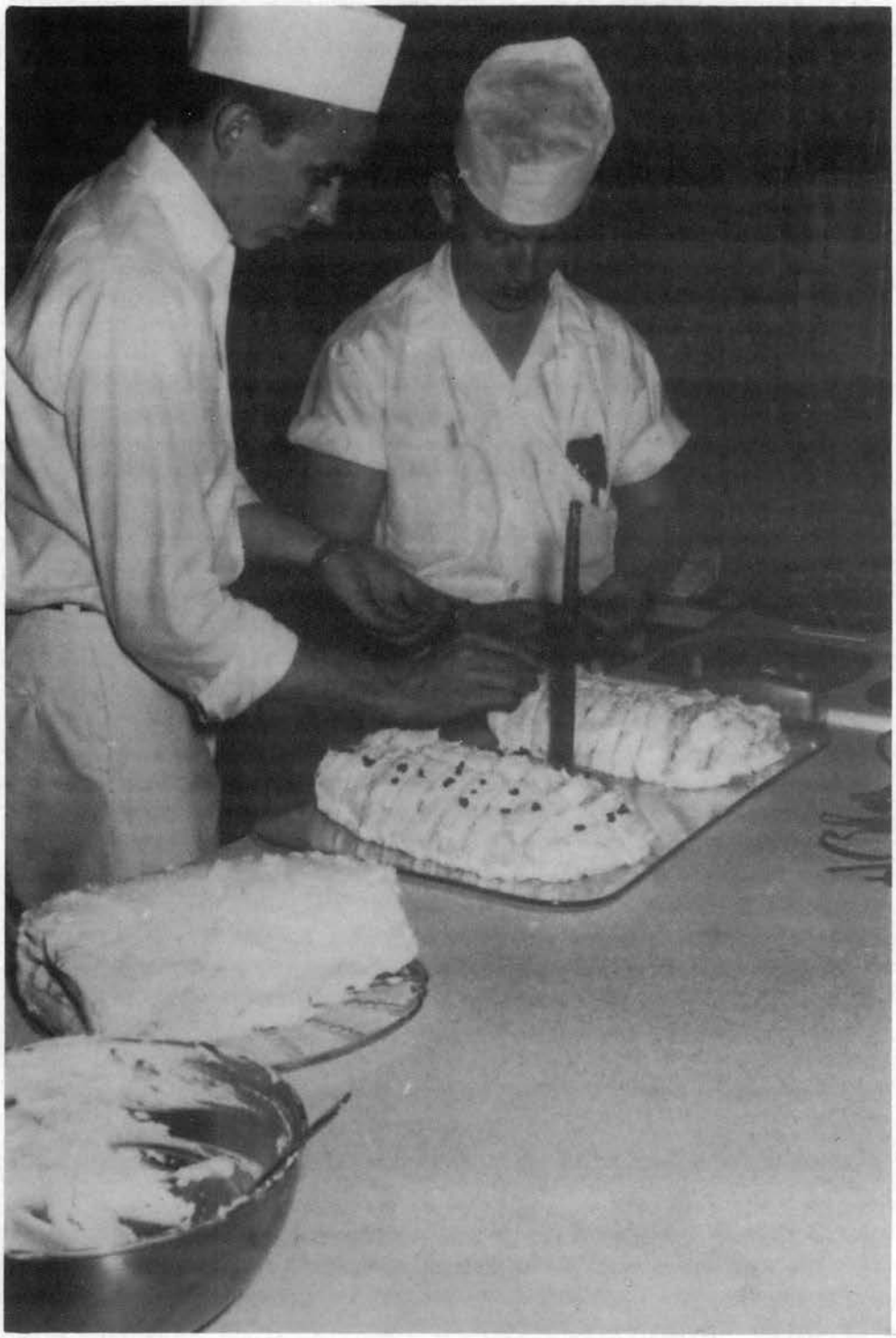


Plate III

Dishing up Cake

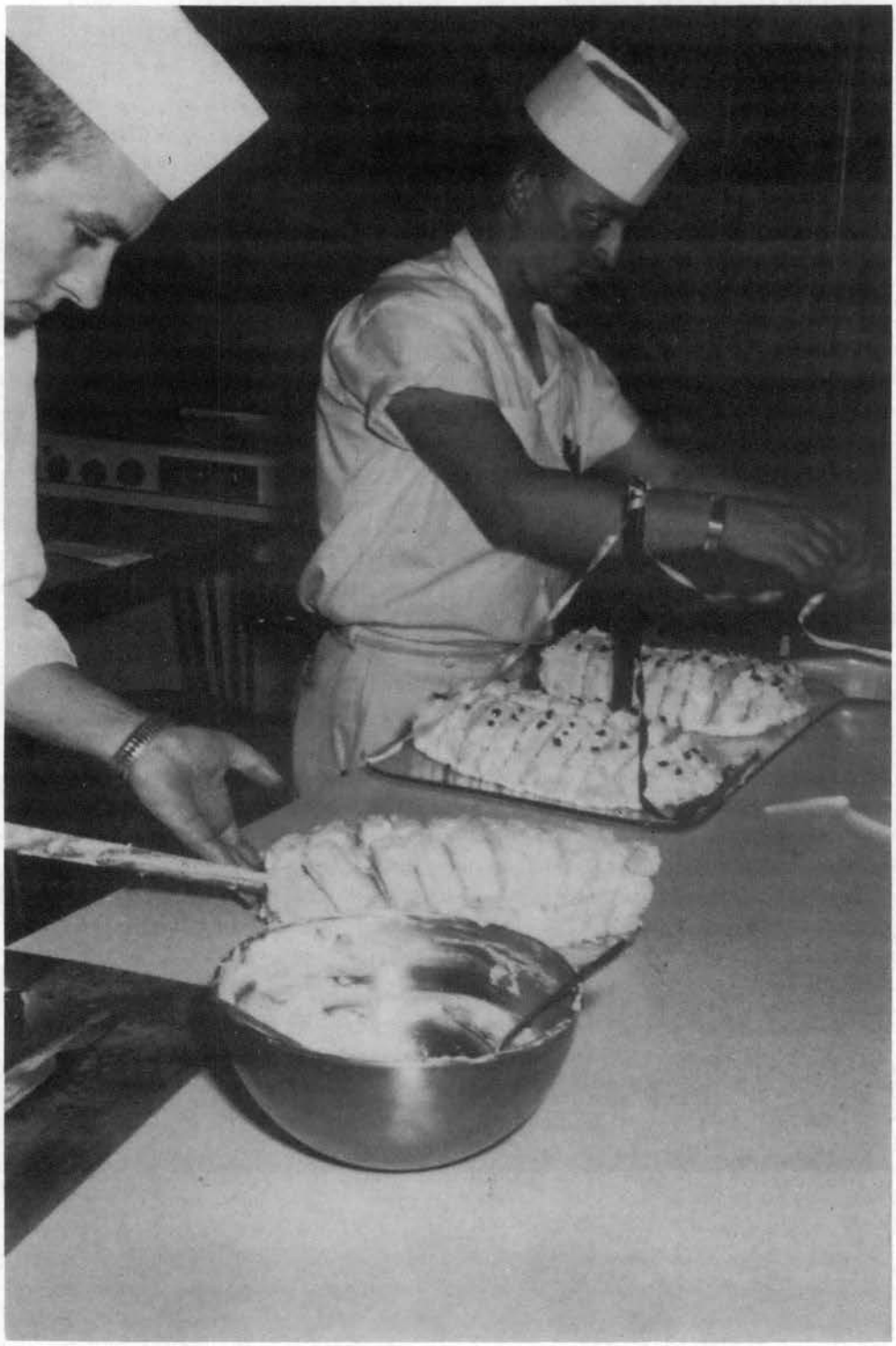


Plate IV

Arranging Food on Platter

Plate V

Icing Cakes

Plate VI

Dishing up Peach Crumb Dessert

Plate VII

Making Pies

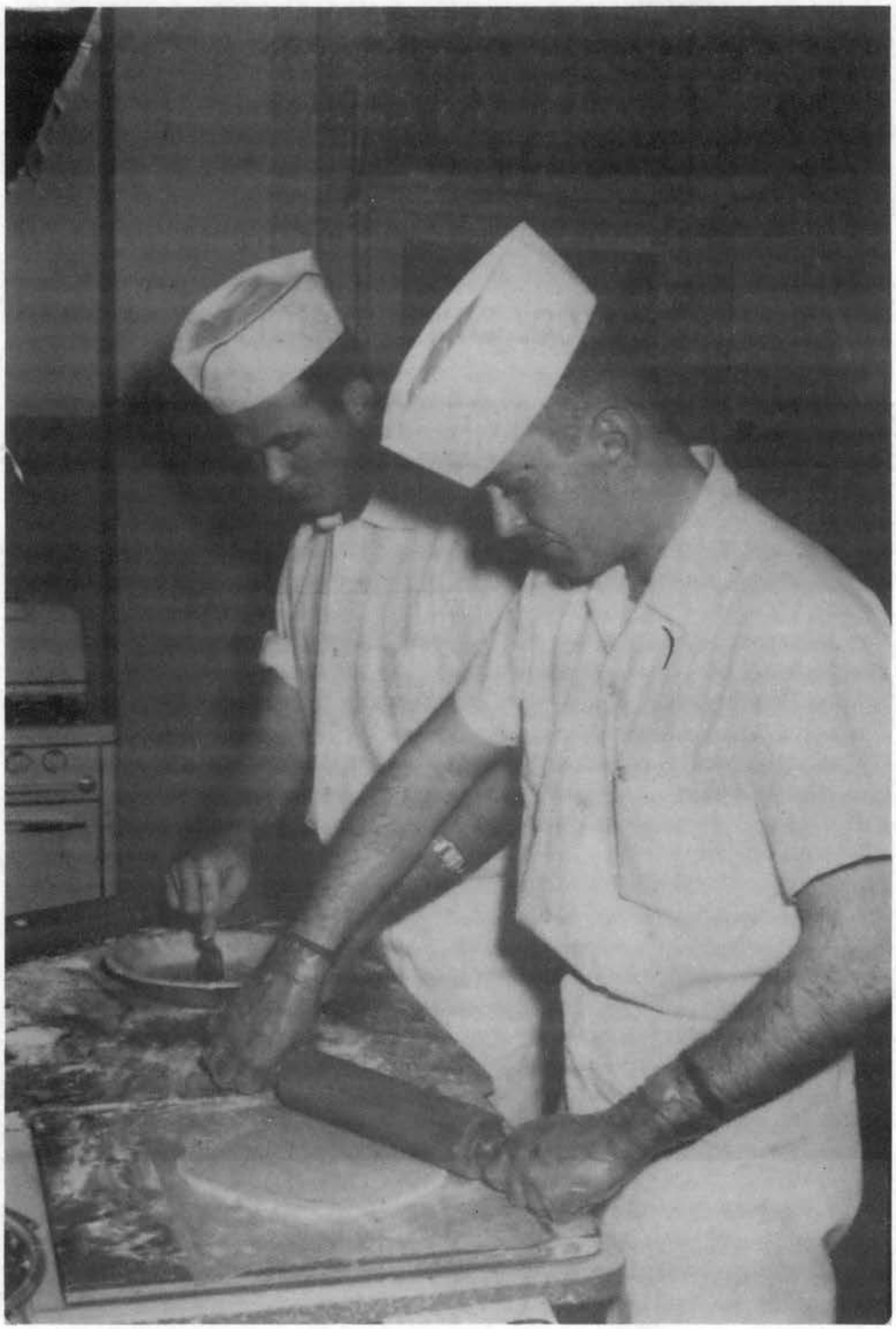


Plate VIII

Preparing Individual Salads

CHAPTER IV

DISCUSSION AND RESULTS

For this research three phases-pretesting, use of modified ratio-delay method and a retest were completed. Each phase was covered by setting a level of observation, using a tool of supervision and determining the amount of increase or decrease, if any, in the observation level of the supervisor.

On the first day of the research project the author met with the food service supervisors in the in-service education classroom at Children's Memorial Hospital in Oklahoma City, Oklahoma. The supervisors chosen by the staff dietitians varied in age, years of service and formal education (Appendix C). Since some of the supervisors had not been to school in the past thirty years and had not been exposed to a modern test, a short explanation on the type of test to be taken was given before the test booklets were opened.

In administering the F.A.C.T. on Judgment and Comprehension, form 8 A, the explanation to the supervisors was that a paragraph, written on a specific topic, would have adjacent to it a list of related objective questions. The supervisor was to select and check the correct answer (multiple choice). When this procedure was clearly understood, the supervisors were asked to open the test booklets to the practice problem and the printed procedure given in the test booklet was audi-

bly followed. The author utilized the Examiner's Manual which gave direction and timing (35 minutes) for this test. While the test was in progress however, two of the older supervisors asked for clarification of a question, indicating more time could have been spent on structure format of this test. Upon completion of the test some concern was manifested by the two supervisors for not understanding the "problem" question. This concern was allayed. This test was given to expose the food service supervisor to a different form of testing and in addition so that the results might indicate individual capabilities. To illustrate the individual test scores and maintain the anonymity of the food service supervisor, numbers from one through eight were assigned for all tests administered during this research. The individual supervisor's stanine scores are noted in graph form (Appendix D).

Next a sample observation card was given to the food service supervisors (See p. 23 Chart I). Then a set of five 35 mm colored slides picturing actual work situations were shown. The supervisors marked the observation card with "W" for working and "I" for idle, upon viewing each slide. This procedure illustrated the method which was followed for the modified ratio-delay phase. While these slides were shown, interest in judging the position of the employees (working or idle) was very high. There was good response from the supervisors during the discussion following each slide.

To explain the procedure of completing the F.A.C.T. on Inspection, form 1 A, an illustration of three rabbits was drawn on the chalkboard. The first picture was the example and the next picture

was changed so as not to be an exact replica. The third picture was drawn to match the first example. The supervisors were told the test pictures would be similar to this illustration; first an example, then a series of pictures from which to select the illustrations that do not match the original example. When this explanation was clearly understood, the supervisors were asked to open the test booklets to the sample and practice problems. The Examiner's Manual was utilized by the author to give audible direction and to set the time (six minutes) for this test. Upon completion of the test the supervisors expressed interest in knowing the scores. Also comments were expressed concerning the "simplicity" and "clarity" of this test (F.A.C.T. on Inspection, form 1 A) using pictures versus the multiple choice F.A.C.T. on Judgment and Comprehension, form 8A. The supervisors' stanine scores are noted in graph form (Appendix D).

The second phase of this research was for the supervisors to use the modified ratio-delay method. Sets of observation cards (15 in each packet) were distributed. It was stressed that these observation cards were a new tool for supervisory observations. The supervisors were asked to note 1) place for name, 2) column listing employee position to observe, 3) random times and 4) blank squares. To cover the various work schedules of each supervisor, the hours of the specific schedules were prefixed to the random times listed on the observation card. A mark of "W" for working or "I" for idle was to be made in the blank squares corresponding with the employee position observed at the random times listed in the column. The eight observation times listed on each card were to be marked for a total of 15

working days. It was explained that if the supervisor had to "cover" for an absent employee, no observation card was to be marked that day but the card would be used the following day when on regular schedule. Among questions from the supervisors was, "What to note if the employee is on a break at the observed time"? It was agreed that a "B" for break should be used. The supervisors were very interested in this phase of the research.

While the food service supervisors were using the modified ratio-delay method weekly trips to the University of Oklahoma Medical Center were made by the author. Each supervisor was contacted at that time and any individual problems or comments on the use of the observation cards were discussed. One of the supervisors was concerned with an employee who did not show a "break" on the daily observation card. This point was clarified by stressing that the observations were to be taken at the designated times noting the activity observed. Further discussion indicated that the random times listed on the observation cards were "arranged" to cover such a situation.

Some supervisors commented that through the use of the modified ratio-delay method the work performance of employees was visualized in the assigned area and in other areas, also. Giving the food service supervisors the packets of 15 observational cards and describing the sections of the card gave the supervisors background and reasons for the use of the cards. By receiving all 15 cards at once the supervisors had an idea of the amount of time which would be involved on the project.

At the retest session the F.A.C.T. on Inspection, form 1 A was

given again. Reference was made to the illustration of the rabbits used when this test was administered in the preliminary phase. With this example clearly understood again, the supervisors were asked to open the test booklets to the sample and practice problems. The Examiner's Manual was utilized by the author to give audible directions and to determine the time (six minutes) for this test. When the test was completed, the supervisors were very interested in knowing the results of this test. So the author showed how to dismantle the test and to count the number of correct answers to obtain scores. The ones who scored less on this retest were disappointed. The ones who made higher scores were pleased. The individual stanine scores are noted in graph form (Appendix D). Later for further results, the individual answers checked on each question for both tests were compared with the possible answers for each question and noted in graph forms (See p. 45 and46 Chart III - Part I and II).

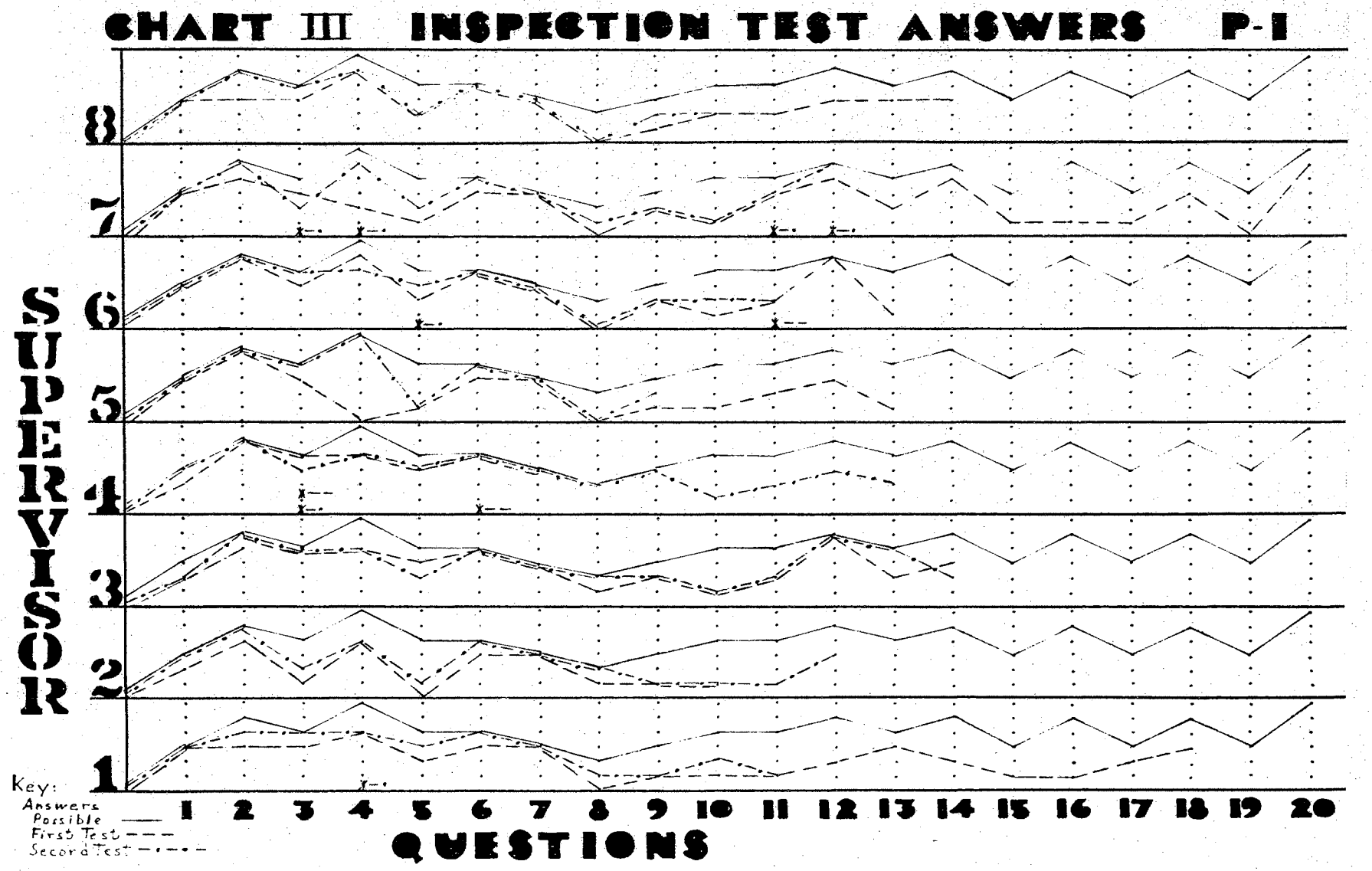


CHART III INSPECTION TEST ANSWERS P-1
SUPERVISOR
8
7
6
5
4
3
2
1
Key:
Answers Possible ___
First Test - - -
Second Test -.-.-
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
QUESTIONS

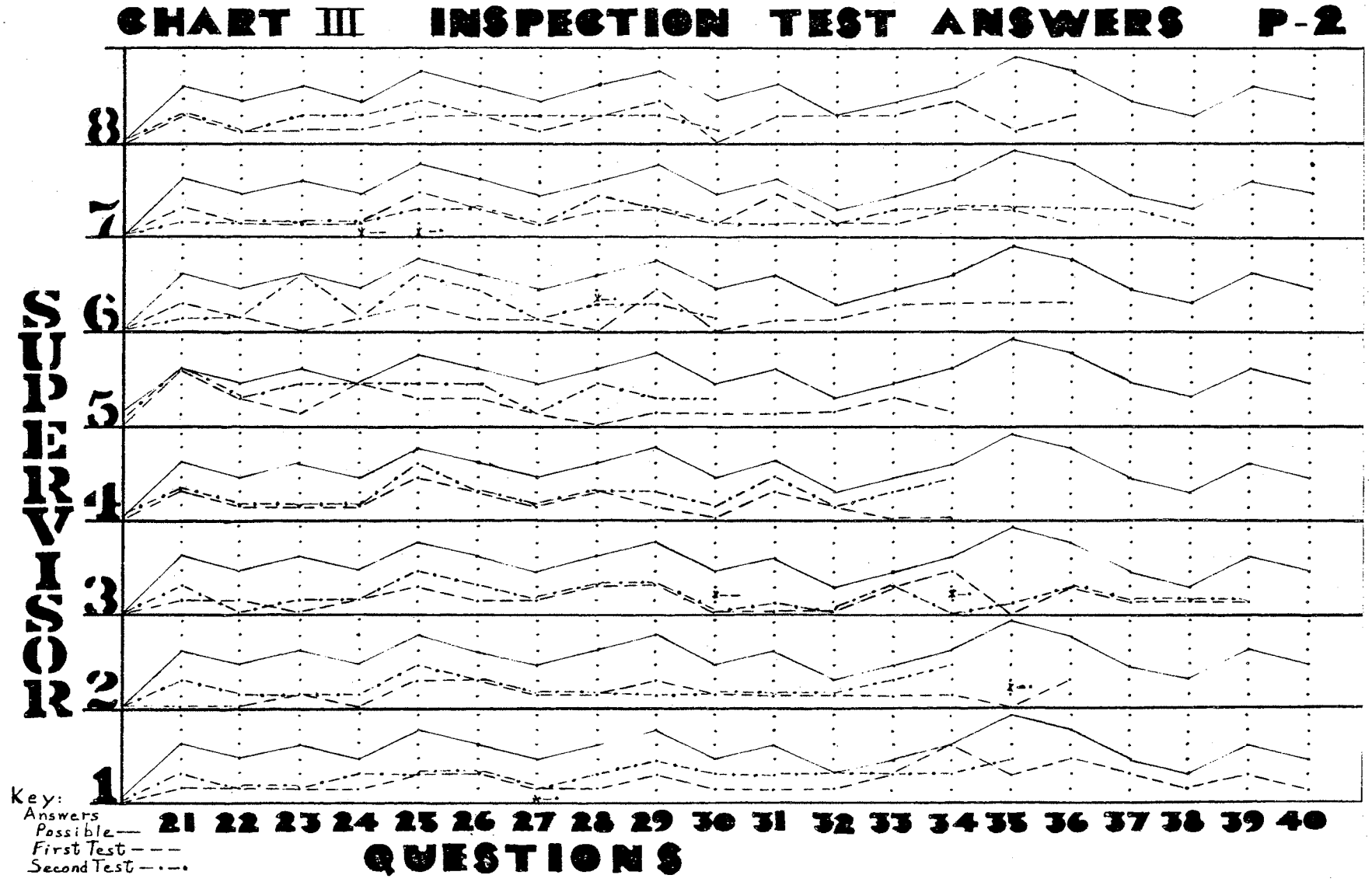


CHART III INSPECTION TEST ANSWERS P-2
SUPERVISOR
8
7
6
5
4
3
2
1
Key:
Answers Possible —
First Test - - -
Second Test - . - .
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
QUESTIONS

Chart III illustrates the possible answers and actual answers checked on the F.A.C.T. on Inspection form 1 A. The numbers, one through 40, correspond to the individual test questions. The numbers one through eight correspond to the individual number assigned to each supervisor (Appendix C). Test I answers are indicated by a dash mark (- - - -), Test II answers are indicated by a dash dot mark (-.-.-.) and all possible answers are indicated by a solid line (----------). If the food service supervisor was unable to complete either of the tests in the time available, the particular line indicates where the supervisor stopped. When a question was answered incorrectly an asterisk (*) indicates this.

The data assembled in Chart III, Appendices C and D were analyzed to determine individual interest points about each supervisor. Number one supervisor was more accurate in the alloted time on the second test but was unable to answer as many questions. Supervisor number two apparently had difficulty reading because of a lack of practice. In fact the F.A.C.T. on Judgment and Comprehension, form 8 A, was read to this supervisor question by question by the author. The supervisor then told the author which multiple choice answer to check. On the F.A.C.T. form 1 A supervisor number 2 indicated more accuracy onthe second test with a raw score of 48 as compared to the raw score of 36 on the first test.

Supervisor number three was the oldest in age in the test group and had been out of school the longest period of time. By obtaining raw scores of 61 and 65 this supervisor was the most consistent scorer, however. The fourth supervisor showed the greatest increase in

raw scores (42 to 65) of any of the supervisors tested. Supervisor number five indicated more accuracy on the second test, but number five was unable to complete as many questions as on the first test.

Next to the oldest in age was supervisor number six, who was the second most consistent scorer with raw scores of 56 and 51. Supervisor number seven was one of the three supervisors with more than a ninth grade education. On the first test this supervisor was the only one to complete all 20 questions on the first part of the test, though there were 35 errors. On the second test greater accuracy (only 11 errors) was indicated but fewer questions were answered. The youngest supervisor was number eight and one of the three supervisors with more than a ninth grade education. This supervisor was the only one who showed very little increase in accuracy on the tests.

From the F.A.C.T. on Inspection, form 1 A, given in the preliminary session and repeated in the final phase these results were obtained:

Chart IV

Test Scores - Form 1 A

	Preliminary		Retest	
Supervisor	Raw	Stanine	Raw	Stanine
Supervisor 1	71	6	60	4
Supervisor 2	36	1	48	2
Supervisor 3	61	5	65	5
Supervisor 4	42	1	65	5
Supervisor 5	45	1	50	3
Supervisor 6	56	4	51	3
Supervisor 7	72	6	64	5
Supervisor 8	64	5	49	2

Computation of the coefficient of variation between the two test scores was figured to indicate the amount of variation. This formula is $CV = \frac{S}{\bar{X}}$, where CV is the coefficient of variation. S is the square root of S^2. S^2 is computed as

$$S^2 = \frac{ZX_i^2 \quad \frac{(ZX_i)^2}{n}}{n - 1},$$

n is the number of scores. X_i is the raw test score, $\bar{X}$ is the mathematical average computed as $\bar{X} = \frac{ZX_i}{n}$, Z is summation. Using the raw scores on the first test, computation of the formula $CV = \frac{S}{\bar{X}}$ gives a score of .242 for the coefficient of variation. As noted in Chart IV page 48 the preliminary test raw scores ranged from 36 to 72 with stanine scores from one to six. However, on retest the raw scores ranged from 48 to 65 and stanine scores from two to five. The computation (Appendix E) of the coefficient of variation from the raw scores on the second test showed .134. So in comparing the coefficients of variation the results indicated the retest had less variation between the individual test scores. This low variation has raised the average test score of the supervisors from 50.8 to 56.5 and indicated the use of the modified ratio-delay method has increased the supervisor's accuracy.

CHAPTER V

SUMMARY AND CONCLUSIONS

The problem as observed by the author was that food service supervisors were consistently unable to relate the operation's sights and sounds to visualizing the work performance of employees. Each supervisor observed and realized that employees were present in the area. However, the supervisor had difficulty seeing the employee as "working" or "idle" and the relationship of this activity to optimum production.

By dividing this research into three phases - pretesting, use of modified ratio-delay method and retest - the author was able to systematically move from phase to phase. In the preliminary phase the use of the F.A.C.T. on Judgment and Comprehension, form 8 A, exposed the supervisor to an objective multiple choice test versus the picture test of Inspection, form 1 A, from the same series. The response to the multiple choice test in scores and interest was less favorable than to the pictorial test. It seems that people who have been out of school a number of years and have limited formal education find objective picture tests easier to comprehend than objective multiple choice tests. Therefore, if this research is to be continued at a later date more attention could be given to the use of pictorial tests and illustrations.

The 35 mm colored slides which are a pictorial form of "teaching" were shown in the preliminary phase and again in the retest phase. Through the use of these slides actual familiar work situations were presented to the supervisors. When viewing the slides the supervisors were asked to determine if the employees pictured were "working" or "idle" and mark the observation card accordingly. This procedure proved to be a good teaching tool, for very few questions had to be resolved in the second phase. This procedure was similar to the situation which was followed in the modified ratio-delay phase. In the ratio-delay phase the "live" employee was observed and the activity marked as working or idle on the observation cards. The use of the observational card with the ratio-delay method also is a visual tool of supervision. By observing a situation and noting the actual happenings (working or idle) the supervisors were given the opportunity to develop the habit of accurate visual observation.

The observation card and actual marking on the card apparently made a favorable impression. Verbal response from the supervisors did indicate that by using the observation cards their interest had been stimulated. There was visualizing of activity in other areas also, indicating aroused observation on the part of the supervisor. The combination of the observation card and the modified ratio-delay method were found to be very satisfactory tools for this research. The 15 day period, which was the length of time used for the modified ratio-delay method, proved to be a satisfactory length of time. The supervisors became familiar with the procedure and were stimulated to make accurate observations. It is possible, though a longer period

than 15 days on this type of research might have lessened the challenge and interest. Some supervisors commented that checking every hour and maintaining supervisory responsibilities made a "full" day.

The scores from the F.A.C.T. on Inspection, form 1 A, administered in the preliminary phase, and in retest, were utilized for the calculation of the coefficient of variation. In figuring the formula for the coefficient of variation the second test showed less variation between individual scores, thus raising the average test scores of the supervisors from 50.8 to 56.5. Overall the supervisors showed high interest with indications that by using the modified ratio-delay method the supervisors' observation level was improved.

The answers of the F.A.C.T. on Inspection, form 1 A, were analyzed question by question. The possible answers of each question were compared with the answer each supervisor checked in the preliminary test and the retest. The analysis showed the supervisors did not answer as many questions on retest but were more accurate in the answers checked. With the use of the observation card the supervisors appeared to be more aware of "observing" a situation.

The variation in the age, years of service and formal education of the food service supervisors poses a problem when modern formalized tests are used. During the initial phase, to compensate for these wide divergencies among individual supervisors, two tests were administered. First was the Flanagan Aptitude Classification Test on Inspection, form 1 A, which uses pictures and the second test was the Judgment and Comprehension, form 8 A, from the same series, which is an objective multiple choice type. The response to the multiple

choice test in scores and interest was less favorable than to the pictorial test.

The procedure of showing 35 mm colored slides received good response. These slides were of actual work situations and required the supervisor to judge "working" or "idle" and to mark an observation card accordingly. This procedure is similar to the method which was used when the supervisors were actually observing the employees in the units for a 15 day period during the second phase. Because very few functional problems were presented when using the observation cards the illustration method, with 35 mm slides, was concluded to be a good teaching tool.

The food service supervisors apparently have difficulty visualizing the work performance of the employees. This impediment implies a lack of efficient supervision. The use of the modified ratio-delay method appears to be useful for increasing the supervisor's accuracy of observation.

REFERENCE LIST

(1) The food service supervisor. An A. D. A. report. J. Am. Dietet. A. 46: 183, 1965.

(2) McFadden, Jean, and Hart, Katherine: Academic preparation for first line supervision. J. Am. Dietet. A. 41: 191, 1962.

(3) Cushman, Frank, and Cushman, Robert W.: Improving Supervision. N. Y.: John Wiley & Sons, Inc., 1947.

(4) Duties and responsibilities in the department of dietetics. An A. D. A. report. J. Am. Dietet. A. 46: 179, 1965.

(5) The Hospital, Institution, and Educational Food Service Society. Leaflet, 1963.

(6) Phillips, S. H., and Foster, T. S.: Self-development training for foreman - a program for participation and motivation. Personnel Journal. 41: 445, 1962.

(7) Frazier, L. M.: What are work standards. Supervisory Management. 7: 50, 1962.

(8) Heiland, Robert E., and Richardson, Wallace J.: Work Sampling. N. Y.: McGraw - Hill Book Co., Inc., 1957.

(9) Zinck, W. C.: What is the key to work simplification. Supervision. 25: 4, 1963.

(10) Johansom, John R.: Work simplification. The Graphic Arts Monthly. 35: 42, 1963.

(11) Barnes, Ralph M.: Motion and Time Study. 5th ed. N. Y.: John Wiley & Sons, Inc., 1963.

(12) Cordier, P.: Application of snap-reading method to work study. Time & Motion Study. 13: 19, 1964.

(13) Wilks, D. W.: A random observation application. Time & Motion Study. 12: 13, 1963.

(14) Barnes, Ralph M.: Work Sampling. 2nd ed. N. Y.: John Wiley & Sons, Inc., 1957.

(15) Schwetter, Joseph P., and Davis, David W.: Analyzing jobs for job evaluation with work sampling. Personnel Journal. 44: 5, 1965.

(16) Amiss, John M., and Sutton, Traver C.: The Industrial Supervisor. N. Y.: Ronald Press Co., 1944.

(17) Close, Guy C.: Work Improvement. N. Y.: John Wiley & Sons, Inc., 1960.

(18) Vroom, Oliver E.: Can managers change their spots. Personnel Journal. 42: 389, 1963.

(19) Noll, Victor H.: Introduction to Educational Measurement. Boston: Houghton Mifflin Co., 1957.

(20) Arny, Clara Brown: Evaluation in Home Economics. N. Y. Appleton-Century-Crofts, Inc., 1953.

(21) Wallace, D. E.: Testing help selection and supervision. The Modern Hospital. 103: 105, 1964.

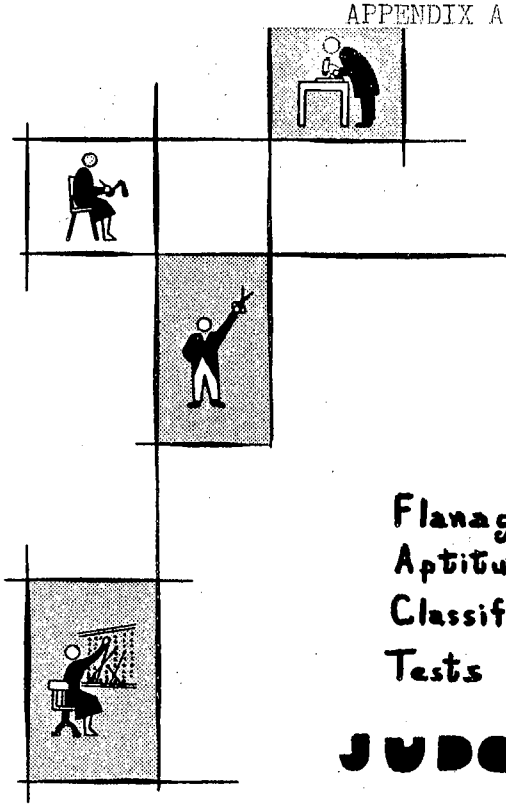
(22) Remmers, H. H., and Gage, N. L.: A Practical Introduction to Measurement and Evaluation. N. Y.: Harper & Brothers, 1955.

(23) Brown, Clara M.: Evaluation and Investigation in Home Economics. N. Y.: F. S. Crofts & Co., 1941.

(24) Furst, Edward J.: Constructing Evaluation Instruments. N. Y.: Longmans, Green & Co., 1958.

A P P E N D I X

NAME (Print: First Initial Last) AGE GROUP SEX DATE

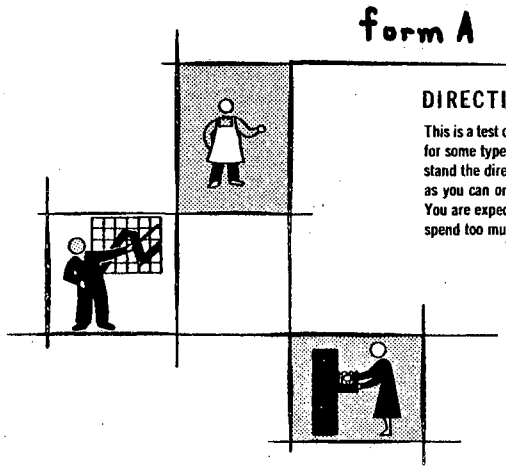


FACT 8A

Flanagan Aptitude Classification Tests

JUDGMENT and COMPREHENSION

form A



DIRECTIONS

This is a test of your ability to do a special type of task. This ability is important for some types of work and not very important for others. Be sure you understand the directions when they are given, then work as quickly and accurately as you can on the test. Answer each of the questions after you have read it. You are expected to have time to finish all of the questions but you should not spend too much time on any one question.

STOP HERE. DO NOT GO ON.

Please use the catalog number when reordering this test booklet.

FACT 8A—JUDGMENT AND COMPREHENSION CATALOG No. 7-2251

DIRECTIONS

This is a test of your ability to understand a situation and determine the proper action to take. Read each paragraph as you come to it and answer the four questions about it.

Each paragraph describes a situation and is followed by a number of questions about this material. Each test item includes four possible answers. You are to put an "X" in the box next to the best answer *on the basis of information in the paragraph.*

PRACTICE PROBLEM

Here is a sample paragraph for you to practice on:

Ed and Jack were talking about the company picnic which was to be held on Saturday. Ed offered to stop by for Jack and his family and drive them to the picnic grounds, but Jack said he was working on the twelve to eight shift and wouldn't be ready to leave until late. However, Ed was sure that the factory was going to close down at six o'clock that day so that all employees would be able to enjoy the picnic.

1. The picnic was being sponsored by

- ☐ **Ed and Jack.**
- ☐ **the men's wives.**
- ☐ **the company.**
- ☐ **the union.**

2. From the information in this paragraph, which of the following statements is most likely to be true?

- ☐ **Ed and Jack work in a steel mill.**
- ☐ **Ed and Jack work for the same company.**
- ☐ **Ed lives near the picnic grounds.**
- ☐ **Jack is a machinist.**

You should have marked the third answer for question 1, and the second answer for question 2.

STOP HERE. DO NOT GO ON.

READ THE PARAGRAPHS AND SELECT THE BEST CHOICE FOR EACH QUESTION.

I have a good foreman. He thinks I have more ability than I think I have, so I consistently do better work than I thought I could. When he gives me a job and has given me all the necessary information about it, he doesn't constantly check up on me but lets me work out the small details of the job. He has a thorough understanding of all the work in the department and is always ready to concentrate all his attention on any problem with which I need help. He is smiling, good-natured, and patient and always shows pleasure when a job is well done.

My understanding of the term "tool owner" is that it applies to a person who helps supply the capital for all the things which a business needs in order to operate. This person theoretically is the owner of these things or tools. Among the purchasers and owners of corporation securities are life insurance companies and banking institutions who are investors in all types of business enterprises on behalf of their policyholders and depositors. The premiums which I pay to my life insurance company and the savings which I have on deposit in my bank are invested in many diversified industries. Indirectly, I have made a productive investment and in this sense I am one of the millions of "tool owners."

When transferred to a higher class position, an employee will continue to make the same wage as that before transfer until he has proved that his work is satisfactory. As soon as his supervisor indicates that his work is satisfactory he will be transferred to the minimum rate for the new position if this is higher than his wage before transfer. If his work continues to be satisfactory, an employee will receive not later than the first of the seventh month after transfer an increase of at least 10% above the minimum rate of the new position, or above the employee's rate before transfer, whichever is greater, provided this new rate would not exceed the maximum rate for the position.

Bill was to be the new boiler operator. He knew that, in general, the water was heated in the boiler to make steam and this steam was used to run the other machines in the shop, including the generator which made all their electricity. But the important details of the job had to be shown to him. They showed him the pressure gauge, explaining that at 200 lbs. steam pressure an automatic safety valve went off. They showed him the valve which controlled the amount of water going into the boiler, and explained that the water-level gauge had to be at least half full to keep the boiler from going dry. They showed him how to regulate the gas burners under the boiler to keep it from getting too hot or to control the amount of steam being made.

---

1. Which one of the following quotations would apply to at least part of this paragraph?
- ☐ **A cheery smile turneth away wrath.**
- ☐ **The art of praising began the art of pleasing.**
- ☐ **The end justifies the means.**
- ☐ **A rolling stone gathers no moss.**

2. The writer of this paragraph would best like a foreman who
- ☐ **was well informed.**
- ☐ **instilled self-confidence.**
- ☐ **saw that each man did his own work.**
- ☐ **didn't work his men too hard.**

3. Arrange the following steps in the order in which a foreman should take them, omitting those not in agreement with the views in this paragraph.

(1) Praise the worker for a job well done.
(2) Get a thorough understanding of the job.
(3) Reprimand the worker for mistakes.
(4) Explain the job to the worker.
(5) Continually check up on the worker.
- ☐ **1 - 4 - 3**
- ☐ **4 - 5 - 1**
- ☐ **2 - 4 - 1**
- ☐ **1 - 5 - 3**

4. Which one of the following statements was implied in the paragraph?
- ☐ **The writer of the paragraph hopes to become a foreman.**
- ☐ **A foreman's job is very difficult.**
- ☐ **Personality is more important than brains in a foreman's job.**
- ☐ **The attitude of a foreman can affect the work of his men.**

---

5. Which one of the following statements is implied in this paragraph?
- ☐ **Large corporations are controlled by banks.**
- ☐ **It is better to invest indirectly in a company through insurance policies and savings accounts.**
- ☐ **You can have a stake in industry without spending a fortune.**
- ☐ **The interest rate on savings accounts fluctuates with the stock-market.**

6. According to the paragraph, which one of the following would *not* necessarily be considered a "tool owner"?
- ☐ **A person with a paid-up insurance policy**
- ☐ **A person with a small savings account.**
- ☐ **A person who had worked for the company for 5 years.**
- ☐ **A person who owned some of the corporation's securities.**

7. Which one of the following *would* be considered a "tool owner" as used in the paragraph?
- ☐ **A person who supplied the factory with tools.**
- ☐ **A person who supplied the factory with raw materials for making tools.**
- ☐ **A person who purchased tools from the company.**
- ☐ **A person who loaned money to the company.**

8. Mr. Smith got a loan from the bank to buy a truck for his trucking business. He hired Mr. Jones to drive the truck and signed a contract with the ABC Company to deliver their products to the XYZ Company. Which of the following would be considered "tool owners" in this trucking business?
- ☐ **The bank and the ABC Company.**
- ☐ **The ABC Company and the XYZ Company.**
- ☐ **Mr. Smith and the bank's depositors.**
- ☐ **The ABC Company and the bank's depositors.**

---

9. According to these rules an employee who has been transferred to a higher class position and has been doing satisfactory work in the new position
- ☐ **will probably get an increase in salary.**
- ☐ **will get at least a 10% increase in his salary.**
- ☐ **will get the minimum rate set for the job.**
- ☐ **will probably get the maximum rate for the job.**

10. This paragraph specifically states that when an employee is transferred to a new job, any increase due him will be paid
- ☐ **the seventh day of the month after transfer.**
- ☐ **no sooner than seven months after transfer.**
- ☐ **after the end of the seventh month in the higher class position.**
- ☐ **on or before the beginning of the seventh month following transfer.**

11. Joe gets paid $1.00 an hour in his present job. He is transferred to a new job which pays $1.50 minimum to $2.00 maximum per hour. Two weeks after starting on the new job, Joe's supervisor tells him his work is satisfactory and he has been put on the new minimum rate. He also says Joe will receive an increase in salary soon. What is the minimum amount of increase he would get under the rules?
- ☐ **10c per hr.**
- ☐ **15c per hr.**
- ☐ **20c per hr.**
- ☐ **25c per hr.**

12. Bill was earning $2.50 per hour when he was transferred to a new job rated at $1.50 minimum to $2.50 maximum per hour. Bill is doing satisfactory work. How much will he be making per hour after seven months on the new job?
- ☐ **$1.65**
- ☐ **$2.00**
- ☐ **$2.50**
- ☐ **$2.75**

---

13. On the first day alone on the job, Bill discovered a valve that was open. No one had told him about this valve. What should he do?
- ☐ **Turn it and see how it affected his pressure gauge.**
- ☐ **Leave it as it is.**
- ☐ **Close it for five minutes and then check the gauges.**
- ☐ **Ask someone about it.**

14. One day the water line became stopped up and Bill couldn't open it enough to get even a small trickle of water into the boiler. What should he do right away?
- ☐ **Turn off the gas burner.**
- ☐ **Open the safety valve.**
- ☐ **Go get the foreman.**
- ☐ **Tell the men to turn off the electricity.**

15. Opening the valve to allow more water to go into the boiler would be most likely to produce which of the following effects?
- ☐ **Raise the steam pressure.**
- ☐ **Lower the level in the water-level gauge.**
- ☐ **Reduce the steam pressure.**
- ☐ **Open the safety valve.**

16. What is the best order in which to perform the operations listed?
- ☐ **Run water into boiler; turn on generator; turn on gas.**
- ☐ **Turn on generator; turn on gas; run water into boiler.**
- ☐ **Run water into boiler; turn on gas; turn on generator.**
- ☐ **Turn on gas; run water into boiler; turn on generator.**

GO ON TO THE NEXT PAGE

As an employee, one of the most important things to realize is that you are always working with and through other people. This simple fact provides a guide for all your actions. The main quality demanded of you by your co-workers will not be skill, knowledge, or talent, but character and integrity. They value honesty on the job more than a citation for production. An important tool for assuring success both with your co-workers and your boss is your ability to organize and express ideas in writing and speaking, yet few people bother to learn this basic skill. The larger the company for which you work, the more important it will be that you know how to express your thoughts in writing and speaking.

17. Which of the following sayings expresses one of the ideas found in this paragraph?

- ☐ When in Rome, do as the Romans do.
- ☐ Principles are the best guides for conduct.
- ☐ The end does not justify the means.
- ☐ An honest man is hard to find.

18. The following courses are being given free to company employees. In line with the paragraph, which one would most help a foreman to advance in his job?

- ☐ Legal principles
- ☐ English composition
- ☐ Company history
- ☐ Sales methods

19. The author of this paragraph believes that the most important of the following for an employee's success is that he

- ☐ surpass his co-workers in production.
- ☐ have the proper training.
- ☐ have high intelligence.
- ☐ be able to say what he means.

20. For several days, Ed, with four other lathe operators, had been working on precision parts for an engine. Today Ed didn't bother to check the setting on his lathe, but after several hours' work, he noticed that his machine was not set properly for the job he was doing. What should he do?

- ☐ Correct the setting and continue working
- ☐ Report his lathe was defective
- ☐ Check the other lathes
- ☐ Report his error to the foreman

Not more than a few hundred years have passed since discoverers and inventors worked by stealth, hiding their knowledge from the world as if it were a crime. In fact, they were treated like criminals and imprisoned or banished. Mankind has finally awakened to the fact that knowledge and invention are good for the world, and with this realization has come the transformation of human life. Few people realize how much of their ease of living was purchased for them by a heart-broken genius who had been scorned by the world. Today our inventors work with the eyes of the world upon them and are encouraged by every conceivable means to improve the lot of mankind. Nothing seems impossible to an age in which we talk into a box and then have the box talk back to us. We may be sure that new inventions will create a true "world of tomorrow."

21. Which of the following would make the best title for this paragraph?

- ☐ The Triumph of Knowledge
- ☐ Inventions of Today
- ☐ Invention as a Career
- ☐ The World of Tomorrow

22. This paragraph implies that

- ☐ early inventors came from the lowest classes.
- ☐ man's intolerance delayed progress.
- ☐ early inventions were impractical.
- ☐ necessity is the mother of invention.

23. Which of the following answers lists these inventions in order of their development?

(1) printing press
(2) vacuum tube
(3) steam engine
(4) automobile
(5) smelting of metals
(6) storage battery

- ☐ 1 · 3 · 5 · 6 · 2 · 4
- ☐ 1 · 5 · 4 · 3 · 6 · 2
- ☐ 5 · 6 · 1 · 3 · 2 · 4
- ☐ 5 · 1 · 3 · 4 · 6 · 2

24. The following outline is to be used in writing an article on inventions.

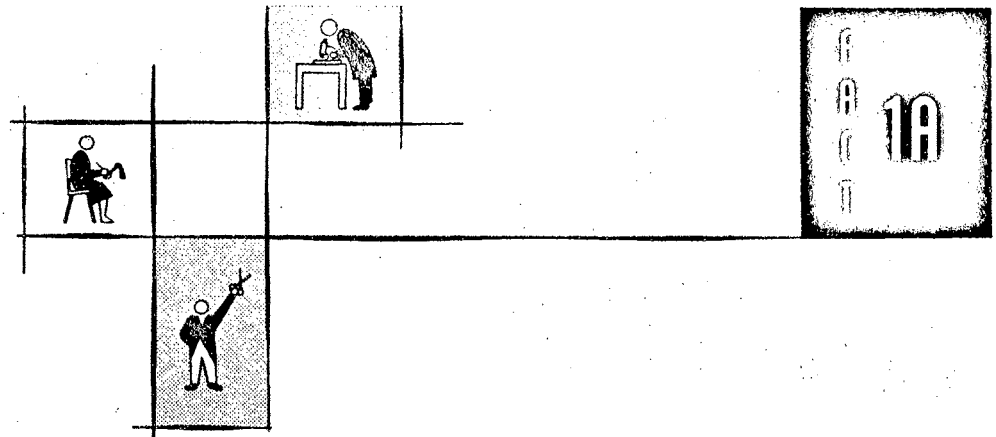
I. Nature of inventions
  A. Definition of invention
  B. Comparison with discovery
II. History of inventions
  A. Early persecution of inventors
    1. Treated as criminals
    2. Ridiculed and scorned
  B. .....
    1. Science taught in the schools
    2. Money given for research

Which of the following choices would be best as item II B?

- ☐ Inventions of today
- ☐ History of science
- ☐ Recognition of the value of knowledge
- ☐ Modern science creates new inventions

STOP HERE

NAME (Print First Initial Last) AGE GROUP SEX DATE

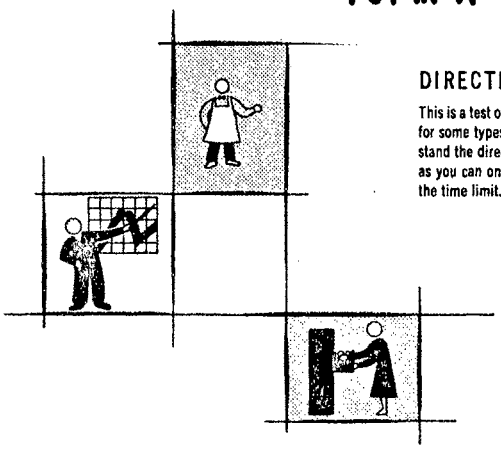


FACT 1A

Flanagan Aptitude Classification Tests

INSPECTION

form A



DIRECTIONS

This is a test of your ability to do a special type of work. This ability is important for some types of work and not very important for others. Be sure you understand the directions when they are given, then work as quickly and accurately as you can on the test. Try to do as many of the problems as you can within the time limit. You are not expected to have time to finish all of the problems.

STOP HERE. DO NOT GO ON.

FACT 1A—INSPECTION CATALOG No. 7-3420

DIRECTIONS

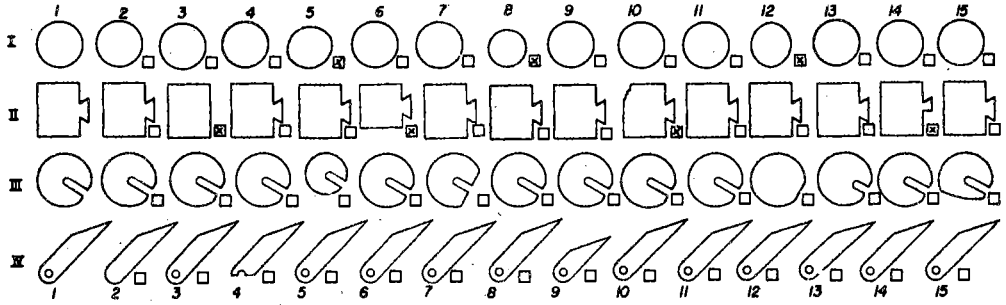
This is a test of your ability to spot flaws or imperfections in small objects quickly and accurately.

Each problem consists of a series of 15 small parts. These parts are identical, except that some of them are perfect and some are imperfect. Your task is to inspect the parts in each problem and pick out the ones which are imperfect or contain flaws. In every case the *first* part in each series is a *perfect sample* of the material you are inspecting.

Look at the first part in each series, then at the remaining ones in the series. Make an X in the box under every part you find with a flaw. You will find *one or more* imperfect parts in every problem. *Mark the boxes for every imperfect part.*

In sample problems I and II below, the imperfect parts have been marked. Look at problems III and IV. Mark a cross in the box below those parts which are *not* exactly like the first one in each series.

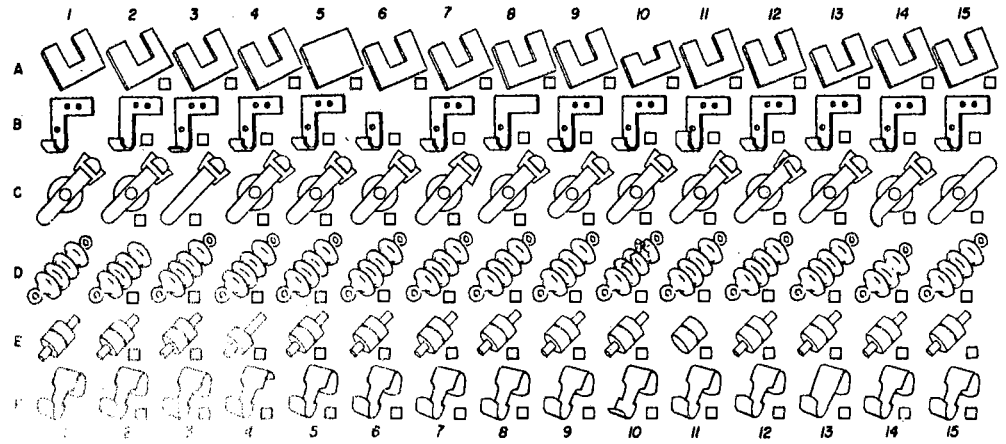
SAMPLE PROBLEMS



You should have marked boxes for parts 5, 7, 12, 13, and 15 in problem III, and parts 2, 4, and 9 in problem IV.

Remember, the first part in each problem is a perfect sample of the part you are inspecting. You will now have a timed practice trial on the next six problems. Mark a cross in the boxes where the parts are not exactly the same as the first one. Work as rapidly and accurately as you can. When the signal is given, you may begin.

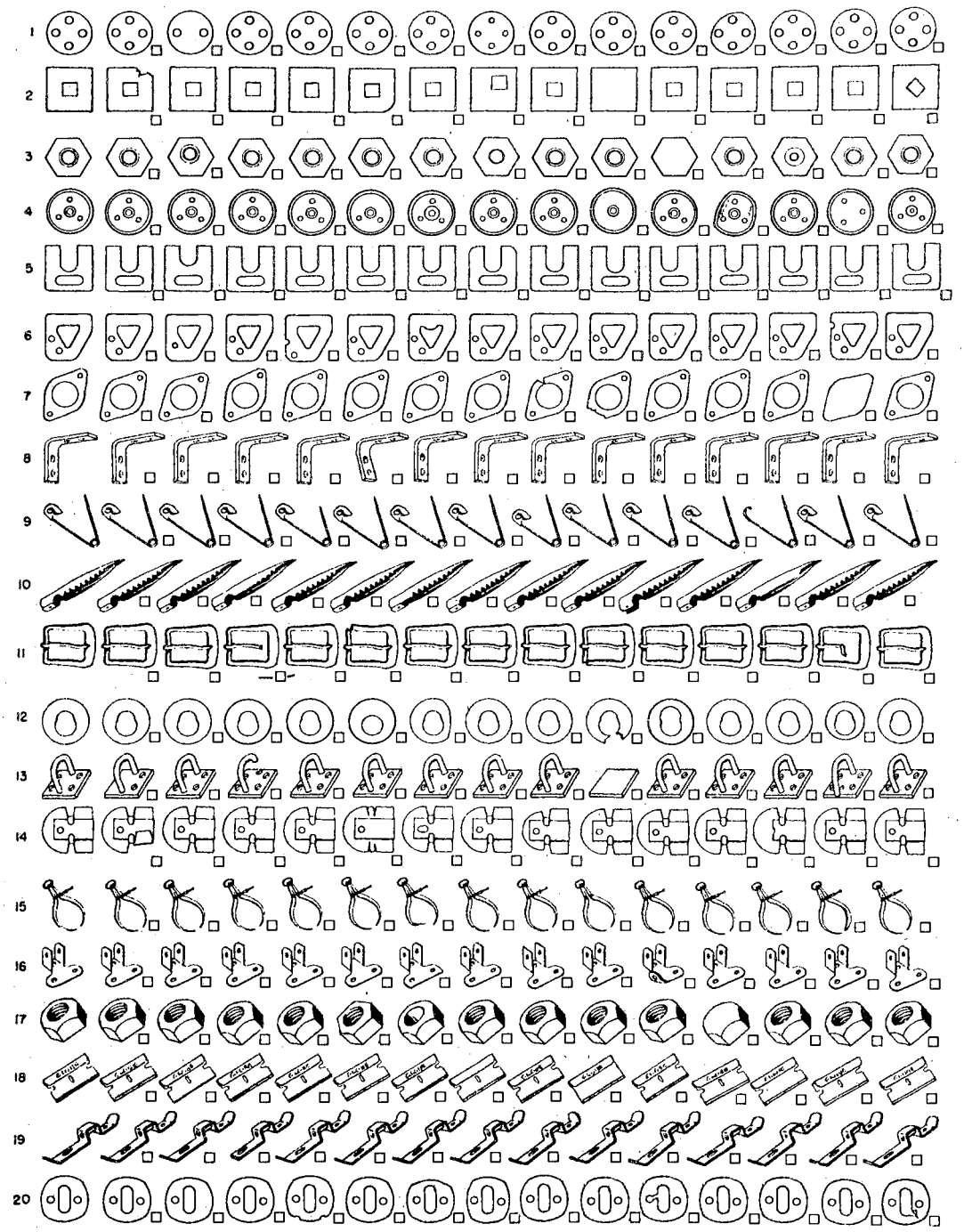
PRACTICE PROBLEMS



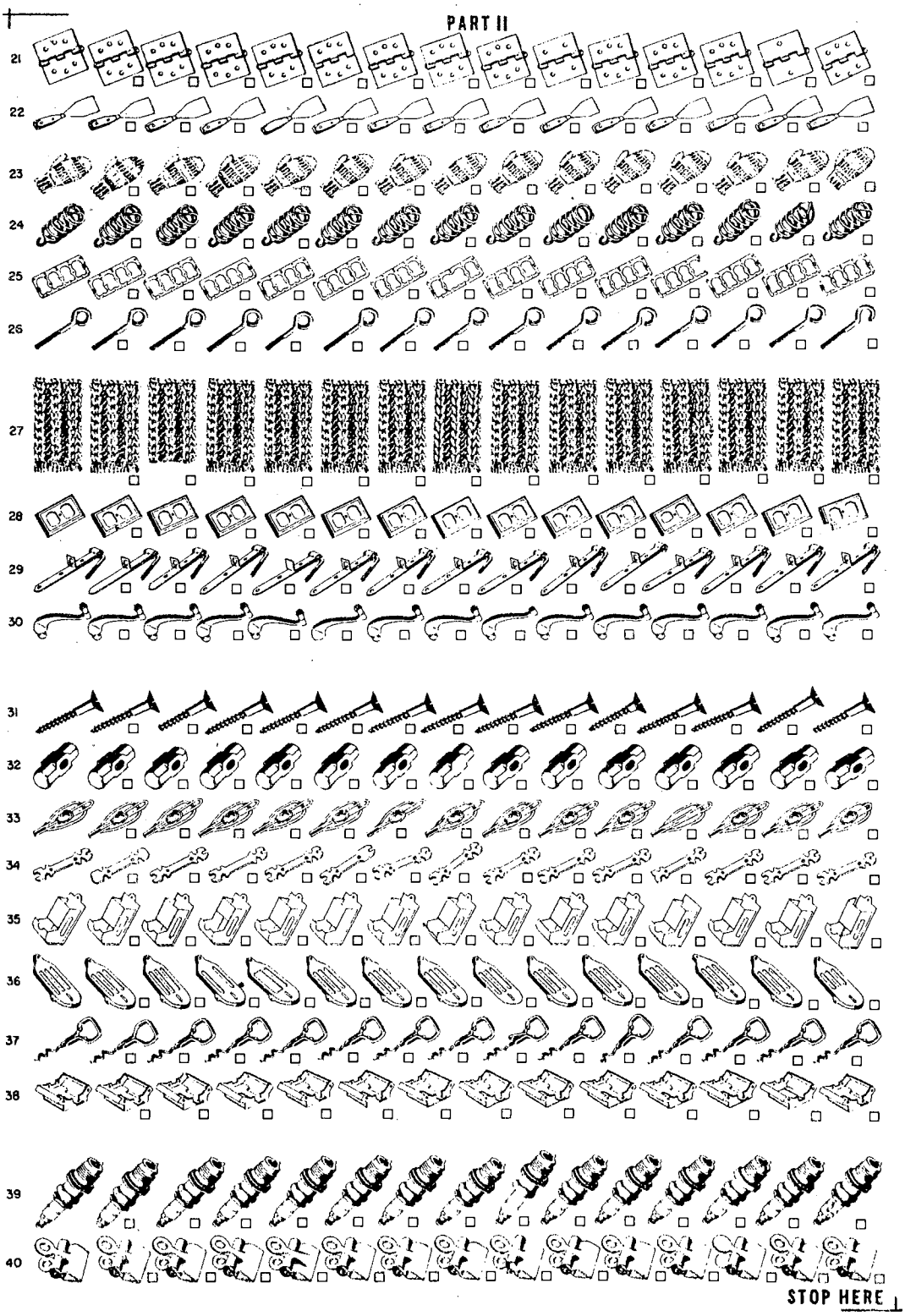
In problem A you should have marked the boxes for parts 2, 5, 10, and 13; in problem B, parts 2, 3, 6, 8, and [illegible]; in problem C, parts [illegible] 12, 14, and 15; in problem D, parts 2, 10, and 14; in problem E, parts 4 and 11; and in problem F, parts [illegible] and 13.

STOP HERE. DO NOT GO ON.

PART I



STOP HERE. DO NOT GO ON.


PART II
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
STOP HERE

APPENDIX C

Data Summary on Food Service Supervisors

Eight food service supervisors from the University of Oklahoma Medical Center were utilized in this study. A data summary of each supervisor is listed below.

1. Employed January 1962
   Appointed to supervisor July 1962
   Limit of formal education: Business college
   Age 30

2. Employed January 1953
   Appointed to supervisor 1958
   Limit of formal education: 9th grade
   Age 34

3. Employed September 1945
   Appointed to supervisor September 1952
   Limit of formal education: 9th grade
   Age 64

4. Employed July 1956
   Appointed to supervisor May 1961
   Limit of formal education: 9th grade
   Age 35

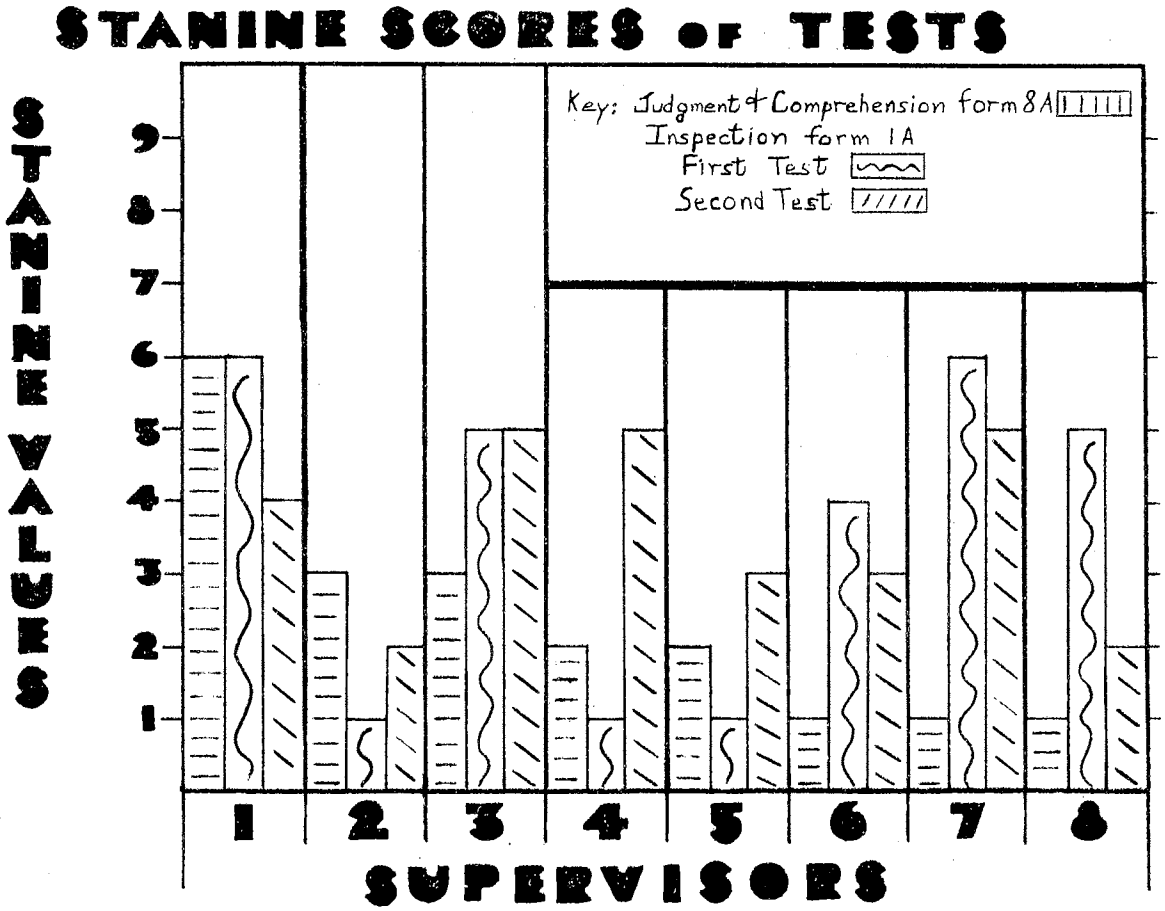
5. Employed January 1956
   Appointed to supervisor April 1956
   Limit of formal education: one year of college
   Age 33

6. Employed September 1953
   Appointed to supervisor 1955
   Limit of formal education: 9th grade
   Age 49

7. Employed March 1958
   Appointed to supervisor December 1961
   Limit of formal education: 11th grade
   Age 39

8. Employed October 1960
   Appointed to supervisor July 1963
   Limit of formal education: 11th grade
   Age 29

APPENDIX D



The graph above is divided into eight sections. The numbers one through eight are used to correspond to each food service supervisor. The nine divisions on the left correspond to the stanine values listed on the tests. Each section is divided in three parts. The first part lists the stanine score obtained on the F.A.C.T. on Judgment and Comprehension, form 8 A. The second part lists the stanine score obtained on the first F.A.C.T. on Inspection, form 1 A. The third part lists the stanine score obtained on the second administration of the (F.A.C.T.) Inspection, form 1 A.

APPENDIX E

Computation for the coefficient of variation on the preliminary raw test scores and raw retest scores follow:

A. Preliminary test $CV = \frac{S}{\bar{X}}$

where $S^2 = \frac{ZX_i^2 - \frac{(ZX_i)^2}{n}}{n-1} = \frac{26152 - \frac{(446)^2}{8}}{7} 183.9$

where $S = S^2 = 13.5$ and $\bar{X} = 55.75$

$$CV = \frac{S}{\bar{X}} = \frac{13.5}{55.75} = .242.$$

B. Retest $CV = \frac{S}{\bar{X}}$

where $S^2 = \frac{ZX_i^2 - \frac{(ZX_i)^2}{n}}{n-1} = \frac{25952 = \frac{(452)^2}{8}}{7} = 59.1$

where $S = S^2$ and $\bar{X} = 56.5$

$$CV = \frac{S}{\bar{X}} = \frac{7.6}{56.5} = .134$$

VITA

Maxine Dolores Schumacher

Candidate for the Degree of

Master of Science

Thesis: THE USE OF A MODIFIED RATIO-DELAY METHOD TO TRAIN FOOD SERVICE SUPERVISORS

Major Field: Food, Nutrition and Institution Administration

Biographical:

Personal Data: Born at Hays, Kansas, March 24, 1931, the daughter of Paul and Catherine Schumacher.

Education: Graduated from Girls Catholic High School, Hays, Kansas, in 1949; received the Bachelor of Science in Nutrition, in May, 1954; attended Kansas State University in the summer of 1954; received a dietetic internship from the University of Oklahoma Medical Center in 1957.

Professional experience: Joined the dietetic staff at the University of Oklahoma Medical Center in September 1957 as a Methods Improvement Dietitian; in June 1960 transferred to Administrative Dietitian; member of the American Dietetic Association; member of the Oklahoma Dietetic Association; member of Kappa Omicron Phi, honorary Home Economics Fraternity.