


AN ABSTRACT OF THE THESIS OF

Ada Jean Fancher for the degree of Doctor of Philosophy in Vocational-
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Title: THE IDENTIFICATION OF COMMON SKILLS, KNOWLEDGES AND RELATED
FACTORS NEEDED FOR SUCCESSFUL EMPLOYMENT IN OREGON

Abstract approved: 
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PURPOSE

The purpose of the study was to identify a list of skills, knowledges and related factors that are common to fourteen occupational cluster areas representative of the work community of Oregon.

PROCEDURES

A list of skills, knowledges and related factors needed for successful employment was derived from existing task analyses of the key occupations within the fourteen cluster areas. A Jury Panel of Experts refined the list into the 59 response items utilized on the Likert survey instrument. Respondents were asked to prioritize the five major reasons why people are terminated from employment.

The sample consisted of 386 firms representing fourteen occupational areas which were Accounting, Agriculture, Child Care, Construction, Electricity/Electronics, Food Service, Forest Products, Graphic

Communications, Health Occupations, Industrial Mechanics, Marketing, Metals, Secretarial-Clerical and Service Occupations. The sample was stratified by firm size and region. A table of random numbers was utilized to select sample firms within the size and geographical groupings.

Three hypotheses were tested by analysis of variance procedures. The hypotheses were:

Ho₁: There is no significant difference in skills, knowledges and related factors needed for successful employment among fourteen occupational cluster areas as identified by employers of representative firms.

Ho₂: There is no significant difference in skills, knowledges and related factors for successful employment among five size groupings of firms as identified by employers of representative firms.

Ho₃: There is no significant interaction effects between the fourteen cluster areas and the five size groupings of firms.

P < .01 was selected as an indicator of significance in evaluating the data. Other statistical treatments utilized in evaluating the data were Least Significant Difference Test, Scheffé Test, Newman-Keuls Test and Pearson Product-Moment Correlation Coefficients.

FINDINGS

Significant differences determined by the analysis of variance were:

1. Forty-six of the fifty-nine criterion statements rejected the null hypotheses for cluster area.
2. The null hypotheses was retained for all criterion statements for size of firm.
3. Two of the fifty-nine response items rejected the null hypothesis for interaction effects between firm size and cluster.

A one-way analysis of variance was conducted to determine if differences exist between geographic location of firms. There were no regional differences at the $P < .01$ level of significance.

The fifty-nine criterion statements were individually evaluated according to their acceptance by the respondents. On the basis of these evaluations, the following findings were made:

1. Fifteen criterion statements were highly accepted by all fourteen occupational cluster groups and designated as extremely important to job success.
2. Twenty-two criterion statements with high level of acceptance among most occupational areas were designated as very important.
3. Fifteen criterion statements with above average acceptance were designated as moderately important.
4. Seven criterion statements were below average in overall acceptance and designated as slightly important.

Each respondent was asked to prioritize the five most common reasons why persons were fired by their firm. In rank order these were: poor work performance, 37.6 percent; absenteeism, 25.7 percent; insubordination, 13.3 percent; dishonesty, 11.1 percent; inability to work with others, 9.6 percent; and miscellaneous, 2.9 percent.

RECOMMENDATIONS

On the basis of this study, it is recommended that:

1. Task analyses be reviewed routinely to assure that cluster curriculum is up-to-date and flexible.
2. Cluster programs in Oregon consider including in their curriculum all criterion statements identified as extremely important.
3. Cluster programs in Oregon review, revise and include in curriculum the criterion statements identified as very important.
4. Cluster programs in Oregon should include, in their curriculum, methods by which students can practice what they are learning enabling them to judge the difference between good work performance and poor work performance.

THE IDENTIFICATION OF COMMON SKILLS,
KNOWLEDGES AND RELATED FACTORS
NEEDED FOR SUCCESSFUL EMPLOYMENT
IN OREGON

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THE IDENTIFICATION OF COMMON SKILLS,
KNOWLEDGES¹ AND RELATED FACTORS
NEEDED FOR SUCCESSFUL EMPLOYMENT
IN OREGON

I. INTRODUCTION

Our educational system is designed to prepare individuals to perform the various life roles within the society. In Oregon, these life roles are defined as being a family member, a citizen, an individual, a learner, a consumer and a producer. All of these roles interrelate with one another and cannot be taken wholly without consideration of their interrelationships. (69)

For the purposes of this study, the producer or work role will be the central focus. The work role refers to a set of functions to be performed by a worker, the performance of which contributes to the production of goods and services. (42) It means roughly the same thing as the term job when it is used colloquially and in industrial psychology. Jacques refers to work as employment work or work roles in which an employer pays the role occupant a wage or salary for services rendered. (42)

Perceptions differ about the requirements for success in the work place. For the worker success might mean one thing, for the employer

¹The term knowledges denotes separate, distinct and identifiable units of knowledge. Knowledges is standard terminology of the Oregon Department of Education for development of vocational cluster curriculum.

success might mean either the same thing or something completely different. The difference between what an employer expects of the employee and what that employee expects of the employer may result in dissatisfaction on the part of both parties. Thus it is important to identify those expectations in order to provide students with those skills.

The work community must communicate the requirements of the work place and identify the skills, knowledges and related factors deemed essential for successful employment. The educational system must translate these criteria into instructional programs for students. Students must assume the responsibility and challenge to prepare for their role as a producer by learning to perform the skills, knowledges and related factors necessary for successful employment in the occupational area of their choice.

In summary, a research-based list of common criterion statements can serve as a basis for further cooperative efforts between the work community and education in order to identify common skills, knowledges and related factors needed for successful employment. The work community in Oregon should be actively involved in prescribing the attributes of a successful worker thus giving direction to the educational criteria within vocational programs.

Purpose of the Study

The purpose of this study was to identify a list of skills, knowledges and related factors that are common to fourteen occupational cluster areas representative of the work community in Oregon. These cluster areas are: Accounting, Agriculture, Child Care,

Construction, Electricity-Electronics, Food Service, Forest Products, Graphics Communication, Health Occupations, Industrial Mechanics, Marketing, Metals, Secretarial-Clerical and Service Occupations.

The skills, knowledges and related factors were reflected as criterion statements in this study. The criterion statements were then utilized to obtain a consensus of essential skills, knowledges and related factors for successful employment as determined by the work community.

Objectives of the Study

The objectives of this study together with the sub-objectives were:

1. To identify the skills, knowledges and related factors that are common to fourteen occupational areas in Oregon.
 - a. To collect task analyses of key occupations that have been completed by the Oregon Department of Education.
 - b. To collect information from the Dictionary of Occupational Titles (D.O.T.) and Occupational Briefs where information was not complete on the task analyses.
 - c. To sort and condense criterion statements of similar intent into a composite form without losing the basic purpose and intent of the statement.

- d. To standardize the language of the criterion statements at a level that is understood by respondents from the work community without losing the basic intent of the statement.
 - e. To survey firms representative of the fourteen occupational areas to determine what skills, knowledges and related factors are needed for successful employment in their respective firms.
 - f. To analyze the responses of the survey in order to determine what skills, knowledges and related factors are needed for success in the work place.
 - g. To develop recommendations based on this study that can be utilized as a basis for further efforts toward the development of curricula that will provide students an opportunity to practice the skills, knowledges and related factors needed for successful employment.
2. To identify five major reasons for employee termination.
- a. To include a statement on questionnaire survey requesting each respondent to rank order the five major reasons for employees termination.
 - b. To summarize the responses.

The Hypotheses

Three hypotheses were tested in this study:

- Ho₁: There is no significant difference in skills, knowledges and related factors needed for successful employment among fourteen cluster areas as identified by employers of representative firms.
- Ho₂: There is no significant difference in skills, knowledges and related factors needed for successful employment among five size groupings of firms as identified by employers of representative firms.
- Ho₃: There is no significant interaction effect between the fourteen cluster areas and the five size groupings of firms.

Assumptions

The following assumptions were made:

1. The work community does hire high school students, graduates and early leavers as well as those persons with more advanced skill training.
2. People want to prepare for the producer role and will prepare themselves for that purpose.
3. Educators should be interested in the results of this research project (i.e., for training plan development, prevocational and vocational curricula development).
4. Organizations select, train and evaluate employees according to job specific criteria.

5. Employers can assess skills, knowledges and related factors that are essential to the work functions of each job.
6. Many variables affect successful employment.

Limitations

The factors that might limit this study include:

1. The criterion statements used as response items may not have been all inclusive of the skills, knowledges and related factors needed for successful employment in the fourteen occupational areas.
2. The attitude of the respondents toward education and educational institutions may vary.
3. The attitudinal characteristics of the occupational areas may vary.
4. The experience and background of the respondents may cause variations in their responses.
5. The experience and background of the researcher may cause an experimenter bias to exist.

Definition of Terms

Criterion Statement. The skills, knowledges and related factors that are common to more than two-thirds of the fourteen occupational clusters and are needed for successful employment.

D.O.T. Dictionary of Occupational Titles. A publication by the United States Department of Labor that identifies occupations and occupational requirements.

Employers. A term generalized to refer to the organizations who hire workers within the work community.

Entry-Level. The work experience and training that employees have when they enter employment. This will be different for each individual and each firm based on job requirements and the training and performance of the entry-level worker.

Instructional Analysis. A process of (a) grouping knowledges and skills, (b) identifying expected behaviors, (c) organizing knowledge requirements, (d) organizing classroom activities, (e) determining scope and sequence by the instructor(s) of the cluster program(s) to complete the instructional analysis and (f) utilizing the task analysis.

Jobs. The on-the-job duties assigned to a worker.

Key Occupations. Jobs with 250 or more employed and a five-year expansion/replacement need of 100 more over a five-year period.

Knowledges. Information required for performing a job (cognitive domain).

Occupational Cluster. Curriculum is organized around core competencies that are common to the family of occupations that constitute the cluster. The goal of the curriculum is to prepare people for work and to be knowledgeable of career opportunities. To qualify as an occupational cluster the job area must employ a minimum of 10,000 persons and have a replacement need of 2,000 persons every five years. Related jobs are grouped into a family of occupations.

Related Factors. Those personal traits required for success in the work place, such as good grooming, the ability to maintain good interpersonal relations, dependable work habits and acceptance of responsibility (affective domain).

Related Occupations. Jobs in which 100 or more persons are employed in Oregon and have basic similarities.

Skills. Manipulative, motor and interpersonal requirements for performing a job (psychomotor domain).

Successful Employment. Continued employment with a firm for more than a year. This definition is based upon interviews with members of the Jury Panel of Experts and the Oregon Employment Division, Albany Branch. Usually the employee experiences some type of orientation to the job, training and routine evaluation.

Supervisor. The worker who is directly responsible for the productivity and job performance of another worker.

Task Analysis. A process of (a) determining and ranking tasks by order of importance and (b) determining the skills, knowledges and related factors required of the tasks. Persons employed in the related occupations complete the task analysis.

Background of the Problem

Business, industry and educators in the public and private sector have been concerned about the level of competence of young workers for many years. In 1944, the National Education Policies Commission issued the following statement:

All youth need to develop saleable skills and those understandings and attitudes that make the worker an intelligent and productive participant in economic life. (63:289-290)

Three years earlier, in 1941, the National Youth Administration published a study of occupational outlook for youth in Georgia, Ohio, New York and Minnesota. This study was summarized by Super in the same year. Super supported the importance and value of surveys of the vocational life of the community for all educators and employers of youth. He concluded that schools would be better able to prepare youth for a realistic work role if periodic study of the various occupations were undertaken. These studies should include the training, skills and personal qualifications required for successful job performance. (89)

In 1933, the nationwide Federal-State employment service began operation. One of its functions was to compile information about occupations. This information was developed by each local public employment office and each office gave its own individual meanings and job titles for use in the employment system operation. As a result, there was no uniform method for exchanging needed occupational information among employment service personnel within local offices as well as the larger scale between state offices within any given state or among state agencies.

An occupational research program begun in 1934, attempted to rectify this problem by studying the actual existing occupations in the U. S. economy. The purpose of this study was to provide a reliable source of occupational information for use by public employment services personnel and others who needed basic facts about occupations, such as

tasks performed; knowledges required; machines, equipment and materials used; physical demands and working conditions involved; and worker characteristics required. The first Dictionary of Occupational Titles (D.O.T.) was released in 1939. Thousands of jobs in industrial and business establishments located around the country were observed and analyzed by occupational analysts. (97)

The second edition of the Dictionary of Occupational Titles was published in 1949 and reflected the economic expansion that accompanied the years during and immediately following World War II. Changing technology and resulting employment problems became a part of the American scene. New occupational research was undertaken to cope with these factors concentrating on improved methods and techniques of gathering and classifying job data. In 1966, the third edition of the Dictionary of Occupational Titles was developed from the new and emerging techniques. (97)

The Employment Service continues to gather and publish information about occupations. Research is designed to reflect the rapidly growing and changing technologies in the American economy. Vocational educators in Oregon utilize this information in planning and implementing vocational programs.

As a result of the research for the third edition of the D.O.T., research analysts determined that jobs could be clustered in a Family of Related Occupations, enabling the worker to have flexibility in the new and emerging job market. As dynamic technology deletes jobs, it also adds new jobs and the worker must be prepared to have the flexibility to move from one job to a related job. (97)

Based on this assumption, the United States Office of Education (U.S.O.E.) organized the cluster approach to education. This approach is based on the premise that students in our educational system must learn the basics of communication, mathematic computation and reading and how to apply these basic skills in the occupational area of their choice.

The Ford Foundation recognized a need for improving the educational system by implementation of this cluster approach to education. In the 1960s they funded educational agencies across the United States including Oregon. This funding source enabled some districts to investigate goal setting and competency development as a basis for their educational programs. In 1969, the Oregon Department of Education conducted a needs assessment which elicited the major needs of education as viewed by the general public, educators, students and dropouts. Based on this needs assessment, further studies were encouraged to study the needs of Oregon education. (68)

Dr. Dale Parnell, Superintendent of Public Instruction in Oregon during the late 1960s and early 1970s, provided the leadership to move Oregon's educational system toward competency-based education and preparation for career entry. This is commonly referred to as The Oregon Way. The Oregon Way is based upon two assumptions:

1. Secondary schools should be preparatory institutions for all students.
2. A preparatory program ties the curriculum to the lives of students in such a way that they are better equipped to choose their future goals and to take their next step. (69)

The Oregon Way capitalized on the U.S.O.E.'s cluster approach in developing the Career Clusters. This delivery system for education enables a student to practice the basic skills, knowledges and related factors needed for successful employment in an occupational area of their choice.

As we enter the 1980s, the public is continuing to inform educators that students must be better prepared for the world of work. The National Academy of Education asked some leading educators and researchers to form a task force to study the relationship between education in all its aspects and the prospect of young people's fulfillment in the employment market. The task force was chaired by Clark Kerr and funded by the Ford Foundation. Each task force member was asked to identify five high priority research items, experiments and policy recommendations. The results of the priority rating indicated that the task force members substantially agreed there is a need:

1. To improve the collective understanding of education and employment problems likely to emerge in the 1980s and 1990s.
2. To know which elements of the high school curriculum are most useful to young people, especially those not planning to attend college.
3. To undertake experimental and other development work in manpower forecasting, lifelong learning and its financing, career development of college students in the liberal arts, and employer initiatives in improving the link between education and employment.

4. For educators to promote the joint contribution of schools, families, employers and community groups in the education and socialization of youths.
5. For educators to improve the performance of schools by continued emphasis on basic skills, establishment of performance objectives, provision of high-quality options to the traditional curriculum, avoidance of invidious distinctions between various programs, better use of student time and by maintenance of all students as close to the mainstream as possible.
6. For the federal government to continue its support of career education reforms, outreach, career guidance and occupational informational systems, reforms to enable education institutions to be more responsive to adults and experiments in lifelong learning. (94)

A recent study by Bond to determine the needs of Vocational Education in the State of Oregon involved responses from employers, instructors and students. Employers identified the need for student competence in vocational skills and related factors (personality, initiative, responsibility, dependability) and the need that curricula be designed to include effective instruction in these areas. (9)

The Research and Exemplary Advisory Committee, Vocational Unit, Oregon Department of Education identified that the area of basic skills needed by all vocational students for successful employment is an area in need of study. These basic skills are identified as skills, knowledges and related factors necessary for successful employment in an occupation. (70)

Based on Oregon's emphasis on the cluster approach as a delivery system for vocational education and the needs identified by the Research and Exemplary Advisory Committee, this study is directed toward strengthening curriculum in vocational education. These criterion statements can serve as guidelines for preparing students for employment.

II. REVIEW OF RELATED LITERATURE

This review of literature verifies the need for this study and establishes a broad perspective of the factors necessary for successful employment. There are three sections in the Review of Related Literature; the first presents a brief historical perspective of work. The second section discusses selected variables that affect job satisfaction, which has an effect on successful employment. The remaining section deals with studies that identify skills, knowledges and related factors needed for successful employment.

A Historical Perspective

The origins of education for work are buried in antiquity. In Greek and Roman history, there are records of the training of cooks, hairdressers, mechanics and architects. However, work was seen as negative in character, a necessary evil. (18)

Hebrew and Christian cultures modified this perspective. In the monastic system of the fourth century, monks were instructed in woodworking, weaving, tailoring, architecture and agriculture. During the Reformation Era, people acquired more positive attitudes toward work. Progressive and original thinkers of the period stressed industrial as well as general education for all. During the seventeenth century on the Continent, there was much interest in education for work and a more practical way of life. But at the same time, there was also extreme widespread poverty. (18)

The sixteenth and seventeenth century Protestant believed that continuous physical or mental labor increased the glory of God. Max Weber, in The Protestant Ethic and the Spirit of Capitalism, claimed that the value of work has roots in the teaching of Calvin and his followers. Weber reported the decline of the Protestant Ethic and its replacement by material values. (106) More recently, other historians have commented on changes in the values of American culture including the decline of the Protestant Ethic from its previous prominent position. (78;108)

The advent of the industrial age brought a more functional approach toward labor. Organizations have changed attitudes toward the worker. Frederick W. Taylor's scientific management method was intended to be a constructive and effective method for organizing modern production and for decreasing human labor, instead of making it more burdensome. In 1912, The Taylor Society was organized as a center for the development of the scientific management method. The Taylor Method concentrated on ways of increasing labor productivity by superior organization of the shop and by control or elimination of unnecessary and wasteful motions in work performance. (18)

Over the years, practitioners have broadened their horizons and have become interested in the much larger problem of the human organization of work. Out of this interest has grown the personnel management movement and the concentration on human potential development as well as productivity. Although modern personnel management dates back to the early 1940s, those personnel problems that required managerial attention and decisions can be traced to the Industrial Revolution.

Today, the role of the personnel manager has changed to accomplish the objectives of both the organization and the individual worker. (30)

Selected Variables Related to Job Satisfaction

The on-the-job performance of two workers will never be the same. Performance is dependent upon the ability and motivation of each individual as well as one's interaction with the environmental variables of the work place. (101)

Environmental variables affect job satisfaction. If workers are satisfied, they will be more likely to remain on the job and less likely to leave it voluntarily. When the rewards at work are such that the workers would rather be at work than absent from work, the environmental variables are combined in such a way as to create job satisfaction. (99)

Cummings and Schwab identified environmental variables as job design, supervision, fellow workers, compensation, working conditions, training and evaluation. (22) For the purposes of this study, the following environmental variables will be discussed and a relationship will be demonstrated between each variable and its effect on job satisfaction: motivation, occupational choice, job design, supervision, social aspects of work, compensation, hours of work and evaluation.

Motivation

Every man and four out of every five women in the United States are members of the labor force at some time in their lives. There are two conditions under which people work. One is economic in nature. There must be an opportunity to work, a demand by society for goods

and services and a demand by employers for people to produce goods and services. The second is motivational. People prefer working to not working. People choose to work when the outcome is positive. In order for full employment to come about, both sets of conditions must be present to the same degree. (4)

Industrial psychologists have long been interested in the conditions which enable workers to be effective in their jobs. The role of motivational processes in determining a worker's level of performance and job satisfaction is now widely recognized by industrial psychologists. Viteles identified the development of the will to work as industry's core problem in the utilization of its manpower. (98) McGregor and Likert outlined theories of management based largely on assumptions about human motivation. (54)(53) Roethlisberger and Dickson's studies in the Hawthorne plant of the Western Electric Company and studies by Lewin, Lippitt and White, Coch and French gave important impetus to the study of motivational influences on performance. (80)(51)(16) Vroom stated that most behavior exhibited by individuals on their jobs as well as their behavior in the job market is voluntary, and consequently motivated. (99)

Many work roles in society provide opportunities for workers to experience a continually changing environment, to play an active part in inducing change in that environment and to use and develop further skills and abilities. Studies of the unemployed and of the retired, as well as of members of such diverse occupational groups as accountants and engineers, managers, steelworkers, salesmen, coalminers and

physicians and assemblers point to the importance attached to being involved in changing the work place as a motivational factor. (39)(75) (31)(96)

Working may also serve a moral purpose for the worker. People seem to cognitively structure their world so as to provide moral justification for their labors. Workers have found that they can contribute to the happiness and well-being of their fellow man. There is no doubt that the sources of job satisfaction vary for different people and that the degree of these satisfactions may differ greatly from one job to another. There is still a great deal to learn about the nature of the interaction between the task or function of work roles and the motivational systems of the worker.

Conclusion: Motivation does have an effect on the job satisfaction of the worker.

Occupational Choice

There are two approaches to occupational choice--normative and empirical or descriptive. The normative approach is concerned with how choices ought to be made. Vocational guidance deals with this approach which consists of a series of methods that include interviewing and psychological testing. The empirical or descriptive approach is concerned with how persons make vocational decisions. These methods are expected to assist individuals in making occupational choices. (101)

Occupational preference, occupational choice and occupational attainment are interrelated factors. Successful attainment of an

occupation is a result of two sets of choices--one by an individual and the other by social institutions. People not only select occupations, they are selected for occupations. This latter process serves to maintain standards of performance in occupations through admitting only those who are expected to prove effective. (12)

The selective functions differ in specific occupations. For the professions, the job of recruiting and selecting members rests largely with members of the profession. For example, the medical profession determines its own selection criteria. This criteria is enforced by each state and prevents unqualified practitioners from performing as a member of that profession. Law and education are similarly controlled. In the semi-skilled and unskilled professions, employers select workers. In the skilled trades labor unions usually control the selection of workers. The only occupation which is not controlled is self-employment. However, financial restrictions, loans and federal and state laws serve as a selective function.

Kuder found that people tend to enter occupations which are consistent with their interest. (45) Strong and Kuder were concerned with constructing an interest test to reflect the degree of similarity between the interests of a given person and the characteristic pattern of interests of people in different occupations. (88)(45)

Changes may occur in psychological variables such as attitude as a result of entry into an occupational role. Lieberman studied factory workers who were later made foremen or shop stewards. He found that those who were made foremen developed a more positive

attitude toward management and a more negative attitude toward unions. Those who were made stewards had a more positive attitude toward unions, but did not change their attitude toward management. (52)

Self-concept plays a major role in vocational development. The greater the degree of commitment of workers to their chosen occupation, the greater is the degree of correspondence between self-description and description of members of that occupation. A person's concept of self and of occupations may change as a result of experiences prior to or following entry into the labor market. Workers who have accurately appraised the occupational situation and the amount of satisfaction derived from the outcomes of employment would be less likely to revoke their occupational choice than those whose appraisals had been less accurate. (90)(91)(60)(87)(26)(8)

People are restricted from making occupational choices for many reasons. There is a strong tendency for a person to choose an occupation for which they believe themselves to have the attributes necessary for success rather than choosing an occupation with more challenge and risk. The effects of a person's values on occupational choice are great. The stereotypes which people have regarding occupations also restricts occupational choices. Many people are not aware of their alternatives for making an occupational choice. (81)(44)(103)

Ginzberg et al. found that the decision concerning one's future vocation is not an event occurring at a single point in time, but a process extending over a long period of time and that occupational choices are irreversible. (34) Roe, however, disagreed and claimed that people and society are more flexible than was suggested by

Ginzberg. (79) Super and associates focused on the prediction of career development and the sequences of occupations. Jobs and positions in the life of the individual should be considered, rather than occupational choice. Super supported the concept that vocational plans may be altered after entering the labor market. (92)(93)

Conclusion: The occupation chosen by the worker does have an effect on job satisfaction.

Job Design

Job Design refers to the design and specification of individual jobs within the organization. There are many factors that affect job design. Some include the proven values of specialization and repetitive operations, changing technology, labor union policies, abilities of present personnel, available supply of potential employees, the interaction requirements among jobs within the organizational structure and psychological and social needs of human beings that can be met by the job. (30) For this study, specialization and repetition will be discussed because of their relationship to job satisfaction.

Specialization and Repetition. Specialization matches the worker to the job and provides specialized training to enhance the worker's ability to perform job tasks. Repetitiveness, or specialization, has led to a decrease in job satisfaction. (43) In 1920, the Industrial Fatigue Research Board in Great Britain found that boredom experienced on the job is somewhat related to the conditions of work. Boredom is less liable to occur under the following circumstances: when the form of activity is changed; operations are paid according to output; work is perceived as self-contained tasks;

employees work in compact social groups, and suitable rest pauses are introduced during the work time. (40) A study by Walker and Guest supported these findings. (103)

In 1911, F. W. Taylor felt that workers should not plan out how they were to do a job; they should just do it. Gilbreth, in 1919, supported this concept by stating that there was one best way of doing work. The Taylor-Gilbreth philosophy led to time and motion studies. Codifications of work methodologies were limited to work roles in which the number of operations performed by the worker was small. (33) Industrial psychologists disagree with this approach. Viteles stated that personal differences in physical and mental make-up must be recognized. (98) Increased output must be joined with speed of work and ease of performance. He further stated that prescribing a single method of doing something decreases job satisfaction. There is no empirical evidence to support this, but a great deal of observed evidence. (98)

Work pace may be controlled socially as a result of close supervision by the supervisor or mechanically by conveyor belts, for example. A study by Walker and Guest found that the worker had to adapt to the rhythm of the machine. (103) Findings from other studies indicated that the inability to control one's pace of work may be highly detrimental to worker satisfaction. (104)(56)

Job enlargement refers to increases in the number of operations that make up a single work role. An assembly-line worker, for example, would complete a total component rather than one part. Studies by Walker found that job enlargement improves job satisfaction. (103)(104)

Conclusion: Job Design does have an effect on the job satisfaction of the worker.

Supervision

The supervisor is an important influence on worker attitude. (78) Both the supervisor's personality and the worker's perception of the supervisor's behavior affects worker attitudes. (55)

The Ohio State Leadership Studies developed the Leader Behavior Description Questionnaire in which subordinates were asked to describe their supervisors' behavior. A related instrument called the Leadership Opinion Questionnaire was completed by supervisors who were asked to describe how they thought they should behave. This questionnaire was developed by Fleishman and provides scores on Consideration and Initiating Structures. (27) There is evidence that the subordinate satisfaction is related to the consideration of employee orientation of their supervisors. (35) Other studies supporting this viewpoint include:

1. Positive relationship between the consideration of school superintendents and the job satisfaction of elementary teachers. (84)
2. Positive relationship between the consideration of foremen and the morale of the subordinates. (29)
3. Positive relationship between an employee-oriented supervisor and satisfied employees. (53)
4. Interaction appeared between low consideration and high structure resulting in high grievance and

turnover rate. (29) In a hierarchical organization, the degree to which a supervisor satisfies the needs of subordinates may be dependent not only on the supervisory methods and practices used, but also on the amount of power held by the supervisor in the larger organizations.

Conclusion: The supervisor does have an effect on the job satisfaction of the worker.

Social Aspects of Work

Social psychologists emphasize the fact that work is a social activity. Many workers interact with other people at work, sometimes more than with their own family. The motives for work cannot be assigned only to economic needs. People may continue to work even though they have no need for material goods. A study by Morse found that 31 percent of the respondents said they would continue to work even if they were economically independent. The reason was the importance of the relationship with other colleagues. For all, work activity provides fellowship and social life. (61)

Herzberg, Mausner, Peterson and Capwell compiled data from fifteen studies of over 28,000 employees. This study emphasized the importance of the social satisfaction derived from work. Social contact with co-workers and supervisory workers were based on individual differences as well as the amount and kind of social interaction permitted or required by work roles. (38)

The manner in which a new employee is accepted by and adjusts to fellow workers may determine to a large extent a number of factors

such as attitude toward job, employer, boss and firm, amount of production and quality of work, and even the length of time that the employee remains with the company. (7) Jackson refers to the degree to which the person is objectively valued by other members of the group or organization as social worth. (41)

Workers' satisfaction in their jobs is related to their opportunities for interaction with others on the job. Studies supporting this viewpoint are:

...man's desire to be continuously associated in work with his fellows is a strong, if not the strongest human characteristic. (57:111)

A group is more attractive, the greater the rewards which may be earned by membership in the group and the greater the anticipation or expectancy of earning them. (5:60)

Isolated workers disliked their jobs and gave social isolation as the principal reason. (103:76)

However, Seashore found that interaction may lead to the emergence of both positive and negative attitudes. (83) Cartwright and Zander support this perspective:

Even though heightened interaction thus in some instances may accompany high cohesiveness, there is no basis for assuming that it is a necessary relationship. (11:80)

Interaction between members of work groups will be satisfying and will result in increased attractiveness of the work group to the extent to which members of the group have similar attitudes. (65)(66)

Conclusion: Social interactions in the work place have an effect on the job satisfaction of the worker.

Compensation

Economists and many executives stress the importance of the size of the pay check in determining a workers' job satisfaction and the likelihood of their remaining on the job. Social scientists supporting the human relations movement disagree. They claim that economic factors are highly overemphasized and stress the importance of social and ego needs. Both sides can find some basis for their positions.

When workers were asked to rank different aspects of the work role in terms of their importance, wages tended to be rated as less important than security, opportunity for advancement and company management, but more important than job content, supervision, social aspects of the job, communication, working conditions and benefits. However, when workers were asked to describe what makes them satisfied or dissatisfied with their jobs, wages were found to be the most frequent source of satisfaction. (38)

Helson suggested that satisfaction from the receipt of wages depends on the relationship between that amount and some standard of comparison used by the individual which is derived from previous wages received or a conception of the amount of wages received by others. (37) Patchen formulated the problem of satisfaction with wages in terms of social comparison theory. (74) In a study of workers in an oil refinery, he found that individuals who chose persons who earn more but are on a higher occupational level as a point of comparison are more satisfied with that comparison than are those who

choose as comparison persons who earn more but are on the same occupational level. These findings support many personnel managers' assertions that satisfaction is dependent on relative rather than absolute wage levels. (100)

Conclusion: The wages a worker receives for services performed in the work role have an effect on job satisfaction, depending upon how the worker makes the judgment.

Hours of Work

The work role affects not only the workers' use of working hours but also their use of leisure time. The job influences the community in which the workers live, the way in which members of the community respond to them, and the amount of time that workers spend with their families. The impact of work roles on leisure time use has generally been overlooked in studies of job satisfaction. Wages certainly affect how a person can use leisure time, but little is known about the nonwork environments associated with various kinds of work roles and the effects of these nonwork environments on satisfaction and adjustment.

If a person's work schedule meshes with desired nonwork environment activities, then no conflict exists. Conflict and dissatisfaction occur when the work schedule and desired activity schedule fall at the same time. (101)

Conclusion: The hours of work have an effect on the job satisfaction of the worker.

Promotional Opportunities

Opportunities for promotion offered to organization members are highly variable and are often assumed to have a marked effect on job satisfaction. Promotional opportunities are difficult to describe in any systematic fashion. A position at a higher level in the same organization typically involves changes in supervision, co-workers, job content and pay. It cuts across each of the topics discussed in this thesis.

Promotions can be described in terms of the probability of their occurrence. The likelihood that an individual will be promoted to a given position, within a specified time period may be assumed to range from no possibility to a definite promotion.

The following studies conclude that the effects of promotional expectation on job satisfaction varied from positive, before information about success and failure in attaining the promotion was received, to negative after it was received:

1. Morse found a positive relationship between a person's statement of promotional opportunities and satisfaction with these promotional opportunities. (61)
2. Sirota found a negative relationship between measures of promotional frustration and measures of attitudes toward the company. (85)
3. Patchen found a higher frequency of absences among persons who felt that they deserved to have been promoted in comparison with those who stated that they did not feel that way at all. (73)

Conclusion: Compensation and promotional opportunities have an effect on job satisfaction.

Evaluation

When a worker attempts to perform a job, a number of different outcomes are possible. Most work situations have standards for evaluating performance outcomes. (99)

The overall basis for judgments on job performance includes obtaining information about the results or accomplishments of a worker during a given period of time and comparing these results or accomplishments with certain evaluative standards. The nature of these evaluative standards is related to the worker's role or job definition. Standards for measurement are not psychological but made in terms of a value system. Measures of level of performance based on these standards are always relative to these values. In complex work roles, standards are often subjective and result from administrative judgments. Clearly defined standards for evaluating performance results in an objective criteria for level of performance. Quantity and quality can be evaluated singly or separately. Objectivity is more difficult as the numbers of functions to be evaluated increase. (101)

Likert outlined an approach to management development in which each work unit evaluates its own performance on the basis of periodic pre-identified measurements. Each manager works with his or her own subordinates in setting objectives for the next period. At the end of the period, success is measured and new objectives are set. (53)

The level of the worker's performance can be increased by feedback or knowledge of the results of job performance. In a study by Annett and Kay, workers had sudden increases in performance with reduced action feedback. (1)

Levinson in the Harvard Business Review identified the need for subjective measurement that is directed toward job performance rather than personality factors and social status. Evaluation must be based on performance and subjective judgments based on objective observations. (50)

Success in one segment of the organization may not necessarily be success in another segment of the organization. Some common criteria for judging successful employment include success in training, on-the-job output, work sample tests, job knowledge tests, systematic performance observations, supervisory ratings and administrative indices on performance such as attendance, lateness, turnover, commendations and awards. Dunnette stated that criterion behavior is complex enough that there may be multiple ways to succeed. (25)

Conclusion: The method of employee appraisal and feedback regarding job performance has an effect on job satisfaction.

Studies That Identify Skills, Knowledges and Related Factors Needed for Successful Employment

Educators have asked business and industry to identify items that should be included in the curricula. Most of the research has been descriptive in nature, usually a survey asking employers to identify the short comings of young workers.

This section of the Review of Related Literature is organized into the following sub-sections: high school studies, business school studies and studies relating to skills, knowledges and related factors.

High School Studies

Studies that have directly involved responses from the work community indicate that schools need to broaden their instructional goals to include the development of personal characteristics, the responsibilities of the work place and the worker, the skills and knowledges needed to perform in the occupational area of training, and the basic skills of language, mathematics and penmanship. A brief summary of these studies follows:

1. Susanville, California employers stated that personal characteristics are the highest priority when hiring workers. (82)
2. Employers in business offices in Granite City, Illinois were asked to delineate their expectations of beginning employees. Personality traits that were declared essential were initiative, fellowship, loyalty and good grooming. Essential skills were basic knowledge of language fundamentals, use of office machines and equipment, and simple bookkeeping and record keeping. (64)
3. A survey of 63 firms in Portland, Oregon that were determined to be representative of the major portion of retail stores employing large numbers of workers identified skills, knowledges and personal traits needed for success. (17)

4. Other states in which studies have been done are Washington (108); Michigan (15); and Texas (47).

Business School Studies

Studies conducted by business schools have indicated that workers need skill competence and related factors. Although total findings were important, the results of educational requirements, occupational training and personality traits were significant.

A survey of business executives of 500 top-ranking firms in the United States reported that office skills are required of entry-level office workers. Equally important factors include good public relations, suitable office procedures and satisfactory personal habits. (13)

A year later, a similar study of 500 firms in the metropolitan area of New York reported that educational requirements, occupational training and personality traits are the requirements of a successful employee. (14) High school graduates were desired but 93 percent preferred college graduates. Ninety-one percent of the respondents recommended that prevocational training (high school) was desirable.

A business survey, In What Respects Do You Find Your New Employees Deficient?, found two categories of deficiencies which were personality and training. In the study of dismissal of 12,000 employees by the 64 companies surveyed, it was indicated that 31 percent were dismissed for inefficiency and 69 percent for personality defects. (95)

Skills, Knowledges and Related Factors

Bates and Ferguson made two comprehensive studies of job changes and business trends, once in 1944 and again in 1948 in Loveland, Colorado. Both surveys indicated that the character traits of prospective office workers should be developed as well as their skills. They recommended that educators include this in the school curricula and that similar surveys should be completed every few years. (7)

The purpose of a study by Wait was to identify factors related to on-the-job success of occupationally-trained adults in programs offered by the continuing education or evening college department of California community colleges. It was recommended that the identified success factors be incorporated into curricula of the occupational programs at the community colleges. (102)

Laws completed a survey in which the mathematical needs of technicians in Michigan industries was determined. The survey instrument was a mathematical checklist which was developed through personal interviews with management personnel. (48)

Rahmlow and Winchell conducted research to conceptualize and identify mathematical knowledges that would be useful in occupations that are most likely to provide employment for substantial numbers of non-college bound youth. Task items from questionnaires in office, general merchandise, retailing, building trades, electronics, food service, child care and agriculture studies were examined by a mathematician and practitioners for mathematical knowledge content. The study revealed that five clusters of mathematical knowledges were useful

in all areas investigated. These clusters were operations with fractions, operations with decimals, concept of percentage and ratio and proportion. (77)

LeDoux studied the mathematical skills needed for entry-level employment in a cluster of electricity-electronics occupations in Oregon. He recommended that the range of mathematical skills needed for entry-level employment in the key occupations should become the core of minimum mathematical skills in the preparation of prospective electricity-electronics cluster teachers. (49)

Dille conducted a study in Lane County, Oregon to determine the importance and frequency of use of certain communication skills to job-entry-level mechanics as assessed by employers, educators at various levels and entry-level industrial mechanics. The instrument was a survey questionnaire consisting of 38 communication-related tasks. Dille recommended that further research was needed and this study should be replicated in other identified job markets utilizing a similar approach. (23)

Ash stated that a major research thrust in curriculum development has been the job-cluster approach which identifies a core of knowledge and skills that are common to several jobs. A person that has been prepared in such a training program would be able to obtain entry-level employment for jobs within a large family of occupations. The ability to adjust to job demands which change with new technological developments, would be inherent in this approach. (3)

Conclusion

Instructional goals of school programs should be broadened to include the skills, knowledges and related factors that are common to a cluster of related occupations. Further research should be done in all occupational areas to determine the commonalities.

Summary

The review of related literature has identified some of the environmental variables that affect job satisfaction. Those identified were: motivation, occupational choice, job design, supervision, social aspects of work, compensation, hours of work and evaluation. Job satisfaction does have an effect on successful employment. If workers are satisfied with their work role, they are more likely to experience success in employment.

The popular use of the term success is the experience of attaining a positive outcome. Failure typically refers to the experience of attaining a negative outcome. This definition is related to the worker's reaction to success and failure. When defined independent of the worker, success and failure refer to effective and ineffective task performance. The degree to which a job requires abilities or skills possessed by the worker should be related to success or failure on that job. A person's liking for or satisfaction with a work role is influenced by the effectiveness of performance in it.

Successful employment is considered to be the overall performance achieved by workers during the performance of their jobs. This is

measured during a given period of time and is based on predetermined criterion. These results or accomplishments are compared with certain evaluative standards. The nature of these evaluative standards are related to the workers role or job definition.

The identification of skills, knowledges and related factors that are common to fourteen occupational areas in Oregon will provide a research-based composite list of criterion statements that could become the basis for strengthening occupational curriculum.

III. PROCEDURES

Design of the Study

Type of Study

This was a descriptive study to identify a list of skills, knowledges and related factors necessary for successful employment that are common to fourteen occupational clusters.

Dependent Variable

The dependent variable of this study was the judgmental response by employers to the list of skills, knowledges and related factors derived from task analyses of the key occupations in Oregon and instruments used in similar studies. A Jury Panel of Experts representative of the fourteen occupational clusters refined the lists into 54 criterion statements (59 response items).

Independent Variables

The two independent variables identified in this study were the size of the firm and the occupational cluster area. Based on a discussion with Mr. Mike Murphy, Research Analyst for District Four, Oregon Department of Labor, Employment Division, Albany, Oregon, fourteen cluster areas were selected that are most representative of Oregon business and industry. They include Accounting, Agriculture, Child Care, Construction, Electricity/Electronics, Food Service, Forest Products, Graphic Communication, Health Occupations, Industrial

Mechanics, Marketing, Metals, Secretarial-Clerical and Service Occupations. Five different sizes of firm groupings were selected as follows: 5-19 employees, 20-49 employees, 50-99 employees, 100-249 employees, 250 plus employees. Similar size groupings have been used in previous State of Oregon, Department of Labor research studies. (62)

Fixed Model

Mr. Mike Murphy, Research Analyst for the State of Oregon, Employment Division, Albany Office, was consulted regarding the sample for this study. Studies that have been conducted by the Research and Statistics Department, Employment Division of the State of Oregon for similar purposes have been stratified by regions within the state and by size of firm. Mr. Murphy, in consultation with his superior, recommended that a similar process be utilized for this study.

In order to assure a balanced sampling of small to large firms, the following size of firm groupings were determined:

1. Firms employing 5 - 19 persons
2. Firms employing 20 - 49 persons
3. Firms employing 50 - 99 persons
4. Firms employing 100 - 249 persons
5. Firms employing 250+ persons

Appendix A identifies the rationale for the sample. The sampling plan indicates the size of firm groupings and the fourteen occupational clusters with a planned cell size of ten respondents equaling a total of 700 planned respondents. The sample plan is reviewed in Appendix B. The actual returns included 386 respondents. Mr. Murphy indicated that

a return of 33 percent to 50 percent is adequate for a study of this type in order to be considered valid and reliable. It was determined that a 50 percent return would be an adequate response rate from which to draw conclusions and make generalizations for the total population.

Another factor to be considered was the stratification of the sample by regions in the state. Six regions were selected because of the distribution of large to small firms and occupational areas within the regions. With the help of Mr. Murphy, the Oregon Employment Statistic Codes and the Standard Industrial Classification Codes were utilized to determine the most appropriate distribution of firms within each region. Because the employers' names are confidential, Mr. Murphy was not able to assist in the actual identification of employers. He did suggest that telephone directories, the Directory of Oregon Manufacturers, professional directories, Chambers of Commerce directories and other directories appropriate to the occupational area be used to identify the sample.

Appendix C identifies the six regions, towns listed by counties, and the number of firms to be selected from each region. A table of random numbers was utilized to select the towns within each region and the firms within each location. Stratification of this sample makes this study a fixed model. (24)

Mathematical Model

Mathematical systems are deductive structures, purely abstract and essentially undefined. Hays explained the need for developing mathematical models for statistical purposes:

When a mathematical system is interpreted in terms of real objects or events, then the system is said to be a mathematical model for those objects or events. (36:8)

An empirical scientist must generalize from observation of a limited number of cases. The mathematical model is essential in moving from deductive theories to inductive generalizations.

Hays presents the following model for the fixed effects two-way analysis of variance:

$$Y_{ijk} = u + a_j + p_k + Y_{jk} + E_{ijk}$$

where,

Y_{ijk} is an observed score.

u is an overall mean population given treatment.

a_j is a differential fixed effect association with occupational areas.

p_k is an interaction effect created by a combination of treatments \underline{j} and \underline{k} over and above any effects associated with treatments \underline{j} and \underline{k} considered separately.

E_{ijk} is random error peculiar to observation \underline{i} and associated with treatments \underline{j} and \underline{k} .

This model asserts that a score (Y_{ijk}) for observation \underline{i} in groups \underline{j} and \underline{k} is based on the sum of five components: the grand mean of the population formed by pooling all of the different populations given the possible treatment combinations \underline{j} and \underline{k} ; the differential fixed effects (a_j) associated with occupational areas; the differential fixed effects (p_k) associated with size of firm; the interaction effect (Y_{jk}) created by a combination of treatments \underline{j} and \underline{k} and the random error (e_{ijk}) associated with treatments \underline{j} and \underline{k} .

The interaction effect is equal to the mean of the population given both the treatments \underline{j} and \underline{k} , minus the means of the treatment population \underline{j} , minus the mean of the population given treatment \underline{k} , plus the grand mean:

$$Y_{jk} = u_{jk} - u_j - u_k + u \quad (36:388)$$

Hypotheses

Three hypotheses were tested for each of the 54 criterion statements (59 response items) listed as skills, knowledges and related factors needed for successful employment. The hypotheses are:

- Ho_1 : There is no significant difference in skills, knowledges and related factors needed for successful employment among fourteen cluster areas as identified by employers of representative firms.
- Ho_2 : There is no significant difference in skills, knowledges and related factors needed for successful employment among five size groupings of firms as identified by employers of representative firms.
- Ho_3 : There is no significant interaction effect between the fourteen cluster areas and the five size groupings of firms.

Design Matrix

The Design Matrix displays the planned cell size by size of firm and occupational cluster. Because of the size of the Design Matrix, it appears on page 43.

DESIGN MATRIX

| SIZE OF FIRM | Accounting | Agriculture | Child Care | Construction | Electricity - Electronics | Food Service | Forest Products | Graphic Communications | Health Occupations | Industrial Mechanics | Marketing | Metals | Secretarial/ Clerical | Service Occupations | TOTAL |
|--------------|------------|-------------|------------|--------------|------------------------------|--------------|-----------------|---------------------------|-----------------------|-------------------------|-----------|--------|--------------------------|------------------------|-------|
| 5 - 19 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| 20 - 49 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| 50 - 99 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| 100 - 249 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| 250 + | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| TOTALS | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 700 |

Type of Instrument

A Likert Scale was chosen for this study because of its adaptability to statistical computation and its utility to measure degrees of acceptance. Inferential statistical computations can be determined with the interval data provided by the Likert ratings. (67)

Statistical Tools

A two-way analysis of variance was used to test each of the three hypotheses at the $P < .01$ level of probability. An F value was calculated for each of the 54 criterion statements and checked against table values to determine if significance existed. (20) Where significant differences occurred between clusters and firms, the Least Significant Different Test (L.S.D.) was used to identify where the differences occurred. (20)

A one-way analysis of variance was used to determine if regional differences occurred. It was determined that if the alpha level of .01 was not met an alpha level of .05 should be considered to determine where the differences occurred.

The Pearson Product-Moment Correlation Coefficient was used to determine relationships between selected pairs of criterion statements and the "r" values were tested for significance at the $P < .01$ level. (19)

Preparation of the Instrument

Developing a Composite List

A survey instrument was developed from synthesizing task analyses of the key occupations of the fourteen cluster areas. These had been completed by the Oregon Department of Education for use in the development of curriculum materials. (71) The task analyses were analyzed according to the skills, knowledges and related factors that were required for employment in each of the key occupations found in the major occupational areas in Oregon. Instruments used in similar types of studies were reviewed and synthesized. If the task statement was common to more than half of the fourteen cluster areas, the statement was retained to be screened by the Jury Panel of Experts. This process of sorting resulted in narrowing the list of over 7,000 criterion statements to 105 statements. Every effort was given to maintain the purpose and intent of each statement, combining like statements and compromising among several styles of expression.

Screening of Statements by the Jury Panel of Experts

The Jury Panel of Experts was composed of 16 persons, 14 industry representatives of the cluster areas of this study and two representatives of vocational education. Some of the members wished to remain anonymous, thus a list is not included. The synthesized list of 105 criterion statements along with a cover letter was mailed to the Jury Panel of Experts. (Appendix D) Each member was asked to rate each

criterion statement in two ways, using a scale of five to zero with a five reflecting complete acceptance and zero indicating total rejection. First, the statement was rated as to the level of importance for an employee to be able to perform the stated criterion for successful employment. Second, the statement was rated as to its clarity of wording. A composite was made of the preliminary review and the revised questionnaire returned to the panel for final revision.

Using this method the list of criterion statements was refined to 54 statements. Statements that did not exceed 3.5 on a five to zero scale were eliminated and/or reworded according to suggestions made by the Jury Panel of Experts. The final 54 statements were refined into 59 response items for use on the survey.

Content Validity

The establishment of content validity was of major concern in the preparation of the instrument. The list of criterion statements must reflect a true composite of the skills, knowledges and related factors needed to be successfully employed in each of the fourteen cluster areas. It was assumed that respondents would view the criterion statements from their own bias or base of familiarity taking into consideration needs within their firm. An effort was made to preserve content validity by the careful refinement of the list of criterion statements from the task analyses and instrument review. The members of the Jury Panel of Experts were selected because of their expertise within their respective occupational areas. Content validity depended on the levels of objectivity reached while developing the final list of criterion statements used in the survey.

Collection of the Data

The owner or personnel manager of each sample firm was sent the following information:

1. A letter explaining the study and the importance of response. (Appendix E)
2. A copy of the questionnaire with a stamped, self-addressed enveloped. (Appendix F)

Respondents were asked to identify the numbers of employees as a verification of the size of firm. They were also asked to rank order the five major reasons why people get fired. The questionnaires were consecutively numbered, with occupational areas given specific number groupings for the actual sample units and alternates. The size of firm and regions were also identified by code number. This process facilitated the collection and organization of the returns.

A cover letter sent to each respondent explained the purpose of the study and asked for the firm's cooperation. The questionnaire returns were collected daily and ordered into the sample sequence. Two weeks after mailing, the returns were assessed to determine if the sample was complete. Alternates were substituted by cluster area and/or size of firm and/or region to complete the sample needed for statistical treatment. A three week time period was allowed between the mailing of the questionnaire and the receipt of sufficient returns to fulfill the sample requirements.

Sample and Method of Sampling

The sample for this study included firms representing the major business and industry base in the State of Oregon. These occupational areas were: Accounting, Agriculture, Child Care, Construction, Electricity/Electronics, Food Service, Forest Products, Graphic Communications, Health Occupations, Industrial Mechanics, Marketing, Metals, Secretarial-Clerical and Service Occupations. In an attempt to gain content validity, five sizes of firms were also included. This study sought to identify the skills, knowledges and related factors common to fourteen major occupational areas that are needed for successful employment. A rationale and a plan for determining the sample sites of individual respondent firms was developed and utilized as a basis for sampling the study population. (Appendix A) Stratification criteria were predetermined and the random samples of firms by cluster were pulled by size groupings. (Appendix B)

In addition to size considerations, the sample was reviewed to assure that the major geographic regions of Oregon were included and that rural, suburban and urban firms had been appropriately represented in the sample. (Appendix C)

Although the size of firm and cluster area was fixed, the respondents within each cluster area were selected at random within assigned size groups, regions and clusters. The table of random numbers was utilized to generate a selection order of firms within each cluster grouping.

The sample was selected from different sources. The most current Directory of Oregon Manufacturers provided over half of the sample. (72) The remainder came from combined sources of Chamber of Commerce directories, professional directories and local telephone directories.

Sample Size

A total of 386 respondents, constituting 55 percent of the 700 planned responses, provided a sufficient response rate to make statistical inferences regarding the skills, knowledges and related factors needed by the general population of employees for successful employment. (32) The number of responses by size of firm and cluster area are given in Appendix G.

Methods of Data Analysis

Correlation Procedure

Pearson Product-Moment Coefficients were computed for paired sets of criterion statements. Pearson "r" values were calculated for the following sets of statements:

- 1 Compute sales receipts accurately.
- 5 Compute by using appropriate methods, i.e. adding, subtracting, multiplying, dividing, percentages, decimals.
- 5 Compute by using appropriate methods, i.e. adding, subtracting, multiplying, dividing, percentages, decimals.
- 17 Complete form (i.e. order, cost estimate, accounting record forms, inventory reports, safety reports, various records and reports, time tickets, work sheets.)

- 24 Ask clear and logical questions.
- 25 Communicate effectively with customers, co-workers and others.
- 32 Observe all safety rules and procedures.
- 44 Demonstrate acceptable attitudes toward work.
- 45 Provide leadership to others.
- 47 Maintain personal cleanliness.
- 49 Work to insure quality of service or product.
- 52 Inspect work for accuracy and quality.

Analysis of Variance

A two-way analysis of variance was conducted on the data to test for the significant difference in the acceptance of each criterion statement as needed for successful employment by the cluster areas and the size of firms. The statistical analysis was used to determine:

1. If a significant differences occurred between identification of criterion statements by the fourteen cluster areas.
2. If significant differences occurred between identification of criterion statements by the size of firm.
3. If a significant interaction effect existed between cluster areas and size of firms.

The statistical approach for this study was based on a methodology for determining similarities and differences among jobs by use of an ANOVA technique developed by Arvey and Mossholder. (2) As a basis for statistical treatment, an analysis of variance table was developed. Table 1 identified a fixed model two-way analysis of variance for this study. A one-way analysis of variance was conducted to determine if regional differences occurred.

TABLE 1
ANALYSIS OF VARIANCE TABLE
(Fixed Model)

| Source of Variation | df | SS | MS | F |
|---------------------|-----|----|-------|-------------------------|
| Cluster Area | 13 | A | A/13 | MS Cluster/ MS Error |
| Size of Firm | 4 | B | B/4 | MS Size/ MS Error |
| Cluster X Size | 52 | C | C/52 | MS C x S/ MS Error |
| Error | 630 | D | D/630 | |
| TOTAL | 699 | | E | |

IV. PRESENTATION OF THE FINDINGS

The three hypotheses shown in Chapter III were tested by analyzing the sample data. The findings are presented in this chapter under the following subheadings: The Sample, Testing the Hypotheses, Correlation of Select Criterion Statements, Evaluating the Criterion Statements, Reasons Why People Get Fired and Summary of the Findings.

The Sample

The data for this study was obtained by a random survey of employers of Oregon. The sample was stratified by general occupational area, number of persons employed by the respondent firms and by region. (Appendices A, B, C) The numbers and percentages of responses for sample groups, by firm size, are shown in Table 2.

Response items for the survey questionnaire were derived from existing task analyses and survey instruments and then screened by a Jury Panel of Experts representing the fourteen occupational areas. The 54 criterion statements (59 response items) used on the questionnaire included skills, knowledges and related factors identified by the Jury Panel of Experts as being necessary for successful employment.

Alternate respondents were randomly selected to equal 50 percent of the needed sample. A second alternate list was developed as a back-up in case the first and second mailings did not generate enough responses to complete the study sample.

TABLE 2
RESPONSE TO QUESTIONNAIRE
(Including Alternates)

*Late responses that were not included in the analysis.

| Size of Firm | Questionnaires Mailed Out | Number of Responses | Percent of Response |
|--------------|---------------------------|---------------------|---------------------|
| 5-19 | 200 | 108 | 54.0% |
| 20-49 | 200 | 92 | 36.5% |
| 50-99 | 200 | 63 | 31.5% |
| 100-249 | 200 | 55 | 27.5% |
| 250+ | 200 | 68 | 34.0% |
| | | 10* | 1.0% |
| TOTAL | 1000 | 396 | 38.6% |

Testing the Hypotheses

A two-way analysis of variance was conducted on 386 responses to the 59 item questionnaire. An F value and significance level was computed for each subgroup and combination of subgroups. The alpha level of .01 was selected as an indicator of significance. The results of the two-way analysis of variance is shown in Appendix H.

Restatements of the hypotheses from Chapter III are:

Ho₁: There is no significant difference in skills, knowledges and related factors needed for successful employment among fourteen cluster areas as identified by employers of representative firms.

Ho₂: There is no significant difference in skills, knowledges and related factors needed for successful employment among five size groupings of firms as identified by employers of representative firms.

Ho₃: There is no significant interaction effect between the fourteen cluster areas and the five size groupings of firms.

A one-way analysis of variance was utilized to determine whether differences existed among the six industrial regions of Oregon in their responses to the criterion statements. An F value and significance level was computed for each subgroup. The alpha level of .01 was selected as an indicator of significance. The results of this test indicated that there were no significant differences (Appendix I). However, some statements were very close to the significance level, and, as previously stated, if this were to occur, the significance would be tested at the alpha level of .05.

A significant difference did exist at the $P < .05$ level for seven items. Multiple range testing was conducted by the Newman-Keuls Test and the Scheffé Test to determine which regions were responsible for the differences.

Significant differences at the $P < .05$ level, as determined by both Newman-Keuls and Scheffé testing, is shown as Table 3.

TABLE 3
SIGNIFICANT (LESS THAN $P < .05$) DIFFERENCE
BETWEEN MEAN RESPONSES BY REGION

| ITEM NO. | CRITERION STATEMENTS | REGIONS RESPONSIBLE FOR DIFFERENCES |
|----------|--|---|
| 3 | Make change accurately. | Metropolitan Tri-County Eastern Oregon |
| 8 | Read and interpret instructional manuals. | Coastal Area Central Oregon |
| 12 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | Central Willamette Valley Coastal Area |
| 14 | Read and interpret microfiche for ordering and maintaining records. | Eastern Oregon |
| 21 | Keep accurate records. | Southern Oregon |
| 22 | Give oral instructions, direct others. | Southern Oregon |
| 26 | Make oral reports. | Southern Oregon Eastern Oregon |

Differences by Occupational
Cluster Area

Ho₁: There is no significant difference in skills, knowledges and related factors needed for successful employment among fourteen occupational cluster areas as identified by employers of representative firms.

Hypothesis #1 was tested to determine if a significant difference exists between employers in their acceptance of individual statements regarding skills, knowledges and related factors needed by employees to be successfully employed. Fifty-four criterion statements (59 response items) were analyzed by a two-way analysis of variance. Of the 59 response items, the null hypothesis was rejected at the alpha level of .01 for 46 of the items. (Appendix H)

The Least Significant Difference Test (L.S.D.) was used to test the differences between means on those items that rejected the null hypothesis. Least Significant Difference testing of the 14 clusters identified 342 significant differences between cluster responses to the 46 items. (Appendix J) Differences due to cluster effect were the result of the variation in item weightings by the fourteen industry groupings. The nature of work within the individual occupational clusters resulted in significant differences between their mean responses to the questionnaire items. An analysis of the L.S.D. values support the following generalizations in regard to the cluster differences:

1. The criterion statements for mathematics had significantly higher mean values by the Accounting, Agriculture, Forest Products and Food Service cluster respondents.
2. The criterion statements regarding safety, tool selection, use of equipment and troubleshooting were of greater importance to Industrial Mechanics, Metals, Forest Products, Construction, Agriculture, Electricity/Electronics than to Child Care, Accounting, Secretarial, Graphic Communication and Marketing cluster respondents.
3. The criterion statement of listening to customer complaints received significantly higher ratings by the customer oriented cluster respondents of Food Service, Service Occupations, Marketing, Health Occupations and Child Care than was shown by non-public oriented cluster respondents such as Metals, Construction, Electricity/Electronics, Accounting and Graphic Communications.
4. Leadership qualities were rated high by the Child Care, Forest Products, Service Occupations and Health Occupation cluster respondents but received lower ratings by Secretarial, Accounting, Electricity/Electronics and Metals cluster respondents.
5. Communication skills involving reading and interpreting written materials and following directions were of greater importance to some respondents than to others. Industrial Mechanics, Graphic Communications, Metals and Health Occupation cluster respondents rated these criterion statements high.

6. Communication skills involving giving oral instructions were rated at a higher level by the Service Occupations, Forest Products and Agriculture cluster respondents than by the other clusters. The lower rankings for this criterion statement were made by the Secretarial, Electricity/Electronics and Industrial Mechanics cluster respondents.
7. Telephone usage was rated high by Secretarial, Service Occupations and Accounting cluster respondents while Construction, Electricity/Electronics and Industrial Mechanics cluster respondents gave lower rankings for this statement.
8. Money handling procedures such as making change, computing sales receipts and check processing were rated high by the Marketing, Food Service and Agriculture cluster respondents. The lowest ratings for these criterion statements were made by the Child Care, Electricity/Electronics and Metals cluster respondents.
9. Personal cleanliness was deemed more important by Child Care, Health Occupations and Food Service cluster respondents than Construction, Metals and Electricity/Electronics cluster respondents.

The percentage distribution of the 342 significant differences between the responses given by the individual cluster respondents is shown in Table 4. Many written comments were added to the survey instruments by respondents. Those comments are included as Appendix S.

TABLE 4
SUMMARY OF LEAST SIGNIFICANT DIFFERENCE TEST RESULTS
AS FOLLOW-UP ON ANALYSIS OF VARIANCE

| Cluster | Number of Differences | Percentage of Total Differences |
|-------------------------|-----------------------|---------------------------------|
| Accounting | 29 | 8.48% |
| Agriculture | 28 | 8.18% |
| Child Care | 20 | 5.86% |
| Construction | 18 | 5.26% |
| Electricity/Electronics | 22 | 6.43% |
| Food Service | 27 | 7.89% |
| Forest Products | 26 | 7.60% |
| Graphic Communications | 25 | 7.31% |
| Health Occupations | 21 | 6.14% |
| Industrial Mechanics | 18 | 5.26% |
| Marketing | 37 | 10.82% |
| Metals | 20 | 5.85% |
| Secretarial/Clerical | 32 | 9.36% |
| Service Occupations | 19 | 5.56% |
| TOTAL | 342 | 100.00% |

Differences by Size of Firm

Ho₂: There is no significant difference in skills, knowledges and related factors needed for successful employment among five size groupings of firms as identified by employers of representative firms.

Hypothesis #2 was tested to determine if a significant difference exists between sizes of firms. The null hypothesis was retained on all item responses indicating no significant differences in the way small to large firms responded to each of the 54 criterion statements. Appendix K identifies the acceptance of criterion statements according to the size of firm by mean and rank.

Differences Due to Interaction Effects

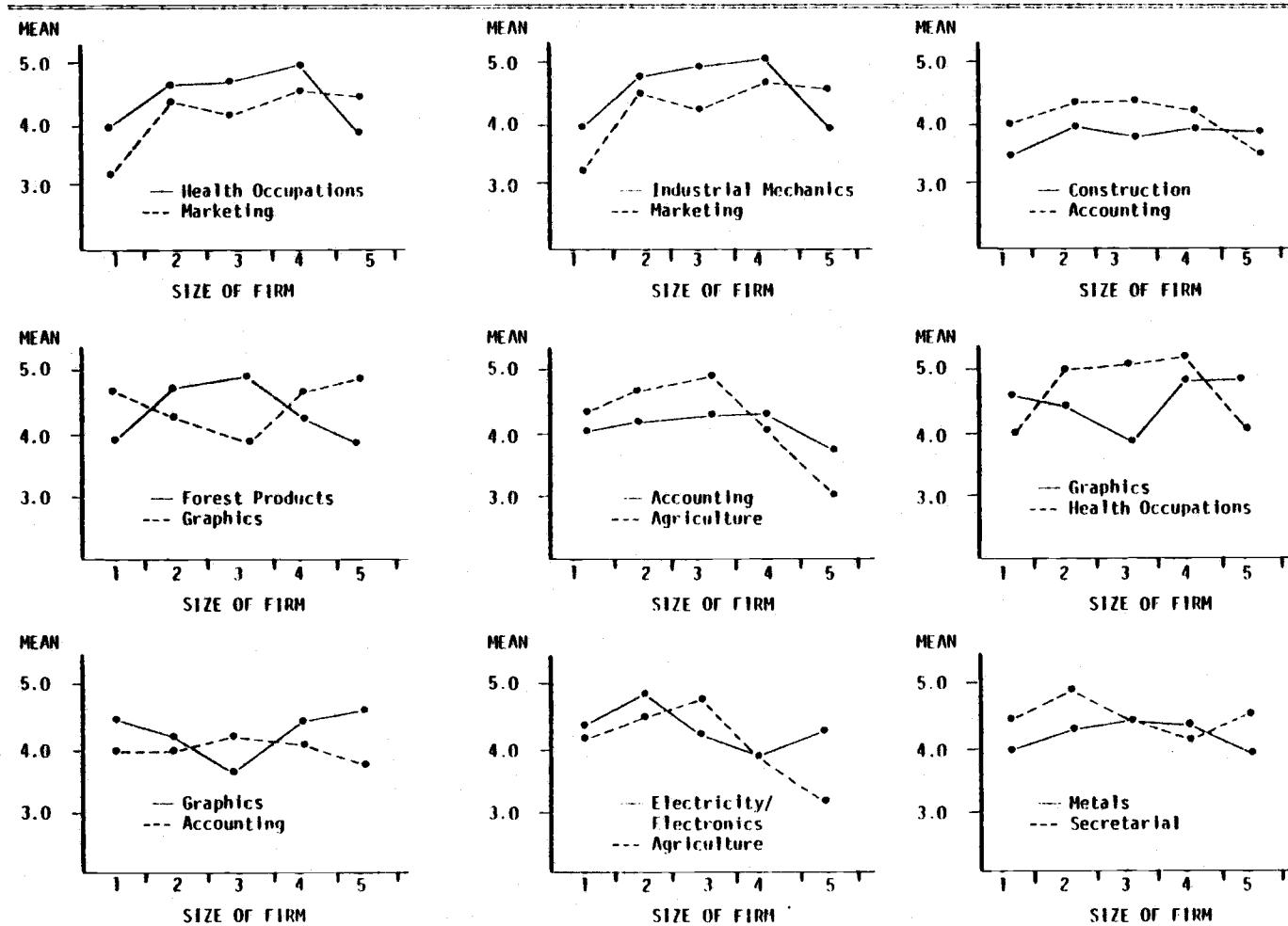
Ho₃: There is no significant interaction effect between the fourteen cluster areas and the five size groupings of firms.

The null hypothesis #3 was rejected by items #38 and #45 due to interaction effects between occupational clusters and firm sizes. A discussion of the interaction effects is related to the individual statements. Charts found in Tables 5 and 6 show the firm size and cluster sources of the interactions.

Criterion Statement #38 -- Collect Payments. Table 5 charts interactions between individual clusters according to firm size. The diversity of the individual interactions to this statement does not allow conclusions to be made regarding firm size and cluster.

TABLE 5

SELECT EXAMPLES OF INTERACTION EFFECTS



INTERACTION EFFECTS FOR STATEMENTS #38 (COLLECT PAYMENTS)
CLUSTER X SIZE OF FIRM

Collection of payments is handled differently in each cluster and in various sizes of firms. The variations in the payment collection process within the respondent firms is responsible for the significant interaction effect of this statement.

Criterion Statement #45 -- Provide Leadership to Others. Table 6 charts interactions between cluster and firm size responses to this statement. Clusters vary in their perceptions of leadership. Those same perceptions fluctuate between firm sizes according to the individuality of the occupational area. The diversity of interaction effects for this statement does not allow general conclusions to be drawn in regard to firm size and cluster interaction effects.

Leadership is not well defined and has different meanings to the various occupational areas. It is interesting to note that the two items with significant interaction effects are related to money and power, both of which are highly susceptible to controversial interpretations and biased responses.

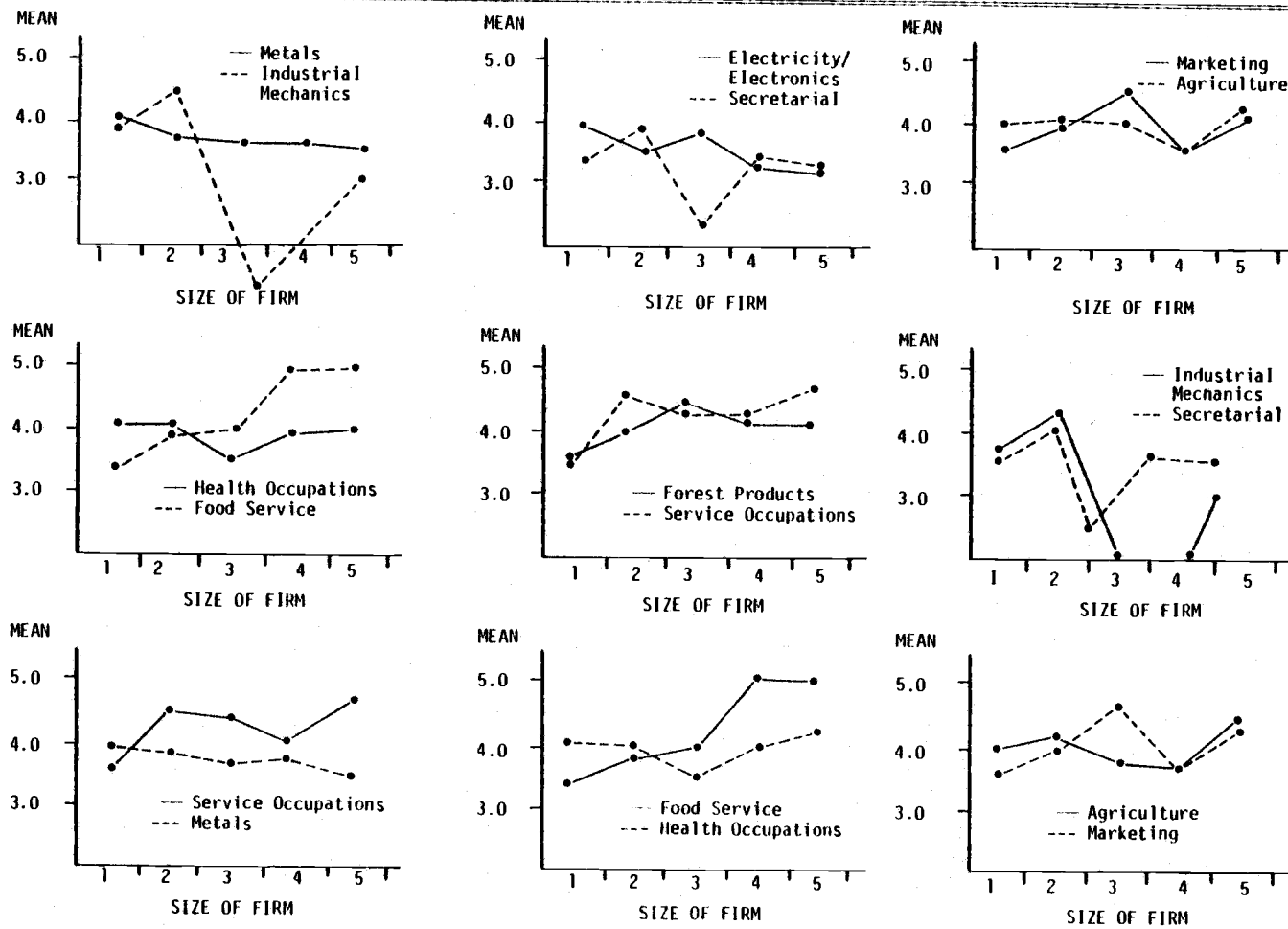
Correlation of Select Criterion Statements

Many of the criterion statements appeared to reflect a common intent although stated at different levels of specificity. In order to assess the relationships of these statements and the consistency of responses to similar statements, Pearson Product-Moment Correlation Coefficients were computed for six selected pairs of statements. The resulting "r" values were tested to significance at the $P < .01$ level.

The "r" values were significant at the $P < .01$ level. A high degree of relationship exists between the responses to the individual

TABLE 6

SELECT EXAMPLES OF INTERACTION EFFECTS



INTERACTION EFFECTS FOR STATEMENT #45 (PROVIDE LEADERSHIP TO OTHERS)
CLUSTER X SIZE OF FIRM

statements within each pair. The paired statements and their corresponding "r" values are shown in Table 7.

Evaluating the Criterion Statements

This study was designed to identify the skills, knowledges and related factors that are common to fourteen occupational areas in Oregon and are needed for successful employment. A synthesized list of 105 criterion statements was developed from task analyses of the key occupations of the fourteen cluster areas and instruments used in similar studies. A Jury Panel of Experts, composed of 14 industry persons representative of the cluster areas of this study and two representatives of vocational education, was asked to screen and refine the criterion statements.

The final 54 criterion statements were used as the 59 response items on the questionnaire survey, organized so that statements of similar criterion were sequenced together. A Likert rating scale enabled the respondents to evaluate each statement on a five to one rating, five indicating extremely important and one indicating of absolutely no importance. Respondents were also asked to rank order the five major reasons why people get fired. In order to obtain a sample of 700, the questionnaire was mailed to a stratified random sample of 1,000 employers in Oregon. There were 386 returns to the survey for a response rate of 38.6 percent.

The analysis of variance procedure was utilized to identify statements. Means were computed by cluster group, size of firm and region. The L.S.D. Test was used for determining the significance

TABLE 7

RELATIONSHIPS OF CRITERION STATEMENTS AS DETERMINED BY
PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS

| Item No. | Criterion Statements | Total "r" | Sample Sig. |
|-------------|--|--------------|----------------|
| 1 | Compute sales receipts accurately. | | |
| 5 | Compute by using appropriate methods, i.e. adding, subtracting, multiplying, dividing, percentages, decimals. | .3991 | .001 |
| 5 | Compute by using appropriate methods, i.e. adding, subtracting, multiplying, dividing, percentages, decimals. | .3366 | .001 |
| 17 | Complete forms (i.e. order, cost estimate, accounting record forms, inventory reports, safety reports, various records and reports, time tickets, work sheets.) | | |
| 24 | Ask clear and logical questions. | .5365 | .001 |
| 25 | Communicate effectively with customers, co-workers and others. | | |
| 32 | Observe all safety rules and procedures. | .1429 | .005 |
| 44 | Has acceptable attitudes towards work. | | |
| 45 | Provide leadership to others. | .2959 | .001 |
| 47 | Maintain personal cleanliness. | | |
| 49 | Work to insure quality of service or product. | | |
| 52 | Inspect work for accuracy and quality. | .3661 | .001 |

between individual means as a follow-up on all criterion statements that rejected a null hypothesis.

The criterion statements were rank ordered for ease of evaluation and the standard deviation was referred to in case of ties in the rank ordering of the statements. (Appendix L) The statements were also evaluated according to acceptance by each of the 14 cluster areas (Appendix M) and by region (Appendix N).

The evaluation of the 54 criterion statements identified four groupings of statements:

Group 1 - Criterion statements that have common acceptance by all clusters and sizes of firms at a grand mean rating >3.50 . This group was identified as extremely important. The 15 criterion statements, by rank order and grand mean for all clusters, are listed in Appendix O.

Group 2 - Criterion statements with a grand mean >3.50 but not accepted by all clusters. This group was identified as very important. The 22 criterion statements are listed in Appendix P.

Group 3 - Criterion statements with grand mean ratings of 3.0 - 3.5 and with above average acceptance by all clusters. This group was identified as moderately important to those clusters with grand means between 3.0 - 3.5. The 15 criterion statements are listed in Appendix Q.

Group 4 - Criterion statements with grand mean ratings of <3.0 and below average in overall acceptance.

This group was identified as slightly important.

These seven criterion statements are listed in Appendix R.

Reasons Why People Get Fired

Each respondent was asked to prioritize the five most common reasons why persons were fired by their firm. In rank order these were: Poor Work Performance, 37.6 percent; Absenteeism, 25.7 percent; Insubordination, 13.1 percent; Dishonesty, 11.1 percent; Inability to Work With Others, 9.6 percent; Miscellaneous, 2.9 percent. Figure 6 presents a summary of all responses.

The largest single reason for employees being fired is poor work performance. Over 50 percent of the respondents representing the Accounting occupational area stated that poor work performance is the primary reason for discharging an employee. Construction, Food Service, Graphic Communications, Health Occupations, Industrial Mechanics and Marketing also gave a high ranking as indicated in Figure 1.

Agriculture, Forest Products, Metals and Service Occupations gave lower ratings for this reason for firing an employee.

Absenteeism was identified by Metals, Forest Products, Electricity/Electronics and Industrial Mechanics as a major reason for employees being fired within their firms. Figure 2 also indicates that absenteeism is less of a problem for Accounting, Food Service and Marketing.

Twenty-one percent of the respondents indicated that insubordination resulted in severance from employment. Service Occupations, Metals and Agriculture rated this reason high while Child Care, Industrial Mechanics, Construction and Graphic Communications were low. Figure 3 shows the way that each cluster responded to this factor.

Dishonesty was rated higher by Agriculture, Marketing and Service Occupations respondents and lower by Child Care, Electricity/Electronics, Graphic Communications and Metals respondents as displayed in Figure 4.

The inability to get along with others ranked higher among Food Service, Child Care and Secretarial-Clerical respondents as a reason for firing an employee. Electricity/Electronics, Forest Products, Graphic Communications and Industrial Mechanics respondents indicated a lower rating as shown in Figure 5.

Miscellaneous reasons constituted 2.9 percent of the responses. Such responses as lack of responsibility, having a criminal record, not being able to get a reliable babysitter and others were identified as miscellaneous reasons for firing an employee.

POOR WORK PERFORMANCE

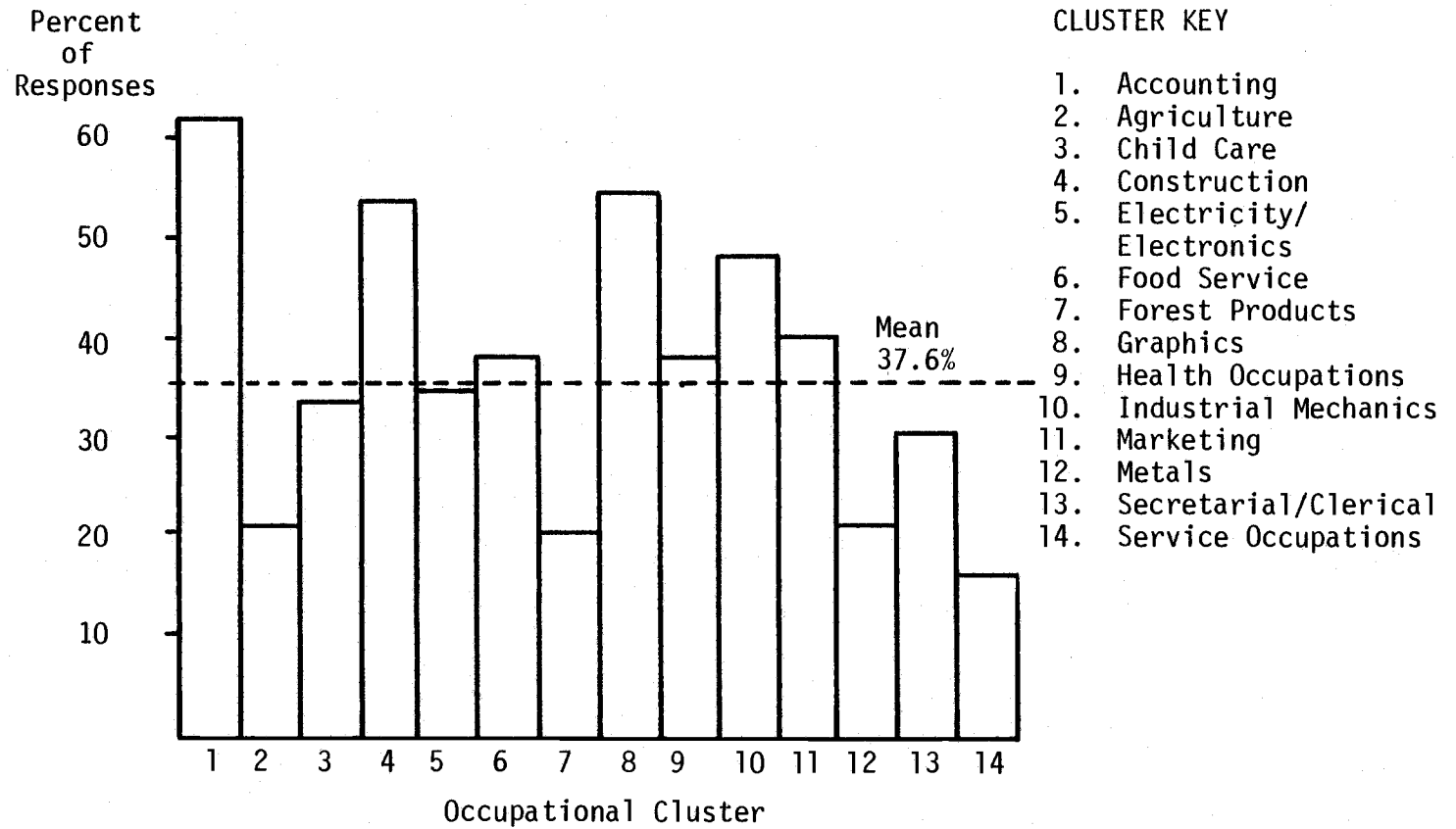


Figure 1. WHY PEOPLE GET FIRED

ABSENTEEISM

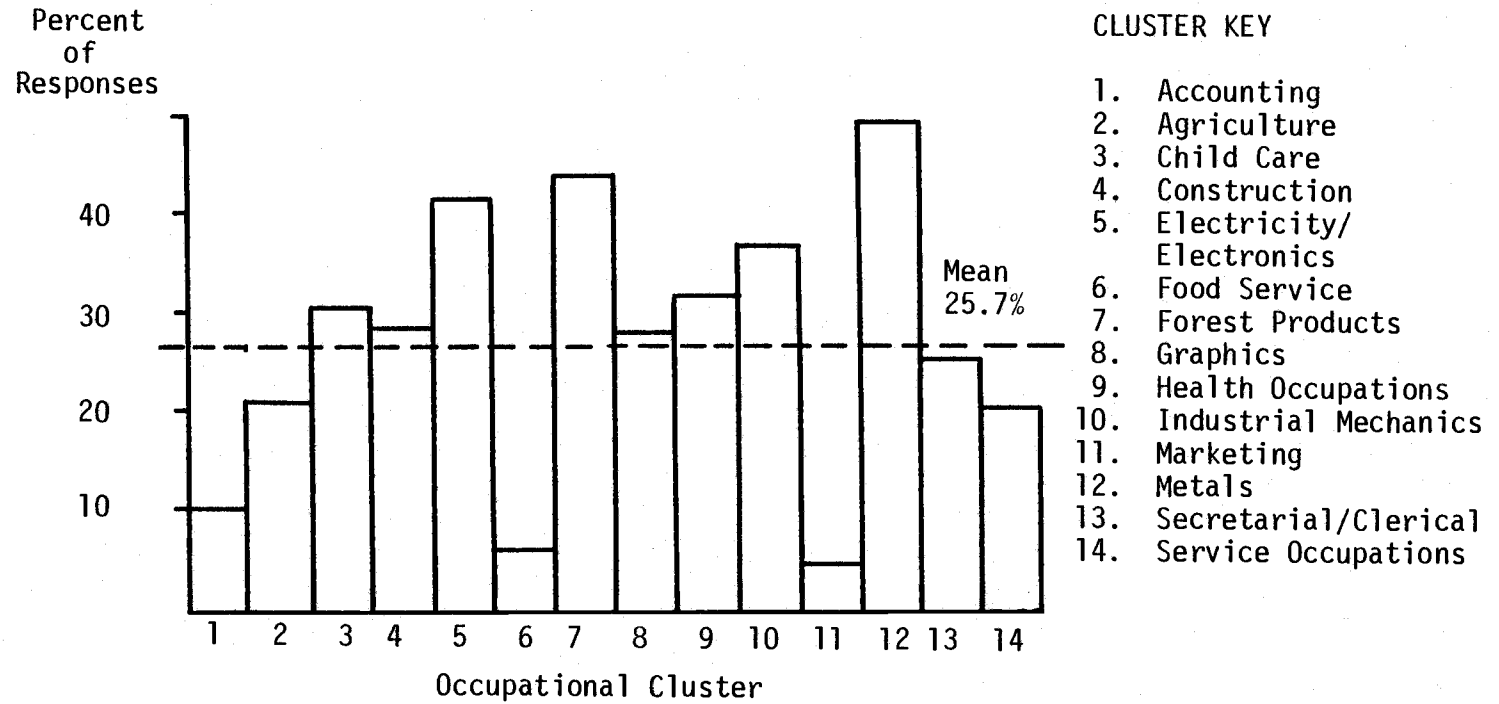


Figure 2. WHY PEOPLE GET FIRED

INSUBORDINATION

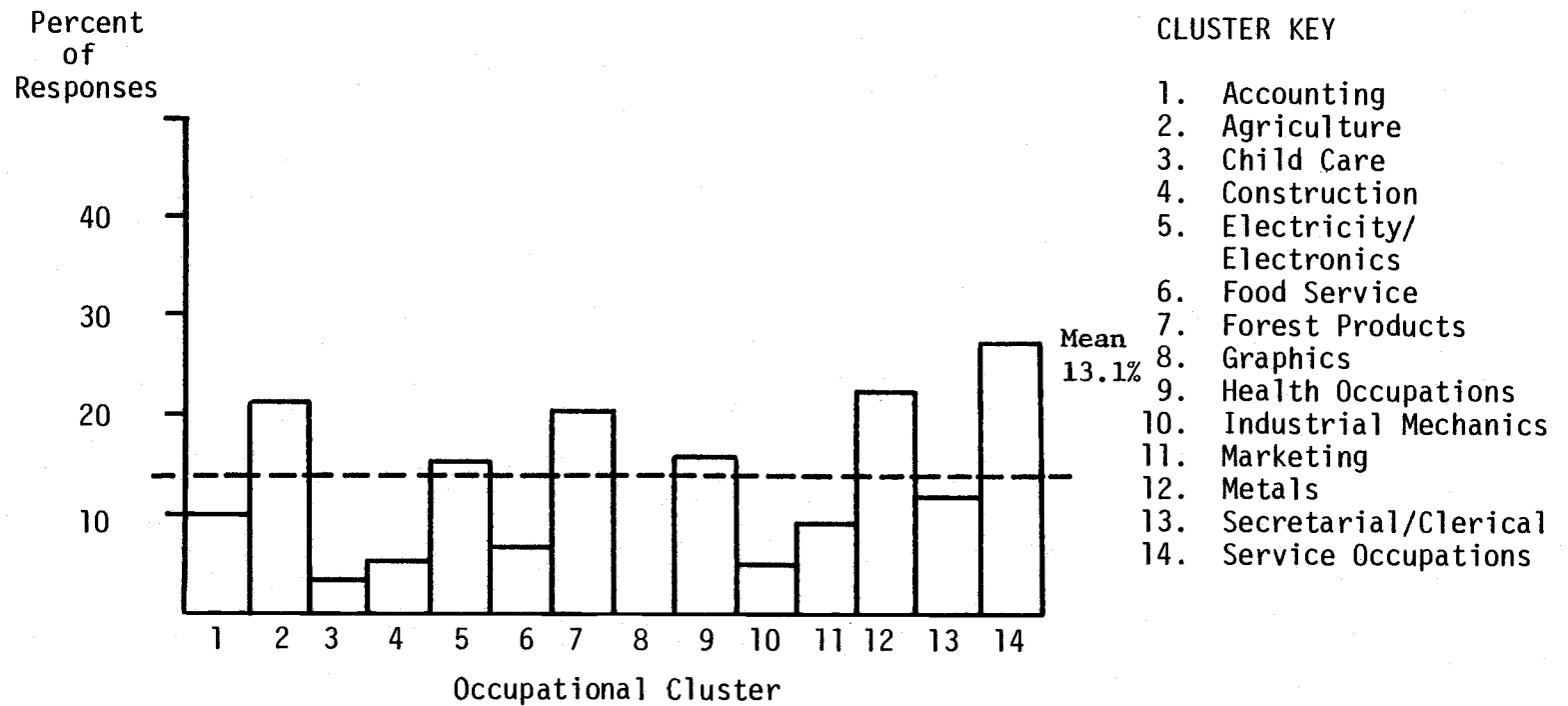


Figure 3. WHY PEOPLE GET FIRED

DISHONESTY

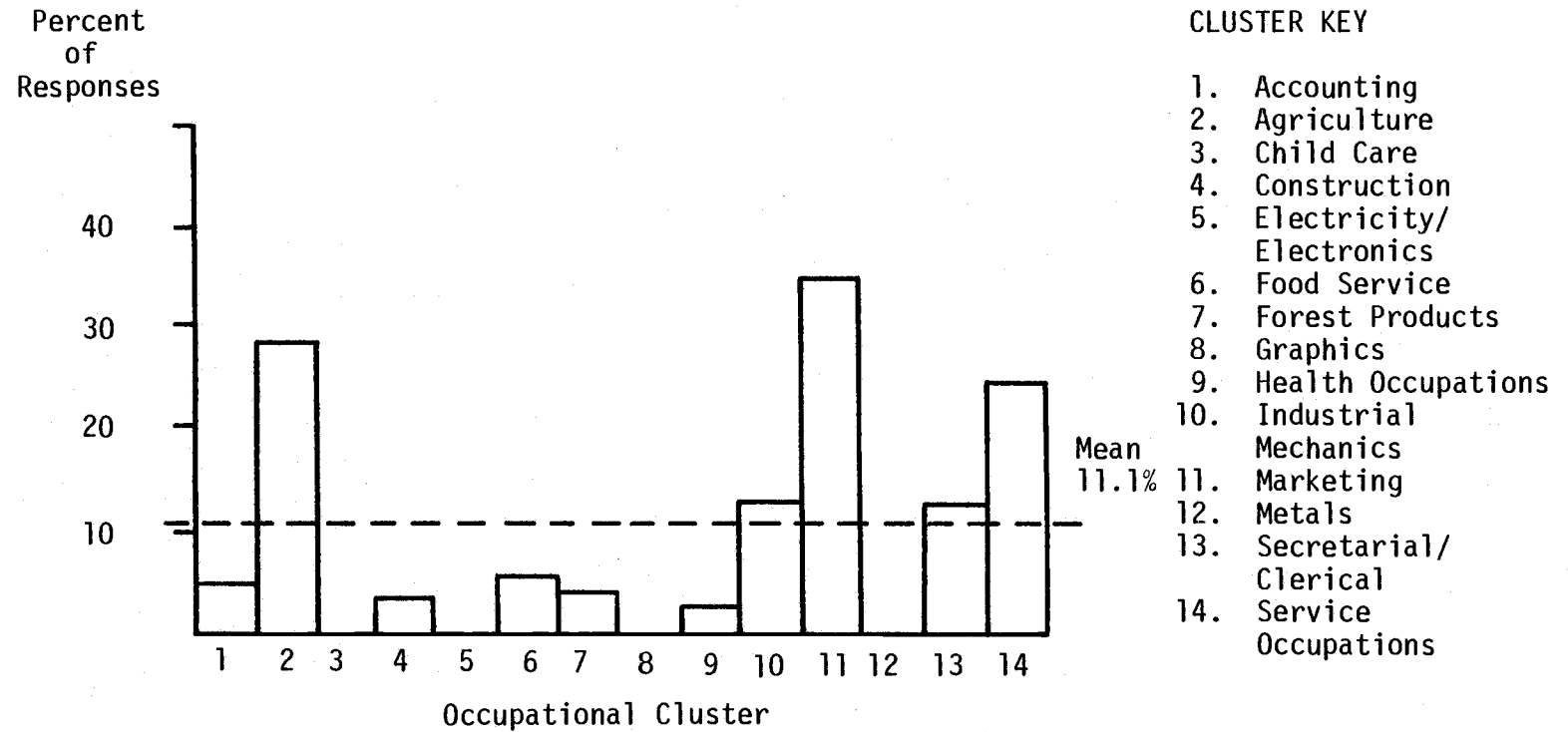


Figure 4. WHY PEOPLE GET FIRED

INABILITY TO WORK WITH OTHERS

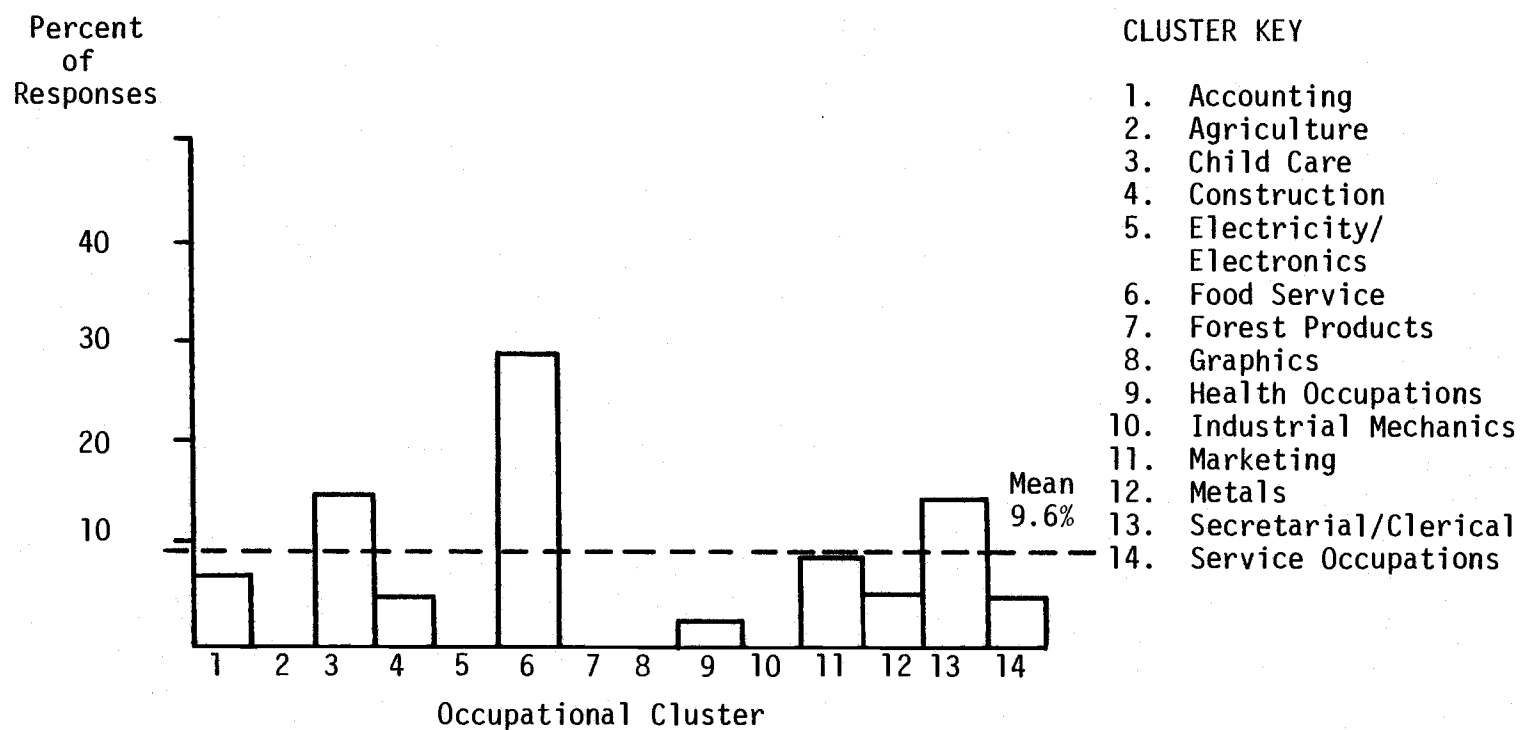


Figure 5. WHY PEOPLE GET FIRED

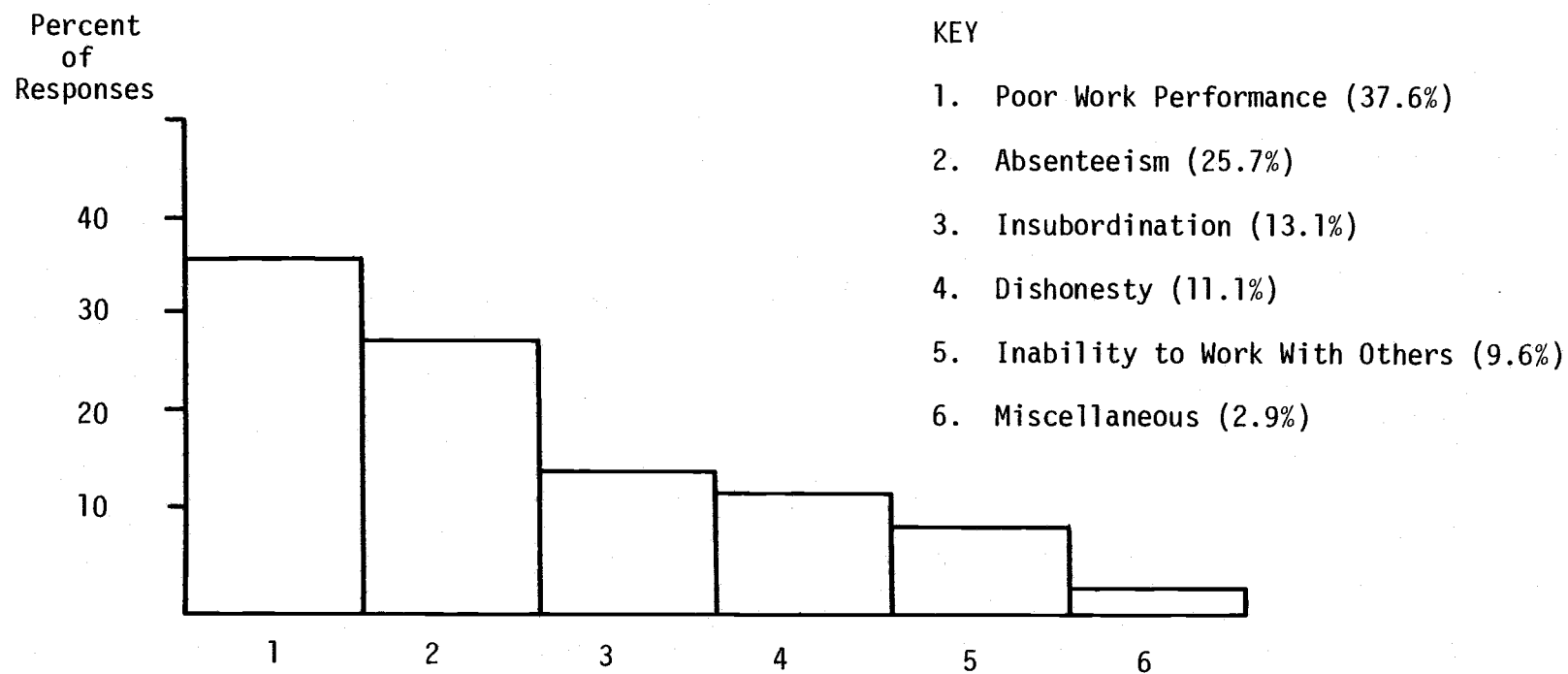


Figure 6. SUMMARY OF WHY PEOPLE GET FIRED

Summary of the Findings

Responses to the 54 criterion statements (59 response items) were statistically analyzed according to computer programs designed for this study. A two-way analysis of variance was conducted on 386 responses, an F value and significance level was computed for each subgroup and combination of subgroups. The alpha level of .01 was selected as an indicator of significance in evaluation of the data. The computer printout provided means, standard deviations, F values, correlations and level of significance for each response item. Each response item was evaluated on the basis of the hypotheses test results. The Least Significant Difference Test (L.S.D.) was used to test the differences between means on those items that rejected a null hypotheses.

A one-way analysis of variance was utilized to determine whether differences existed between the six industrial regions of Oregon in their responses to the criterion statements. Multiple range testing was conducted by the Newman-Keuls Test and the Scheffé Test to determine which regions were responsible for the differences. There was no significant difference at the $P < .01$ level, however, at the $P < .05$ level there were differences on items 3, 8, 12, 14, 21, 22 and 26.

Of 59 response items, the null hypothesis was rejected at the alpha level of .01 for 46 of the items when testing hypothesis #1. Least Significant Difference testing of the 14 clusters identified 342 significant differences between cluster responses to the 46 items.

Although there are many commonalities regarding the various functions within the 14 cluster areas, employer responses were job specific. Those items rejected were: 1-14, 18-23, 26-40, 45, 47, 48, 50, 51 and 54.

Hypothesis #2 was tested to determine if a significant difference exists between sizes of firms. The null hypothesis was retained on all item responses indicating that all firms responded similarly to the criterion statements.

The null hypothesis #3 was rejected by items #38 and #45 due to interaction effects between occupational cluster and firm sizes. Responses to criterion statement #38 (Collect Payments) indicated that the collection of payments is handled differently in different occupational areas. Clusters vary in their perceptions of leadership as indicated by the responses to criterion statement #45 (Provide Leadership to Others). The diversity of the individual interactions to these statements does not allow conclusions to be made in regard to firm size and cluster.

Fifteen criterion statements were accepted by all fourteen occupational cluster groups and were considered to be extremely important. Designations of very important were given to 22 criterion statements with means above 3.5 but that lacked acceptance among some clusters. Fifteen criterion statements with mean ratings of 3.0 - 3.5 and with above average acceptance by all clusters were recommended as moderately important. Seven criteria statements were identified as slightly important. This group had mean ratings of <3.0 and was below average in overall acceptance.

Each respondent was asked to rank order the five most common reasons why persons were fired by their firm. A summary of these responses revealed that people get fired because of:

1. Poor Work Performance, 37.6%
2. Absenteeism, 25.5%
3. Insubordination, 13.1%
4. Dishonesty, 11.1%
5. Inability to Work With Others, 9.6%

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter contains three sections: summary, conclusion and recommendations.

Summary

A descriptive study was conducted in 386 firms in Oregon to identify a list of common skills, knowledges and related factors necessary for successful employment in fourteen occupational clusters. A quota sampling procedure was utilized to achieve a balanced representation of size of firm and regional distribution. The sample was selected from the Oregon Directory of Manufacturers, 1978-1979, local telephone directories, local Chambers of Commerce directories and professional lists. A table of random numbers was utilized to assure randomness of the stratified sample. The final sample was composed of 386 respondents.

Three hypotheses were tested by a two-way analysis of variance on the 54 criterion statements. The null hypotheses were rejected on 48 of the questionnaire items. The L.S.D. Test was used as a follow-up test to identify where the differences occurred.

A one-way analysis of variance was utilized to determine whether differences existed between the six industrial regions of Oregon in their responses to the criterion statements. Multiple range testing was conducted by the Newman-Keuls Test and the Scheffé Test to determine

which regions were responsible for the differences at the $P < .05$ level. There was no significance at the $P < .01$ level.

Pearson Product-Moment Correlation Coefficients were used to determine the relationships on six pairs of statements. A high degree of relationship existed between the responses to the individual statements within each pair.

Means were calculated by subgroup, group and various combinations of groups. The evaluation of the 54 criterion statements identified four groupings of statements. These groupings are:

- Group 1 - Extremely important. Common acceptance to all clusters at a grand mean rating >3.5 .
- Group 2 - Very Important. Grand mean >3.5 , but without acceptance by all clusters.
- Group 3 - Moderately Important. Grand mean ratings of 3.0 - 3.5, with above average acceptance by all clusters.
- Group 4 - Slightly important. Grand mean ratings of <3.0 and below average in overall acceptance by clusters.

The five most common reasons why employees are fired as identified by priority ranking of the respondents were:

1. Poor Work Performance, 37.6%
2. Absenteeism, 25.7%
3. Insubordination, 13.1%
4. Dishonesty, 11.1%
5. Inability to Work With Others, 9.6%

Conclusions

As a result of the data collected and analyzed by this study, some defensible conclusions were made in regard to the identification of common skills, knowledges and related factors needed for successful employment.

The skills, knowledges and related factors needed for successful employment can be identified through the procedures used in this study. These procedures include task analyses synthesis, screening by a Jury Panel of Experts and a questionnaire survey to test the strength of the criterion statements. This process assures the retention of current criteria for inclusion in curriculum up-date.

Job requirements differ by individual cluster area. Although some skills, knowledges and related factors are common to all clusters, others are job specific to the occupational area.

The geographic location of firms has slight influence on the skills, knowledges and related factors needed for successful employment. Southern and Eastern Oregon have somewhat different perceptions of job requirements for a few select criterion statements than do the other four regions.

Size of firm has no effect on the common skills, knowledges and related factors needed for successful employment within individual cluster areas. Respondents indicated similar ratings for the criterion statements.

The five most common reasons why people are fired from their jobs are because of poor work performance, absenteeism, insubordination, dishonesty and inability to work with others.

Recommendations

Recommendations are provided to those concerned with achieving quality in cluster programs. The product of this study and the process by which the product was achieved were both important outcomes and the recommendations describe this importance.

On the basis of this study, it is recommended that:

1. Task analyses be reviewed routinely in order to assure that curriculum is up-to-date and flexible. The Jury Panel of Experts should be utilized for this purpose. This could be facilitated for one cluster area or for several clusters, depending upon whether the need was for job specific information or more general information.
2. Cluster programs in Oregon should consider including in their curriculum all of the criterion statements that were identified as extremely important by the 386 respondents of this study. (Appendix O)
3. Cluster programs in Oregon should consider including in their curriculum all of the criterion statements that were identified as very important, revising the statements to fit the job specificity of their individual cluster. (Appendix P)
4. Cluster programs in Oregon should review the statements identified as moderately important and utilize

the Jury Panel of Experts to identify those statements of importance to their clusters. (Appendix Q)

5. Cluster programs in Oregon should review the statements identified as slightly important, utilizing the Jury Panel of Experts to identify the criterion statements that are appropriate to their individual clusters. (Appendix R)
6. Cluster programs in Oregon should include in their curriculum, methods by which students can practice what they are learning so that they can judge the difference between good work performance and poor work performance. Students must practice before they can perform.
7. Cluster programs in Oregon should include in their curriculum methodologies that will assist students in identifying the importance of consistent attendance, honesty, following directions and company policies, and getting along with others.
8. The Oregon Department of Education, Career and Vocational Education Unit, should consider the 37 criterion statements recommended in the lists, extremely important and very important, for inclusion in cluster curriculum guides.
9. Cluster programs should work very closely with the occupational area for which they are training in order to determine the criterion needed for successful employment within that occupational area.

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APPENDICES

APPENDIX A

RATIONALE FOR SAMPLE

The United States Office of Education identifies seventeen occupational clusters that reflect national labor demands. The focus of this study was on the State of Oregon. Thus, it was necessary to identify Oregon labor demands.

The fourteen occupational cluster areas from which sample respondents were selected are representative of the work community of Oregon. The Oregon Occupational Information System and the Research and Statistics Department of the Oregon Employment Division have assisted the Oregon Department of Education in the identification of these occupational cluster areas as being the areas of major employment in the state.

It was determined that three considerations be made in selecting the sample for this study. These were:

- 1) That the fourteen occupational cluster areas be represented in the sample.
- 2) That all sizes of firms be included in the sample.
- 3) That all geographic regions of Oregon be represented in the sample.

In making considerations on sample stratification, the fourteen cluster areas are well identified in Oregon education and employment data. Firm sizes are consistent with those used by the Oregon Employment Division in their Research and Statistics section.

2

Regional stratification was made on the advice of the State Employment Service according to population distribution and geographic location.

APPENDIX B

SAMPLING PLAN

| SIZE OF FIRM | Accounting | Agriculture | Child Care | Construction | Electricity - Electronics | Food Service | Forest Products | Graphic Communications | Health Occupations | Industrial Mechanics | Marketing | Metals | Secretarial/ Clerical | Service Occupations | TOTAL |
|--------------|------------|-------------|------------|--------------|------------------------------|--------------|-----------------|---------------------------|-----------------------|-------------------------|-----------|--------|--------------------------|------------------------|-------|
| 5 - 19 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| 20 - 49 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| 50 - 99 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| 100 - 249 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| 250 + | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 140 |
| TOTALS | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 700 |

APPENDIX C

GEOGRAPHIC REPRESENTATION OF SAMPLE

Samples were selected by a table of random numbers from firms located in these communities:

I. TRI-COUNTY METROPOLITAN AREA:

Sample Size = 10 regular
Per Cluster: 5 alternates

Clackamas County:

Aurora
Beavercreek
Boring
Canby
Clackamas
Estacada
Gladstone
Hubbard
Lake Grove
Lake Oswego
Marylhurst
Milwaukie
Molalla
Mulino
Oak Grove
Oregon City
Portland
Sandy
West Linn
Wilsonville

Multnomah County:

Bridal Veil
Fairview
Gresham
Lake Oswego
Portland
Troutdale
Wood Village

Washington County:

Aloha
Banks
Beaverton

II. CENTRAL WILLAMETTE VALLEY:

Sample Size = 8 regular
Per Cluster: 5 alternates

Benton County:

Alsea
Blodgett
Corvallis
Kings Valley
Monroe
Philomath

Linn County:

Albany
Brownsville
Cascadia
Crabtree
Foster
Halsey
Harrisburg
Lebanon
Lyons
Mill City
Scio
Shedd
Sweet Home
Tangent

Marion County:

Aumsville
Aurora
Brooks
Detroit
Donald
Gervais
Hubbard
Idanha
Jefferson
Mehama

Washington County (Contd.):

Buxton
 Cornelius
 Forest Grove
 Gales Creek
 Garden Home
 Gaston
 Hillsboro
 Lake Oswego
 Manning
 North Plains
 Portland
 Sherwood
 Tigard
 Tualatin
 West Union

Marion County (Contd.):

Mill City
 Mt. Angel
 Salem
 Scotts Mills
 Silverton
 St. Paul
 Stayton
 Sublimity
 Turner
 Woodburn

Polk County:

Amity
 Dallas
 Grand Ronde
 Independence
 Monmouth
 Rickreall
 Salem
 Valsetz
 Willamina

Yamhill County:

Amity
 Carlton
 Dayton
 Dundee
 Lafayette
 McMinnville
 Newberg
 Sheridan
 Willamina
 Yamhill

III. COASTAL AREA:

Sample Size = 8 regular
 Per Cluster: 4 alternates

Clatsop County:

Astoria
 Cannon Beach
 Hammond
 Seaside
 Warrenton
 Wauna

IV. SOUTH WILLAMETTE VALLEY/South
 Central Oregon:

Sample Size = 8 regular
 Per Cluster: 5 alternates

Douglas County:

Azalea
 Camas Valley
 Canyonville
 Days Creek
 Dillard

Columbia County:

Birkenfeld
Clatskanie
Goble
Mist
Rainier
Scappoose
St. Helens
Vernonia
Warren

Coos County:

Myrtle Point
North Bend
Norway
Powers

Curry County:

Brookings
Gold Beach
Harbor
Langlois
Ophir
Port Orford
Sixes
Wedderburn

Lincoln County:

Burnt Woods
Depoe Bay
Gleneden Beach
Lincoln City
Newport
Otis
Rose Lodge
Siletz
South Beach
Tidewater
Toledo
Waldport
Yachats

Tillamook County

Bay City
Beaver
Garbaldi
Hebo
Nehalem

Douglas County (Contd.):

Drain
Elkton
Gardiner
Glendale
Glide
Myrtle Creek
Oakland
Reedsport
Riddle
Roseburg
Sutherlin
Umpqua
Winchester
Winchester Bay
Winston
Yoncalla

Jackson County:

Ashland
Butte Falls
Central Point
Eagle Point
Gold Hill
Jacksonville
Medford
Phoenix
Prospect
Rogue River
Shady Cove
Talent
Trail
White City

Josephine County

Cave Junction
Grants Pass
Bonanza
Merlin
Murphy
O'Brien
Selma
Sunny Valley
Williams
Wolf Creek

Lane County:

Blue River
Cheshire

Tillamook County (Contd.):

Rockaway
Tillamook

Lane County (Contd.):

Coburg
Cottage Grove
Creswell
Culp Creek
Dexter
Disston
Elmira
Eugene
Fall Creek
Florence
Goshen
Jasper
Junction City
Leaburg
Lorane
Lowell
Mapleton
Marcola
McKenzie Bridge
Noti
Oakridge
Pleasant Hill
Saginaw
Springfield
Swisshome
Veneta
Vida
Walterville
Westfir
Westlake

V. CENTRAL OREGON:

Sample Size = 8 regular
Per cluster: 4 alternates

Crook County:

Powell Butte
Prineville

Deschutes

Bend
La Pine
Prineville
Redmond
Sisters
Terrebonne

VI. EASTERN OREGON AREA:

Sample Size = 8 regular
Per Cluster: 4 alternates

Baker County:

Baker
Durkee
Haines
Halfway
Hereford
Huntington
Sumpter

Gilliam County:

Condon

Grant County:
Canyon City
Dayville
John Day
Long Creek
Monument
Mt. Vernon
Prairie City
Seneca

Harney County:
Burns
Hines

Hood River County:
Cascade Locks
Hoof River
Odell
Parkdale

Jefferson:
Culver
Madras
Warm Springs

Klamath County:
Bonanza
Chemult
Chiloquin
Crescent
Gilchrist
Klamath Falls
Malin
Merrill

Sherman County:
Motor

Wasco County:
Maupin
Mosier
The Dalles
Tygh Valley

Wheel County:
Kinzua
Mitchell
Spray

Lake County:
Lakeview
New Pine Creek
Paisley

Malheur County:
Harrisburg
Myssa
Ontario
Vale

Morrow County:
Boardman
Happner
Tone
Lexington

Umatilla County:
Athena
Echo
McNary
Hermiston
Milton-Freewater
Pendleton
Pilot Rock
Stanfield
Ukiah
Umatilla
Weston

Union County:
Cove
Elgin
Island City
La Grande
Union

Wallowa County:
Enterprise
Joseph
Lostine
Wallowa

APPENDIX D

COVER LETTER TO JURY PANEL OF EXPERTS

Dear

Thank you for your willingness to assist me in the development of a questionnaire to be used for the collection of data for a study regarding skills, knowledges, and related factors needed for successful employment.

The enclosed list was compiled from synthesizing the Task Analyses for Key Occupations for Oregon industries that were completed by representative industries for the Oregon Department of Education. These were then used in the development of curriculum at the secondary and post-secondary levels. Only those skills, knowledges, and related factors that were common to more than half of the Task Analyses reviewed have been listed on the enclosed survey.

After the questionnaire has been revised to include your suggestions, it will be returned to you for final review. Seven hundred employers in Oregon will be randomly selected to respond to the questionnaire.

To assist in this process, your job is to:

1. Review the list of items for completeness. Does the list include skills, knowledges, and related factors that are needed for successful employment?
2. Rate each item. Is it required by employees of your industry or occupation? (right hand 5-1 rating scale).
3. Rate each item for clarity of statement. (left hand 3-0 rating scale) If change is required, please reword the statement on the line provided.
4. Review the format of the instrument and give suggestions for improvement.

Cover Letter to Jury Panel of Experts
Page -2-

5. Return questionnaire to me by August 10, 1979, in the enclosed self-addressed envelope.

Fourteen persons are involved as members of the Jury Panel of Experts. Upon receipt of all of the questionnaires, I will revise the instrument and return it to you for a final approval or revision.

Thank you for your cooperation in this project.

Sincerely,

Ada J. Fancher
5890 NW Primrose
Albany, Oregon 97321
(503) 926-3125

AJF/js

APPENDIX E

COVER LETTER TO QUESTIONNAIRE RESPONDENTS

Dear Employer:

As a graduate student at Oregon State University, I am conducting a research study on the identification of skills, knowledges and related factors needed for successful employment. The purpose of this study is to identify a list of task statements that are common to fourteen occupational areas. If a research-based list of common task statements can be identified from this study, the findings will serve as a basis for developing work attitudes and skills in our educational programs. Business and industry in Oregon must be actively involved in prescribing what makes a person successful in their employment.

The task statements on the enclosed questionnaire survey were derived from task analyses previously verified by personnel managers, supervisors and owners of representative firms within the fourteen major occupational areas in Oregon. A select group of industry persons have assisted me in screening the original list of task statements from 105 to 54.

Your cooperation in filling out the enclosed questionnaire survey should not take more than 15 minutes of your time. The following step-by-step procedure should enable you to complete this process quickly.

1. Complete this form as if you were considering hiring a person who needed basic skills in service oriented occupations*.
2. Keep in mind that it is your opinion that is sought; there is no right or wrong response.
3. It is important that you respond to every item. I will be running a computer analysis of all responses, unfinished returns will not assist in the research.
4. Use the stamped self-addressed envelope for your convenience.
5. Please return no later than July 27, 1980.

Cover Letter to Questionnaire Respondents
Page -2-

Your response and your firm name will not appear in the results or analyses of this research. The number on your questionnaire survey is necessary, however, in order to keep track of the occupational area you represent and the number of persons you employ. Your response will remain anonymous.

If you desire, summaries of this survey can be obtained upon special request. Thank you so much for your involvement in this study.

Sincerely,

Ada J. Fancher
Vocational-Technical Education

Earl E. Smith, EdD; Industrial
Education
Major Professor

*The appropriate occupational cluster was inserted here.

APPENDIX F

SURVEY QUESTIONNAIRE

SURVEY QUESTIONNAIRE
COMMON
SKILLS, KNOWLEDGES, AND RELATED FACTORS
NEEDED FOR SUCCESSFUL EMPLOYMENT IN FOURTEEN OCCUPATIONAL AREAS

A Research Project
By
Ada Jean Fancher

INSTRUCTIONS

CIRCLE THE RATING FOR EACH STATEMENT THAT MOST NEARLY DESCRIBES
THE COMPETENCE NEEDED FOR SUCCESSFUL EMPLOYMENT WITH YOUR FIRM:

| | Extremely Important | Very Important | Moderately Important | Slightly Important | Of Absolutely No Importance |
|---|---------------------|----------------|----------------------|--------------------|-----------------------------|
| EXAMPLE: Assumes Responsibility | | | | | |
| If you think this competency is essential, CIRCLE #5 | ⑤ | 4 | 3 | 2 | 1 |
| If you think this competency is important most of the time, CIRCLE #4 | 5 | ④ | 3 | 2 | 1 |
| If you think this competency is nice to have, CIRCLE #3 | 5 | 4 | ③ | 2 | 1 |
| If you think this competency is needed once in a while, CIRCLE #2 | 5 | 4 | 3 | ② | 1 |
| If you think this competency is completely unnecessary, CIRCLE #1 | 5 | 4 | 3 | 2 | ① |

- Keep in mind that it is your opinion that is sought; there is no right or wrong response.
- It is important that you respond to every item. Please mark every item.

NEED FOR SUCCESSFUL EMPLOYMENT

SKILLS, KNOWLEDGES AND RELATED FACTORS:

| | Extremely Important | Very Important | Moderately Important | Slightly Important | Of Absolutely No Importance |
|--|---------------------|----------------|----------------------|--------------------|-----------------------------|
| 1. Compute sales receipts accurately. | 5 | 4 | 3 | 2 | 1 |
| 2. Process credit purchases. | 5 | 4 | 3 | 2 | 1 |
| 3. Make change accurately. | 5 | 4 | 3 | 2 | 1 |
| 4. Process checks according to company procedures. | 5 | 4 | 3 | 2 | 1 |
| 5. Compute by using appropriate methods: (identify skills needed) | | | | | |
| A. Adding | 5 | 4 | 3 | 2 | 1 |
| B. Subtracting | 5 | 4 | 3 | 2 | 1 |
| C. Multiplying | 5 | 4 | 3 | 2 | 1 |
| D. Dividing | 5 | 4 | 3 | 2 | 1 |
| E. Percentage | 5 | 4 | 3 | 2 | 1 |
| F. Decimals | 5 | 4 | 3 | 2 | 1 |
| G. Other (Please list) | | | | | |
| _____ | 5 | 4 | 3 | 2 | 1 |
| 6. Read and interpret job specifications. | 5 | 4 | 3 | 2 | 1 |
| 7. Read and interpret direction labels. | 5 | 4 | 3 | 2 | 1 |
| 8. Read and interpret instructional manuals. | 5 | 4 | 3 | 2 | 1 |
| 9. Listen to customer complaints. | 5 | 4 | 3 | 2 | 1 |
| 10. Read and interpret safety codes. | 5 | 4 | 3 | 2 | 1 |

NEED FOR SUCCESSFUL EMPLOYMENT

SKILLS, KNOWLEDGES AND RELATED FACTORS:

| | Extremely Important | Very Important | Moderately Important | Slightly Important | Of Absolutely No Importance |
|--|---------------------|----------------|----------------------|--------------------|-----------------------------|
| 11. Read and interpret service orders. | 5 | 4 | 3 | 2 | 1 |
| 12. Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 5 | 4 | 3 | 2 | 1 |
| 13. Read and interpret parts and supply catalogs. | 5 | 4 | 3 | 2 | 1 |
| 14. Read and interpret micro-fische for ordering and maintaining records. | 5 | 4 | 3 | 2 | 1 |
| 15. Write orders for supplies, parts. | 5 | 4 | 3 | 2 | 1 |
| 16. Develop work schedules. | 5 | 4 | 3 | 2 | 1 |
| 17. Complete forms (i.e., order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets. | 5 | 4 | 3 | 2 | 1 |
| 18. Write formal and informal reports legibly. | 5 | 4 | 3 | 2 | 1 |
| 19. Use trade terms and symbols appropriate to the occupation. | 5 | 4 | 3 | 2 | 1 |
| 20. Write business letters. | 5 | 4 | 3 | 2 | 1 |
| 21. Keep accurate records. | 5 | 4 | 3 | 2 | 1 |
| 22. Give oral instructions, direct others. | 5 | 4 | 3 | 2 | 1 |
| 23. Use the telephone. | 5 | 4 | 3 | 2 | 1 |
| 24. Ask clear and logical questions. | 5 | 4 | 3 | 2 | 1 |
| 25. Communicate effectively with customers, co-workers and others. | 5 | 4 | 3 | 2 | 1 |

NEED FOR SUCCESSFUL
EMPLOYMENT

SKILLS, KNOWLEDGES AND RELATED FACTORS:

| | Extremely Important | Very Important | Moderately Important | Slightly Important | Of Absolutely No Importance |
|---|---------------------|----------------|----------------------|--------------------|-----------------------------|
| 26. Make oral reports. | 5 | 4 | 3 | 2 | 1 |
| 27. Use basic hand signals. | 5 | 4 | 3 | 2 | 1 |
| 28. Operate equipment safely. | 5 | 4 | 3 | 2 | 1 |
| 29. Use cleaners correctly. | 5 | 4 | 3 | 2 | 1 |
| 30. Clean and repair work areas, equipment, and tools. | 5 | 4 | 3 | 2 | 1 |
| 31. Use correct safety and protective gear. | 5 | 4 | 3 | 2 | 1 |
| 32. Observe all safety rules and procedures. | 5 | 4 | 3 | 2 | 1 |
| 33. Lift and carry objects properly. | 5 | 4 | 3 | 2 | 1 |
| 34. Clean and store equipment according to regulations. | 5 | 4 | 3 | 2 | 1 |
| 35. Operate business machines (i.e. hand-held calculators, computer). | 5 | 4 | 3 | 2 | 1 |
| 36. File business records. | 5 | 4 | 3 | 2 | 1 |
| 37. Apply business ethics. | 5 | 4 | 3 | 2 | 1 |
| 38. Collect payments. | 5 | 4 | 3 | 2 | 1 |
| 39. Develop and maintain good personal relations. | 5 | 4 | 3 | 2 | 1 |
| 40. Relieve or assist other employees during emergencies or rush periods. | 5 | 4 | 3 | 2 | 1 |
| 41. Take directions from others. | 5 | 4 | 3 | 2 | 1 |
| 42. Assume responsibility. | 5 | 4 | 3 | 2 | 1 |

NEED FOR SUCCESSFUL
EMPLOYMENT

SKILLS, KNOWLEDGES AND RELATED FACTORS:

| | Extremely Important | Very Important | Moderately Important | Slightly Important | Of Absolutely No Importance |
|--|---------------------|----------------|----------------------|--------------------|-----------------------------|
| 43. Cooperate with supervisors. | 5 | 4 | 3 | 2 | 1 |
| 44. Has acceptable attitudes towards work. | 5 | 4 | 3 | 2 | 1 |
| 45. Provide leadership to others. | 5 | 4 | 3 | 2 | 1 |
| 46. Take advantage of personal development opportunities. | 5 | 4 | 3 | 2 | 1 |
| 47. Maintain personal cleanliness. | 5 | 4 | 3 | 2 | 1 |
| 48. Maintain good health. | 5 | 4 | 3 | 2 | 1 |
| 49. Work to insure quality of service or product. | 5 | 4 | 3 | 2 | 1 |
| 50. Select appropriate tools and/or equipment to complete the job. | 5 | 4 | 3 | 2 | 1 |
| 51. Select appropriate materials to use for job completion. | 5 | 4 | 3 | 2 | 1 |
| 52. Inspect work for accuracy and quality. | 5 | 4 | 3 | 2 | 1 |
| 53. Diagnose problems and determine solutions. | 5 | 4 | 3 | 2 | 1 |
| 54. Troubleshoot simple equipment problems. | 5 | 4 | 3 | 2 | 1 |

MORE ON THE BACK.....

Please indicate the number of persons you employ:

5-19 ____ 20-49 ____ 50-99 ____ 100-249 ____ 250+ ____

List five of the most common reasons why persons in your firm are fired: (Prioritize)

1. _____
2. _____
3. _____
4. _____
5. _____

Make any comments below.

THANKS FOR YOUR COOPERATION!

Lida J. Fancher

APPENDIX G

SAMPLE RESPONSE BY SIZE OF FIRM AND CLUSTER

| SIZE OF FIRM | Accounting | Agriculture | Child Care* | Construction | Electricity/ Electronics | Food Service | Forest Products | Graphics Communications | Health Occupations | Industrial Mechanics | Marketing | Metals | Secretarial/ Clerical | Service Occupations | TOTAL |
|--------------|------------|-------------|-------------|--------------|-----------------------------|--------------|-----------------|----------------------------|-----------------------|-------------------------|-----------|--------|--------------------------|------------------------|-------|
| 5 - 19 | 10 | 4 | 15 | 10 | 5 | 3 | 3 | 10 | 6 | 10 | 10 | 2 | 10 | 10 | 108 |
| 20 - 49 | 10 | 6 | 13 | 4 | 4 | 7 | 2 | 6 | 8 | 10 | 7 | 4 | 5 | 6 | 92 |
| 50 - 99 | 10 | 5 | 0 | 0 | 5 | 5 | 4 | 3 | 10 | 4 | 6 | 3 | 3 | 5 | 63 |
| 100 - 249 | 4 | 5 | 0 | 3 | 3 | 1 | 6 | 3 | 8 | 1 | 3 | 4 | 10 | 4 | 55 |
| 250 + | 8 | 3 | 0 | 6 | 4 | 1 | 10 | 0 | 9 | 1 | 5 | 7 | 10 | 4 | 68 |
| TOTAL | 42 | 23 | 28* | 23 | 21 | 17 | 25 | 22 | 41 | 26 | 31 | 20 | 38 | 29 | 386 |

*Child Care returns indicated that there were no child care centers in Oregon who employ more than 49 persons.

APPENDIX H

RESULTS OF TWO-WAY ANALYSIS OF VARIANCE ON INDIVIDUAL STATEMENTS

| ITEM NO. | SKILLS, KNOWLEDGES AND RELATED FACTORS | GRAND MEAN | HYPOTHESES #1 OCCUPATIONAL AREA | | | HYPOTHESES #2 SIZE OF FIRM | | | HYPOTHESES #3 OCCUPATION X SIZE | | |
|----------|---|------------|------------------------------------|-----------|--------------|-------------------------------|-----------|--------------|------------------------------------|-----------|--------------|
| | | | F Value | Sig. of F | Null Hypoth. | F Value | Sig. of F | Null Hypoth. | F Value | Sig. of F | Null Hypoth. |
| 1 | Compute sales receipts accurately | 3.1503 | 3.044 | .001* | Reject | 1.887 | .112 | Retain | 1.373 | .063 | Retain |
| 2 | Process credit purchases. | 2.7902 | 2.693 | .001* | Reject | 1.539 | .191 | Retain | 1.235 | .152 | Retain |
| 3 | Make change accurately. | 3.2047 | 3.188 | .001* | Reject | .602 | .661 | Retain | 1.178 | .211 | Retain |
| 4 | Process checks according to company procedures. | 3.3627 | 2.522 | .003* | Reject | 1.189 | .316 | Retain | 1.143 | .253 | Retain |
| 5 | Compute by using appropriate methods: (identify skills needed) | | | | | | | | | | |
| | A. Adding | 4.0907 | 2.650 | .003* | Reject | .462 | .763 | Retain | .694 | .934 | Retain |
| | B. Subtracting | 4.0440 | 2.488 | .003* | Reject | .447 | .775 | Retain | .636 | .968 | Retain |
| | C. Multiplying | 3.9301 | 2.680 | .001* | Reject | .538 | .708 | Retain | .796 | .825 | Retain |
| | D. Dividing | 3.7720 | 3.027 | .001* | Reject | .352 | .842 | Retain | .775 | .835 | Retain |
| | E. Percentage | 3.5933 | 3.256 | .001* | Reject | .330 | .858 | Retain | 1.294 | .106 | Retain |
| | F. Decimals | 3.5181 | 2.744 | .001* | Reject | .407 | .803 | Retain | 1.047 | .397 | Retain |
| | G. Other (Please list) | | | | | | | | | | |
| | <u>Fractions</u> | | | | | | | | | | |
| 6 | Read and interpret job specifications. | 3.7021 | 2.905 | .001* | Reject | .028 | .998 | Retain | .970 | .532 | Retain |
| 7 | Read and interpret direction labels. | 3.6917 | 4.233 | .001* | Reject | .301 | .877 | Retain | 1.072 | .356 | Retain |

*Item responses that rejected the null hypothesis.

APPENDIX H--Continued

| ITEM NO. | SKILLS, KNOWLEDGES AND RELATED FACTORS | GRAND MEAN | HYPOTHESES #1 OCCUPATIONAL AREA | | | HYPOTHESES #2 SIZE OF FIRM | | | HYPOTHESES #3 OCCUPATION X SIZE | | |
|----------|--|------------|------------------------------------|-----------|--------------|-------------------------------|-----------|--------------|------------------------------------|-----------|--------------|
| | | | F Value | Sig. of F | Null Hypoth. | F Value | Sig. of F | Null Hypoth. | F Value | Sig. of F | Null Hypoth. |
| 8 | Read and interpret instructional manuals. | 3.8523 | 2.402 | .004* | Reject | .183 | .947 | Retain | 1.133 | .266 | Retain |
| 9 | Listen to customer complaints. | 3.7513 | 3.895 | .001* | Reject | 1.114 | .350 | Retain | .788 | .836 | Retain |
| 10 | Read and interpret safety codes. | 3.4767 | 6.248 | .001* | Reject | 1.434 | .223 | Retain | 1.129 | .271 | Retain |
| 11 | Read and interpret service orders. | 3.2358 | 4.219 | .001* | Reject | .603 | .661 | Retain | .763 | .868 | Retain |
| 12 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 3.2306 | 5.046 | .001* | Reject | 1.289 | .274 | Retain | 1.180 | .208 | Retain |
| 13 | Read and interpret parts and supply catalogs. | 2.6166 | 4.841 | .001* | Reject | 1.054 | .380 | Retain | .977 | .520 | Retain |
| 14 | Read and interpret micro-fiche for ordering and maintaining records. | 2.3446 | 3.046 | .001* | Reject | 1.446 | .218 | Retain | .775 | .853 | Retain |
| 15 | Write orders for supplies, parts. | 2.7358 | 1.885 | .031 | Retain | 1.549 | .188 | Retain | .954 | .561 | Retain |
| 16 | Develop work schedules. | 3.2435 | .937 | .515 | Retain | .636 | .637 | Retain | 1.024 | .436 | Retain |
| 17 | Complete forms (i.e., order, cost estimates, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets.) | 3.6218 | .999 | .451 | Retain | 1.141 | .337 | Retain | 1.036 | .415 | Retain |
| 18 | Write formal and informal reports legibly. | 3.5052 | 2.542 | .002* | Reject | 1.767 | .135 | Retain | .828 | .779 | Retain |
| 19 | Use trade terms and symbols appropriate to the occupation. | 3.5259 | 2.641 | .002* | Reject | .868 | .483 | Retain | 1.554 | .016 | Retain |

APPENDIX H--Continued

| ITEM NO. | SKILLS, KNOWLEDGES AND RELATED FACTORS | GRAND MEAN | HYPOTHESES #1 OCCUPATIONAL AREA | | | HYPOTHESES #2 SIZE OF FIRM | | | HYPOTHESES #3 OCCUPATION X SIZE | | |
|-------------|---|---------------|------------------------------------|--------------|-----------------|-------------------------------|--------------|-----------------|------------------------------------|--------------|-----------------|
| | | | F Value | Sig. of F | Null Hypoth. | F Value | Sig. of F | Null Hypoth. | F Value | Sig. of F | Null Hypoth. |
| 20 | Write business letters. | 3.0311 | 3.635 | .001* | Reject | 2.345 | .055 | Retain | 1.237 | .150 | Retain |
| 21 | Keep accurate records. | 4.1839 | 3.191 | .001* | Reject | 2.029 | .090 | Retain | 1.339 | .079 | Retain |
| 22 | Give oral instructions, direct others. | 3.7927 | 3.344 | .001* | Reject | 1.344 | .254 | Retain | 1.168 | .222 | Retain |
| 23 | Use the telephone. | 3.9404 | 3.771 | .001* | Reject | 1.122 | .346 | Retain | .971 | .530 | Retain |
| 24 | Ask clear and logical questions. | 4.2021 | 1.013 | .438 | Retain | 1.823 | .124 | Retain | .824 | .785 | Retain |
| 25 | Communicate effectively with customers, co-workers and others. | 4.5674 | 1.507 | .113 | Retain | .674 | .610 | Retain | 1.096 | .319 | Retain |
| 26 | Make oral reports. | 3.2642 | 2.516 | .003* | Reject | 1.081 | .366 | Retain | 1.135 | .264 | Retain |
| 27 | Use basic hand signals. | 2.0259 | 4.425 | .001* | Reject | 1.353 | .250 | Retain | 1.300 | .102 | Retain |
| 28 | Operate equipment safely. | 3.6813 | 7.914 | .001* | Reject | .412 | .800 | Retain | 1.052 | .389 | Retain |
| 29 | Use cleaners correctly. | 2.8912 | 4.140 | .001* | Reject | .751 | .558 | Retain | 1.022 | .439 | Retain |
| 30 | Clean and repair work areas, equipment, and tools. | 3.1554 | 5.129 | .001* | Reject | .721 | .578 | Retain | 1.101 | .312 | Retain |
| 31 | Use correct safety and protective gear. | 3.2876 | 9.951 | .001* | Reject | 1.678 | .155 | Retain | 1.118 | .286 | Retain |
| 32 | Observe all safety rules and procedures. | 3.8238 | 6.234 | .001* | Reject | .768 | .547 | Retain | 1.000 | .477 | Retain |
| 33 | Lift and carry objects properly. | 3.5026 | 7.844 | .001* | Reject | .936 | .443 | Retain | 1.225 | .162 | Retain |
| 34 | Clean and store equipment according to regulations. | 3.3601 | 5.882 | .001* | Reject | .734 | .569 | Retain | 1.026 | .432 | Retain |
| 35 | Operate business machines (i.e. hand- held calculators, computer). | 3.2409 | 2.699 | .001* | Reject | 1.364 | .246 | Retain | .897 | .665 | Retain |

APPENDIX H--Continued

| ITEM NO. | SKILLS, KNOWLEDGES AND RELATED FACTORS | GRAND MEAN | HYPOTHESES #1 OCCUPATIONAL AREA | | | HYPOTHESES #2 SIZE OF FIRM | | | HYPOTHESES #3 OCCUPATION X SIZE | | |
|----------|---|------------|------------------------------------|-----------|--------------|-------------------------------|-----------|--------------|------------------------------------|-----------|--------------|
| | | | F Value | Sig. of F | Null Hypoth. | F Value | Sig. of F | Null Hypoth. | F Value | Sig. of F | Null Hypoth. |
| 36 | File business records. | 3.2358 | 3.516 | .001* | Reject | 1.536 | .192 | Retain | 1.201 | .186 | Retain |
| 37 | Apply business ethics. | 3.9171 | 2.855 | .001* | Reject | 1.712 | .147 | Retain | 1.335 | .081 | Retain |
| 38 | Collect payments. | 2.8990 | 2.719 | .001* | Reject | 1.531 | .193 | Retain | 1.643 | .008* | Reject |
| 39 | Develop and maintain good personal relations. | 4.3964 | 2.275 | .007* | Reject | 2.667 | .032 | Retain | .937 | .591 | Retain |
| 40 | Relieve or assist other employees during emergencies or rush periods. | 4.2150 | 2.781 | .001* | Reject | .624 | .646 | Retain | .635 | .969 | Retain |
| 41 | Take directions from others. | 4.4560 | 1.469 | .127 | Retain | .297 | .880 | Retain | .881 | .692 | Retain |
| 42 | Assume responsibility. | 4.4689 | 1.386 | .164 | Retain | .411 | .801 | Retain | 1.069 | .361 | Retain |
| 43 | Cooperate with supervisors. | 4.6244 | 1.019 | .433 | Retain | 1.750 | .139 | Retain | .712 | .919 | Retain |
| 44 | Has acceptable attitudes towards work. | 4.5777 | .809 | .651 | Retain | 1.373 | .243 | Retain | .752 | .880 | Retain |
| 45 | Provide leadership to others. | 3.8731 | 3.362 | .001* | Reject | .932 | .446 | Retain | 1.755 | .003* | Reject |
| 46 | Take advantage of personal development. | 3.9145 | 1.638 | .074 | Retain | 1.897 | .111 | Retain | .806 | .812 | Retain |
| 47 | Maintain personal cleanliness. | 4.1788 | 6.535 | .001* | Reject | 1.362 | .247 | Retain | .947 | .573 | Retain |
| 48 | Maintain good health. | 4.2202 | 2.746 | .001* | Reject | .941 | .441 | Retain | 1.201 | .185 | Retain |
| 49 | Work to insure quality of service or product. | 4.5492 | 1.140 | .324 | Retain | .579 | .678 | Retain | 1.073 | .355 | Retain |
| 50 | Select appropriate tools and/or equipment to complete the job. | 3.6684 | 4.444 | .001* | Reject | .652 | .626 | Retain | .943 | .582 | Retain |

APPENDIX H--Continued

| ITEM NO. | SKILLS, KNOWLEDGES AND RELATED FACTORS | GRAND MEAN | HYPOTHESES #1 OCCUPATIONAL AREA | | | HYPOTHESES #2 SIZE OF FIRM | | | HYPOTHESE #3 OCCUPATION X SIZE | | |
|-------------|--|---------------|------------------------------------|--------------|--------------------|-------------------------------|--------------|--------------------|-----------------------------------|--------------|--------------------|
| | | | F Value | Sig. of F | Null Hypothesis | F Value | Sig. of F | Null Hypothesis | F Value | Sig. of F | Null Hypothesis |
| 51 | Select appropriate materials to use for job completion. | 3.7772 | 2.456 | .003* | Reject | .515 | .725 | Retain | .930 | .605 | Retain |
| 52 | Inspect work for accuracy and quality. | 4.3420 | 1.666 | .067 | Retain | .295 | .881 | Retain | 1.004 | .470 | Retain |
| 53 | Diagnose problems and determine solutions. | 4.0907 | 1.549 | .099 | Retain | .104 | .981 | Retain | 1.094 | .322 | Retain |
| 54 | Troubleshoot simple equipment problems. | 3.1399 | 6.333 | .001* | Reject | 2.063 | .085 | Retain | .743 | .890 | Retain |

APPENDIX I

RESULTS OF ONE-WAY ANALYSIS OF VARIANCE ON INDIVIDUAL STATEMENTS BY REGIONS

| Item No. | Criterion Statement | F Value | Hypothesis | |
|----------|---|---------|------------|-----------------|
| | | | Sig of F | Null Hypothesis |
| 1 | Compute sales receipts accurately. | 1.484 | .1942 | Retain |
| 2 | Process credit purchases. | 1.569 | .1679 | Retain |
| 3 | Make change accurately. | 2.507 | .0300 | Retain |
| 4 | Process checks according to company procedures. | .818 | .5373 | Retain |
| 5 | Compute by using appropriate methods: (identify skills needed) | | | |
| | A. Adding | 1.537 | .1773 | Retain |
| | B. Subtracting | 2.094 | .0655 | Retain |
| | C. Multiplying | .794 | .5544 | Retain |
| | D. Dividing | 1.065 | .3795 | Retain |
| | E. Percentage | .850 | .5150 | Retain |
| | F. Decimals | 1.199 | .3091 | Retain |
| | G. Other (Please list) | | | |
| 6 | Read and interpret job specifications. | .347 | .8843 | Retain |

| Item No. | Criterion Statement | F Value | Hypothesis | |
|----------|---|---------|------------|-----------------|
| | | | Sig of F | Null Hypothesis |
| 7 | Read and interpret job specifications. | 2.082 | .0669 | Retain |
| 8 | Read and interpret direction labels. | 2.560 | .0270 | Retain |
| 9 | Listen to customer complaints. | .624 | .6815 | Retain |
| 10 | Read and interpret safety codes. | .986 | .4263 | Retain |
| 11 | Read and interpret service orders. | .566 | .7258 | Retain |
| 12 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 2.361 | .0396 | Retain |
| 13 | Read and interpret parts and supply catalogs. | 1.308 | .2599 | Retain |
| 14 | Read and interpret micro-fiche for ordering and maintaining records. | 2.802 | .0169 | Retain |
| 15 | Write orders for supplies, parts. | 1.199 | .3091 | Retain |
| 16 | Develop work schedules. | .663 | .6517 | Retain |
| 17 | Complete forms (i.e., order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets.) | 1.601 | .1589 | Retain |
| 18 | Write formal and informal reports legibly. | .958 | .4437 | Retain |

| Item No. | Criterion Statement | F Value | Hypothesis | |
|----------|--|---------|------------|-----------------|
| | | | Sig of F | Null Hypothesis |
| 19 | Use trade terms and symbols appropriate to the occupation. | 1.352 | .2417 | Retain |
| 20 | Write business letters. | .526 | .7565 | Retain |
| 21 | Keep accurate records. | 2.921 | .0133 | Retain |
| 22 | Give oral instructions, direct others. | 2.715 | .0200 | Retain |
| 23 | Use the telephone | 1.517 | .1834 | Retain |
| 24 | Ask clear and logical questions. | .608 | .6941 | Retain |
| 25 | Communicate effectively with customers, co-workers and others. | 1.252 | .2840 | Retain |
| 26 | Make oral reports. | 2.613 | .0244 | Retain |
| 27 | Use basic hand signals. | 1.323 | .2536 | Retain |
| 28 | Operate equipment safely. | 1.082 | .3781 | Retain |
| 29 | Use cleaners correctly. | .553 | .7363 | Retain |
| 30 | Clean and repair work areas, equipment, and tools. | 1.391 | .2267 | Retain |
| 31 | Use correct safety and protective gear. | .942 | .4534 | Retain |

| Item No. | Criterion Statement | F Value | Hypothesis | |
|----------|---|---------|------------|-----------------|
| | | | Sig of F | Null Hypothesis |
| 32 | Observe all safety rules and procedures. | 1.066 | .3787 | Retain |
| 33 | Lift and carry objects properly. | 1.407 | .2207 | Retain |
| 34 | Clean and store equipment according to regulations. | 2.129 | .0613 | Retain |
| 35 | Operate business machines (i.e. hand-held calculators, computer). | .538 | .7472 | Retain |
| 36 | File business records. | .672 | .6450 | Retain |
| 37 | Apply business ethics. | .415 | .8381 | Retain |
| 38 | Collect payments. | .593 | .7050 | Retain |
| 39 | Develop and maintain good personal relations. | 1.070 | .3767 | Retain |
| 40 | Relieve or assist other employees during emergencies or rush periods. | 1.138 | .3398 | Retain |
| 41 | Take directions from others. | .729 | .6019 | Retain |
| 42 | Assume responsibility. | .826 | .5319 | Retain |
| 43 | Cooperate with supervisors. | .754 | .5836 | Retain |
| 44 | Has acceptable attitudes towards work. | .851 | .5142 | Retain |

| Item No. | Criterion Statement | F Value | Hypothesis | |
|----------|--|---------|------------|-----------------|
| | | | Sig of F | Null Hypothesis |
| 45 | Provide leadership to others. | 1.579 | .1650 | Retain |
| 46 | Take advantage of personal development opportunities. | 1.459 | .2023 | Retain |
| 47 | Maintain personal cleanliness. | .931 | .4609 | Retain |
| 48 | Maintain good health. | .833 | .5266 | Retain |
| 49 | Work to insure quality of service or product. | 1.957 | .0843 | Retain |
| 50 | Select appropriate tools and/or equipment to complete the job. | 1.257 | .2821 | Retain |
| 51 | Select appropriate materials to use for job completion. | .694 | .6286 | Retain |
| 52 | Inspect work for accuracy and quality. | .207 | .9593 | Retain |
| 53 | Diagnose problems and determine solutions. | 1.977 | .0813 | Retain |
| 54 | Troubleshoot simple equipment problems. | 1.042 | .3926 | Retain |

APPENDIX J

MATRIX OF SIGNIFICANT DIFFERENCES BETWEEN CLUSTERS AS DETERMINED BY A TEST OF LEAST SIGNIFICANT DIFFERENCE
ON CRITERION THAT REJECTED HYPOTHESIS #1

| Clusters (Greater Means) | Accounting | Agriculture | Child Care | Construction | Electricity/ Electronics | Food Service | Forest Products | Graphics Communications | Health Occupations | Industrial Mechanics | Marketing | Metals | Secretarial/ Clerical | Service Occupations | Number of Significant Differences (Greater Means) |
|-----------------------------|------------|--------------------------|---------------|--------------|-----------------------------|---------------|-----------------|----------------------------|-----------------------|-------------------------|---------------|--------|--------------------------|------------------------|--|
| Accounting | | 5A, 5B, 5C, 5F, 47 | | | 9 | | 5D, 5E | | | | | 38 | 35, 45 | 37 | 12 |
| Agriculture | | | | | 36 | 2 | 1, 5F, 9 | 5D, 10, 11 | 3, 36, 54 | | | | | | 11 |
| Child Care | 3, 13 | | | | 7, 37 | 39, 47 | 45 | 29 | 48 | | 54 | 4 | 31 | | 12 |
| Construction | | 33 | | | 48 | 5E, 14, 51 | | | 5F, 12 | 40 | | | 5A, 13 | | 10 |
| Electricity/ Electronics | | 54 | | 6, 29 | | 32 | 13 | | 28 | 35 | 10, 33 | 1 | | 31 | 11 |
| Food Service | | 27, 29 | 5D, 5E, 13 | | 50 | | | 11 | 31, 40 | | 1, 2, 4 | | | 9 | 13 |
| Forest Products | 4 | 5D, 28 | | 27, 39 | 34 | 5A, 37 | | 5C, 36 | 1, 10 | 2 | 6 | 47 | 33 | 12 | 17 |
| Graphics Communications | 27, 40 | | 14 | 12, 47 | | | 33 | | 11 | | 5D, 5F, 31 | | 5E | 7, 51 | 13 |
| Health Occupations | | | | | 35 | 54 | | 32 | | | 14, 47 | | 5C | 4 | 7 |

APPENDIX J-- Continued

| Clusters (Greater Means) | Accounting | Agriculture | Child Care | Construction | Electricity/ Electronics | Food Service | Forest Products | Graphics Communications | Health Occupations | Industrial Mechanics | Marketing | Metals | Secretarial/ Clerical | Service Occupations | Number of Significant Differences (Greater Means) |
|--|---|-------------|------------|--------------|-----------------------------|--------------|-----------------|----------------------------|-----------------------|-------------------------|-----------|----------------------|-------------------------------|------------------------|--|
| Industrial Mechanics | | 7,9 | | | | 11 | | 13 | | | | 31,35 45,51 54 | 14 | 8 | 11 |
| Marketing | 6,7 | 1,2 3 | 31 | | 40 | 12 | 4 | | | 5A,5B, 36 | | | 9,10, 28,32 34,50 51 | 33,48 | 21 |
| Metals | | | 11 | 48 | 39 | 5B | | 5F | 5D,29 | | 5C,13 | | | 10 | 10 |
| Secretarial/ Clerical | 10,28, 31,32, 34,50, 51,54 29 | 35 | 12 | 5F | 14 | | | 12 | | 9 | | | | | 15 |
| Service Occupations | 33 | | 28 | | | 27 | | 33 | | | 32,50 | 38 | 29 | | 8 |
| Number of Significant Differences of Lesser Means | 17 | 17 | 8 | 8 | 11 | 14 | 9 | 12 | 14 | 7 | 16 | 10 | 17 | 11 | |

APPENDIX K

ACCEPTANCE OF CRITERION STATEMENTS ACCORDING TO SIZE OF FIRM

| Item No. | Criterion Statement | 5-19 | | 20-49 | | 50-99 | | 100-249 | | 250+ | | TOTAL | |
|----------|---|--------|------|--------|------|--------|------|---------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 1 | Compute sales receipts accurately. | 3.1214 | 45 | 3.3425 | 49 | 3.3962 | 41 | 3.3333 | 45 | 2.7333 | 53 | 3.1503 | 50 |
| 2 | Process credit purchases. | 2.6357 | 55 | 3.0548 | 54 | 2.9623 | 53 | 3.0444 | 55 | 2.5467 | 57 | 2.7902 | 55 |
| 3 | Make change accurately. | 3.2429 | 38 | 3.3288 | 50 | 3.3585 | 43 | 3.2889 | 49 | 2.8533 | 51 | 3.2047 | 48 |
| 4 | Process checks according to company procedures. | 3.2000 | 39 | 3.7534 | 29 | 3.3774 | 42 | 3.2889 | 50 | 3.3200 | 40 | 3.3627 | 39 |
| 5 | Compute by using appropriate methods: (identify skills needed) | | | | | | | | | | | | |
| | A. Adding | 4.1286 | 14 | 4.1096 | 16 | 4.0943 | 15 | 4.1556 | 12 | 3.9600 | 13 | 4.0907 | 14 |
| | B. Subtracting | 4.0714 | 15 | 4.0411 | 21 | 4.0566 | 17 | 4.1333 | 16 | 3.9333 | 15 | 4.0440 | 16 |
| | C. Multiplying | 3.9643 | 18 | 3.9178 | 24 | 3.9434 | 19 | 4.0222 | 19 | 3.8133 | 21 | 3.9301 | 18 |
| | D. Dividing | 3.7786 | 23 | 3.6712 | 32 | 3.7358 | 29 | 3.9333 | 23 | 3.7867 | 24 | 3.7720 | 26 |
| | E. Percentage | 3.5857 | 29 | 3.5890 | 36 | 3.5283 | 36 | 3.7778 | 34 | 3.5467 | 32 | 3.5933 | 33 |
| | F. Decimals | 3.4571 | 33 | 3.4521 | 43 | 3.4906 | 38 | 3.8222 | 31 | 3.5333 | 34 | 3.5181 | 35 |
| | G. Other (Please list) | | | | | | | | | | | | |
| 6 | Read and interpret job specifications. | 3.7000 | 27 | 3.7534 | 30 | 3.8491 | 22 | 3.7778 | 35 | 3.5067 | 35 | 3.7021 | 28 |
| 7 | Read and interpret direction labels. | 3.7071 | 26 | 3.8082 | 28 | 3.7736 | 28 | 3.7333 | 37 | 3.4667 | 36 | 3.6917 | 29 |
| 8 | Read and interpret instructional manuals. | 3.8357 | 22 | 3.9726 | 22 | 3.8113 | 26 | 3.8444 | 29 | 3.8000 | 23 | 3.8523 | 22 |
| 9 | Listen to customer complaints. | 3.6929 | 28 | 3.9589 | 23 | 3.9057 | 20 | 3.9111 | 24 | 3.4533 | 37 | 3.7513 | 27 |

| Item No. | Criterion Statement | 5-19 | | 20-49 | | 50-99 | | 100-249 | | 250+ | | TOTAL | |
|----------|---|--------|------|--------|------|--------|------|---------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 10 | Read and interpret safety codes. | 3.3357 | 37 | 3.5342 | 38 | 3.6981 | 31 | 3.9111 | 25 | 3.2667 | 42 | 3.4767 | 38 |
| 11 | Read and interpret service orders. | 3.1957 | 40 | 3.4795 | 40 | 3.0943 | 50 | 3.5778 | 41 | 2.9867 | 49 | 3.2358 | 45 |
| 12 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 3.0500 | 47 | 3.4658 | 41 | 3.3396 | 44 | 3.4667 | 43 | 3.1200 | 44 | 3.2306 | 47 |
| 13 | Read and interpret parts and supply catalogs. | 2.4286 | 56 | 2.8904 | 57 | 2.5283 | 57 | 3.0222 | 56 | 2.5200 | 58 | 2.6166 | 57 |
| 14 | Read and interpret micro-fiche for ordering and maintaining records. | 2.0929 | 58 | 2.5616 | 58 | 2.2264 | 58 | 2.3333 | 58 | 2.6933 | 54 | 2.3446 | 58 |
| 15 | Write orders for supplies, parts. | 2.4000 | 57 | 3.0411 | 56 | 2.8679 | 54 | 2.9556 | 57 | 2.8400 | 52 | 2.7358 | 56 |
| 16 | Develop work schedules. | 3.1643 | 43 | 3.4521 | 44 | 3.3019 | 47 | 3.3111 | 47 | 3.1067 | 45 | 3.2435 | 43 |
| 17 | Complete forms (i.e., order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets.) | 3.4786 | 32 | 3.6301 | 34 | 3.4528 | 39 | 3.9111 | 26 | 3.8267 | 18 | 3.6218 | 32 |
| 18 | Write formal and informal reports legibly. | 3.3786 | 34 | 3.6575 | 33 | 3.3396 | 45 | 3.6000 | 40 | 3.6533 | 28 | 3.5052 | 36 |
| 19 | Use trade terms and symbols appropriate to the occupation. | 3.3643 | 36 | 3.6027 | 35 | 3.5094 | 37 | 3.7111 | 39 | 3.6533 | 29 | 3.5259 | 34 |
| 20 | Write business letters. | 3.0000 | 48 | 3.2055 | 52 | 2.7547 | 56 | 3.1333 | 52 | 3.0533 | 47 | 3.0311 | 52 |
| 21 | Keep accurate records. | 4.0714 | 16 | 4.3425 | 9 | 4.0943 | 16 | 4.2000 | 10 | 4.2933 | 9 | 4.1839 | 12 |
| 22 | Give oral instructions, direct others. | 3.7286 | 25 | 4.0959 | 17 | 3.8491 | 23 | 3.8444 | 30 | 3.5467 | 33 | 3.7927 | 24 |

| Item No. | Criterion Statement | 5-19 | | 20-49 | | 50-99 | | 100-249 | | 250+ | | TOTAL | |
|----------|---|--------|------|--------|------|--------|------|---------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 23 | Use the telephone. | 3.9500 | 19 | 4.0548 | 18 | 4.0000 | 18 | 3.9111 | 27 | 3.7867 | 25 | 3.9404 | 17 |
| 24 | Ask clear and logical questions. | 4.2500 | 10 | 4.2877 | 13 | 4.1887 | 9 | 4.2444 | 9 | 4.0133 | 12 | 4.2021 | 11 |
| 25 | Communicate effectively with customers, co-workers and others. | 4.5714 | 2 | 4.7260 | 2 | 4.5094 | 3 | 4.5111 | 2 | 4.4800 | 4 | 4.5674 | 3 |
| 26 | Make oral reports. | 3.1429 | 44 | 3.4658 | 42 | 3.3019 | 48 | 3.3111 | 48 | 3.2400 | 43 | 3.2642 | 42 |
| 27 | Use basic hand signals. | 1.8929 | 59 | 2.1096 | 59 | 2.0943 | 59 | 2.2000 | 59 | 2.0400 | 59 | 2.0259 | 59 |
| 28 | Operate equipment safely. | 3.3786 | 35 | 3.7123 | 31 | 3.8491 | 24 | 4.1556 | 13 | 3.8133 | 22 | 3.6813 | 30 |
| 29 | Use cleaners correctly. | 2.8000 | 54 | 3.0959 | 53 | 2.9811 | 52 | 3.1333 | 53 | 2.6533 | 55 | 2.8912 | 54 |
| 30 | Clean and repair work areas, equipment, and tools. | 2.9857 | 51 | 3.3973 | 46 | 3.3208 | 46 | 3.3333 | 46 | 3.0133 | 48 | 3.1554 | 49 |
| 31 | Use correct safety and protective gear. | 2.8214 | 53 | 3.4384 | 45 | 3.5849 | 34 | 3.9778 | 22 | 3.3867 | 38 | 3.2876 | 41 |
| 32 | Observe all safety rules and procedures. | 3.4929 | 31 | 3.9041 | 25 | 4.1132 | 14 | 4.1556 | 14 | 3.9600 | 14 | 3.8238 | 23 |
| 33 | Lift and carry objects properly. | 2.9929 | 49 | 3.5753 | 37 | 3.8302 | 25 | 4.0444 | 18 | 3.8267 | 19 | 3.5026 | 37 |
| 34 | Clean and store equipment according to regulations. | 3.0857 | 46 | 3.5068 | 39 | 3.5849 | 35 | 3.7333 | 38 | 3.3467 | 39 | 3.3601 | 40 |
| 35 | Operate business machines (i.e. hand-held calculators, computer). | 3.1857 | 41 | 3.3836 | 47 | 3.3019 | 49 | 3.3778 | 44 | 3.0800 | 46 | 3.2409 | 44 |
| 36 | File business records. | 3.1857 | 42 | 3.3562 | 48 | 3.0943 | 51 | 3.2889 | 51 | 3.2800 | 41 | 3.2358 | 46 |
| 37 | Apply business ethics. | 3.8714 | 21 | 4.2329 | 14 | 3.6604 | 33 | 4.0000 | 20 | 3.8267 | 20 | 3.9171 | 19 |
| 38 | Collect payments. | 2.9429 | 52 | 3.0548 | 55 | 2.8491 | 55 | 3.0667 | 54 | 2.6000 | 56 | 2.8990 | 53 |
| 39 | Develop and maintain good personal relations. | 4.3286 | 7 | 4.5616 | 6 | 4.4906 | 4 | 4.3778 | 7 | 4.3067 | 8 | 4.3964 | 7 |

| Item No. | Criterion Statement | 5-19 | | 20-49 | | 50-99 | | 100-249 | | 250+ | | TOTAL | |
|----------|---|--------|------|--------|------|--------|------|---------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 40 | Relieve or assist other employees during emergencies or rush periods. | 4.2357 | 12 | 4.3425 | 10 | 4.1509 | 12 | 4.1556 | 15 | 4.1333 | 10 | 4.2150 | 10 |
| 41 | Take directions from others. | 4.4286 | 6 | 4.5068 | 7 | 4.4340 | 7 | 4.4889 | 4 | 4.4533 | 5 | 4.4560 | 6 |
| 42 | Assume responsibility. | 4.5357 | 4 | 4.5753 | 5 | 4.4528 | 5 | 4.3556 | 8 | 4.3200 | 7 | 4.4689 | 5 |
| 43 | Cooperate with supervisors. | 4.5571 | 3 | 4.7397 | 1 | 4.5849 | 1 | 4.6444 | 1 | 4.6533 | 1 | 4.6244 | 1 |
| 44 | Has acceptable attitudes towards work. | 4.5857 | 1 | 4.7123 | 3 | 4.4528 | 6 | 4.5111 | 3 | 4.5600 | 2 | 4.5777 | 2 |
| 45 | Provide leadership to others. | 3.8857 | 20 | 4.0548 | 19 | 3.8679 | 21 | 3.8667 | 28 | 3.6800 | 27 | 3.8731 | 21 |
| 46 | Take advantage of personal development opportunities. | 4.0643 | 17 | 4.0548 | 20 | 3.7925 | 27 | 3.8222 | 32 | 3.6400 | 30 | 3.9145 | 20 |
| 47 | Maintain personal cleanliness. | 4.2500 | 11 | 4.3425 | 11 | 4.1698 | 11 | 4.1333 | 17 | 3.9200 | 16 | 4.1788 | 13 |
| 48 | Maintain good health. | 4.2857 | 8 | 4.3014 | 12 | 4.1887 | 10 | 4.2000 | 11 | 4.0533 | 11 | 4.2202 | 9 |
| 49 | Work to insure quality of service or product. | 4.5214 | 5 | 4.6712 | 4 | 4.5283 | 2 | 4.4667 | 5 | 4.5467 | 3 | 4.5492 | 4 |
| 50 | Select appropriate tools and/or equipment to complete the job. | 3.5786 | 30 | 3.8767 | 27 | 3.6981 | 32 | 3.7556 | 36 | 3.5600 | 31 | 3.6684 | 31 |
| 51 | Select appropriate materials to use for job completion. | 3.7429 | 24 | 3.8904 | 26 | 3.7358 | 30 | 3.8000 | 33 | 3.7467 | 26 | 3.7772 | 25 |
| 52 | Inspect work for accuracy and quality. | 4.2857 | 9 | 4.4110 | 8 | 4.2830 | 8 | 4.4444 | 6 | 4.3600 | 6 | 4.3420 | 8 |
| 53 | Diagnose problems and determine solutions. | 4.1857 | 13 | 4.1370 | 15 | 4.1509 | 13 | 4.0000 | 21 | 3.8800 | 17 | 4.0907 | 15 |
| 54 | Troubleshoot simple equipment problems. | 2.9929 | 50 | 3.2466 | 51 | 3.4528 | 40 | 3.5111 | 42 | 2.8667 | 50 | 3.1399 | 51 |

APPENDIX L

RANK ORDER OF CRITERION STATEMENTS ACCORDING TO OVERALL ACCEPTANCE

| Rank Order | Criterion Statement | GRAND MEAN | STANDARD DEVIATION | ANALYSIS OF VARIANCE | | |
|---------------|--|---------------|-----------------------|----------------------|-----------------|-----------------|
| | | | | Ho ₁ | Ho ₂ | Ho ₃ |
| 1 | Cooperate with supervisors. | 4.6244 | .5406 | Retain | Retain | Retain |
| 2 | Has acceptable attitudes towards work. | 4.5777 | .5679 | Retain | Retain | Retain |
| 3 | Communicate effectively with customers, co-workers and others. | 4.5674 | .6502 | Retain | Retain | Retain |
| 4 | Work to insure quality of service or product. | 4.5492 | .6675 | Retain | Retain | Retain |
| 5 | Assume responsibility. | 4.4689 | .7027 | Retain | Retain | Retain |
| 6 | Take directions from others. | 4.4560 | .6718 | Retain | Retain | Retain |
| 7 | Develop and maintain good personal relations. | 4.3964 | .7802 | *Reject | Retain | Retain |
| 8 | Inspect work for accuracy and quality. | 4.3420 | .8449 | Retain | Retain | Retain |
| 9 | Maintain good health. | 4.2202 | .7213 | *Reject | Retain | Retain |
| 10 | Relieve or assist other employees during emergencies or rush periods. | 4.2150 | .8844 | *Reject | Retain | Retain |

| Rank Order | Criterion Statement | GRAND MEAN | STANDARD DEVIATION | ANALYSIS OF VARIANCE | | |
|---------------|---|---------------|-----------------------|----------------------|-----------------|-----------------|
| | | | | Ho ₁ | Ho ₂ | Ho ₃ |
| 11 | Ask clear and logical questions. | 4.2021 | .7800 | Retain | Retain | Retain |
| 12 | Keep accurate records. | 4.1839 | 1.0218 | *Reject | Retain | Retain |
| 13 | Maintain personal cleanliness. | 4.1788 | .8197 | *Reject | Retain | Retain |
| 14 | Computing: Adding | 4.0907 | 1.0267 | *Reject | Retain | Retain |
| 15 | Diagnose problems and determine solutions. | 4.0907 | .9312 | Retain | Retain | Retain |
| 16 | Computing: Subtracting. | 4.0440 | 1.0373 | *Reject | Retain | Retain |
| 17 | Use the telephone. | 3.9404 | 1.0997 | *Reject | Retain | Retain |
| 18 | Computing: Multiplying. | 3.9301 | 1.0849 | *Reject | Retain | Retain |
| 19 | Apply business ethics. | 3.9171 | 1.2330 | *Reject | Retain | Retain |
| 20 | Take advantage of personal development opportunities. | 3.9145 | .8157 | Retain | Retain | Retain |
| 21 | Provide leadership to others. | 3.8731 | .8868 | *Reject | Retain | *Reject |
| 22 | Read and interpret instructional manuals. | 3.8523 | 1.1032 | *Reject | Retain | Retain |

| Rank Order | Criterion Statement | GRAND MEAN | STANDARD DEVIATION | ANALYSIS OF VARIANCE | | |
|---------------|--|---------------|-----------------------|----------------------|-----------------|-----------------|
| | | | | Ho ₁ | Ho ₂ | Ho ₃ |
| 23 | Observe all safety rules and procedures. | 3.8238 | 1.2893 | *Reject | Retain | Retain |
| 24 | Give oral instructions, direct others. | 3.7927 | 1.1252 | *Reject | Retain | Retain |
| 25 | Select appropriate materials to use for job completion. | 3.7772 | 1.0676 | *Reject | Retain | Retain |
| 26 | Computing: Dividing. | 3.7720 | 1.1599 | *Reject | Retain | Retain |
| 27 | Listen to customer complaints. | 3.7513 | 1.2753 | *Reject | Retain | Retain |
| 28 | Read and interpret job specifications. | 3.7021 | 1.1917 | *Reject | Retain | Retain |
| 29 | Read and interpret direction labels. | 3.6917 | 1.1513 | *Reject | Retain | Retain |
| 30 | Operate equipment safely. | 3.6813 | 1.3654 | *Reject | Retain | Retain |
| 31 | Select appropriate tools and/or equipment to complete the job. | 3.6684 | 1.1207 | *Reject | Retain | Retain |
| 32 | Complete forms (i.e., order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets and work sheets.) | 3.6218 | 1.2637 | Retain | Retain | Retain |

| Rank Order | Criterion Statement | GRAND MEAN | STANDARD DEVIATION | ANALYSIS OF VARIANCE | | |
|---------------|--|---------------|-----------------------|----------------------|-----------------|-----------------|
| | | | | Ho ₁ | Ho ₂ | Ho ₃ |
| 33 | Compute using percentages. | 3.5933 | 1.2286 | *Reject | Retain | Retain |
| 34 | Use trade terms and symbols appropriate to the occupation. | 3.5259 | 1.1802 | *Reject | Retain | Retain |
| 35 | Compute using decimals. | 3.5181 | 1.2550 | *Reject | Retain | Retain |
| 36 | Write formal and informal reports legibly. | 3.5052 | 1.2258 | *Reject | Retain | Retain |
| 37 | List and carry objects properly. | 3.5026 | 1.4128 | *Reject | Retain | Retain |
| 38 | Read and interpret safety codes. | 3.4767 | 1.3195 | *Reject | Retain | Retain |
| 39 | Process checks according to company procedures. | 3.3627 | 1.5502 | *Reject | Retain | Retain |
| 40 | Clean and store equipment according to regulations. | 3.3601 | 1.3299 | *Reject | Retain | Retain |
| 41 | Use correct safety and protective gear. | 3.2876 | 1.5750 | *Reject | Retain | Retain |
| 42 | Make oral reports. | 3.2642 | 1.1247 | *Reject | Retain | Retain |
| 43 | Develop work schedules. | 3.2435 | 1.3044 | Retain | Retain | Retain |

| Rank Order | Criterion Statement | GRAND MEAN | STANDARD DEVIATION | ANALYSIS OF VARIANCE | | |
|---------------|--|---------------|-----------------------|----------------------|-----------------|-----------------|
| | | | | Ho ₁ | Ho ₂ | Ho ₃ |
| 44 | Operate business machines (i.e. hand-held calculators, computer). | 3.2409 | 1.2757 | *Reject | Retain | Retain |
| 45 | Read and interpret service orders. | 3.2358 | 1.4537 | *Reject | Retain | Retain |
| 46 | File business records. | 3.2358 | 1.3305 | *Reject | Retain | Retain |
| 47 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 3.2306 | 1.3962 | *Reject | Retain | Retain |
| 48 | Make change accurately. | 3.2047 | 1.6599 | *Reject | Retain | Retain |
| 49 | Clean and repair work areas, equipment, and tools. | 3.1554 | 1.3452 | *Reject | Retain | Retain |
| 50 | Compute sales receipts accurately. | 3.1503 | 1.6111 | *Reject | Retain | Retain |
| 51 | Troubleshoot simple equipment problems. | 3.1399 | 1.3117 | *Reject | Retain | Retain |
| 52 | Write business letters. | 3.0311 | 1.3879 | *Reject | Retain | Retain |
| 53 | Collect payments. | 3.8990 | 1.4639 | *Reject | Retain | *Reject |
| 54 | Use cleaners correctly. | 2.8912 | 1.4553 | *Reject | Retain | Retain |
| 55 | Process credit purchases. | 2.7902 | 1.5425 | *Reject | Retain | Retain |

| Rank Order | Criterion Statement | GRAND MEAN | STANDARD DEVIATION | ANALYSIS OF VARIANCE | | |
|---------------|--|---------------|-----------------------|----------------------|-----------------|-----------------|
| | | | | Ho ₁ | Ho ₂ | Ho ₃ |
| 56 | Write orders for supplies, parts. | 2.7358 | 1.2843 | Retain | Retain | Retain |
| 57 | Read and interpret parts and supply catalogs. | 2.6166 | 1.3244 | *Reject | Retain | Retain |
| 58 | Read and interpret micro-fiche for ordering and maintaining records. | 2.3446 | 1.3781 | *Reject | Retain | Retain |
| 59 | Use basic hand signals. | 2.0259 | 1.1046 | *Reject | Retain | Retain |

APPENDIX M

ACCEPTANCE OF CRITERION STATEMENTS BY OCCUPATIONAL CLUSTER

| Item No. | Criterion Statement | Accounting | | Agriculture | | Child Care | | Construction | | Electricity/ Electronics | |
|----------|---|------------|------|-------------|------|------------|------|--------------|------|--------------------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 1 | Compute sales receipts accurately. | 3.000 | 39 | 3.8696 | 31 | 2.3929 | 52 | 3.0435 | 43 | 2.7619 | 52 |
| 2 | Process credit purchases. | 2.7381 | 43 | 3.5652 | 43 | 2.1429 | 55 | 2.7391 | 49 | 2.4286 | 57 |
| 3 | Make change accurately. | 3.1190 | 35 | 3.7391 | 36 | 3.3214 | 37 | 2.9565 | 44 | 2.5714 | 55 |
| 4 | Process checks according to company procedures. | 3.6429 | 30 | 3.5217 | 46 | 2.9286 | 42 | 2.9565 | 45 | 2.5238 | 56 |
| 5 | Compute by using appropriate methods: (identify skills needed) | | | | | | | | | | |
| | A. Adding | 4.6905 | 2 | 4.4348 | 6 | 3.6071 | 28 | 3.9130 | 17 | 3.6190 | 23 |
| | B. Subtracting | 4.6905 | 3 | 4.4348 | 7 | 3.6071 | 29 | 3.7391 | 24 | 3.6190 | 24 |
| | C. Multiplying | 4.6429 | 4 | 4.4348 | 8 | 3.4286 | 33 | 3.6087 | 32 | 3.6190 | 25 |
| | D. Dividing | 4.6429 | 5 | 4.2174 | 17 | 2.9643 | 40 | 3.4783 | 34 | 3.6190 | 26 |
| | E. Percentage | 4.4762 | 12 | 4.0435 | 23 | 2.7857 | 46 | 3.2174 | 38 | 3.4286 | 37 |
| | F. Decimals | 4.4048 | 16 | 4.1739 | 18 | 2.8571 | 43 | 2.9130 | 47 | 3.5238 | 31 |
| | G. Other (Please list) | | | | | | | | | | |
| 6 | Read and interpret job specifications. | 3.0952 | 36 | 3.6522 | 40 | 3.6786 | 26 | 3.7826 | 21 | 4.0476 | 11 |
| 7 | Read and interpret direction labels. | 2.8810 | 40 | 4.0000 | 24 | 4.0000 | 20 | 3.7391 | 25 | 3.8571 | 17 |
| 8 | Read and interpret instructional manuals. | 3.8810 | 41 | 3.7826 | 34 | 3.8929 | 23 | 3.4348 | 35 | 3.8095 | 19 |
| 9 | Listen to customer complaints. | 3.3095 | 34 | 3.5652 | 44 | 4.2857 | 17 | 2.9565 | 46 | 3.0000 | 47 |

| Item No. | Criterion Statement | <u>Accounting</u> | | <u>Agriculture</u> | | <u>Child Care</u> | | <u>Construction</u> | | <u>Electricity Electronics</u> | |
|----------|---|-------------------|------|--------------------|------|-------------------|------|---------------------|------|--------------------------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 10 | Read and interpret safety codes. | 1.9524 | 49 | 3.6522 | 41 | 4.3214 | 15 | 3.6522 | 30 | 3.4762 | 32 |
| 11 | Read and interpret service orders. | 2.1667 | 47 | 3.5652 | 45 | 2.2143 | 53 | 3.2174 | 39 | 3.5714 | 30 |
| 12 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 2.6667 | 44 | 3.0435 | 54 | 2.0000 | 56 | 3.6957 | 28 | 4.0952 | 9 |
| 13 | Read and interpret parts and supply catalogs. | 1.6667 | 54 | 3.0000 | 56 | 1.9286 | 57 | 2.4348 | 55 | 3.4762 | 33 |
| 14 | Read and interpret micro-fiche for ordering and maintaining records. | 2.2857 | 46 | 2.6087 | 58 | 1.3571 | 59 | 2.0000 | 59 | 2.7143 | 53 |
| 15 | Write orders for supplies, parts. | 1.6667 | 55 | 3.0435 | 55 | 2.1786 | 54 | 2.5217 | 53 | 3.0952 | 45 |
| 16 | Develop work schedules. | 2.8333 | 42 | 3.4783 | 47 | 3.3929 | 35 | 3.1304 | 40 | 2.9524 | 49 |
| 17 | Complete forms (i.e., order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets.) | 3.7619 | 27 | 3.9130 | 28 | 2.9643 | 41 | 3.7826 | 22 | 3.2381 | 42 |
| 18 | Write formal and informal reports legibly. | 4.2143 | 21 | 3.4783 | 48 | 3.2857 | 39 | 2.6957 | 50 | 3.1905 | 43 |
| 19 | Use trade terms and symbols appropriate to the occupation. | 3.3810 | 33 | 3.6522 | 42 | 2.6429 | 48 | 3.1304 | 41 | 3.4762 | 34 |
| 20 | Write business letters. | 3.7143 | 29 | 3.0870 | 52 | 2.6071 | 50 | 2.2174 | 58 | 2.7143 | 54 |
| 21 | Keep accurate records. | 4.7619 | 1 | 4.2609 | 15 | 4.0714 | 19 | 3.5652 | 33 | 3.7619 | 21 |
| 22 | Give oral instructions, direct others. | 3.7619 | 28 | 3.9565 | 25 | 4.3214 | 16 | 3.4348 | 36 | 3.1429 | 44 |
| 23 | Use the telephone. | 4.2381 | 20 | 3.8696 | 32 | 3.9286 | 22 | 3.0870 | 42 | 3.3333 | 39 |
| 24 | Ask clear and logical questions. | 4.4286 | 15 | 4.0870 | 20 | 4.1786 | 18 | 3.8261 | 19 | 4.0000 | 14 |

| Item No. | Criterion Statement | Accounting | | Agriculture | | Child Care | | Construction | | Electricity/ Electronics | |
|----------|---|------------|------|-------------|------|------------|------|--------------|------|--------------------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 25 | Communicate effectively with customers, co-workers and others. | 4.4524 | 14 | 4.3478 | 12 | 4.7143 | 8 | 4.2609 | 10 | 4.3810 | 4 |
| 26 | Make oral reports. | 3.5714 | 32 | 2.9130 | 57 | 3.4286 | 34 | 2.6522 | 51 | 3.0000 | 48 |
| 27 | Use basic hand signals. | 1.3095 | 59 | 2.2174 | 59 | 1.9286 | 58 | 2.6522 | 52 | 2.0476 | 59 |
| 28 | Operate equipment safely. | 1.7857 | 50 | 4.2609 | 16 | 3.3214 | 38 | 4.5652 | 4 | 4.1905 | 8 |
| 29 | Use cleaners correctly. | 1.3333 | 57 | 3.8261 | 33 | 3.5714 | 30 | 2.8696 | 48 | 3.0952 | 46 |
| 30 | Clean and repair work areas, equipment, and tools. | 1.6905 | 53 | 3.7391 | 37 | 3.3929 | 36 | 3.7391 | 26 | 3.3333 | 40 |
| 31 | Use correct safety and protective gear. | 1.3333 | 58 | 4.3478 | 13 | 2.6429 | 49 | 4.2609 | 11 | 4.0476 | 12 |
| 32 | Observe all safety rules and procedures. | 2.1429 | 48 | 4.3913 | 9 | 4.3571 | 14 | 4.4348 | 7 | 4.3333 | 5 |
| 33 | Lift and carry objects properly. | 1.7143 | 52 | 3.9130 | 29 | 2.8571 | 44 | 4.1304 | 14 | 3.9048 | 16 |
| 34 | Clean and store equipment according to regulations. | 1.6667 | 56 | 3.9130 | 30 | 3.8571 | 25 | 3.7826 | 23 | 3.4762 | 35 |
| 35 | Operate business machines (i.e. hand-held calculators, computer). | 4.2857 | 18 | 3.4348 | 49 | 2.5357 | 51 | 2.5217 | 54 | 2.9048 | 50 |
| 36 | File business records. | 4.0476 | 25 | 3.2609 | 51 | 2.8214 | 45 | 2.3913 | 56 | 2.8571 | 51 |
| 37 | Apply business ethics. | 4.6429 | 6 | 4.0870 | 21 | 3.5357 | 32 | 3.2609 | 37 | 3.2857 | 41 |
| 38 | Collect payments. | 3.0238 | 38 | 3.0870 | 53 | 3.5714 | 31 | 3.2609 | 57 | 2.0952 | 58 |
| 39 | Develop and maintain good personal relations. | 4.4762 | 13 | 4.3913 | 10 | 4.8214 | 4 | 4.1304 | 15 | 3.8571 | 18 |
| 40 | Relieve or assist other employees during emergencies or rush periods. | 4.1905 | 22 | 4.3913 | 11 | 4.7500 | 7 | 4.1739 | 13 | 3.6190 | 27 |

| Item No. | Criterion Statement | Accounting | | Agriculture | | Child Care | | Construction | | Electricity/ Electronics | |
|----------|--|------------|------|-------------|------|------------|------|--------------|------|--------------------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 41 | Take directions from others. | 4.4048 | 17 | 4.5217 | 4 | 4.7857 | 5 | 4.6087 | 1 | 4.0476 | 13 |
| 42 | Assume responsibility. | 4.5476 | 10 | 4.5652 | 3 | 4.8929 | 1 | 4.3478 | 8 | 4.2857 | 7 |
| 43 | Cooperate with supervisors. | 4.6190 | 7 | 4.6087 | 2 | 4.8929 | 2 | 4.6087 | 2 | 4.4286 | 2 |
| 44 | Has acceptable attitudes towards work. | 4.5476 | 11 | 4.5217 | 5 | 4.8929 | 3 | 4.6087 | 3 | 4.4286 | 3 |
| 45 | Provide leadership to others. | 3.5952 | 31 | 3.9565 | 26 | 4.5000 | 12 | 3.8696 | 18 | 3.6190 | 28 |
| 46 | Take advantage of personal development opportunities. | 3.9762 | 26 | 3.6957 | 38 | 4.7143 | 9 | 3.8261 | 20 | 3.4762 | 36 |
| 47 | Maintain personal cleanliness. | 4.2619 | 19 | 4.1304 | 19 | 4.7857 | 6 | 3.6522 | 31 | 3.4286 | 38 |
| 48 | Maintain good health. | 4.0714 | 24 | 4.0870 | 22 | 4.6429 | 10 | 3.9565 | 16 | 3.6190 | 29 |
| 49 | Work to insure quality of service or product. | 4.5952 | 8 | 4.6957 | 1 | 4.5714 | 11 | 4.4783 | 6 | 4.3333 | 6 |
| 50 | Select appropriate tools and/or equipment to complete the job. | 2.6429 | 45 | 3.6957 | 39 | 3.8929 | 24 | 4.3043 | 9 | 3.9524 | 15 |
| 51 | Select appropriate materials to use for job completion. | 3.0952 | 37 | 3.7826 | 35 | 3.9643 | 21 | 4.2609 | 12 | 3.8095 | 20 |
| 52 | Inspect work for accuracy and quality. | 4.5714 | 9 | 4.3043 | 14 | 3.6786 | 27 | 4.5217 | 5 | 4.4762 | 1 |
| 53 | Diagnose problems and determine solutions. | 4.1190 | 23 | 3.9565 | 27 | 4.4643 | 13 | 3.7391 | 27 | 4.0952 | 10 |
| 54 | Troubleshoot simple equipment problems. | 1.7381 | 51 | 3.4348 | 50 | 2.7857 | 47 | 3.6957 | 29 | 3.6667 | 22 |

APPENDIX M--Continued

| Item No. | Criterion Statement | Food Service | | Forest Products | | Graphics Communications | | Health Occupations | | Industrial Mechanics | |
|----------|---|--------------|------|-----------------|------|-------------------------|------|--------------------|------|----------------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 1 | Compute sales receipts accurately | 4.6471 | 5 | 3.3600 | 49 | 3.0000 | 51 | 3.0732 | 53 | 2.8846 | 52 |
| 2 | Process credit purchases. | 3.3529 | 44 | 3.2400 | 51 | 2.5652 | 56 | 2.5854 | 56 | 2.8462 | 53 |
| 3 | Make change accurately. | 4.7059 | 1 | 2.7200 | 58 | 2.8696 | 55 | 3.4878 | 44 | 2.6154 | 56 |
| 4 | Process checks according to company procedures. | 4.4118 | 12 | 3.9200 | 26 | 3.0000 | 52 | 3.5366 | 39 | 3.0000 | 51 |
| 5 | Compute by using appropriate methods: (Identify skills needed) | | | | | | | | | | |
| | A. Adding | 4.3529 | 15 | 4.4000 | 7 | 4.3043 | 9 | 4.1463 | 21 | 3.9231 | 29 |
| | B. Subtracting | 4.0588 | 21 | 4.4000 | 8 | 4.3043 | 10 | 4.0488 | 24 | 3.8077 | 35 |
| | C. Multiplying | 3.5882 | 37 | 4.3600 | 10 | 4.2174 | 13 | 3.8293 | 34 | 3.8462 | 30 |
| | D. Dividing | 3.2353 | 47 | 4.3600 | 11 | 4.0435 | 17 | 3.6341 | 36 | 3.6154 | 39 |
| | E. Percentage | 3.0000 | 49 | 4.1600 | 19 | 3.9130 | 21 | 3.2927 | 47 | 3.3846 | 44 |
| | F. Decimals | 2.8235 | 53 | 3.9200 | 27 | 3.6957 | 35 | 3.2927 | 48 | 3.4615 | 43 |
| | G. Other (Please list) | | | | | | | | | | |
| 6 | Read and interpret job specifications. | 3.7059 | 36 | 3.5600 | 41 | 4.2609 | 11 | 4.1220 | 22 | 4.3846 | 19 |
| 7 | Read and interpret direction labels. | 3.8235 | 33 | 3.4400 | 47 | 3.6957 | 36 | 4.4390 | 11 | 4.4231 | 15 |
| 8 | Read and interpret instructional manuals. | 3.7647 | 35 | 3.5600 | 42 | 3.9565 | 19 | 4.4390 | 12 | 3.3462 | 46 |
| 9 | Listen to customer complaints. | 4.5294 | 11 | 3.4000 | 48 | 3.3913 | 42 | 4.2439 | 16 | 3.8077 | 36 |
| 10 | Read and interpret safety codes. | 3.9412 | 27 | 4.2000 | 17 | 3.4783 | 40 | 3.9756 | 28 | 4.2692 | 21 |

| Item No. | Criterion Statement | Food Service | | Forest Products | | Graphics Communications | | Health Occupations | | Industrial Mechanics | |
|----------|---|--------------|------|-----------------|------|-------------------------|------|--------------------|------|----------------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 11 | Read and interpret service orders. | 4.0588 | 22 | 3.1600 | 52 | 3.8696 | 23 | 3.6829 | 35 | 4.5769 | 7 |
| 12 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 2.7647 | 54 | 3.4800 | 45 | 3.8696 | 24 | 3.5122 | 42 | 4.2308 | 22 |
| 13 | Read and interpret parts and supply catalogs. | 2.1176 | 57 | 3.0400 | 54 | 3.5652 | 39 | 2.5366 | 58 | 4.0385 | 27 |
| 14 | Read and interpret micro-fiche for ordering and maintaining records. | 1.8235 | 59 | 2.1200 | 59 | 1.6522 | 58 | 2.5610 | 57 | 3.3462 | 47 |
| 15 | Write orders for supplies, parts. | 2.8824 | 51 | 3.0400 | 55 | 2.9565 | 54 | 3.0732 | 54 | 3.2308 | 50 |
| 16 | Develop work schedules. | 3.4118 | 41 | 3.8000 | 34 | 3.3478 | 46 | 3.4390 | 45 | 3.3846 | 45 |
| 17 | Complete forms (i.e., order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets.) | 3.1765 | 48 | 4.0000 | 24 | 3.7391 | 31 | 3.5854 | 38 | 3.6154 | 40 |
| 18 | Write formal and informal reports legibly. | 2.8824 | 52 | 3.4800 | 46 | 3.4348 | 41 | 3.6098 | 37 | 3.5769 | 41 |
| 19 | Use trade terms and symbols appropriate to the occupation. | 3.4118 | 42 | 3.7600 | 35 | 3.6522 | 37 | 4.0976 | 23 | 3.8077 | 37 |
| 20 | Write business letters. | 2.1176 | 58 | 3.5200 | 43 | 2.6522 | 38 | 2.9024 | 55 | 2.4615 | 57 |
| 21 | Keep accurate records. | 3.5882 | 38 | 4.3200 | 16 | 3.9130 | 22 | 4.6585 | 4 | 3.5385 | 42 |
| 22 | Give oral instructions, direct others. | 3.8235 | 34 | 4.2000 | 18 | 3.8261 | 29 | 4.0244 | 27 | 3.3077 | 49 |
| 23 | Use the telephone. | 3.8824 | 29 | 3.7600 | 36 | 3.8696 | 25 | 4.1707 | 18 | 3.3462 | 48 |
| 24 | Ask clear and logical questions. | 4.0000 | 25 | 3.9200 | 28 | 4.2174 | 14 | 4.2927 | 14 | 4.1538 | 23 |
| 25 | Communicate effectively with customers, co-workers and others. | 4.7059 | 2 | 4.5200 | 2 | 4.4348 | 6 | 4.7317 | 1 | 4.6538 | 4 |

| Item | Criterion Statement | Food Service | | Forest Products | | Graphics Communications | | Health Occupations | | Industrial Mechanics | |
|------|---|--------------|------|-----------------|------|-------------------------|------|--------------------|------|----------------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 26 | Make oral reports. | 3.2941 | 46 | 3.6000 | 39 | 3.0000 | 53 | 3.5122 | 43 | 3.8462 | 31 |
| 27 | Use basic hand signals. | 2.3529 | 56 | 2.9200 | 56 | 1.6522 | 59 | 1.8049 | 59 | 2.1923 | 59 |
| 28 | Operate equipment safely. | 4.2353 | 17 | 4.4000 | 9 | 3.9565 | 20 | 3.9756 | 29 | 4.5000 | 12 |
| 29 | Use cleaners correctly. | 4.0000 | 26 | 2.8000 | 57 | 3.3913 | 43 | 3.1463 | 51 | 3.6923 | 38 |
| 30 | Clean and repair work areas, equipment, and tools. | 3.8924 | 30 | 3.7200 | 38 | 3.3913 | 44 | 3.5366 | 40 | 3.8462 | 32 |
| 31 | Use correct safety and protective gear. | 3.5882 | 39 | 4.3600 | 12 | 3.3043 | 47 | 3.3902 | 46 | 4.5769 | 8 |
| 32 | Observe all safety rules and procedures. | 4.1765 | 20 | 4.4800 | 4 | 3.8696 | 26 | 4.0488 | 25 | 4.5385 | 10 |
| 33 | Lift and carry objects properly. | 4.2353 | 18 | 4.3600 | 13 | 3.1304 | 50 | 4.1707 | 19 | 4.4615 | 14 |
| 34 | Clean and store equipment according to regulations. | 3.8824 | 31 | 3.7600 | 37 | 3.2609 | 49 | 4.0488 | 26 | 4.0769 | 25 |
| 35 | Operate business machines (i.e. hand-held calculators, computer). | 3.3529 | 45 | 3.3200 | 50 | 3.3913 | 45 | 3.1220 | 52 | 2.7308 | 54 |
| 36 | File business records. | 2.5882 | 55 | 3.5200 | 44 | 3.3043 | 48 | 3.5366 | 41 | 2.6538 | 55 |
| 37 | Apply business ethics. | 3.5882 | 40 | 3.8400 | 32 | 3.8696 | 27 | 4.1707 | 20 | 3.8462 | 33 |
| 38 | Collect payments. | 3.4118 | 43 | 3.1600 | 53 | 2.3913 | 57 | 3.2439 | 50 | 2.4231 | 58 |
| 39 | Develop and maintain good personal relations. | 4.5882 | 9 | 4.3600 | 14 | 4.0870 | 16 | 4.5854 | 7 | 4.3846 | 20 |
| 40 | Relieve or assist other employees during emergencies or rush periods. | 4.7059 | 3 | 4.0000 | 25 | 4.3478 | 8 | 4.4634 | 9 | 4.0385 | 28 |
| 41 | Take directions from others. | 4.7059 | 4 | 4.3600 | 15 | 4.4348 | 7 | 4.4634 | 10 | 4.5769 | 9 |
| 42 | Assume responsibility. | 4.2941 | 16 | 4.4400 | 6 | 4.5217 | 4 | 4.5122 | 8 | 4.4231 | 16 |

| Item No. | Criterion Statement | Food Service | | Forest Products | | Graphics Communications | | Health Occupations | | Industrial Mechanics | |
|----------|--|--------------|------|-----------------|------|-------------------------|------|--------------------|------|----------------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 43 | Cooperate with supervisors. | 4.6471 | 6 | 4.5200 | 3 | 4.5217 | 5 | 4.6829 | 2 | 4.6154 | 6 |
| 44 | Has acceptable attitudes towards work. | 4.5882 | 10 | 4.4800 | 5 | 4.5652 | 2 | 4.6341 | 5 | 4.6538 | 5 |
| 45 | Provide leadership to others. | 3.9412 | 28 | 4.1200 | 22 | 3.8696 | 28 | 3.9756 | 30 | 3.8462 | 34 |
| 46 | Take advantage of personal development opportunities. | 3.8824 | 32 | 3.9200 | 29 | 3.7391 | 32 | 3.9512 | 31 | 4.0769 | 26 |
| 47 | Maintain personal cleanliness. | 4.6471 | 7 | 3.6000 | 40 | 4.0435 | 18 | 4.6341 | 6 | 4.1154 | 24 |
| 48 | Maintain good health. | 4.1118 | 13 | 4.1600 | 20 | 4.1739 | 15 | 4.4390 | 13 | 4.4231 | 17 |
| 49 | Work to insure quality of service or product. | 4.6471 | 8 | 4.5600 | 1 | 4.6957 | 1 | 4.6829 | 3 | 4.6923 | 2 |
| 50 | Select appropriate tools and/or equipment to complete the job. | 4.2353 | 19 | 3.9200 | 30 | 3.7391 | 33 | 3.8537 | 33 | 4.4231 | 18 |
| 51 | Select appropriate materials to use for job completion. | 4.0588 | 23 | 3.9200 | 31 | 3.7826 | 30 | 3.9512 | 32 | 4.5000 | 13 |
| 52 | Inspect work for accuracy and quality. | 4.4118 | 14 | 4.0800 | 23 | 4.5652 | 3 | 4.2683 | 15 | 4.7692 | 1 |
| 53 | Diagnose problems and determine solutions. | 4.0588 | 24 | 4.1600 | 21 | 4.2609 | 12 | 4.1463 | 17 | 4.6923 | 3 |
| 54 | Troubleshoot simple equipment problems. | 2.9412 | 50 | 3.8400 | 33 | 3.7391 | 34 | 3.2927 | 49 | 4.5385 | 11 |

APPENDIX M--Continued

| Item No. | Criterion Statement | Marketing | | Metals | | Secretarial | | Service Occupations | | Grand Total | |
|----------|---|-----------|------|--------|------|-------------|------|---------------------|------|-------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 1 | Compute sales receipts accurately. | 4.1935 | 11 | 2.4211 | 56 | 2.8684 | 45 | 3.0345 | 50 | 3.1503 | 50 |
| 2 | Process credit purchases. | 3.9677 | 18 | 2.3158 | 57 | 2.3684 | 54 | 2.4828 | 57 | 2.7902 | 55 |
| 3 | Make change accurately. | 4.1935 | 12 | 2.5789 | 51 | 2.9474 | 41 | 3.0690 | 48 | 3.2047 | 48 |
| 4 | Process checks according to company procedures. | 4.1290 | 15 | 2.6316 | 50 | 3.3684 | 33 | 3.1034 | 47 | 3.3627 | 39 |
| 5 | Compute by using appropriate methods: (identify skills needed) | | | | | | | | | | |
| | A. Adding | 4.1290 | 16 | 4.2105 | 15 | 3.7632 | 25 | 3.6897 | 27 | 4.0907 | 14 |
| | B. Subtracting | 4.0323 | 17 | 4.2105 | 16 | 3.7895 | 24 | 3.6897 | 28 | 4.0440 | 16 |
| | C. Multiplying | 3.9032 | 24 | 4.1053 | 19 | 3.6842 | 26 | 3.5172 | 34 | 3.9301 | 18 |
| | D. Dividing | 3.8710 | 26 | 3.8421 | 26 | 3.5000 | 29 | 3.4138 | 38 | 3.7720 | 26 |
| | E. Percentage | 3.9677 | 19 | 3.4211 | 37 | 3.4474 | 30 | 3.2759 | 42 | 3.5933 | 33 |
| | F. Decimals | 3.6129 | 31 | 3.8421 | 27 | 3.1842 | 36 | 3.2414 | 44 | 3.5181 | 35 |
| | G. Other (Please list) | | | | | | | | | | |
| 6 | Read and interpret job specifications. | 3.3548 | 36 | 4.2105 | 17 | 3.0526 | 38 | 3.6897 | 29 | 3.7021 | 28 |
| 7 | Read and interpret direction labels. | 3.3548 | 37 | 3.4211 | 38 | 3.4211 | 31 | 3.4828 | 36 | 3.6917 | 29 |
| 8 | Read and interpret instructional manuals. | 3.4839 | 32 | 3.4211 | 39 | 3.6842 | 27 | 4.0345 | 20 | 3.8523 | 22 |
| 9 | Listen to customer complaints. | 4.1935 | 13 | 2.8947 | 45 | 4.0263 | 17 | 4.3103 | 14 | 3.7513 | 27 |
| 10 | Read and interpret safety codes. | 3.0645 | 45 | 3.8947 | 24 | 2.5263 | 51 | 3.6897 | 30 | 3.4767 | 38 |

| Item No. | Criterion Statement | Marketing | | Metals | | Secretarial | | Service Occupations | | Grand Total | |
|----------|---|-----------|------|--------|------|-------------|------|---------------------|------|-------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 11 | Read and interpret service orders. | 3.0323 | 47 | 2.8421 | 48 | 3.0000 | 39 | 3.3103 | 40 | 3.2358 | 45 |
| 12 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 3.0323 | 48 | 4.3158 | 11 | 2.5263 | 52 | 3.0690 | 49 | 3.2306 | 47 |
| 13 | Read and interpret parts and supply catalogs. | 2.6452 | 55 | 2.8947 | 46 | 2.2368 | 55 | 2.1724 | 59 | 2.6166 | 57 |
| 14 | Read and interpret micro-fiche for ordering and maintaining records. | 2.3226 | 58 | 1.7895 | 59 | 2.9211 | 42 | 2.6552 | 54 | 2.3446 | 58 |
| 15 | Write orders for supplies, parts. | 3.0000 | 49 | 2.9474 | 44 | 2.8421 | 47 | 2.4828 | 58 | 2.7358 | 56 |
| 16 | Develop work schedules. | 3.0645 | 46 | 3.0000 | 43 | 3.0789 | 37 | 3.1303 | 46 | 3.2435 | 43 |
| 17 | Complete forms (i.e., order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets.) | 3.2903 | 39 | 3.7895 | 28 | 3.9474 | 19 | 3.6897 | 31 | 3.6218 | 32 |
| 18 | Write formal and informal reports legibly. | 3.3226 | 38 | 2.8421 | 49 | 3.8947 | 21 | 3.9310 | 21 | 3.5052 | 36 |
| 19 | Use trade terms and symbols appropriate to the occupation. | 3.4194 | 35 | 3.4737 | 35 | 3.4474 | 20 | 3.7931 | 24 | 3.5259 | 34 |
| 20 | Write business letters. | 2.7742 | 54 | 2.4737 | 53 | 4.2368 | 12 | 3.4483 | 37 | 3.0311 | 52 |
| 21 | Keep accurate records. | 3.9677 | 20 | 4.0000 | 22 | 4.5000 | 5 | 4.4828 | 7 | 4.1839 | 12 |
| 22 | Give oral instructions, direct others. | 3.7742 | 29 | 3.6316 | 32 | 3.3684 | 34 | 4.3448 | 12 | 3.7927 | 24 |
| 23 | Use the telephone. | 4.1613 | 14 | 3.1053 | 42 | 4.6579 | 2 | 4.5172 | 6 | 3.9404 | 17 |
| 24 | Ask clear and logical questions. | 4.2258 | 10 | 4.2632 | 13 | 4.3421 | 9 | 4.4483 | 9 | 4.2021 | 11 |
| 25 | Communicate effectively with customers, co-workers and others. | 4.7097 | 1 | 4.4737 | 7 | 4.6842 | 1 | 4.6552 | 1 | 4.5674 | 3 |

| Item No. | Criterion Statement | Marketing | | Metals | | Secretarial | | Service Occupations | | Grand Total | |
|----------|---|-----------|------|--------|------|-------------|------|---------------------|------|-------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 26 | Make oral reports. | 2.9032 | 50 | 2.8947 | 47 | 2.8684 | 46 | 3.7931 | 25 | 3.2642 | 42 |
| 27 | Use basic hand signals. | 1.8710 | 59 | 2.1053 | 58 | 1.6842 | 59 | 2.5517 | 55 | 2.0259 | 59 |
| 28 | Operate equipment safely. | 3.2258 | 41 | 4.6316 | 2 | 2.8947 | 43 | 3.8276 | 23 | 3.6813 | 30 |
| 29 | Use cleaners correctly. | 2.6452 | 56 | 3.3158 | 40 | 2.1579 | 56 | 2.5172 | 56 | 2.8912 | 54 |
| 30 | Clean and repair work areas, equipment, and tools. | 2.8710 | 51 | 3.7368 | 31 | 2.1316 | 57 | 3.0000 | 51 | 3.1554 | 49 |
| 31 | Use correct safety and protective gear. | 2.8710 | 52 | 4.4211 | 9 | 1.9211 | 58 | 3.6552 | 32 | 3.2876 | 41 |
| 32 | Observe all safety rules and procedures. | 3.4839 | 33 | 4.5263 | 4 | 2.8947 | 44 | 3.7931 | 26 | 3.8238 | 23 |
| 33 | Lift and carry objects properly. | 3.6774 | 30 | 4.4211 | 10 | 2.6053 | 49 | 3.3103 | 41 | 3.5026 | 37 |
| 34 | Clean and store equipment according to regulations. | 3.1613 | 44 | 3.7895 | 29 | 2.5000 | 53 | 3.3448 | 39 | 3.3601 | 40 |
| 35 | Operate business machines (i.e. hand-held calculators, computer). | 3.1935 | 42 | 2.5789 | 52 | 3.8158 | 23 | 3.1724 | 45 | 3.2409 | 44 |
| 36 | File business records. | 2.9065 | 53 | 2.4737 | 54 | 4.1842 | 14 | 3.2759 | 43 | 3.2358 | 46 |
| 37 | Apply business ethics. | 3.9677 | 21 | 3.2632 | 41 | 4.1053 | 16 | 4.2069 | 18 | 3.9171 | 19 |
| 38 | Collect payments. | 3.2581 | 40 | 2.4737 | 55 | 2.8421 | 48 | 2.7931 | 53 | 2.8990 | 53 |
| 39 | Develop and maintain good personal relations. | 4.3871 | 5 | 4.0526 | 20 | 4.4474 | 8 | 4.5317 | 5 | 4.3964 | 7 |
| 40 | Relieve or assist other employees during emergencies or rush periods. | 3.9355 | 23 | 3.9474 | 23 | 4.0263 | 18 | 4.3793 | 10 | 4.2150 | 10 |
| 41 | Take directions from others. | 4.2903 | 9 | 4.5263 | 5 | 4.4737 | 6 | 4.2759 | 15 | 4.4560 | 6 |
| 42 | Assume responsibility. | 4.4516 | 4 | 4.2105 | 18 | 4.2632 | 11 | 4.6207 | 3 | 4.4689 | 5 |

| Item No. | Criterion Statement | Marketing | | Metals | | Secretarial | | Service Occupations | | Grand Total | |
|----------|--|-----------|------|--------|------|-------------|------|---------------------|------|-------------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 43 | Cooperate with supervisors. | 4.5806 | 2 | 4.6842 | 1 | 4.6053 | 3 | 4.6552 | 2 | 4.6244 | 1 |
| 44 | Has acceptable attitudes towards work. | 4.5806 | 3 | 4.4737 | 8 | 4.5526 | 4 | 4.4828 | 8 | 4.5777 | 2 |
| 45 | Provide leadership to others. | 3.9677 | 22 | 3.6316 | 33 | 3.4211 | 32 | 4.0690 | 19 | 3.8731 | 21 |
| 46 | Take advantage of personal development opportunities. | 3.9032 | 25 | 3.5263 | 34 | 3.8421 | 22 | 3.9310 | 22 | 3.9145 | 20 |
| 47 | Maintain personal cleanliness. | 4.3371 | 6 | 3.4737 | 36 | 4.3158 | 16 | 4.2759 | 16 | 4.1788 | 13 |
| 48 | Maintain good health. | 4.3871 | 7 | 4.0526 | 21 | 4.1842 | 15 | 4.2414 | 17 | 4.2202 | 9 |
| 49 | Work to insure quality of service or product. | 4.3871 | 8 | 4.6316 | 3 | 4.2368 | 13 | 4.5862 | 4 | 4.5492 | 4 |
| 50 | Select appropriate tools and/or equipment to complete the job. | 3.1935 | 43 | 4.2632 | 14 | 3.0000 | 40 | 3.6552 | 33 | 3.6684 | 31 |
| 51 | Select appropriate materials to use for job completion. | 3.4839 | 34 | 4.3158 | 12 | 3.3421 | 35 | 3.5172 | 35 | 3.7772 | 25 |
| 52 | Inspect work for accuracy and quality. | 3.8710 | 27 | 4.5263 | 6 | 4.4737 | 7 | 4.3793 | 11 | 4.3420 | 8 |
| 53 | Diagnose problems and determine solutions. | 3.8065 | 28 | 3.7895 | 30 | 3.6579 | 28 | 4.3448 | 13 | 4.0907 | 15 |
| 54 | Troubleshoot simple equipment problems. | 2.6452 | 57 | 3.8947 | 25 | 2.5526 | 50 | 2.8276 | 52 | 3.1399 | 51 |

APPENDIX N

ACCEPTANCE OF CRITERION STATEMENTS BY REGION

| Item No. | Criterion Statement | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | Grand | |
|----------|--|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 1 | Compute sales receipts accurately. | 3.0909 | 49 | 2.9492 | 51 | 3.0833 | 46 | 3.5652 | 33 | 3.3333 | 44 | 2.9286 | 49 | 3.1503 | 50 |
| 2 | Process credit purchases. | 2.8595 | 53 | 2.5254 | 57 | 2.5417 | 54 | 3.0725 | 51 | 3.0513 | 53 | 2.7143 | 53 | 2.7902 | 55 |
| 3 | Make change accurately. | 3.3140 | 41 | 2.8983 | 53 | 3.2083 | 41 | 3.5507 | 35 | 3.4872 | 38 | 2.3571 | 58 | 3.2047 | 48 |
| 4 | Process checks according to company procedures. | 3.3884 | 38 | 3.2881 | 44 | 3.2500 | 39 | 3.5217 | 37 | 3.5385 | 36 | 2.7143 | 54 | 3.3627 | 39 |
| 5 | Compute by using appropriate methods: (identify skills needed) | | | | | | | | | | | | | | |
| | A. Adding | 4.0744 | 15 | 3.9746 | 15 | 4.0833 | 17 | 4.1739 | 10 | 4.4359 | 8 | 3.7857 | 26 | 4.0907 | 14 |
| | B. Subtracting | 4.0165 | 17 | 3.9239 | 18 | 4.0833 | 18 | 4.1594 | 12 | 4.4103 | 9 | 3.5714 | 35 | 4.0440 | 16 |
| | C. Multiplying | 3.9256 | 19 | 3.8644 | 20 | 3.7917 | 24 | 3.9710 | 15 | 4.2051 | 17 | 3.7143 | 28 | 3.9301 | 18 |
| | D. Dividing | 3.7273 | 26 | 3.6864 | 32 | 3.7083 | 27 | 3.8696 | 17 | 4.1026 | 21 | 3.5000 | 36 | 3.7720 | 26 |
| | E. Percentage | 3.6198 | 30 | 3.5339 | 36 | 3.2917 | 35 | 3.5797 | 32 | 3.8974 | 27 | 3.5000 | 37 | 3.5933 | 33 |
| | F. Decimals | 3.5455 | 33 | 3.4492 | 38 | 3.0833 | 47 | 3.5362 | 36 | 3.8462 | 28 | 3.5000 | 38 | 3.5181 | 35 |
| | G. Other (Please list) | | | | | | | | | | | | | | |
| 6 | Read and interpret job specifications. | 3.6777 | 28 | 3.7542 | 25 | 3.6667 | 28 | 3.7826 | 23 | 3.5385 | 37 | 3.5000 | 39 | 3.7021 | 28 |
| 7 | Read and interpret direction labels. | 3.5455 | 34 | 3.7458 | 26 | 3.2083 | 42 | 3.7826 | 24 | 4.0000 | 23 | 3.9286 | 23 | 3.6917 | 29 |

| Item No. | Criterion Statement | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | Grand | |
|----------|--|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 8 | Read and interpret instructional manuals. | 3.8017 | 24 | 3.9153 | 19 | 3.3333 | 34 | 3.7971 | 22 | 4.2821 | 15 | 3.6429 | 32 | 3.8523 | 22 |
| 9 | Listen to customer complaints. | 3.7934 | 25 | 3.7373 | 30 | 3.9167 | 20 | 3.6377 | 30 | 3.9231 | 25 | 3.3571 | 40 | 3.7513 | 27 |
| 10 | Read and interpret safety codes. | 3.4380 | 36 | 3.4237 | 39 | 3.3750 | 33 | 3.4203 | 39 | 3.6667 | 31 | 4.1429 | 15 | 3.4767 | 38 |
| 11 | Read and interpret service orders. | 3.1157 | 48 | 3.3898 | 40 | 3.0000 | 49 | 3.2754 | 45 | 3.2051 | 49 | 3.2143 | 43 | 3.2358 | 45 |
| 12 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 3.1322 | 47 | 3.5169 | 37 | 2.5417 | 55 | 3.1594 | 47 | 3.2308 | 48 | 3.2857 | 42 | 3.2306 | 47 |
| 13 | Read and interpret parts and supply catalogs. | 2.5372 | 57 | 2.8136 | 54 | 2.1250 | 58 | 2.5652 | 56 | 2.6667 | 56 | 2.5714 | 56 | 2.6166 | 57 |
| 14 | Read and interpret microfiche for ordering and maintaining records. | 2.4050 | 58 | 2.5254 | 58 | 1.9583 | 59 | 2.1014 | 58 | 2.5897 | 57 | 1.4286 | 59 | 2.3446 | 58 |
| 15 | Write orders for supplies, parts. | 2.7025 | 56 | 2.9492 | 52 | 2.5000 | 56 | 2.5652 | 57 | 2.5897 | 58 | 2.8571 | 51 | 2.7358 | 56 |
| 16 | Develop work schedules. | 3.2231 | 44 | 3.3644 | 42 | 3.2083 | 43 | 3.0145 | 52 | 3.2821 | 47 | 3.3571 | 41 | 3.2435 | 43 |
| 17 | Complete forms (i.e. order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets.) | 3.6612 | 29 | 3.7458 | 27 | 3.6250 | 29 | 3.3913 | 40 | 3.3333 | 45 | 4.1429 | 16 | 3.6318 | 32 |

| Item No. | Criterion Statement | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | Grand | |
|----------|--|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 18 | Write formal and informal reports legibly. | 3.5207 | 35 | 3.5847 | 34 | 3.4583 | 32 | 3.3043 | 43 | 3.7179 | 30 | 3.1429 | 44 | 3.5052 | 36 |
| 19 | Use trade terms and symbols appropriate to the occupation. | 3.4380 | 37 | 3.7203 | 29 | 3.2917 | 36 | 3.5652 | 34 | 3.4103 | 41 | 3.1429 | 45 | 3.5259 | 34 |
| 20 | Write business letters. | 3.0413 | 50 | 3.0932 | 49 | 3.2083 | 44 | 2.7971 | 55 | 3.0769 | 52 | 3.0000 | 46 | 3.0311 | 52 |
| 21 | Keep accurate records. | 4.2727 | 10 | 4.2288 | 10 | 4.2083 | 12 | 3.7826 | 25 | 4.3590 | 11 | 4.5000 | 6 | 4.1839 | 12 |
| 22 | Give oral instructions, direct others. | 3.8926 | 21 | 3.8136 | 22 | 3.7500 | 25 | 3.3913 | 41 | 4.1282 | 18 | 3.7857 | 27 | 3.7927 | 24 |
| 23 | Use the telephone. | 4.0909 | 14 | 3.9661 | 16 | 3.8333 | 23 | 3.6667 | 29 | 4.0000 | 24 | 3.7143 | 29 | 3.9404 | 17 |
| 24 | Ask clear and logical questions. | 4.2479 | 12 | 4.2458 | 9 | 4.1250 | 16 | 4.0725 | 14 | 4.2308 | 16 | 4.1429 | 17 | 4.2021 | 11 |
| 25 | Communicate effectively with customers, co-workers and others. | 4.6364 | 2 | 4.5424 | 4 | 4.7083 | 2 | 4.4928 | 2 | 4.5897 | 4 | 4.2857 | 10 | 4.5674 | 3 |
| 26 | Make oral reports. | 3.3140 | 40 | 3.3729 | 41 | 3.5833 | 31 | 2.8696 | 54 | 3.3590 | 43 | 3.0000 | 47 | 3.2642 | 42 |
| 27 | Use basic hand signals. | 2.0579 | 59 | 1.8559 | 59 | 2.2500 | 57 | 2.0580 | 59 | 2.0769 | 59 | 2.5000 | 57 | 2.0259 | 59 |
| 28 | Operate equipment safely. | 3.5702 | 32 | 3.7373 | 31 | 3.6350 | 30 | 3.6957 | 27 | 3.5897 | 34 | 4.4286 | 7 | 3.6813 | 30 |
| 29 | Use cleaners correctly. | 2.8595 | 54 | 2.8136 | 55 | 2.6250 | 53 | 3.0870 | 49 | 3.0256 | 54 | 2.9286 | 50 | 2.8912 | 54 |
| 30 | Clean and repair work areas, equipment, and tools. | 3.0248 | 51 | 3.0678 | 50 | 3.0417 | 48 | 3.2899 | 44 | 3.4615 | 39 | 3.7143 | 30 | 3.1554 | 49 |
| 31 | Use correct safety and protective gear. | 3.2149 | 45 | 3.2627 | 46 | 3.0000 | 50 | 3.3623 | 42 | 3.3077 | 46 | 4.0714 | 20 | 3.2876 | 41 |
| 32 | Observe all safety rules and procedures. | 3.8182 | 23 | 3.7458 | 28 | 3.7500 | 26 | 3.8551 | 19 | 3.7692 | 29 | 4.5714 | 4 | 3.8238 | 23 |

| Item No. | Criterion Statement | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | Grand | |
|----------|---|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 33 | Lift and carry objects properly. | 3.3140 | 42 | 3.5424 | 35 | 3.2917 | 37 | 3.5942 | 31 | 3.6410 | 32 | 4.2143 | 13 | 3.5026 | 37 |
| 34 | Clean and store equipment according to regulations. | 3.1818 | 46 | 3.3305 | 43 | 3.2500 | 40 | 3.4638 | 38 | 3.5641 | 35 | 4.2857 | 11 | 3.3601 | 40 |
| 35 | Operate business machines (i.e. hand-held calculators, computer). | 3.3058 | 43 | 3.2288 | 48 | 2.9583 | 52 | 3.2174 | 46 | 3.4103 | 42 | 3.0000 | 48 | 3.2409 | 44 |
| 36 | File business records. | 3.3636 | 29 | 3.2797 | 45 | 3.1667 | 45 | 3.0870 | 50 | 3.1795 | 50 | 2.8571 | 52 | 3.2358 | 46 |
| 37 | Apply business ethics. | 3.9174 | 20 | 3.9407 | 17 | 4.1667 | 15 | 3.8261 | 20 | 3.9231 | 25 | 3.6429 | 33 | 3.9171 | 19 |
| 38 | Collect payments. | 3.8512 | 55 | 2.8051 | 56 | 3.2917 | 38 | 2.9855 | 53 | 3.0000 | 55 | 2.7143 | 55 | 2.8990 | 53 |
| 39 | Develop and maintain good personal relations. | 4.3884 | 7 | 4.3729 | 8 | 4.5833 | 5 | 4.3623 | 6 | 4.5385 | 6 | 4.0714 | 21 | 4.3964 | 7 |
| 40 | Relieve or assist other employees during emergencies or rush periods. | 4.2562 | 11 | 4.1017 | 14 | 4.4583 | 8 | 4.1739 | 10 | 4.3846 | 10 | 4.1429 | 18 | 4.2150 | 10 |
| 41 | Take directions from others. | 4.4380 | 6 | 4.4068 | 6 | 4.5833 | 6 | 4.4638 | 4 | 4.4615 | 7 | 4.7143 | 2 | 4.4560 | 6 |
| 42 | Assume responsibility. | 4.4463 | 5 | 4.4831 | 5 | 4.6250 | 3 | 4.3623 | 7 | 4.5897 | 5 | 4.4286 | 8 | 4.4689 | 5 |
| 43 | Cooperate with supervisors. | 4.6446 | 1 | 4.6695 | 1 | 4.5833 | 7 | 4.5217 | 1 | 4.6410 | 2 | 4.5714 | 5 | 4.6244 | 1 |
| 44 | Has acceptable attitudes towards work. | 4.6033 | 3 | 4.5508 | 3 | 4.6250 | 4 | 4.4928 | 3 | 4.6154 | 3 | 4.7857 | 1 | 4.5777 | 2 |
| 45 | Provide leadership to others. | 3.8595 | 22 | 3.8390 | 21 | 4.0833 | 19 | 3.6957 | 28 | 4.1282 | 19 | 4.0000 | 22 | 3.8731 | 21 |
| 46 | Take advantage of personal development opportunities. | 3.9752 | 18 | 3.7966 | 24 | 4.2083 | 13 | 3.8696 | 18 | 4.0256 | 22 | 3.8571 | 25 | 3.9145 | 20 |

| Item No. | Criterion Statement | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | Grand | |
|----------|---|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|
| | | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank | Mean | Rank |
| 47 | Maintain personal cleanliness. | 4.2231 | 13 | 4.1102 | 13 | 4.2500 | 11 | 4.1449 | 13 | 4.3590 | 12 | 3.9286 | 24 | 4.1788 | 13 |
| 48 | Maintain good health. | 4.2893 | 9 | 4.1186 | 12 | 4.2083 | 14 | 4.2319 | 9 | 4.3077 | 14 | 4.2857 | 12 | 4.2202 | 9 |
| 49 | Work to insure quality of service or product. | 4.5455 | 4 | 4.5593 | 2 | 4.7500 | 1 | 4.3623 | 5 | 4.6923 | 1 | 4.6429 | 3 | 4.5492 | 4 |
| 50 | Select appropriate tools and/or equipment for job completion. | 3.6116 | 31 | 3.6356 | 33 | 3.8750 | 22 | 3.7536 | 26 | 3.4615 | 40 | 4.2143 | 14 | 3.6684 | 31 |
| 51 | Select appropriate materials to use for job completion. | 3.7025 | 27 | 3.8136 | 23 | 3.9167 | 21 | 3.8116 | 21 | 3.6410 | 33 | 4.1429 | 19 | 3.7772 | 25 |
| 52 | Inspect work for accuracy and quality. | 4.3058 | 8 | 4.3898 | 7 | 4.3750 | 9 | 4.2899 | 8 | 4.3333 | 13 | 4.4286 | 9 | 4.3420 | 8 |
| 53 | Diagnose problems and determine solutions. | 4.0496 | 16 | 4.2288 | 11 | 4.2917 | 10 | 3.9130 | 16 | 4.1282 | 20 | 3.6429 | 34 | 4.0907 | 15 |
| 54 | Troubleshoot simple equipment problems. | 2.9917 | 52 | 3.2373 | 47 | 3.0000 | 51 | 3.1594 | 48 | 3.1026 | 51 | 3.7143 | 31 | 3.1399 | 51 |

APPENDIX O

CRITERION STATEMENTS THAT HAVE COMMON ACCEPTANCE BY ALL CLUSTERS AND SIZES OF FIRMS AT A MEAN RATING >3.50

| Rank Order | Criterion Statement | Grand Mean (All Clusters) |
|---------------|---|---------------------------------|
| 1 | Cooperate with supervisors. | 4.6244 |
| 2 | Has acceptable attitudes towards work. | 4.5777 |
| 3 | Communicate effectively with customers, co-workers and others. | 4.5674 |
| 4 | Work to insure quality of service or product. | 4.5492 |
| 5 | Assume responsibility. | 4.4689 |
| 6 | Take directions from others. | 4.4560 |
| 7 | Develop and maintain good personal relations. | 4.3964 |
| 8 | Inspect work for accuracy and quality. | 4.3420 |
| 9 | Maintain good health. | 4.2202 |
| 10 | Relieve or assist other employees during emergencies or rush periods. | 4.2150 |
| 11 | Ask clear and logical questions. | 4.2021 |
| 12 | Keep accurate records. | 4.1839 |
| 14 | Compute by adding. | 4.0907 |

| Rank Order | Criterion Statement | Grand Mean (All Clusters) |
|---------------|--|---------------------------------|
| 15 | Diagnose problems and determine solutions. | 4.0907 |
| 16 | Compute by subtracting. | 4.0440 |

APPENDIX P

CRITERION STATEMENTS THAT HAVE ACCEPTANCE AT A MEAN RATING >3.5 BUT ARE NOT ACCEPTED BY ALL CLUSTERS

| Rank Order | Criterion Statement | Grand Mean (All Clusters) | Clusters With Mean Ratings Below Average of 3.5 |
|---------------|--|---------------------------------|---|
| 13 | Maintain personal cleanliness. | 4.1788 | Metals, Electricity/Electronics |
| 17 | Use the telephone. | 3.9404 | Construction, Electricity/Electronics, Industrial Mechanics, Metals |
| 18 | Computation by multiplying. | 3.9301 | Child Care |
| 19 | Apply business ethics. | 3.9171 | Construction, Electricity/Electronics, Metals |
| 20 | Take advantage of personal development opportunities | 3.9145 | Electricity/Electronics |
| 21 | Provide leadership to others. | 3.8731 | Secretarial |
| 22 | Read and interpret instructional manuals. | 3.8523 | Industrial Mechanics, Marketing, Metals, Construction |
| 23 | Observe all safety rules and procedures. | 3.8238 | Accounting, Marketing, Secretarial |
| 24 | Give oral instructions, direct others. | 3.7927 | Construction, Electricity/Electronics, Industrial Mechanics, Secretarial |
| 25 | Select appropriate materials to use for job completion. | 3.7772 | Accounting, Marketing, Secretarial |
| 26 | Computing by dividing. | 3.7720 | Child Care, Construction, Food Service, Service Occupations |
| 27 | Listen to customer complaints. | 3.7513 | Accounting, Construction, Electricity/Electronics, Forest Products, Graphics, Metals |
| 28 | Read and interpret job specifications. | 3.7021 | Accounting, Marketing, Secretarial |
| 29 | Read and interpret direction labels. | 3.6917 | Accounting, Forest Products, Marketing, Metals, Secretarial, Service Occupations |
| 30 | Operate equipment safely. | 3.6813 | Accounting, Child Care, Marketing, Secretarial |

| Rank Order | Criterion Statement | Grand Mean (All Clusters) | Clusters With Mean Rating Below Average of 3.5 |
|------------|---|------------------------------|---|
| 31 | Select appropriate tools and/or equipment to complete the job. | 3.6684 | Accounting, Marketing, Secretarial |
| 32 | Complete forms (i.e., order, cost estimate, accounting record forms, inventory reports, safety reports, various records and report, time tickets, work sheets.) | 3.6218 | Child Care, Electricity/Electronics, Food Service, Marketing |
| 33 | Compute using percentages. | 3.5933 | Child Care, Construction, Electricity/Electronics, Food Service, Health Occupations, Industrial Mechanics, Metals, Secretarial, Service Occupations |
| 34 | Use trade terms and symbols appropriate to the occupation. | 3.5259 | Accounting, Child Care, Construction, Electricity/Electronics, Food Service, Marketing, Metals, Secretarial |
| 35 | Compute Using decimals. | 3.5181 | Child Care, Construction, Food Service, Health Occupations, Industrial Mechanics, Secretarial, Service Occupations |
| 36 | Write formal and informal reports legibly. | 3.5052 | Agriculture, Child Care, Construction, Electricity/Electronics, Food Service, Forest Products, Graphics Communications, Marketing, Metals |
| 37 | Lift and carry objects properly. | 3.5026 | Accounting, Child Care, Graphic Communications, Secretarial, Service Occupations |

APPENDIX Q

CRITERION STATEMENTS WITH MEAN RATINGS OF 3.0 - 3.5 AND WITH ABOVE AVERAGE ACCEPTANCE

| Rank Order | Criterion Statement | Grand Mean (All Clusters) | Clusters With Mean Ratings Below Average of 3.0 |
|---------------|--|---------------------------------|--|
| 38 | Read and interpret safety codes. | 3.4767 | Accounting, Secretarial |
| 39 | Process checks according to company procedures. | 3.3627 | Child Care, Electricity/Electronics, Metals |
| 40 | Clean and store equipment according to regulations. | 3.3601 | Accounting, Secretarial |
| 41 | Use correct safety and protective gear. | 3.2876 | Accounting, Child Care, Marketing, Secretarial |
| 42 | Make oral reports. | 3.2642 | Agriculture, Construction, Industrial Mechanics, Marketing, Metals, Secretarial |
| 43 | Develop work schedules. | 3.2435 | Accounting, Electricity/Electronics |
| 44 | Operate business machines (i.e. hand-held calculators, computer). | 3.2409 | Child Care, Construction, Electricity/Electronics, Industrial Mechanics, Metals |
| 45 | Read and interpret service orders. | 3.2358 | Accounting, Child Care, Metals |
| 46 | File business records. | 3.2358 | Child Care, Construction, Electricity/Electronics, Food Service, Industrial Mechanics, Marketing, Metals |
| 47 | Read and interpret charts, diagrams, symbols, print dimensions, schematic symbols. | 3.2306 | Accounting, Child Care, Food Service, Secretarial |
| 48 | Make change accurately. | 3.2047 | Construction, Electricity/Electronics, Forest Products, Industrial Mechanics, Metals, Secretarial |
| 49 | Clean and repair work areas, equipment, and tools. | 3.1554 | Accounting, Marketing, Secretarial |

| Rank Order | Criterion Statement | Grand Mean (All Clusters) | Clusters With Mean Ratings Below Average of 3.0 |
|---------------|---|---------------------------------|--|
| 50 | Compute sales receipts accurately. | 3.1503 | Child Care, Electricity/Electronics, Industrial Mechanics, Metals, Secretarial |
| 51 | Troubleshoot simple equipment problems. | 3.1399 | Accounting, Child Care, Food Service, Marketing, Secretarial, Service Occupations |
| 52 | Write business letters. | 3.0311 | Child Care, Construction, Electricity/Electronics, Food Service, Graphics, Health Occupations, Industrial Mechanics, Marketing, Metals |

APPENDIX R

CRITERION STATEMENTS WITH MEAN RATINGS < 3.0 AND BELOW AVERAGE IN OVERALL ACCEPTANCE

| Rank Order | Criterion Statement | Grand Mean (All Clusters) | Clusters With Mean Ratings Above Average of 3.0 |
|---------------|--|---------------------------------|--|
| 53 | Collect payments. | 2.8990 | Accounting, Agriculture, Child Care, Food Service, Forest Products, Health Occupations, Marketing |
| 54 | Use cleaners correctly. | 2.8912 | Agriculture, Child Care, Electricity/Electronics, Food Service, Graphics, Health Occupations, Industrial Mechanics, Metals |
| 55 | Process credit purchases. | 2.7902 | Agriculture, Food Service, Forest Products, Marketing |
| 56 | Write orders for supplies, parts. | 2.7358 | Agriculture, Electricity/Electronics, Forest Products, Health Occupations, Industrial Mechanics, Marketing |
| 57 | Read and interpret parts and supply catalogs. | 2.6166 | Agriculture, Electricity/Electronics, Forest Products, Graphics, Industrial Mechanics |
| 58 | Read and interpret micro-fiche for ordering and maintaining records. | 2.3446 | Industrial Mechanics |
| 59 | Use basic hand signals | 2.0259 | |

APPENDIX S

COMMENTS OF RESPONDENTS
BY OCCUPATIONAL CLUSTER

ACCOUNTING

- ...Since we have several hundred different jobs for which we hire, the questionnaire was filled out based upon the most common opening which is a commercial teller.
- ...Please send me your survey results. Questionnaire unclear what you want. Hiring a person with very basic skills in accounting. My requirements are different based on whether the job is entry-level (requiring basic skills) and a senior manager (also requiring some basic skills.)
- ...Best Wishes!
- ...Questionnaires such as this are difficult to complete without a specific frame of reference.
- ...More emphasis is necessary on reading and writing skills. Knowledge of good English is also very important. Communication skills are often very weak.
- ...This is a professional firm, with 9 employees; four have passed uniform, professional test and have bachelor degrees from college; two have advanced degrees and are working on passing the standard test; 1 is licensed by the state in her field and two have extensive experience in their part of our profession.

AGRICULTURE

- ...The statement "hiring a person with basic skills in agriculture" is so general in nature that these responses seem of little worth. We hire people for specific tasks, at least initially. Some of the factors in the questionnaire may be appropriate for one job function, but not for another.
- ...Very awkward questionnaire to fill out; i.e., hard to relate the questions to our variety of production jobs.
- ...It is very difficult to determine qualifications for jobs in this food processing plant, as the work requirements range from clerical to skilled craftsman to unskilled to supervisors and managers. I therefore assume a general heavy duty laborer for this questionnaire.

- ...Generally, we can successfully employ anyone with a desire to work. Our jobs are diversified so that people can be given jobs that match their unique skills and talents. Our plant processes filberts and is not directly involved in the growing of them.
- ...It is very difficult to complete this type of report relating to all employees. We have about 70 employees whose responsibilities vary all the way from bagging oats to feeding a computer. The types of skills and what will be required of each varies according to his job, i.e. you could have a very good oat bagger who could not read, or a very good store clerk who could not lift over 25#.

CHILD CARE

- ...I have only fired two people, others do not stay too long and leave on their own when they recognize they do not have the skills or patience to be with young children.
- ...Take advantage of work related classes and training. Very important for Day Care Centers.
- ...We are a day care center so most of your questions do not apply.
- ...I have completed the form for a day care teacher. Qualifications for a director would be much more stringent, particularly in areas of fiscal responsibility, record-keeping, managerial skills.

CONSTRUCTION TRADES

- ...This questionnaire was being answered as if I were going to hire an entry-level person in the timber industries. Usually communication skills and other basic skills which appear to be necessary may sometimes not be so due to affirmative action and equal employment opportunity requirements of eliminating those skills absolutely unnecessary for a position. In other words, where a person cannot verbally communicate well, it is the employer's obligation to work around that problem if it doesn't directly affect the job. Our entry level positions are considered as clean-up positions or pulling greenchain, etc. Another example would be if a person couldn't read, we are obligated to verbally explain something to that individual.
- ...There are many levels of jobs in our type of work. You are not specific in which ones apply to this survey.
- ...We are an incentive shop. This is answered for production line workers.

- ...Basic skills of reading, writing and speaking well together with a grasp of basic math are essential. These plus willingness, integrity and dependability are the basis upon which hiring decisions are started.
- ...I have answered as if I were hiring for the average mill worker position in the plant.
- ...We have fired very few employees in the 34 years I have been with the company. I feel that a good attitude toward one's work and fellow employees is extremely important.
- ...Our workers (employees) work in heavy construction on the job site where only a basic need of reading and calculating is necessary.
- ...Generally, a person with little experience and few skills is no problem. Wanting to learn to do the job well will usually compensate, and skills are learned. A person who is mainly concerned with doing just enough to justify his wage will probably never change, and the poor attitude is very expensive to his employer.

ELECTRICITY/ELECTRONICS

- ...NONE

FOOD SERVICE

- ...Attitude, Self Discipline, Endurance, Maturity are needed.
- ...Several of your questions concerned skills used by management personnel only. The other employees would not be concerned at all.

FOREST PRODUCTS

- ...Difficult questionnaire to answer accurately as job specifications are not separated, i.e. office/clerical, first line supervisor, management, quality control, etc.
- ...All of these questions could/should be answered with a five depending on what area the applicant is seeking a job. However, if for an hourly mill worker then few answers would be a five.
- ...Those answers pertain to logging operations.

GRAPHICS COMMUNICATIONS

- ...The answers are in relation to an employee in graphic communications who is in management, supervision, technical activities, administration and skilled assistants in these disciplines.

- ...We have only fired two people in five years, one for the theft of funds and the other for falsifying employment application. Several others have left under mutual agreement because they were unable to handle job pressures.
- ...I could not answer your questions without knowing what job categories you are asking for information about. All can be answered "extremely important" depending upon the job to be done. We employ clerical, sales, mechanical, business office, supervisory, production and administrative people. Not all skills are required for all people, but all of the skills listed must be filled by somebody in the office. I would be glad to try again if you could let me know what direction and who we are referring to in a newspaper.
- ...We hire for lots of different areas! Some questions pertain more to one area than another. Difficult to answer for overall company!
- ...We seldom find it necessary to fire anyone. In most cases, we can work with the employees to correct the shortcoming, even with dishonest employees.
- ...In my firm there are many different jobs. Each could have brought about different responses. I selected the job carried by the most people in order to be the most consistent.

HEALTH OCCUPATIONS

- ...Since a hospital covers almost every occupation, variety, I tried to think of all positions in answering questions.
- ...A hospital has a wide variety of job descriptions and each of the items listed would be extremely important in some area. Because of the nature of the work in a hospital standards of performance are higher.
- ...So few are ever fired.
- ...Turn-over rates are very high, therefore, terminations are really not a problem. Poor staff usually falls by the wayside. Unable to take the pressures of the job.
- ...Am sure you realize we are a "temporary" service in the medical field.
- ...This applies mainly to the nurse aides as they are the largest group in the company.

- ...Since we have file clerks, medical secretaries, R.N.'s LPN's, Med. Assts, Bookkeeper, general office clerks, Xray techs. lab techs--all of items as marked to not apply to all positions in the clinic. Found this difficult to make a judgement when filling it out.
- ...It is not clear what health occupations are of interest to you. For example, we employ a broad range of people--including nurses, clerks, D=P personnel, manitors, lab techs, etc. Some of the characteristics you list could be a 5 for an accounting clerk, a 3 for a nurse, and a 1 for a janitor. The basic skills needed in health occupations will vary with the occupations.
- ...We actually have fired very few people compared to the total number who have been employed.
- ...Employees might also be dismissed for giving medical advice to patients if they are not a part of the medical team (i.e. doctors, nurses, technicians.)

INDUSTRIAL MECHANICS

- ...All of these items are all extremely important "given" the area of employment.
- ...The biggest problem in finding personnel for the mechanical field is finding people who can think for themselves, take the initiative in solving the problem, and the ability to reason or consider the outcome of their decision.
- ...We very seldom fire anyone. We get the message across so they have an alternative to quit.
- ...Most past employees seem to be used to large unions to protect their jobs, which gave them a "I don't have to" attitude.

MARKETING

- ...This survey was based on employment in one area of airline structure--that of Passenger Service Agent.
- ...Firm has low discharge rate. Dishonesty as #1 above does not indicate that it happens a lot; only that it is the most irreversible reason for discharge.
- ...Questionnaire not too applicable to our business. However, I assume you are looking at commonalities in various kinds of work. Would appreciate having the results of your study.

- ...On your cover letter statement #1 (concerning hiring a person) we have a number of positions we hire for, i.e., clerks for 9 depts. plus, cashiers, bookkeepers, and lobby person. All of the job descriptions are varied. I considered statement #1 as a combination of all of these positions, as a result you might find overall value of the questions as high opposed to considering the questions for a single department.
After the initial interview: We hire on a 90 day trial basis. After 30 days we interview the employee, emphasizing his/her good points and suggesting any needed changes. Sixty days later we again interview the employee and either give a meaningful pay increase or terminate for failing to meet our job performance standards.

METALS OCCUPATIONS

- ...Items 4 & 5 are not reasons for firing a person, but are requirements for normal achievement. In this trade, and undoubtedly in others, this leads to attitudes that end in failure. Quitting or being fired are too often the end result.
- ...To fire an employee is very rare. Discipline is normally effective before this step.
- ...Most employees that get into trouble have a poor sense of values, and seem to be out for a "free ride" at someone else's expense. Do not want to put forth any.
- ...Initiative and have poor training from their parents, and do not seem to realize what makes private enterprise successful.

SECRETARIAL

- ...The only problem that I see with this questionnaire, is how do you account for the differences in the people answering the questions. If I answer Very Important to a question, someone else may answer Moderately Important. We may both be talking about the same position, but have a different definition of what is moderate and what is very. Or the difference between very and extremely. The total competence needed would be the same but just in different terms.
- ...Most of the questions did not appear to be for a "secretary". We have "clerks" performing some or most of the duties described. Most of the interpretation and decisions are made by supervisors.
- ...This questionnaire does not seem to be effectively related to secretarial occupations as I would define secretarial.

- ...These are aimed primarily at classified--not teaching staff. (the response items on the questionnaire)
- ...Responses were made as follows: Questions 1-54 related to secretarial employees only. The number of employees relates to the entire corporation. The reasons for termination relates to the entire corporation.
- ...We have very little turnover.
- ...We seem to have an ongoing problem particularly with younger employees in that they want to accept the prestige and higher salary of better jobs. However, they are unwilling to accept the increased responsibility that warrants greater salaries. We also have a problem with this same age group bringing their personal problems to the workplace.
- ...I like employees who can think things through to the end and get them done.
- ...The business that I have involves custom typing for a very wide field of clients, i.e., medical, legal, real estate, insurance, geology, statistical, computer, plus a variety of general and form typing. People receive quality, professional results and any employee must be able to produce efficient, professional work and have the experience to manage their time wisely, as well as work alone.
- ...I have answered and/or noted questions relative to operating an insurance agency, which is a service and sales business. I have note this questionnaire was addressed to personnel manager, with the exception of very large agencies, the owner and office manager handle all job interviews and select employees.

SERVICE OCCUPATIONS

- ...We have very small turnover in full time personnel. We fire very few people, failure to show for work is the most common.
- ...Some items do not apply to a law enforcement agency or may apply in a different sense than you have intended--interpretation may be different.
- ...Your questionnaire is not valid for certain competencies are relevant to some jobs, not others. Therefore, a generalization doesn't give you the information you want.
- ...We have never fired anyone during my eight years with the organization. Under protection of Oregon State Employees Association and the Personnel Department of the State of Oregon, it is virtually

impossible to discharge an employee. What is listed above are the reasons I have wished for the power to discharge someone.

- ...Violation of company policies covers various causes from drinking, drugs, insubordination, tampering with time sheets, etc. Some of these answers may be unfair responses since we have many varied departments. These responses are a personal viewpoint for the employees that meet the public. I am not qualified to answer for all departments.
- ...Questions really do not apply well to our tasks.
- ...Most of our work is unskilled, but even in unskilled workers able to work together and communicate is most important.
- ...Although all 54 areas of survey are very important to us, we do not expect one person to excel in all categories. The 54 items in this survey are handled by 4 departments--office, register, shop and purchasing.
- ...We have just recently taken over the managership of this motel, and there has only been two dismissals and the reasons are listed above. Our answers in the survey may seem inconsistent, but we employ 2 office workers, 9 maids plus maintenance people, so our employment needs vary.
- ...Most of the material focused upon herein is not particularly applicable to this situation. Our staff deals to a great extent with volunteers who present a different set of problems than the normal business situation. Considering the current emphasis on volunteerism, perhaps some effort should be directed toward managerial training for the small non-profit organization.