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THE DEVELOPMENT OF A VOCATIONAL INTEREST INVENTORY
USING "WORKER-ORIENTED" JOB ELEMENTS

by

Alma F. Harris

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1971

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Finally, I am most grateful to my wife, Gayle, and our children for their help and understanding and for the sacrifices they have made while I have been continuing my education.

A handwritten signature in cursive script that reads "Alma F. Harris". The signature is written in dark ink and is positioned to the right of the typed name.

Alma F. Harris

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ABSTRACT

The Development of a Vocational Interest Inventory
Using "Worker-Oriented" Job Elements

by

Alma F. Harris, Master of Science

Utah State University, 1971

Major Professor: Dr. John Cragun

Department: Business Administration and Psychology

The purpose of this study was to develop a vocational interest inventory, using the "worker-oriented" job elements of Dr. Ernest J. McCormick and his associates, and to assess the reliability of the resulting instrument.

The interest inventory was prepared, based on 191 of the questions from the Position Analysis Questionnaire (McCormick, E.J., Jeanneret, P.R., & Mecham, R.C. The Development and Background of the Position Analysis Questionnaire (PAQ), Lafayette, Indiana: Occupational Research Center, Purdue University, 1969.), and the test-retest reliability was calculated for a sample of 71 high school students, over a three-week period.

The mean correlation coefficient for the five over-all "job dimension" scores of the interest inventory was .80, and the average item reliability was .54. These coefficients were considered high enough to justify additional development and research on the instrument.

INTRODUCTION

Origin and Nature of the Problem

Since the publication of the Strong Vocational Interest Blank (SVIB) in 1927, there has been intensive research in the area of interest assessment. A number of approaches have been used, but the bulk of the research has been with interest inventories. Of these, two, the SVIB and the Kuder Preference Record Form C, have been the subjects of much of the study. As a result, considerable reliability and validity data has accumulated, and the two inventories are generally regarded as valuable appraisal instruments. However, some shortcomings persist which seriously limit their usefulness. These are especially apparent when an attempt is made to interpret the inventoried interests in terms of specific occupations.

There are two ways that the interest inventories can be interpreted. First, the results can be presented in terms of broad interest areas. The Kuder Form C, as an example, utilizes scores in each of the ten following areas: Outdoor, Mechanical, Computational, Scientific, Persuasive, Artistic, Literary, Musical, Social Service and Clerical (Kuder, 1960, p. 2). Second, as indicated above, measured interests can be related to specific occupations. To do this, occupational "keys" are prepared by comparing the interest patterns of satisfied members of a particular profession with those of a pool of "men in general" or "women in general" from various occupations. Items on which the two groups differ are counted in the scoring keys.

In most vocational counseling situations the generalized interpretation would perhaps be the more useful. A widely accepted approach to the use of measured interests in vocational counseling, is to assist the student or client in identifying general groups of activities in which he has an expressed interest. The goal is to assist the individual in understanding himself, rather than to select a specific occupation of training program (Cronbach, 1960; Darley & Hagenah, 1955). However, at times a more specific application of the information gained from interest measurement is required. There are situations in which it is useful if the counselor can say definitely whether the client's interests are compatible with a particular occupation. To do this, occupational keys or profiles are required for all of the occupations under consideration, but at present only a very limited number are available.

There are 54 occupational scoring keys presently available for the men's form of the Strong Vocational Interest Blank, and 30 for the women's form. The 1960 edition of the administrator's manual for the Kuder Form C contains profiles for only 41 occupational families (Kuder, 1960). New keys are developed periodically, but the number available is completely inadequate. As an example, presently available keys are concerned with less than one percent of the 22,000 different occupations listed in the third edition of the Dictionary of Occupational Titles (U.S. Department of Labor, 1965). Furthermore, the number of occupations is rapidly increasing as there are new developments in the different occupational areas. This lack of keys has been noted as a major problem by a number of researchers, but practical considerations limit the number of new keys that can be developed.

Strong's first occupational keys were based on about 150 cases. The number, for keys developed later, was increased to 250 cases per occupation, and then to between 400 and 500 cases (Super & Crites, 1962). It is very difficult to gain access to a group of that size in a particular occupation. After access is gained, some criterion of satisfaction must be established and checked, and then there still is considerable expense in administering the inventory to that many individuals and in comparing interest patterns of criterion groups and men in general to establish the desired key.

Once the keys are developed, "temporal validity" becomes a concern. Changes in a particular occupation over a period of time may invalidate the key prepared for that occupation. As an example, Strong's scoring key for psychologists was prepared in 1928 and revised in 1938 (Darley & Hagenah, 1955). There have been many changes in psychology over the last 40 years, and Kriedt (1949) has confirmed the fact that changes in the psychology occupations are reflected in measured interests.

An additional problem in developing the needed keys concerns the newly developing occupations. Keys could sometimes be used very profitably to select personnel to work in an entirely new area, in which there is no criterion group from which to develop a key. Until the present there has been no reliable method of synthetically predicting measured interests which are related to a particular job.

Aside from the problems associated with the occupational keys, there are two other problem areas in present interest assessment methods. The first concerns faking. Interest inventories are rarely used for

personnel selection and classification. The limited number of occupational keys limits the inventories usefulness for this purpose, but an equally important concern is that a number of studies have indicated that individuals can purposely change their interest inventory results (Bordin, 1943; Longstaff, 1948; Strong, 1943; Gehman, 1957; Becker, 1963).

The second problem is that the Strong and Kuder inventories can relate inventoried interests to broad interest areas or specific occupations, but they provide very little insight into the sources of interests. As an example, one of the Strong questions asks if the individual taking the inventory would like the work of a Real Estate Salesman. The answer is then compared with the answer given by the criterion group in the occupation being considered. There is no way to determine why an individual likes a particular activity, or which aspect of the activity appeals to him.

Use of Job Analysis Data in Interest Measurement

It does not appear that the problems reviewed can be overcome by using existing approaches to interest assessment. With this in mind, the present study approaches the measurement of interests from a different theoretical viewpoint. Rather than attempting to develop occupational keys empirically, by measuring the interests of individuals in given occupations, an attempt will be made to relate interests directly to the behavioral units characterizing each occupation. This will involve the use of the job analysis approach recently developed by Ernest J. McCormick and his associates.

McCormick (1959) attempted to overcome the quantification and statistical evaluation limitations of the essay job description by proposing a system of job analysis based on "worker-oriented" job elements. These elements might be described as characteristics of work, generally defined in terms of the worker's behaviors. Some, however, were concerned with such things as the situational aspects of jobs to which the worker would need to adapt, job demands as they affected the worker, and personal variables desirable in the worker. Since there is a logically limited number of human behavioral variables relevant to job performance, McCormick has considered these job elements as "common denominators" of work, relevant to any type of job (Mecham, 1970).

Utilizing this concept of "worker-oriented" job elements, McCormick, Jeanneret and Mecham (1969) developed a job analysis questionnaire called the Position Analysis Questionnaire (PAQ). Form B of the PAQ contains 194 of the above described job elements generally chosen to include the human behaviors in work that parallel the conventional S-O-R (stimulus-organism-response) paradigm. This is apparent from the organization of the first three sections of the PAQ:

1. Information Input
2. Mental Processes
3. Work Output

The last three sections are concerned with the job context:

4. Relationships With Other Workers
5. Job Context
6. Other Job Characteristics.

(McCormick, Jeanneret & Mecham, 1969)

Some of the research that has been done with the PAQ since it's development, includes the identification of "job dimensions" through the factor analysis of PAQ data (Jeanneret & McCormick, 1969), and the synthetic prediction of aptitude test scores, cutting scores, and salaries associated with various jobs (Mecham, 1970; Vincent, 1971).

For the present study, the PAQ has been revised and used for a different purpose than it was used for in previous research. Rather than assessing the applicability of behaviors and conditions to various jobs, the PAQ will be used as an interest inventory to determine the individual's preference for those same behaviors and conditions. In its original form, the PAQ asks questions such as: "How much time is spent in this behavior?" and "How important is contact with this particular type of individual in this job?" As revised into an interest inventory, the PAQ asks: "How important would you like this behavior to be in your work?" etc.

If the resulting interest inventory is sufficiently reliable and valid, the problems inherent in existing interest inventories could be largely overcome. Occupational profiles based on the job dimensions of the PAQ could be readily prepared with minimal expense. This would eliminate the present concern with temporal validity and the problem of lack of required keys. Also, since development of the keys would not require a criterion group, occupational profiles could be developed for newly emerging occupations.

Determining the degree to which the interest inventory can be faked, will require additional research. However, since most people have little actual knowledge of the specific behaviors and requirements associated with particular jobs, the newly developed inventory may prove to be more resistant to faking than existing inventories.

Finally, associating measured interests with specific behaviors and job requirements, may provide some insight into interest development and interest patterns.

Objectives

1. Review the PAQ into a vocational interest assessment instrument.
2. Determine the reliability of the individual items in the resulting instrument.
3. Determine the reliability of the dimensions of the resulting instrument.

REVIEW OF LITERATURE

Position Analysis Questionnaire

McCormick, Jeanneret & Mecham, (1969a) describe in some detail the development and history of the Position Analysis Questionnaire: Form B (PAQ). In summary, the PAQ is a job analysis questionnaire consisting of 194 elements, with which a job can be assessed. The elements are worker-oriented as contrasted with job-oriented. Generally they describe in behavioral terms what the worker does in accomplishing his work. Some, however, are concerned with the environmental and situational aspects of the job, such as the noise level, temperature, etc. Some of the elements are of a checklist nature, requiring the user to indicate only if the element is applicable or nonapplicable to the job in question. Other elements utilize rating scales which require a numerical indication of the "Amount of Time," "Importance to This Job," etc.

These worker-oriented job elements are conceived of as "common denominators" of work, which make possible a quantified job analysis, amenable to statistical evaluation (McCormick, Cunningham, & Gordon, 1967). Three basic assumptions are involved in this approach. First, it is assumed that a given kind of work activity involves the same requirements of the worker in whatever job the activity occurs. Second, it is assumed that there is order or structure in human work, and that the use of the worker-oriented job elements will make possible the statistical determination of the nature of that structure (McCormick, Jeanneret & Mecham, 1969b).

To simplify the quantified characterization of jobs, which the worker-oriented job elements made possible, Jeanneret and McCormick (1969) used principal components analysis on a sample of 536 job analyses to identify job dimensions within the divisions of the PAQ and also 5 overall job dimensions. The intent of this analysis was to identify job elements which tend to occur in combination in any job which might be considered. These dimensions have subsequently been used in a number of studies on the validity of the PAQ (Mecham & McCormick, 1969; Vincent, 1971).

Major concerns, with an instrument like the PAQ, are, of course, reliability and validity. The PAQ was designed to be used with minimal training, and at present it is being used by job analysts, supervisors, employment and personnel officers, and by some individuals performing the work being analyzed. The reliability coefficients of the individual elements between pairs of the above analysts averaged approximately .80 in a recent study by McCormick, Jeanneret & Mecham (1969).

A principal criticism of the PAQ (Allen, 1969) is that the worker-oriented versus job-oriented continuum upon which it is based, is not unidimensional. With this in mind and considering the limited research on the PAQ up to the time of this study, Allen strongly questioned the usefulness of the worker-oriented versus job-oriented continuum.

The question of unidimensionality may be an important consideration, however, the usefulness of the instrument is directly related to validity. Subsequent to Allen's study there has been additional research which indicates that the instrument is valid and useful in synthetically

predicting such things as aptitude requirements for jobs, cutting scores for personnel selection and rates of monetary compensation. Following is a brief review of these studies.

Mecham and McCormick (1969) carried out regression analysis on PAQ based job dimensions as related to aptitude test scores. The mean test scores were obtained from U.S. Employment Service (USES) data, and were based on the 9 tests of the General Aptitude Test Battery (GATB). Multiple correlations of the various combinations of job dimension scores with mean test scores ranged from .59 to .80, with a median of .71. These fairly high correlations would suggest that test standards for jobs could be synthetically derived from job analysis data.

In further research to determine the validity of the PAQ, Mecham and McCormick (1969) utilized three sets of data, based on the PAQ to predict the monthly salaries associated with a sample of 340 jobs. The multiple correlation coefficients, of data based on the PAQ with actual compensation rates, ranged from .83 to .90.

The most recent study (Vincent, 1971) explored the use of synthetically derived GATB cutting scores based on PAQ data. The predictive validity of the PAQ cutting scores was low, but comparable to USES predictions. The low predictive validity of both the PAQ and USES cutting scores may have been due to an inadequate criterion.

In the rather limited research that has been done with the PAQ, then, the coefficients of reliability have been respectable (average .80) and the three studies cited indicate substantial evidence of validity.

Vocational Interest Assessment

Super (1947) made a valuable contribution to the field of interest assessment by defining some basic terms. Various descriptive terms had earlier been used for the same concepts, making it difficult to communicate. Often a designation was developed by a researcher which carried evaluative connotations, reflecting the bias of the originator. This has not been completely eliminated, and Dolliver (1969) has expressed some concern about it. However, a degree of order has been introduced, and it may be worthwhile to review some of Super's definitions. Following is a brief summary of Super's four interest categories as outlined in Super and Crites (1962).

There have been four major interpretations of the term interest, based on the four methods of obtaining interest data. The most widely used approaches to interest assessment have been based on "inventoried interests". Assessment is by the use of a list of items which the subject expresses a like or dislike for. The subject's answers are then given an experimentally determined weight, and the weights are added to give a score which represents a pattern of interests.

The predominant orientation of counselors and researchers for a number of years has been toward the use of the inventory approach (Super & Crites, 1962; Darley & Hagenah, 1955; Strong, 1943; Birdie, 1950; Cronbach, 1960; Anastasi, 1955). Commonly used interest assessment instruments, such as the Strong Vocational Interest Blank, the Kuder Preference Records, the Cleeton Vocational Interest Inventory, the Allport-Vernon Study of Values, the Lee-Thorpe Occupational Interest

Inventory, and many others fall into this category. Only recently has there been serious question of the comparative advantages of this approach. Some of the questions raised will be reviewed in conjunction with one of the other interest categories.

The second type of interest is "manifest interest". The assumption is that participation in an activity or occupation is a direct indication of interest. This has not been used as a predictor of interest in many studies, but is often used as a criterion for other types of interest assessment approaches.

"Tested Interest", the third category, is measured by objective tests, rather than by subjective self-estimates. The rationale underlying this method of interest assessment is that interest in a vocation or activity will be manifest in an accumulation of information pertinent to that field.

The final approach to interest measurement is "expressed interest", which is simply a verbal profession of interest in an activity, occupation, task, etc. Any questions used are direct and straight-forward, and the answers are not experimentally weighted.

The PAQ, as revised into an interest assessment instrument, differs from the commonly used interest inventories, in that the answers are not weighted by comparison with criterion groups. However, like the inventories, it will provide scores which represent a pattern of interests. It consists of straight-forward questions, which require only a simple expression of preference. In this sense, it may be more closely related to Super's expressed interest category than to the interest inventories.

With this in mind, the research on expressed interests will be reviewed in some detail.

Fryer (1931) reviewed the early research on expressed interests, and although there has been many criticisms of this approach since Fryer's review, there has been very little additional research and few new findings. The criticisms have generally centered around the subjects lack of factual information concerning the occupations he may be expressing a preference for, and the apparent lack of stability of those preferences. As examples, Cronbach (1960, p. 405) stated that expressed interests may be based on ignorance or superficial understanding of the vocation concerned. Some small aspect of the vocation may be appealing to the subject while the more important requirements, with which he is not familiar, may hold no attraction. Darley and Hagenah (1955, p. 61) state that specific claimed choices are often produced by factors of stereotypy, prestige drives, pressures and naivete. Super and Crites (1962) point out that expressed interests of children and adolescents are unstable and do not provide useful data for prediction.

The few studies that have been done since Fryer's review have seemed to substantiate earlier findings and some of the criticisms. Trow (1941) asked 330 eighth, tenth, and twelfth grade pupils the following three questions: 1. "What kind of job do you think you will probably be able to do when you are through school?" 2. "If you could be sure to get the education and training that you would need, what kind of job would you choose?" 3. "People sometimes think about what they would like to be although they don't really believe it could ever come true. If by some magic you could be anything you want, what would you like to be?" The questions were designed to reflect probability, possibility,

and fantasy. Forty percent of the students answered the first two questions the same, while only twelve percent answered all three of the questions with the same job choice. Gelger (1942), asked three similar questions to a sample of college students, and obtained similar results.

These studies illustrate the importance of the phrasing of the question in determining expressed interests. This is not so important or critical if the answer is to be weighted by comparison with answers given by criterion groups, but it is a major consideration if the answer is to be considered without weighting.

Birdie (1950) had 500 men estimate their similarity of interests, in nine occupational areas, with men working in those areas. These estimates were compared with SVIB and Kuder Preference Record results for the same 500 men. Correlation coefficients between measured and expressed interests averaged about .50. Noting this rather low correlation, Birdie concluded that both expressed and inventoried interests should be considered in counseling.

It might be noted that there have been a number of other studies which have shown the same low correlations between expressed and inventoried interests found in Birdie's study (Laleger, 1942; Kopp & Tussing, 1947; Crosby & Winsor, 1941).

Schmidt and Rothney (1955) obtained the expressed vocational interests of 347 students each year for the three years the students were in high school. Only 34.9% were consistent in their expressed occupational choice over the three year period. Each year 33.6% changed their occupational choice.

These studies are generally representative of the research that has been done with expressed interests. However, very recently a few researchers have been reevaluating earlier studies, and additional emphasis has been placed on the validity of the expressed interests.

Holland and Lutz (1968) strongly criticized the present preference for interest inventories over expressed interests. In their study, student vocational choices were categorized according to a six-category classification scheme for men and an eight-category scheme for women. Using this classification system, it was found that expressed choice had about twice the predictive efficiency of the Holland Vocational Preference Inventory.

Two recent reviews of studies relating to expressed and inventoried interests strengthen Holland and Lutz's position. Dolliver (1969) questioned the use of inventoried interests as a criterion in determining the validity of expressed interests. Studies such as that of Berdie (1950), which require a self-estimate of interest inventory scores were considered to have no relevance in the comparison of inventoried and expressed interests, which are two independent assessment methods.

After a careful review of the related research, Dolliver pointed out that there is an apparent discrepancy. In comparison with the SVIB, expressed interests appear to be highly valid, but they are not as reliable as SVIB results. He concluded, "There is no evidence to show that the SVIB is superior to expressed interests. Counselors and others have apparently supposed a body of experimental evidence which does not exist."

Whitney (1969) reviewed large-sample longitudinal studies on the predictive validity of expressed vocational choice, and concluded that, ". . . a person's expressed vocational choice predicts his future employment about as well as interest inventories. . . ."

In summarizing the literature on vocational interest assessment, it appears that the bulk of the research has been done with interest inventories, and the general feeling among counselors and researchers is that this area has been more productive than other approaches. When expressed interests are considered as an alternative to inventoried interests, low reliability is often cited as a concern. Another common criticism is that people lack sufficient information about different jobs to make an intelligent choice. These criticisms have been countered recently by Holland's (1968) study and by Dolliver (1969) and Whitney's (1969) reviews which emphasized the predictive validity of expressed interests.

METHOD OF PROCEDURE

Instrumentation

The Position Analysis Questionnaire (PAQ) consists of 194 questions designed to determine the applicability of various behaviors and environmental conditions to a particular job being analyzed. For this study the PAQ has been revised into an interest inventory. The subject taking the inventory is asked to rate the degree to which he likes or dislikes the behaviors and environmental conditions considered in the PAQ.

Sample

At Sky View High School, Smithfield, Utah, all junior students are required to take junior English, and they are registered into the 15 classes at random, by computer. The same procedure is used with the sophomore students and the sophomore English classes.

The interest inventory was administered to 16 senior students while it was in the process of revision and development. Items were changed when the students indicated difficulty in understanding them. In March the inventory was administered to 61 sophomore students in two of the sophomore English classes to provide an additional check on the difficulty of the items and the instructions. The students were able to complete the inventory in the one hour class period, and there did not appear to be a problem in understanding the instructions or questions.

Early in May the inventory was administered to three of the junior English classes. The total number of students was 88. In three weeks the inventory was readministered to 71 of the same students. Seventeen students in the original sample were absent at the time of the retest, and the school administration requested that make-up tests not be given because of the disruption of the regular classes.

After the inventory was administered, the sample (N=71) was divided into three subsamples by grade point average during the junior year. Group A (N = 25) had grade point averages above 3.0 on a 4.0 scale. Members of group B (N = 25) had grade points between 2.5 and 3.0. Members of group C (N = 21) had grade point averages below 2.5.

As mentioned earlier, the sample was taken from the junior class at Sky View High School. The enrollment of the high school is approximately 1,500 students, and the area serviced by the high school includes the small farming communities and rural areas of Cache County, in Northern Utah. The largest community in the school district, Smithfield, has a population of 3,342.

Analysis

As mentioned in the Review of Literature, Jeanneret and McCormick (1969) obtained two sets of job dimensions through principal components analysis of PAQ data from a sample of 536 jobs. Job dimensions one through twenty-seven were obtained from separate principal components analyses of the six divisions of the PAQ, and dimensions twenty-eight through

thirty-two were extracted from an overall analysis of all elements of the PAQ. For the purposes of this study, scores were obtained on each of the job dimensions for each subject. The PAQ items included in each dimension, along with the factor loadings for each item can be found in The Job Dimensions of "Worker Oriented" Job Variables and of Their Attribute Profiles as Based on Data From the Position Analysis Questionnaire (Jeanneret & McCormick, 1969). A list of the PAQ form A item numbers and the corresponding interest inventory numbers are listed in the appendix of this study. The question order of the PAQ was changed to eliminate duplication of instructions.

As a first step in assessing the reliability of the instrument, test-retest reliability coefficients were calculated for each of the job dimensions, along with mean dimensions cores, the standard deviation for each of the dimensions, and the standard error of measurement. Fisher's Z transformation was then used to obtain an average or mean correlation coefficient for dimensions one through twenty-seven and for dimensions twenty-eight through thirty-two.

In the next step, test-retest reliability coefficients were calculated for each of the items. Fisher's logarithmic transformation was then again used to obtain an average item reliability coefficient for the sample (N=71), and average reliability coefficients for each of the subsamples. The mean and standard deviation for the ratings given each of the 191 items were also calculated for the entire sample and for each of the subsamples.

RESULTS

Test-retest reliability coefficients on the job dimensions are given in Table Two of the appendix. The mean reliability coefficient for the five overall job dimensions was .80. The coefficients on the section dimensions (numbers 1 through 27) ranged from a high on dimension JC-13 (General Body Activity) of .81 to a low of .40 on dimension JD-20 (Supervisor-Subordinate Relationships). The mean coefficient for these 27 dimensions was .66.

Test-retest reliability data for each of the items of the interest inventory is provided in Table Three of the appendix. The mean of the item reliability coefficients for the full sample (N=71) was .54. The mean item reliability coefficients for the three subsamples were as follows:

Sample A (N = 25, Grade point average above 3.0).....	.64
Sample B (N = 25, Grade point between 2.5 and 3.0)51
Sample C (N = 21, Grade point average below 2.5)51

The mean and standard deviation for each of the items for the three subsamples are provided in Table Four of the appendix.

DISCUSSION AND CONCLUSIONS

Strong (1943) felt that four aspects of reliability were especially important in considering his interest inventory scores. The four that he listed were test-retest correlations of each scoring key, permanence of scores within an individual at the time of a second testing, comparisons of test-retest mean scores, and test-retest consistency of letter grades and patterns. Strong was not particularly concerned with item reliability, since as he pointed out, with his scoring method there could be shifts in response to as many as 125 items among the 400 in the SVIB without affecting the final score to any great extent.

Three of Strong's reliability considerations are applicable only to his inventory and others which use similar scoring systems. The second, however, which concerns the permanence of an individual's scores would be generally applicable. Two sets of scores could be considered for the revised PAQ interest inventory. The five overall dimension scores would probably be used in relating assessed interests to specific occupations and would consequently be especially critical. The average correlation for these five scores was .80, which is a very respectable level of reliability. The other set of scores would be the twenty-seven section dimension scores. The mean correlation coefficient for this set of scores was .66.

A comparison of the reliability of this interest assessment instrument with the SVIB and some of the other widely used interest inventories would be helpful in assessing the instrument's potential usefulness. However, the different instruments have completely different scoring

methods with widely varying numbers of items contributing to each scale score. Under these circumstances a reliability comparison would have little value.

The item test-retest reliability coefficients were included in the appendix of this study primarily so that they could be used in future revisions of the inventory. While the average coefficient was moderately high for items (.54), a number of the correlations were not significant. One reason for the lack of correlation on some items may be that the subjects have not yet developed stable preferences in those areas. Additional study will be required to determine the reliability of the items with different age groups. With a number of items, it may be that the behavior or environmental condition under consideration will prove inconsequential and thus unreliable with any age group. This may be a possibility with number 170. The question asks if the subject would like to receive part of his pay in the form of supplementary compensation, such as stocks, profit sharing plans, dividends, bonuses, gifts, etc. The correlation on this item was slightly negative, and it may be that the subjects will never develop a strong preference in this area. As long as pay is received, the form in which it is received may be unimportant to the subject, although important in job analysis and categorization.

Another possibility with some of the items, including 170, is that the subjects did not understand the question. As was noted in the results section, the item reliability for sample A, with the higher grade point, was considerably higher than for the other two samples. There may be a number of factors involved in this reliability difference, including a difference in interest stability for the three groups. However, considering

the complexity of some of the items, it may be that those with the higher grade point understood the questions better, and were less inclined to guess on the ratings. In light of this possibility, additional simplification of some of the less reliable items appears to be warranted.

If some of the items are revised, in an effort to increase reliability, additional consideration should be given to the rating scale format. In the inventory's present form, most of the items utilize a rating scale which does not have defined intervals. Those few which do have defined intervals are generally the items which were considered especially important, or which were difficult to understand. Because of the way the items were selected for defined or undefined intervals, it would be difficult, with the present data, to isolate only the effect on reliability of the type of rating scale. Future development of the inventory should include an investigation of the relative reliability of the two types of intervals.

As noted in the introduction to this study, the main objectives were to develop the interest inventory and to investigate its reliability. It was felt that research into the validity of the instrument was beyond the scope of the present study. However, some strong indications of validity are apparent and some comments appear to be warranted. One of the main criticisms of other interest assessment methods has been that they provide no insight into interest development and into the specific interests which make up the overall vocational preferences. In the present study, the mean item ratings for the three subsamples appear to be effectively tapping the lower level interests. At very least, the three groups appear to be effectively separated into vocational interest categories compatible with their ability levels.

On the first question, as an example, the subject is asked how much reading he wants to do in his work. Sample A (grade point average over 3.0) gave this question an average rating of 3.08. Sample B (grade point average between 2.5 and 3.0) rated it 2.64 and sample C (grade point average under 2.5) rated it 2.29. This pattern of ratings was common with items which required a high ability level in academic areas, a high decision making level, or a high responsibility level. Items which assessed interests in some of the lower level occupations had a pattern of ratings just opposite to the above. Question number 116 asked how important the subject would want operating equipment (cranes, hoists, elevators, etc.) to be in his work. Sample A rated this item 1.28. Sample B rated it 1.72 and sample C rated it 1.90.

Somewhat surprising, but logical, was the fact that some questions were selected for a high rating by the middle subsample, but not the other two. This was especially noticeable with the questions related to selling occupations (numbers 30, 58, 79, 149, and 168). These questions were consistently rated higher by sample B than by the other two samples.

With this inventory, it may be possible to study interest development and the effect of specific experiences on measured interests. Also, it will be interesting, in the future, to see if this approach will effectively differentiate between the lower level occupations, which is something that existing approaches have not been able to do.

In conclusion, the reliability of the interest inventory was high enough to justify additional development, and there were strong indications of validity which should be explored further. In the future development of the instrument, a few hypotheses which might be tested

are first, that the instrument would show increased reliability with older age groups. As pointed out earlier, there was a substantial difference in reliability between the sample with the higher grade point average and the other two samples. This may be due in part to a difference in the maturity level of the three samples. Another possibility is that the students with the higher grade point understood the questions more completely. This would lead us to a second hypothesis: The simplification of some of the items, and the addition of defined intervals to all of the items would increase the reliability of the instrument.

Finally, this study has indicated interest differences related to scholastic achievement. The extent of this should be explored further. Possibly the students grade point average could be predicted through the use of this inventory, although correlations have not been high enough to permit this with other interest inventories (Cronbach, 1960).

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APPENDIX

Table 1

PAQ-Form A and Corresponding Interest Inventory Numbers

PAQ Number	Inventory Number	PAQ Number	Inventory Number	PAQ Number	Inventory Number	PAQ Number	Inventory Number
1	1	28	26	55	96	82	43
2	3	29	27	56	97	83	44
3	2	30	28	57	98	84	42
4	6	31	29	58	99	85	41
5	4	32	30	59	100	86	-
6	7	33	32	60	-	87	122
7	8	34	33	61	101	88	47
8	9	35	31	62	102	89	48
9	5	36	172	63	103	90	119
10	10	37	173	64	104	91	121
11	11	38	35	65	105	92	120
12	12	39	36	66	106	93	179
13	13	40	37	67	107	94	49
14	14	41	38	68	108	95	51
15	15	42	39	69	109	96	52
16	16	43	-	70	-	97	53
17	17	44	40	71	110	98	54
18	18	45	175	72	111	99	-
19	19	46	176	73	113	100	56
20	-	47	177	74	114	101	57
21	171	48	155	75	115	102	58
22	20	49	178	76	112	103	59
23	21	50	91	77	116	104	60

Table 1

PAQ-Form A and Corresponding Interest Inventory Numbers

PAQ Number	Inventory Number	PAQ Number	Inventory Number	PAQ Number	Inventory Number	PAQ Number	Inventory Number
23	21	50	91	77	116	104	60
24	22	51	92	78	117	105	61
25	23	52	93	79	46	106	63
26	24	53	94	80	45	107	64
27	25	54	95	81	50	108	65
109	66	129	-	149	87	169	149
110	67	130	-	150	88	170	150
111	68	131	69	151	89	171	151
112	-	132	70	152	-	172	153
113	180	133	71	153	187	173	-
114	72	134	181	154	156	174	154
115	75	135	185	155	157	175	136
116	73	136	123	156	158	176	140
117	74	137	124	157	159	177	137
118	77	138	125	158	160	178	141
119	78	139	-	159	161	179	142
120	79	140	126	160	162	180	-
121	80	141	127	161	163	181	144
122	81	142	128	162	165	182	145
123	82	143	129	163	166	183	146

Table 1

PAQ-Form A and Corresponding Interest Inventory Numbers

PAQ Number	Inventory Number	PAQ Number	Inventory Number	PAQ Number	Inventory Number	PAQ Number	Inventory Number
124	83	144	130	164	167	184	147
125	84	145	-	165	168	185	164
126	85	146	-	166	169	186	131
127	-	147	186	167	170	187	188
128	-	148	86	168	148	188	189
						189	190

Table 2

Job Dimension Test-Retest Reliability Data (N=71)

Dimension	Mean	Std.Dev.	Rel.Coef.	Std.Error of Meas.
JA-1 Visual Input from Devices/Materials	0.28	0.75	0.54	0.51
JA-2 Perceptual Interpretation	0.61	0.93	0.71	0.50
JA-3 Information from People	0.25	0.78	0.69	0.44
JA-4 Visual Input From Distal Sources	0.26	0.86	0.71	0.47
JA-5 Evaluation of Information from Physical Sources	0.41	0.89	0.59	0.57
JA-6 Environmental Awareness	3.44	1.54	0.71	0.83
JA-7 Awareness of Body Movement/Posture	3.18	1.95	0.56	1.29
JB-8 Decision Making	0.45	0.71	0.69	0.39
JB-9 Information Processing	0.39	0.96	0.59	0.62
JC-10 Machine/Process Control	-0.08	0.63	0.63	0.39
JC-11 Manual Control/Coordin- ation Activities	1.23	0.96	0.65	0.57
JC-12 Control/Equipment Operation	1.81	1.22	0.71	0.66
JC-13 General Body Activity	1.75	1.36	0.81	0.60
JC-14 Handling/Manipulating Activities	-0.18	0.92	0.65	0.55
JC-15 Use of Finger-controlled Devices vs. Physical Work	-1.24	1.08	0.71	0.58
JC-16 Skilled/Technical Activities	1.05	1.12	0.72	0.60
JD-17 Communication of Decisions/Judgments	0.13	0.56	0.70	0.31

Table 2

Job Dimension Test-Retest Reliability Data (N=71)

Dimension	Mean	Std.Dev.	Rel.Coef.	Std. Error of Meas.
JD-18 Job-related Information Exchange	3.05	0.96	0.50	0.68
JD-19 Staff/Related Activities	1.75	1.16	0.70	0.64
JD-20 Supervisor-Subordinate Relationships	-0.33	0.46	0.40	0.36
JD-21 Public/Related Contact	2.75	0.98	0.57	0.64
JE-22 Unpleasant/Hazardous Physical Environment	1.71	1.31	0.73	0.68
JE-23 Personally Demanding Situations	1.64	0.99	0.73	0.52
JF-24 Businesslike Work Situations	-0.01	0.60	0.63	0.37
JF-25 Attentive/Discriminating Work Demands	0.12	0.88	0.79	0.41
JF-26 Unstructured vs. Structured Work	-1.03	0.80	0.74	0.41
JF-27 Variable vs. Regular Work Schedule	-1.22	0.34	0.56	0.23
JO-I Decision/Communication/Social Responsibilities	1.36	0.60	0.83	0.25
JO-II Skilled Activities	0.30	0.76	0.82	0.32
JO-III Physical Activities/Related Environmental Conditions	2.49	1.12	0.84	0.45
JO-IV Equipment/Vehicle Operation	1.55	0.90	0.78	0.42
JO-V Information Processing Activities	1.10	0.95	0.75	0.48

Table 3
Item Test-Retest Reliability Data (N=71)

Item	Reliability Coefficient	Level of Significance	Item	Reliability Coefficient	Level of Significance
1	0.66	.001	29	0.47	.001
2	0.74	.001	30	0.51	.001
3	0.36	.001	31	0.45	.001
4	0.53	.001	32	0.67	.001
5	0.58	.001	33	0.66	.001
6	0.59	.001	34	0.41	.001
7	0.66	.001	35	0.58	.001
8	0.53	.001	36	0.49	.001
9	0.40	.001	37	0.48	.001
10	0.66	.001	38	0.59	.001
11	0.53	.001	39	0.49	.001
12	0.59	.001	40	0.66	.001
13	0.53	.001	41	0.56	.001
14	0.69	.001	42	0.65	.001
15	0.61	.001	43	0.51	.001
16	0.56	.001	44	0.66	.001
17	0.62	.001	45	0.63	.001
18	0.57	.001	46	0.43	.001
19	0.64	.001	47	0.70	.001
20	0.28	.008	48	0.62	.001
21	0.48	.001	49	0.62	.001

Table 3
Item Test-Retest Reliability Data (N=71)

Item	Reliability Coefficient	Level of Significance	Item	Reliability Coefficient	Level of Significance
22	0.47	.001	50	0.63	.001
23	0.54	.001	51	0.61	.001
24	0.55	.001	52	0.43	.001
25	0.58	.001	53	0.63	.001
26	0.65	.001	54	0.67	.001
27	0.72	.001	55	0.70	.001
28	0.65	.001	56	0.55	.001
57	0.53	.001	85	0.49	.001
58	0.66	.001	86	0.50	.001
59	0.68	.001	87	0.49	.001
60	0.64	.001	88	0.53	.001
61	0.51	.001	89	0.62	.001
62	0.67	.001	90	0.62	.001
63	0.68	.001	91	0.60	.001
64	0.64	.001	92	0.58	.001
65	0.58	.001	93	0.58	.001
66	0.71	.001	94	0.50	.001
67	0.80	.001	95	0.67	.001
68	0.70	.001	96	0.72	.001
69	0.57	.001	97	0.60	.001
70	0.68	.001	98	0.74	.001

Table 3
Item Test-Retest Reliability Data (N=71)

Item	Reliability Coefficient	Level of Significance	Item	Reliability Coefficient	Level of Significance
71	0.69	.001	99	0.69	.001
72	0.38	.001	100	0.76	.001
73	0.47	.001	101	0.54	.001
74	0.40	.001	102	0.67	.001
75	0.35	.002	103	0.58	.001
76	0.36	.001	104	0.47	.001
77	0.54	.001	105	0.68	.001
78	0.48	.001	106	0.66	.001
79	0.52	.001	107	0.65	.001
80	0.61	.001	108	0.65	.001
81	0.47	.001	109	0.55	.001
82	0.43	.001	110	0.52	.001
83	0.27	.001	111	0.56	.001
84	0.55	.001	112	0.80	.001
113	0.64	.001	141	0.57	.001
114	0.76	.001	142	0.69	.001
115	0.59	.001	143	0.63	.001
116	0.59	.001	144	0.60	.001
117	0.76	.001	145	0.60	.001
118	0.47	.001	146	0.66	.001
119	0.49	.001	147	0.68	.001

Table 3

Item Test-Retest Reliability Data (N=71)

Item	Reliability Coefficient	Level of Significance	Item	Reliability Coefficient	Level of Significance
120	0.62	.001	148	0.14	.126
121	0.56	.001	149	0.20	.045
122	0.54	.001	150	0.31	.004
123	0.78	.001	151	0.24	.021
124	0.40	.001	152	0.20	.047
125	0.58	.001	153	0.14	.115
126	0.63	.001	154	0.09	.225
127	0.70	.001	155	0.06	.295
128	0.67	.001	156	0.38	.001
129	0.64	.001	157	0.13	.132
130	0.57	.001	158	0.24	.020
131	0.78	.001	159	0.19	.052
132	0.55	.001	160	0.26	.014
133	0.50	.001	161	0.29	.007
134	0.51	.001	162	0.06	.306
135	0.60	.001	163	0.29	.006
136	0.60	.001	164	0.41	.001
137	0.70	.001	165	0.18	.063
138	0.58	.001	166	0.45	.001
139	0.47	.001	167	0.12	.157
140	0.61	.001	168	0.46	.001

Table 3

Item Test-Retest Reliability Data (N=71)

Item	Reliability Coefficient	Level of Significance	Item	Reliability Coefficient	Level of Significance
169	0.13	.138	181	0.64	.001
170	-0.01	.445	182	0.41	.001
171	0.44	.001	183	0.47	.001
172	0.47	.001	184	0.44	.001
173	0.41	.001	185	0.48	.001
174	0.46	.001	186	0.27	.001
175	0.67	.001	187	0.40	.001
176	0.61	.001	188	0.60	.001
177	0.44	.001	189	0.54	.001
178	0.78	.001	190	0.43	.001
179	0.58	.001	191	0.43	.001
180	0.16	.091			

Table 4
Mean and Standard Deviation of Item Ratings

Item	Description	Sample A (N=25, GPA Over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C (N=21, GPA Under 2.5)	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
1	Reading	3.08	1.15	2.64	1.63	2.29	1.15
2	Numbers	2.64	1.11	2.40	1.26	1.95	1.07
3	Pictures	2.88	1.30	2.56	1.32	2.48	1.25
4	Patterns	2.28	1.17	2.28	1.27	1.95	1.36
5	Displays	2.12	1.51	1.88	1.33	1.95	1.24
6	Measuring Devices	1.92	1.32	1.68	1.18	2.19	1.29
7	Mechanical Devices	2.08	1.47	2.36	1.75	2.71	1.55
8	Materials in Process	2.40	1.38	2.80	1.50	1.95	0.92
9	Materials not in Process	1.84	1.07	2.24	1.05	1.81	1.33
10	Observing Nature	3.04	1.69	3.20	1.32	2.71	1.68
11	Man-made Features	2.52	1.29	2.64	1.68	2.00	1.30
12	Behavior	3.12	1.42	3.32	1.14	2.71	1.19
13	Observing Events	2.24	1.39	2.44	1.29	2.09	1.09
14	Art	2.64	1.55	2.92	1.49	2.00	1.26
15	Listening (Verbal Sources)	2.60	1.22	2.44	1.38	1.81	1.21
16	Listening (Sounds)	2.80	1.12	2.60	1.53	2.90	1.26
17	Touching	3.48	1.12	3.08	1.26	2.76	1.09
18	Smelling	2.40	1.19	2.48	1.36	2.24	0.99

Table 4

Mean and Standard Deviation of Item Ratings

Item Description	Sample A (N=25), GPA Over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C (N=21, GPA Under 2.5)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
19 Tasting	2.56	1.32	3.16	1.31	2.52	1.08
20 Far Visual Discrimination	3.04	1.14	3.08	1.38	3.24	0.94
21 Depth Discrimination	2.28	1.43	2.64	1.35	2.47	1.21
22 Color discrimination	3.08	1.11	3.20	1.15	2.71	1.19
23 Sound Pattern Discrimination	2.84	1.43	2.52	1.53	2.66	0.85
24 Sound Discrimination	2.36	1.44	2.20	1.53	2.19	1.36
25 Body movement discrimination	2.20	1.41	2.20	1.50	2.24	1.18
26 Body Balance	1.92	1.41	2.20	1.50	2.24	1.18
27 Estimating speed of moving parts	1.32	1.28	1.76	1.61	1.85	1.35
28 Estimating speed of moving objects	1.40	1.11	2.12	1.50	1.76	1.33
29 Estimating speed of processes	2.08	1.07	2.64	1.55	1.57	0.87
30 Judging	2.12	1.30	2.68	1.60	1.95	1.16
31 Inspecting	2.16	1.34	2.88	1.23	2.04	1.11
32 Estimating speed of processes	1.80	1.29	2.04	1.48	1.66	1.19
33 Estimating size	1.92	1.41	1.88	1.23	1.71	1.23

Table 4
Mean and Standard Deviation of Item Ratings

Item	Description	Sample A (N=25 , GPA Over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C (N=21, GPA Under 2.5)	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
34	Estimating Time	2.20	1.11	2.28	1.42	1.80	1.36
35	Combining information	2.48	1.61	2.32	1.37	2.19	1.36
36	Analyzing Information	2.68	1.40	2.56	1.41	2.19	1.28
37	Gathering and class- ifying information	2.56	1.32	2.72	1.42	1.90	1.30
38	Coding or decoding	2.12	1.09	2.28	1.67	1.85	1.38
39	Copying	1.96	1.36	2.64	1.22	1.76	1.30
40	Short-term memory	2.40	1.44	3.04	1.30	1.71	1.48
41	Setting-up	1.88	1.56	1.84	1.43	1.90	1.37
42	Manually modifying	2.36	1.38	3.32	1.49	2.23	1.41
43	Material-controlling	2.60	1.25	2.72	1.17	2.00	1.18
44	Assembling	2.12	1.56	2.48	1.44	2.19	1.56
45	Arranging/positioning	2.48	1.38	3.12	1.20	2.42	1.24
46	Handling objects	2.92	1.46	3.36	1.22	2.66	1.31
47	Agility	3.20	1.52	2.80	1.50	3.00	1.37
48	Balancing	2.04	1.51	2.20	1.65	1.80	1.24
49	Finger manipulation	2.88	1.42	2.72	1.67	2.28	1.61
50	Feeding/off-bearing	1.68	1.10	2.56	1.04	1.90	1.37
51	Hand-arm manipulation	2.40	1.41	2.72	1.59	2.23	1.51
52	Hand-arm steadiness	2.56	1.22	2.32	1.79	2.04	1.35
53	Eye-hand-foot co- ordination	2.92	1.28	3.16	1.28	2.66	1.23

Table 4
Mean and Standard Deviation of Item Ratings

Item Description	Sample A (N=25, GPA Over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C N=21, GPA Under 2.5)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
54 Blind positioning	2.56	1.52	3.20	1.38	2.47	1.36
55 Hand-ear coordination	2.48	1.47	2.32	1.43	2.14	1.35
56 Advising	2.88	1.50	2.80	1.44	2.00	1.18
57 Negotiating	2.36	1.43	2.72	1.69	1.57	1.28
58 Persuading	2.44	1.35	3.04	1.24	1.66	1.19
59 Instructing	2.68	1.40	2.88	1.33	1.76	1.67
60 Interviewing	2.64	1.31	2.80	1.22	1.57	1.32
61 Exchanging Information	2.04	1.01	2.40	1.41	1.85	1.23
62 Non-routine information exchange	2.68	1.37	2.48	1.32	1.76	1.26
63 Public speaking	2.52	1.58	2.32	1.77	1.52	1.28
64 Writing	2.48	1.50	2.80	1.63	1.80	1.24
65 Signaling	2.24	1.09	2.20	1.44	1.71	1.18
66 Code communications	1.76	1.12	2.52	1.71	1.61	1.49
67 Entertaining	2.80	1.63	2.48	1.35	2.04	1.71
68 Serving/catering	2.28	1.59	3.20	1.47	1.66	1.42
69 Supervise non- employees	2.80	1.38	3.00	1.55	2.19	1.32
70 Coordinates activities	2.56	1.52	2.26	1.60	1.61	1.32
71 Staff functions	2.84	1.40	2.60	1.47	2.04	1.43
72 Executive/officials	2.60	1.22	2.04	1.48	2.09	1.17

Table 4
Mean and Standard Deviation of Item Ratings

Item Description	Sample A (N=25, GPA over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C N=21, GPA Under 2.5)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
73 Middle management per- sonnel	2.80	1.32	2.68	1.10	2.47	1.16
74 Supervisors	2.88	1.01	3.08	0.86	2.33	1.06
75 Professional personnel	3.60	1.15	3.32	1.34	2.61	1.11
76 Semi-professional personnel	3.08	1.11	2.80	1.29	2.47	1.12
77 Clerical personnel	2.68	1.28	3.00	1.08	2.28	1.18
78 Manual and service workers	2.84	1.21	2.96	1.20	2.76	1.04
79 Sales personnel	2.16	1.14	3.12	1.39	1.76	1.22
80 Buyers	2.28	1.40	2.68	1.57	2.00	1.34
81 Customers	2.84	1.24	3.16	1.62	2.57	1.43
82 The public	2.88	1.16	2.44	1.12	2.80	1.28
83 Students/trainees	2.88	1.23	2.92	1.18	2.52	1.28
84 Clients/patients	3.04	1.42	2.80	1.38	2.00	1.09
85 Special interest groups	2.40	1.22	2.56	1.19	2.19	1.47
86 Civic obligations	2.32	1.40	2.24	1.23	1.80	1.12
87 Frustrating situations	2.52	1.41	2.20	1.52	1.71	1.18
88 Strained personal contacts	2.16	1.40	1.76	1.42	1.47	1.24
89 Personalacrifice	2.48	1.73	2.44	1.52	2.09	1.26
90 Interpersonal conflict Situations	1.76	1.36	1.72	1.56	1.42	1.07

Table 4
Mean and Standard Deviation of Item Ratings

Item Description	Sample A (N=25, GPA over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C N=21, GPA Under 2.5)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
91 Precision tools/ instruments	2.60	1.63	2.20	1.60	2.04	1.32
92 Non-precision tools/ instruments	2.48	1.44	2.52	1.55	2.28	1.58
93 Long-handle tools	1.40	1.32	1.60	1.47	1.47	1.32
94 Handling devices	1.68	1.21	1.80	1.55	1.96	0.97
95 Precision tools/ instruments	1.88	1.53	1.76	1.56	2.04	1.53
96 Non-precision tools/ instruments	1.76	1.50	1.56	1.58	1.95	1.39
97 Drawing devices	2.72	1.45	2.48	1.41	2.19	1.50
98 Applicators	2.00	1.29	2.32	1.62	1.66	1.35
99 Measuring devices	2.04	1.56	2.16	1.46	2.42	1.63
100 Technical and related devices	2.48	1.32	2.20	1.47	2.04	1.49
101 Machines/equipment	1.76	1.20	1.92	1.22	1.80	1.20
102 Activation controls	1.88	1.23	2.12	1.30	2.09	1.33
103 Fixed setting controls	2.12	1.30	2.24	1.30	2.38	1.16
104 Variable setting controls	1.84	1.24	2.16	1.40	2.28	1.23
105 Keyboard devices	2.48	1.53	3.08	1.38	2.38	1.49
106 Hand-operated controls	1.68	1.51	1.88	1.53	2.19	1.40
107 Foot-operated controls	1.92	1.03	1.92	1.41	1.95	1.28

Table 4

Mean and Standard Deviation of Item Ratings

Item	Description	Sample A (N=25, GPA Over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C (N=21, GPA Under 2.5)	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
108	Hand-operated controls	1.84	1.37	2.08	1.55	1.90	1.17
109	Continuous foot- operated controls	2.16	1.31	2.08	1.68	2.14	1.42
110	Man-powered vehicles	2.36	1.38	1.76	1.53	1.90	1.41
111	Powered highway/ rail vehicles	2.52	1.19	1.64	1.60	2.38	1.39
112	Powered mobile equip- ment	1.52	1.44	1.24	1.42	1.47	1.28
113	Powered water vehicles	2.12	1.45	1.36	1.72	1.42	1.36
114	Air/space vehicles	2.44	1.52	1.44	1.93	2.14	1.71
115	Man-moved mobile equipment	1.40	1.29	1.84	1.54	1.19	1.03
116	Operating equipment	1.28	1.27	1.72	1.54	1.90	1.51
117	Remote-controlled equipment	1.48	1.29	1.68	1.74	1.52	1.28
118	Sitting	2.24	1.05	2.64	1.07	2.47	0.98
119	Standing	2.52	0.96	2.68	0.98	2.38	0.80
120	Walking/running	2.32	0.90	2.12	1.05	2.00	1.04
121	Climbing	1.44	1.08	1.12	1.16	1.38	1.35
122	Kneeling/stooping	1.28	0.84	1.44	0.91	1.57	1.07
123	Outdoor environment	2.64	1.60	1.56	1.52	1.90	1.64
124	High temperature	0.84	0.80	0.92	1.22	0.66	0.79
125	Low temperature	0.84	0.74	1.04	1.30	0.95	1.35

Table 4

Mean and Standard Deviation of Item Ratings

Item	Description	Sample A (N=25, GPA Over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C (N=21, GPA Under 2.5)	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
126	Air contamination	0.68	0.80	0.76	1.16	0.52	0.87
127	Vibration	1.28	1.06	1.24	1.45	1.42	1.20
128	Improper illumination	0.88	0.78	0.96	1.20	0.85	1.10
129	Dirty environment	1.16	1.14	0.68	1.02	1.23	1.44
130	Awkward work space	1.08	0.99	1.12	1.30	0.76	0.94
131	Travel	3.48	1.15	3.28	1.79	3.47	1.32
132	First-aid cases	3.08	1.38	2.88	1.50	2.47	1.63
133	Temporary disability	2.76	1.53	2.88	1.69	2.19	1.32
134	Permanent partial impairment	0.88	1.20	1.20	1.41	1.23	1.09
135	Permanent total disability/death	0.80	1.15	0.60	1.11	1.14	1.42
136	Specified work pace	1.52	1.08	1.64	1.25	1.28	1.23
137	Repetitive activities	1.80	1.44	2.08	1.32	1.47	1.16
138	Cycled work act- ivities	1.88	1.30	2.36	1.18	1.52	1.07
139	Set procedures	2.00	1.22	2.24	1.16	1.52	0.98
140	Time pressure	1.96	1.17	2.20	1.55	1.47	1.32
141	Precision	2.32	1.28	2.44	1.35	2.19	1.36
142	Attention to detail	2.80	1.11	3.04	1.27	1.90	1.30
143	Recognition	2.92	0.99	2.84	1.28	2.00	1.14

Table 4
 Mean and Standard Deviation of Item Ratings

Item	Description	Sample A (N=25, GPA Over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C (N=21, GPA Under 2.5)	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
144	Vigilance: Frequent events	2.04	1.39	2.04	1.59	1.85	1.62
145	Vigilance: Infrequent events	2.60	1.29	2.00	1.58	2.09	1.41
146	Distractions	2.24	1.23	2.28	0.93	1.85	1.19
147	Updating job knowledge	3.18	1.30	2.88	1.45	2.28	1.27
148	Self-employed	1.60	0.76	1.60	0.70	1.42	0.67
149	Business suit	1.40	0.76	1.60	0.86	1.47	0.60
150	Uniform	1.28	0.54	1.44	0.65	1.61	0.66
151	Work clothing	1.36	0.56	1.64	0.70	1.42	0.59
152	Protective clothing	1.56	0.50	1.84	0.68	1.61	0.66
153	Informal attire	1.44	0.91	1.40	1.00	1.33	0.79
154	Optional apparel	1.44	0.91	1.32	0.55	1.19	0.40
155	Licensing/certification	1.20	0.70	1.56	0.91	1.47	0.74
156	Regular work	1.20	0.50	1.52	1.00	1.14	0.47
157	Irregular work	1.56	0.58	1.80	0.50	1.76	0.53
158	Regular hours	1.48	0.82	1.48	0.91	1.47	0.61
159	Variable shift	1.32	0.62	1.68	0.55	1.38	0.58
160	Irregular hours	1.48	0.82	1.60	0.70	1.52	0.67
161	Day hours	1.24	0.59	1.44	0.91	1.47	0.81
162	Night hours	1.48	0.58	1.64	0.56	1.57	0.59

Table 4

Mean and Standard Deviation of Item Ratings

Item	Description	Sample A (N=25, GPA over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C N=21, GPA Under 2.5)	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
163	Day and night hours	1.60	0.57	1.48	0.50	1.47	0.67
164	Special talent	1.32	0.69	1.48	1.04	1.47	1.03
165	Salary	1.52	0.77	1.40	0.76	1.52	0.60
166	Hourly wage	1.36	0.70	1.52	1.04	1.42	0.02
167	Incentive pay	1.60	0.57	1.64	0.48	1.71	0.46
168	Commission	1.72	0.54	1.80	0.57	1.76	0.62
169	Tips	1.68	0.62	1.80	0.91	1.80	0.40
170	Supplementary com- pensation	1.52	0.58	1.80	0.76	1.71	0.56
171	Near visual differ- entiation	3.32	0.80	3.52	0.91	3.14	1.01
172	Decision making	3.72	0.84	3.48	0.65	3.00	1.04
173	Reasoning	3.60	0.86	3.36	0.95	2.85	0.96
174	Planning/scheduling	3.16	1.21	3.48	0.82	3.04	0.92
175	Education	3.80	0.76	3.20	1.15	3.00	1.00
176	Experience	2.32	1.18	2.52	1.32	2.14	1.38
177	Training	2.44	1.08	2.80	1.15	2.80	1.32
178	Mathematics	2.80	1.22	2.60	1.11	2.28	1.00
179	Physical exertion	2.72	0.84	2.44	0.71	2.90	0.94
180	Job-required personal contact	3.88	0.88	3.76	1.33	3.23	1.30

Table 4
Mean and Standard Deviation of Item Ratings

Item	Description	Sample A (N=25, GPA over 3.0)		Sample B (N=25, GPA Between 2.5 and 3.0)		Sample C N=21, GPA Under 2.5)	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
181	Supervision of personnel	2.68	1.34	2.16	1.28	2.28	1.41
182	Direction of super visors	1.44	0.96	1.24	1.01	1.28	1.38
183	Responsibility	3.88	0.72	3.40	0.57	2.90	1.41
184	Personnel respon- sibility	1.56	1.15	1.04	1.05	1.19	0.87
185	Supervision received	3.24	0.96	2.96	1.13	2.85	1.06
186	Noise intensity	3.04	0.53	2.52	1.04	2.66	1.06
187	Social contact	3.56	0.58	3.56	1.15	3.23	1.04
188	Safety respon- sibility	2.84	1.40	2.72	1.56	2.47	1.63
189	Material respon- sibility	3.40	1.15	2.72	1.17	2.85	1.52
190	Job structure	3.36	1.35	3.00	1.15	3.00	1.18
191	Criticality of position	3.16	1.34	2.92	1.15	2.57	1.28

INTEREST ANALYSIS QUESTIONNAIRE (IAQ)

Answers to the following questions will be used to assist you in selecting occupations compatible with your interests. Please answer the questions carefully so that the results will be of maximum value to you.

INSTRUCTIONS

Answers are to be recorded on the answer sheet only. Spaces are provided on the answer sheet for 10 possible answers. The most that will be used with this questionnaire is the first six. Ignore the space between the 4th and 5th answers on the answer sheet.

Be sure to make firm black marks on the answer sheet, and completely fill in the space provided. There is no time limit.

INTEREST ANALYSIS QUESTIONNAIRE (IAQ)

SECTION 1

Use the numbers from 0 to 5 to measure how much you would like to use each of the following to direct and guide you in your work.

None	Little					Much
0	1	2	3	4	5	

1. Reading.
2. Numbers (graphs, accounts, specifications, tables of numbers, etc.).
3. Pictures (drawings, blueprints, diagrams, maps, tracings, X-ray films, TV pictures, etc.).
4. Patterns and related devices (stencils, patterns, templates, etc.).
5. Displays (dials, gauges, signal lights, radar scopes, speedometers, clocks, etc.).
6. Measuring devices (rulers, calipers, tire pressure gauges, scales, thermometers, etc.).
7. Mechanical devices (tools, equipment, machinery, and other mechanical devices which provide information when observed during use or operation).
8. Observing materials that you are working with (bread dough texture, the shape of wood being cut, the appearance of metal being welded, etc.).
9. Looking at parts, materials, or objects that you are not working on; such as boxes to be inventoried, items to be inspected, or items to be selected.
10. Observing nature (landscapes, fields, geological samples, plants, cloud formations or other features of nature).
11. Looking at man-made features, such as buildings, dams, highways, bridges, docks, railroads, etc. to gain information.
12. Observing the behavior of people or animals.
13. Observing the events or circumstances around you (the flow of traffic, the movement of materials, airport control tower operations, etc.).
14. Looking at art or decorations, such as paintings, sculpture, jewelry, window displays, etc.
15. Listening to spoken information.

16. Listening to sounds.
17. Touching.
18. Smelling.
19. Tasting.

SECTION 2A

Rate how important you would like each of the following abilities and activities to be in your work. Use the numbers 0 to 5.

- | | None | Minor | | | Extremely important |
|-----|--|-------|---|---|---------------------|
| | 0 | 1 | 2 | 3 | 4 5 |
| 20. | Ability to see differences in objects at distances beyond arms length. Some examples might be the ability to see well enough to drive a car, referee a sport, etc. | | | | |
| 21. | Ability to judge the distance from yourself to an object, or the distance between objects, as in running a crane or operating a dentist's drill. | | | | |
| 22. | Color perception (the ability to tell the difference between things by color). | | | | |
| 23. | Recognizing sound patterns. Some examples might be recognizing morse code, heart beats, or an engine not running properly. | | | | |
| 24. | Recognizing sounds by loudness, pitch or tone quality, for example, in tuning pianos, or in repairing sound systems. | | | | |
| 25. | Ability to tell changes in the direction or speed at which the body is moving, without using sight or hearing. Some examples are: in flying a plane, or in working in a submarine. | | | | |
| 26. | Body balance (as in walking on steel beams, climbing high poles, or in working on steep roofs). | | | | |
| 27. | Estimating the speed of moving parts, for example, the revolutions per minute of a motor, or the speed that a lathe turns. | | | | |
| 28. | Estimating the speed of moving objects, for example, the speed that a car is going, or how fast materials might be moving on a conveyor belt. | | | | |
| 29. | Estimating the speed of processes (chemical reactions, food preparations, etc.). | | | | |
| 30. | Judging condition or quality (antique dealer, appraiser, jeweler, used car dealer, coin dealer, etc.). | | | | |

31. Inspecting (grading or finding defects).
32. Estimating quantity, such as the number of board feet of lumber in a log, the weight of a horse, the number of bacteria in an area by looking through a microscope, etc.
33. Estimating size, such as the height of a tree, the measurements of a box, etc.
34. Estimating time, such as the time required to make a delivery, service a piece of equipment, etc.
35. Combining information from two or more sources to establish new facts or theories, such as a weatherman using different pieces of information to prepare a weather report, or a pilot using different bits of information to fly his plane.
36. Analyzing information, such as interpreting financial reports, determining why an automobile engine will not run, diagnosing an illness, etc.
37. Gathering, grouping, or classifying information (for example, in preparing reports, filing correspondence, etc.).
38. Coding or decoding, as in reading Morse Code, translating foreign languages, or using other coding systems such as shorthand.
39. Copying or posting information for later use, such as copying meter readings in a record book.
40. Learning and remembering information for a brief period of time, for example, waitress, short-order cook, telephone operator, etc.
41. Setting up, adjusting, calibrating, aligning machines or equipment, for example, setting up a lathe or drill press, or adjusting an engine carburetor.
42. Using hands to form or change materials or products, for example, kneading dough by hand, folding letters, massaging, etc.
43. Controlling or guiding materials being processed, for example, in operating a sewing machine, jig saw, etc.
44. Assembling or disassembling (putting parts together to form a complete item, or taking an item apart).
45. Arranging or positioning (placing objects, materials, persons, etc. in a specific position or arrangement, for example, arranging library books, window displays, stocking shelves, or positioning patients for dental work).
46. Physically handling objects, materials, animals, human beings, etc., for example, loading or unloading trucks, farming activities, taking care of babies in a nursery, etc.

47. Highly skilled body coordination activities, such as athletics or dancing.
48. Balancing (maintaining body balance on narrow, slippery, steeply inclined or moving surfaces).
49. Finger manipulation (making careful finger movements in various types of activities, such as in the use of precision tools, repairing watches, or in playing the piano).
50. Feeding materials into a machine or removing materials from a machine or piece of processing equipment.
51. Activities involving hand and arm movements, such as might be used in repairing automobiles, or in packaging products.
52. Activities requiring steady hand and arm movements, as might be necessary in using a welding torch or in performing surgery.
53. Coordinating hand or foot movements with what is seen, for example, driving a car or operating a sewing machine.
54. Movement of body limbs from one position to another without the use of vision, as in playing a musical instrument or in typing, etc.
55. Coordinating hand movements with sounds or instructions that are heard, for example, tuning radio receivers, tuning musical instruments, piloting aircraft by control tower instructions, etc.
56. Advising (using legal, financial, scientific, technical, clinical, spiritual, or other professional principles to counsel or guide individuals).
57. Negotiating (dealing with others to reach an agreement or solution, for example, labor bargaining, diplomatic relations, etc.).
58. Persuading (influencing others, as in selling or political campaigning).
59. Teaching.
60. Interviewing, such as interviewing job applicants, census taking, etc.
61. Giving and receiving routine information as might be done by a ticket agent or a taxi-cab dispatcher.
62. Giving and receiving specialized information, as might be done in professional committee meetings, or as engineers might do when discussing a product design.
63. Public speaking.
64. Writing (for example, writing letters, reports, newspaper articles, etc.)

65. Signaling (communicating by some type of signal, for example, hand signals, whistles, horns, bells, lights, etc.).
66. Communicating by code (telegraph, cryptography, shorthand, etc.).
67. Entertaining (performing to amuse or entertain others).
68. Serving or catering (performing personal services, or attending to the needs of others, for example, waiting on tables, hairdressing, etc.).
69. Supervising non-employees (students, patients, campers, etc.).
70. Coordinating activities (social director, committee chairman, etc.).
71. Serving as a staff member (advising, consulting, and giving other types of assistance to management personnel, for example, legal adviser, accountant, etc.).

SECTION 2B

Different jobs require you to associate with different types of individuals. How important would you want personal contact with the following types of individuals to be? Use the numbers from 0 to 5.

None	Minor				Extreme Importance
0	1	2	3	4	5

72. Executives or officials, such as government administrators, corporation vice-presidents or plant superintendents.
73. Middle management, such as division or district managers.
74. Supervisors, such as foremen, office managers, etc.
75. Professional personnel, such as doctors, lawyers, scientists, engineers, professors, teachers, etc.
76. Semi-professional personnel, such as technicians, draftsmen, designers, photographers, surveyors, etc.
77. Personnel engaged in office work, such as clerks, bookkeepers, receptionists, etc.
78. Skilled and unskilled workers.
79. Sales personnel.
80. Purchasing agents (individuals who buy for companies).
81. Customers (as in stores or restaurants).

- 82. The public generally, such as police officers or park attendants might come in contact with.
- 83. Students, trainees, and apprentices.
- 84. Clients, patients, and individuals being counseled.
- 85. Special interest groups, such as stockholders, property owners, lobbyists, etc.

SECTION 2C

Following are 5 social aspects of jobs. Use the numbers from 0 to 5 to indicate how much importance you would want each to have in your work.

None	Minor			Extreme Importance		
0	1	2	3	4	5	

- 86. Civic obligations, such as serving on zoning boards, helping with United Fund drives, assisting with school activities, etc.
- 87. Frustrating situations (situations in which you would become frustrated because your attempts to do something might be hindered or obstructed).
- 88. Unpleasant personal contacts, such as in some types of police work, handling certain mental patients, etc.
- 89. Personal sacrifice in the service of others, such as a policeman, minister of religion, social worker, etc., might be required to make.
- 90. Disagreements or conflict situations, such as might be necessary for a person involved in labor negotiations, or a person who must enforce an unpopular policy, etc.

SECTION 3

Use the numbers from 0 to 5 to indicate how much importance you would like each of the following devices or pieces of equipment to have in your work.

None	Minor			Extreme Importance		
0	1	2	3	4	5	

- 91. Precision hand tools (engraver's tools, watchmaker's tools, surgical instruments, etc.).
- 92. Other hand tools (hammers, wrenches, knives, scissors, etc.).

93. Long-handle tools (hoes, rakes, shovels, picks, axes, brooms, etc.).
94. Tools used for moving or handling things (tongs, ladles, dippers, forceps, etc.).
95. Hand-held power tools used to perform very precise work (dentist drills, welding equipment, etc.).
96. Hand-held power tools which do not require great accuracy or precision (ordinary power saws, drills, sanders, clippers, etc.).
97. Instruments used in writing, sketching, illustrating, drafting, etc. (pens, pencils, artist's brushes, drafting equipment, etc.).
98. Applicators (brushes, rags, paint rollers, used in applying solutions, materials, etc.).
99. Measuring devices (rulers, measuring tapes, calipers, tire gauges, etc.).
100. Technical devices (cameras, stopwatches, slide rules, etc.).
101. Stationary machines, used to process, modify or construct parts, objects, materials, etc.
102. Hand or foot operated controls used to start or stop something (light switches, electric motor switches, ignition switches, etc.).
103. Hand or foot operated controls with distinct settings or positions (TV selector switch, gear-shift in an automobile, etc.).
104. Hand or foot operated control which does not have set positions (TV volume control, room thermostat, etc.).
105. Keyboard devices, such as pianos, typewriters, or adding machines.
106. Controls operated by hand for making frequent, but not continuous, adjustments (hand controls on a crane, bulldozer, forklift, etc.).
107. Controls operated with the foot for making frequent, but not continuous, adjustments (foot pedal on drill press, automobile brakes, etc.).
108. Controls operated by hand for making continuous adjustments (steering devices on boats, tractors, automobiles, handlebars on bicycles, etc.).
109. Controls operated with the foot for making continuous adjustments (foot control on sewing machine, gas feed in automobile, etc.).
110. Man-powered vehicles (bicycles, rowboats, canoes, etc.).
111. Powered highway or rail vehicles (automobiles, trucks, buses, trains, etc.).

- 112. Powered mobile equipment (fork lifts, self-propelled lawn mowers, road graders, tractors, etc.).
- 113. Powered water vehicles (ships, submarines, motor boats, etc.).
- 114. Air or space vehicles (planes, helicopters, balloons, gliders, rocketships, etc.).
- 115. Man-moved mobile equipment (hand-pushed lawn mowers, wheel barrows, floor polishers, etc.).
- 116. Operating equipment (cranes, hoists, elevators, etc.).
- 117. Remote-controlled equipment (conveyor systems, etc.).

SECTION 4

Use the numbers from 0 to 5 to indicate how much of your working time you would be willing to spend in the following activities or under the following circumstances.

- 0 None
- 1 Under 1/10 of the time
- 2 Under 1/3 of the time
- 3 Between 1/2 and 2/3 of the time
- 4 Over 2/3 of the time
- 5 Almost continually

- 118. Sitting.
- 119. Standing.
- 120. Walking or running.
- 121. Climbing (for example, house painter, telephone lineman).
- 122. Kneeling or stooping (or other body positions which may be uncomfortable or awkward).
- 123. Working outdoors under the different weather conditions.
- 124. Working indoors in high temperatures (conditions in which you may be uncomfortable, such as in boiler rooms, around furnaces, etc.).
- 125. Working indoors in low temperatures (conditions in which you would be definitely cold even though you wore heavy clothing, such as in refrigerated rooms, etc.).
- 126. Working in dust, fumes, smoke, or with bad odors.

127. Working with equipment that vibrates the whole body or body limbs, such as driving a tractor or truck or operating an air hammer.
128. Working under poor lighting conditions (not enough light, excessive glare, etc.).
129. Dirty working conditions (garages, foundries, coal mines, highway construction, furnace cleaning, etc.)
130. Awkward or small work space (conditions in which the body is cramped or uncomfortable).
131. Traveling.

SECTION 5

Below are descriptions of 4 degrees of injury, ranging from minor to very serious. Use the numbers from 0 to 5 to indicate the chance of each occurring which you would be willing to accept as a part of your work.

- 0 No possibility
- 1 Very limited possibility
- 2 Limited possibility
- 3 Moderate possibility
- 4 Fairly high possibility
- 5 High possibility

132. Minor injury or illness which might result in a day or less of lost time.
133. An injury or illness which would prevent you from working for one full day or more, but which would not have any permanent effects.
134. Permanent injury or illness (injury or illness resulting in the loss of an arm, leg, hearing, sight of one eye, etc.).
135. Permanent total disability or death (injury or illness which would result in disability for life, or in death).

SECTION 6

Following is a list of job requirements. Use the numbers from 0 to 5 to indicate the importance you would want each of these requirements to have in your work.

None	Minor				Extreme Importance
0	1	2	3	4	5

- 136. A set specified rate of work, such as on an assembly line.
- 137. Repeating the same activity, without interruption, for periods of time.
- 138. Working according to a schedule, which repeats weekly, daily, or hourly, such as a postman or milkman making his rounds, or a guard patrolling his beat.
- 139. Following set procedures, such as following a check-out list to inspect a piece of equipment, or using a list of instructions to perform a laboratory test.
- 140. Working under time pressure, such as rush hours in a restaurant, or performing rush jobs.
- 141. Precision (need to be more than normally precise and accurate).
- 142. Attention to detail.
- 143. Identifying and recognizing objects, events, processes, behavior, etc.
- 144. Need to continually search for events that do not happen often, such as watching for forest fires.
- 145. Need to continually be aware of a changing situation, as might be necessary in driving in traffic or controlling aircraft traffic.
- 146. Working in a situation where there are a lot of distractions, such as telephone calls, interruptions or disturbances from others.
- 147. Need to keep job knowledge current (continually learning new developments related to the job).

SECTION 7

Use the numbers 1 or 2 to indicate if you would want the following work characteristics or conditions.

1 = Yes

2 = No

148. Self-employment (working for yourself).
149. Business suit, jacket and tie, or street dress required for work.
150. Uniform required for work (nurse, doorman, bus driver, etc.).
151. Work clothing required, such as might be worn in factories or on construction work.
152. Protective clothing required, such as safety helmets, goggles, safety shoes, etc.
153. Casual clothes or sports wear required.
154. Any type of clothing acceptable.
155. License or certification required for work.
156. Work that is regular, continuing year-round, without layoffs due to such things as weather or business conditions.
157. Work that is not regular (depending on weather, season, production changes, etc.).
158. Regular working hours (same basic work schedule every week).
159. Work shift that varies from time to time.
160. Work hours that vary daily because of such things as the convenience of customers, amount of work to be done, or other requirements of the business.
161. Work regular day hours (8:00 in the morning to 5:00 in the afternoon).
162. Work night or evening hours.
163. Work some days and some nights (swing shift).
164. Work requires some special skill or talent. (If answer is yes, list the special talent you would like to use in the space provided at the top of the second page of your answer sheet.)
165. Pay based on a monthly salary (paid by the month).

173. What reasoning or problem solving level would you want your work to require?

1. Low (use of common sense to carry out simple instructions, as might be done by a janitor or a deliveryman).
2. Below average (use of some experience or training, such as a sales clerk, a postman, a keypunch operator or an electrician's apprentice might use).
3. Average (use of principles to solve practical problems, such as might be required in farming, drafting, or carpentry).
4. Above average (use of logic or scientific thinking, as might be used by a mechanical engineer, a personnel director, or the manager of a store).
5. High (use of principles of logic or scientific thinking to solve a wide range of problems, as might be done by a research chemist, a nuclear engineer, a corporate president, or the manager of a large plant).

174. How much planning or scheduling would you like to do in your work?

0. None.
1. Very little (little chance to plan your own activities, such as in selling tickets at a theater, or working on an assembly line).
2. Little (some planning required, but not a great deal, as in delivering milk or working as a janitor).
3. Average amount (example, a carpenter who must plan the best way to build a house, or the planning that must be done by a taxi dispatcher).
4. Considerable (example, a foreman who must plan what his workers must do, or a teacher who must prepare lectures or lesson plans).
5. Large amount (example, a department store manager, an executive who must plan the activities of different work groups, or an architect).

175. How much education would you want your work to require?

0. None.
1. Less than high school.
2. High school diploma.
3. Some college education.
4. College degree.
5. Advanced degree (M.S., Ph.D., M.D., L.L.D., etc.).

176. How much experience in related or lower-level jobs would you like your work to require?

0. None
1. Less than 1 month.
2. Less than 1 year.
3. Between 1 and 3 years.
4. Between 3 and 5 years.
5. Over 5 years.

177. How much training, other than the education in number 175, would you want your work to require? Consider such things as on-the-job training, apprentice training, technical and vocational schools, and orientation training.
0. None.
 1. Between 1 and 30 days.
 2. Between 30 days and 6 months.
 3. Between 6 months and 1 year.
 4. Between 1 and 3 years.
 5. Over 3 years.
178. How much mathematics would you want your job to require?
0. None.
 1. Simple counting, addition and subtraction of numbers smaller than 100.
 2. Addition and subtraction of numbers up to 1,000, and some multiplication and division.
 3. Use of fractions, decimals, percentages, etc.
 4. Algebra, geometry, trigonometry, and statistics.
 5. Very advanced use of calculus, topology, vector analysis, factor analysis, probability theory, etc.
179. How much physical effort would you want your work to require?
1. Very light (occasionally walking or standing, or occasionally moving light objects, such as might be done by a secretary, watchmaker, or telephone operator).
 2. Light (frequently walking or standing and often exerting effort equal to that which would be required to lift between 10 and 20 pounds, for example, sales clerk, bank teller, etc.).
 3. Moderate (frequently exerting effort equal to that which would be required to lift between 25 and 50 pounds, for example, auto mechanic, coin vending machine serviceman, bus driver, etc.).
 4. Heavy (lifting between 50 and 100 pounds, for example, general laborer, bulldozer operator, baggage porter, etc.).
 5. Very heavy (frequently using enough effort to lift 50 pounds, and occasionally using enough effort to lift over 100 pounds, for example, quarry mining, setting up concrete forms, etc.).
180. How much personal contact with other people would you like your job to require?
1. Very infrequent (almost no contact with others).
 2. Infrequent (limited contact with others).
 3. Occasional (average amount of contact with others).
 4. Frequent (considerable contact with others).
 5. Very frequent (in contact with others almost all of the time).

181. How many workers would you want to supervise?

0. None.
1. 1 or 2 workers.
2. 3 to 5 workers.
3. 6 to 8 workers.
4. 9 to 12 workers.
5. 13 or more workers.

182. How many supervisors would you want to direct in your work?

0. None.
1. 1 or 2 supervisors.
2. 3 to 5 supervisors.
3. 6 to 8 supervisors.
4. 9 to 12 supervisors.
5. 13 or more supervisors.

183. How much general responsibility would you want in your work?

1. Very little.
2. Little.
3. Average amount.
4. Substantial.
5. Very substantial.

184. How many personnel would you like to be responsible for in your work? For example, a president of a corporation would be responsible for everyone who worked for the corporation.

0. None.
1. 10 or fewer workers.
2. 11 to 50 workers.
3. 51 to 250 workers.
4. 251 to 750 workers.
5. 751 or more workers.

185. How much supervision would you want to receive in your work?

1. Close supervision, including job assignments and close observation of work.
2. General supervision.
3. General guidance, but quite independent of others.
4. Very little direction or guidance.
5. No supervision.

186. What noise level would you be willing to have in your work?
1. Very quiet (as in a hospital, greenhouse, photo lab, etc.).
 2. Quiet (private office, library, etc.).
 3. Moderate (department store, business office where typewriters are used, light automobile traffic, etc.).
 4. Loud (many factories, heavy traffic, machine shops, carpenter shops, etc.).
 5. Very loud (close to jet engines, large earth-moving equipment, riveting, etc.).
187. It is possible to talk and joke and have other social interaction and contact in some types of work. How often would you want these opportunities in your work?
1. Almost no opportunity.
 2. Limited opportunity.
 3. Moderate opportunity.
 4. Frequent opportunity.
 5. Possible almost all of the time.
188. How much responsibility for the safety of others would you be willing to assume in your work?
0. None.
 1. Little (working only with small hand tools, machines which are not dangerous, etc.).
 2. Less than average (responsible to exercise only reasonable care).
 3. Intermediate (must be especially careful to avoid hurting others, as in operating overhead cranes, driving vehicles, etc.).
 4. Substantial (must constantly be careful not to injure others, as in handling dangerous chemicals or explosives, etc.).
 5. Very substantial (the safety of others would depend entirely upon you, as in piloting an aircraft, performing major surgery, etc.).
189. How much property would you be willing to assume responsibility for?
1. Very little (a few dollars worth).
 2. Little (up to about one hundred dollars worth).
 3. Moderate amount (a few hundred dollars worth).
 4. Substantial amount (one or two thousand dollars worth).
 5. Very substantial amount (more than two thousand dollars worth).

190. To what extent would you want to follow a routine, or have your work outlined for you?

1. Almost no change from a predetermined job routine, such as in working on an assembly line.
2. Little change from the work routine possible, as in book-keeping or stocking items in a warehouse.
3. Certain work must be done, but you can determine your own schedule or routine, as might be done by a carpenter, automobile mechanic, or machinist.
4. Little routine work (most of the decisions would be made by you, for example, store manager, industrial engineer, etc.).
5. No routine (a wide variety of problems must be dealt with, and you would determine your own solutions, for example, corporation vice-president, research chemist, etc.).

191. Some positions in a company are especially important or critical. If not filled properly, such things as the company's earnings or reputation might seriously suffer. With this in mind, how important would you want your job or position to be?

1. Very little importance.
2. Little importance.
3. Moderate importance.
4. High importance.
5. Very high importance.

192. What do you want your monthly salary to be in your work? (Put your answer in the space provided at the top of the second page of your answer sheet.)

193. What occupation are you most interested in right now? (Put your answer in the space provided at the top of the second page of your answer sheet.)

VITA

Alma Frank Harris

Candidate for the Degree of

Master of Science

Thesis: The Development of a Vocational Interest Inventory Using
"Worker-Oriented" Job Elements

Major Field: Counseling Psychology

Biographical Information:

Personal Data: Born at Logan, Utah, June 9, 1939, son of Frank
E. and Emma R. Harris; married Gayle H. Harris, 1962; five
children--Rebecca Lee, Jeffrey Martin, Kimberly, Marnie,
David Alma.

Education: Graduated from South Cache High School in 1957;
received Bachelor of Science degree from Utah State
University, June 1963; completed requirements for the
Master of Science Degree in Counseling Psychology at
Utah State University in 1971.

Professional Experience: Counselor at Sky View High School,
Smithfield, Utah, 1970 to 1971.