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A comparison of holistic to decomposed rating of position analysis questionnaire work dimensions

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RICE UNIVERSITY

A COMPARISON OF HOLISTIC TO DECOMPOSED RATING OF POSITION ANALYSIS QUESTIONNAIRE WORK DIMENSIONS

by

STEPHANIE K. BUTLER

A Thesis Submitted
in Partial Fulfillment of the
Requirements for the Degree

MASTER OF ARTS

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January, 1987

A Comparison of Holistic to Decomposed Rating of

Position Analysis Questionnaire Work Dimensions

by

Stephanie K. Butler

Abstract

Several methods for improving the job analysis process were examined using the Position Analysis Questionnaire (PAQ). Holistic ratings of PAQ dimensions for four jobs were obtained from 63 non-experts, nine graduate students who were familiar with the PAQ, and three professional job analysts who were very familiar with the PAQ. Holistic ratings were compared to a traditional score profile obtained from professional job analysts. For all groups, holistic ratings of the dimensions were not similar to the traditional score profiles; consequently, rating PAQ dimensions holistically is probably not a viable alternative to reducing the effort required in the job analysis process. Additionally, a comparison of three rating scales in the holistic condition showed that they were moderately correlated. Future research investigating rating scales that yield independent information should be conducted. The potential benefits of a detailed item training session for job analysts are also discussed.

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A Comparison of Holistic to Decomposed Rating of Position Analysis Questionnaire Work Dimensions

Background

Job analysis refers to any strategy used to desribe the work activities and environment of people in an organization. Job analysis involves every phase of personnel administration and research; its uses can be divided into four categories (Cascio, p. 49), the first of which is organizational design. Employees can have a general idea of the actions expected of them because, through job analysis, roles are defined and organized within an industry. Human resource planning entails job analysis information because one needs to know the components of a job and the behaviors necessary to perform the job successfully in order to fulfill the company's present and future needs for particular skills.

A second area in which job analysis information is used is personnel administration. Examples include job evaluations, recruitment, selection, placement, training and personnel development, performance appraisal, compensation, promotions and transfers, career path planning, and labor relations. Job analysis is used from the time an applicant applies for a job throughout his/her involvement with the organization until the termination of his/her career.

The third area, work and equipment design, involves engineering and job design, methods improvement, and safety. With job analysis, one can determine possible hazards that may occur on the job and design equipment to avoid accidents.

A final category in which job analysis is useful includes vocational guidance, rehabilitation counseling, job classification systems, and personnel research. For example, sample job analyses are used to aid people in narrowing their career choice.

Job analysis provides both a deeper understanding of job components, including the behavioral characteristics needed for the job, and a groundwork for making job-related decisions. A failure to effectively address the issues mentioned previously through job analysis techniques can waste employee skills and threaten the life of the firm. Therefore, it is imperative that the method of job analysis chosen by a firm is useful and effective.

The three major methods of job analysis include task-oriented methods, abilities-oriented methods, and worker-oriented methods (Cascio, 1982, p. 61; Harvey & Wilson, 1986). Task-oriented methods involve behaviorally specific, technical descriptions of jobs. Abilities-oriented methods focus on the underlying human abilities needed for successful job performance to describe work. Worker-oriented methods describe work in terms of a relatively small number of dimensions of work common to all jobs and take a more abstract view of the job than the other methods. A worker-oriented method, the Position Analysis Questionnaire System I (PAQ, McCormick ,Jeanneret, & Mecham, 1972) was used in the research project.

Unfortunately, most methods of job analysis are time-consuming and costly. Much time is taken to interview job incumbents and to assemble the inventory. After all jobs are analyzed, periodic updating is required because job tasks change over time. Behaviorally explicit task-based inventories are especially cumbersome because they are highly situation specific. Task-based and worker-oriented methods have been criticized for requiring much quantitative analysis (Cornelius, Schmidt, & Carron, 1984; Schmidt, Hunter & Pearlman, 1981).

Because job analysis is used in practically every area of organizational life, it would be an advantage to reduce the costs and complication of job analysis methods while simultaneously providing equally useful data. Unfortunately, even though several simpler methods of job analysis have been suggested, they often do not yield ratings of adequate accuracy or reliability (Harvey & Wilson, 1986). The purpose of this paper is to describe the Position Analysis Questionnaire, discuss three methods for simplifying the job analysis process that have been investigated, and report a study examining novel ways to simplify the PAQ job analysis process.

A Description of the Position Analysis Questionnaire

The Position Analysis Questionnaire System I is a worker-oriented method of job analysis consisting of 189 job elements. It deals with job elements as they imply human behavior and avoids describing specific tasks and duties of a job. Major divisions of the PAQ are information input, mediation processes, work output, interpersonal activities, work situations and job context, and miscellaneous aspects. Each division is partitioned into sections containing job elements which describe general job activities, job characteristics, or work conditions. When rating the PAQ, 178 job elements are evaluated on one of five rating scales. In the case of elements on the PAQ that do not apply to the job, a —does not apply' (DNA) option is available. In addition, there are eleven elements that require an answer to be written in.

The PAQ has several advantages over other methods of job analysis. Statistical measures and predictions are used because most ratings are numerical rather than written. Because of its generality of item content and quantitative nature, PAQ scores can be directly compared across jobs and settings (McCormick et al., 1977). Virtually all jobs or positions can be evaluated using the PAQ. Moreover, a business does not have to undergo the tedious process and high costs of developing its own inventory (McCormick, Jeanneret, & Mechem,1972; McCormick et al., 1977).

Unfortunately, the PAQ is intrusive because interviews with job incumbents can take up to two hours. Moreover, it is recommended that each incumbent be interviewed separately and that at least three analysts be used to analyze each job (McCormick et al., 1977; Mecham et al., 1977). It is evident that even though the PAQ has advantages over other methods, it can be quite time-consuming.

A principal component factor analysis of the PAQ was conducted using 536 jobs and 32 dimensions were derived (McCormick et. al, 1972). When scoring the PAQ, 32 dimension scores are derived from a factor scoring process using the job elements that are related to each dimension (Jeanneret, 1969). These 32 scores are used for practically every job analysis purpose including job classification and compensation, performance appraisal development, employee placement test selection and/or construction, job redesign, job description, career counseling, etc. (McCormick et. al, 1977; Mecham et. al, 1977).

The PAQ System I scoring method that is used to produce the 32 dimension scores is known; therefore, PAQ System I will be used in this project. Titles of the dimensions and the job elements related to each dimension are listed in Appendix A.

Using Naive vs. Expert Raters

One method of job analysis process simplification involves decreasing the amount of job-related information given to raters. This process implies that giving detailed job information to raters does not help rating accuracy and that good ratings will be made even if the rater does not have experience with the particular job (Harvey & Wilson, 1986).

Smith and Hakel (1979) claimed that job expert ratings on the PAQ had high convergent validities with ratings of college students who were given no information about jobs other than their titles (average convergent validity $r=.92$). It was concluded

that the PAQ measures knowledge about work behavior that both expert and naive raters possess. However, the job analyst experts used by Smith & Hakel (1979) had not been trained using the PAQ. Moreover, Cornelius , Denisi, & Blencoe (1984) claimed that the method used by Smith and Hakel gave an overestimation of convergent validity correlations. Specifically, in the Smith and Hakel (1979) study, convergent validities were obtained by collapsing across jobs instead of calculating convergence for each job before pooling the results. In a replication (with different jobs) using a different statistical analysis, Cornelius et al. (1980) reported an average convergent validity of only r=.58. They also pointed out the possibility that naive and expert raters could agree on those elements that do not apply to the job and produce moderately high convergent validities, yet not agree on factors that are relevant to the job. In a Monte Carlo study, Harvey and Hayes (1986) found that interrater reliabilities of the size found in other studies (Jones, Main, Butler & Johnson, 1982; Smith & Hakel, 1979) could be obtained with agreement on a small number of 'does not apply' items and random responses on the remaining items. Specifically, when 15-20% of the items were rated —DNA' and random responses were generated for the remainder of the items, interrater reliabilities in the .50's were obtained.

Jones et al. (1982) obtained PAQ ratings from graduate students who read a short, narrative summary of jobs before completing the PAQ. They found that people were able to classify positions subjectively into meaningful job families and subfamilies using only these narrative descriptions. Unfortunately, the student ratings were not compared to job content analysts' ratings or another external standard of accuracy. Additionally, the reliabilities obtained in this study were not very high (item-level median r=.48 and dimension-level median r=.65). The interrater reliabilities reported in both studies supporting the use of naive raters (Jones et al., 1982; Smith & Hakel, 1979) are both below the PAQ interrater reliabilities most often obtained from job content experts, which are usually in the .80's and .90's (Jeanneret, 1985), as well as below the 'worse case'

baselines identified by Harvey & Hayes (1986). As an extension of the Harvey and Hayes (1986) Monte Carlo design, Blunt and Harvey (1986) compared item to dimension level interrater reliabilities and discovered that a .65 dimension level interrater reliability which was supported by Jones et al. (1982), could be obtained when the item level interrater reliability was approximately .50. Therefore, the value of using naive raters to reduce the cost and intrusiveness of job analysis is strongly questioned.

Most other evidence has supported the use of only job content experts to provide accurate and reliable job ratings. Friedman and Harvey (1986) found that practice completing another worker-oriented job analysis instrument did not improve the convergence of ratings between naive raters and trained job analysts on the PAQ, and that when the amount of job description given to naive raters was increased, the convergence with the expert ratings rose. These convergent validities were low; however, mean convergent validities with trained job analyst ratings were $r=.56$ for naive raters who were given only titles of the jobs, $r=.63$ for those given narrative summaries of the jobs, and $r= .64$ for the group given an extensive task summary. Harvey and Lozada-Larson (1985) also found improved but inadequate convergent validities between trained job analysts and naive raters in a task-oriented job analysis setting.

In summary, reducing the amount of job information available does not seem to be a good solution to decreasing the intrusiveness of the job analysis process. It seems doubtful that naive raters can make reliable and valid job analysis ratings. Therefore, in the study only jobs with which students are familiar will be used.

Reducing the Number of Rating Items

Simplification of the job analysis process by reducing the number of rating items has also been investigated. Sackett, Cornelius, and Carron (1981) compared a task oriented job analysis requiring 100 man hours to complete to a simplified rating task taking only

15 minutes to complete. The simplified rating task involved a panel of judges conducting a paired comparison of jobs on a single Likert-type scale, with each job being compared once with each other job. Results showed that the paired comparison task involving a few general judgments yielded identical conclusions to the task-oriented approach when participants classified jobs into similar and dissimilar categories.

In the Sackett et. al. study, only eight jobs were used and, as the number of jobs used increases, so does the number of comparisons one would have to make (Harvey & Wilson, 1986; Sackett et al, 1981). Therefore, this method could quickly become time-consuming and cost inefficient. Sackett et al. (1981) also suggested that even though task analysis methods take much longer, they produce a larger body of data which may be used for purposes other than grouping jobs into categories. In other words, this simplified method may be easier than the intrusive methods when comparing only a few jobs, but the results are not useful for purposes other than job categorization. As mentioned earlier, we would like to simplify job analysis procedures while retaining the present effectiveness and widespread applicability of job analysis results.

Cornelius, Schmidt, and Carron (1984) asked raters to make a single holistic judgment categorizing job titles into one of four a priori job families; each rater made only one rating for each job to be analyzed. They compared results obtained from this holistic task to results obtained from a Likert-type scale on which raters judged the amount of time spent on 26 ability requirements and 39 task- and worker-oriented dimensions. Job classification results from these two methods corresponded well; consequently, the authors concluded that the single judgment holistic approach and the more involved procedure were equally effective. However, this short-cut strategy probably would not be equally effective when results are used for compensation, performance appraisal, etc.

Harvey, Wilson, and Blunt (1985) compared subjective and objective methods of deriving job dimensions. In the subjective case, 36 rationally derived job dimensions were

obtained from experts who sorted tasks into separate categories. The decomposed objective method involved obtaining job dimension scores from factor analyses of a 521-item task inventory. These two methods of deriving job dimensions did not yield similar results. The authors found that the ratings on the rationally derived dimensions were not similar to the job dimension scores obtained from a decomposed task analysis. Using the highest correlations between each pair of rationally (subjective) and empirically (objective) derived job dimensions, the median correlation across all job analysis dimensions was only r=.52.

In another study, reducing the number of judgments to be made was investigated by comparing three alternative job strategies used to help job incumbents make overall evaluations of worker requirements and motivational characterisics of their own jobs. Rating accuracy was assessed by computing intrarater reliability across time and comparing incumbent ratings to job analysis expert and supervisor ratings (Cornelius and Lyness, 1980). The authors found that holistic judgments were as effective as fully decomposed judgments (which were combined using an algorithm to obtain an overall score) in developing summary evaluations by job incumbents. Decomposed estimates followed by holistic overall evaluations (decomposed clinical) was the least effective strategy. This finding was replicated in a study involving performance appraisal (Lyness & Cornelius, 1982).

One explanation proposed for Cornelius & Lyness' findings is that participants may have been overloaded with quantity or complexity of information, inhibiting them from making correct decisions in the decomposed clinical condition. The 'limits' in human processing ability have been reported as consisting of anywhere from five to 15 elements (Kafry et al., 1979; Miller, 1956; Miller,1960). After an individual's limit is reached, use of information will decrease in both quality and quantity and the individual will not perform well (Driver & Streufert, 1969; Miller, 1960).

The conclusion that a decomposed algorithm strategy is effective is not surprising. Linear models are not subject to distractions, fatigue, boredom, overload, or the effect of previous information as are human decision makers. In one study, linear models predicted first year evaluations for graduate students better than judges. Both methods used grade point ratio, quality of undergraduate institution, and GRE scores as variables (Dawes, 1971). Dawes and Corrigan (1974) found that random linear models yielded predictions superior to judges in predicting grade point ratio for students and psychiatric diagnosis for the mentally disturbed. A policy capturing model of an interviewers' information use strategy yielded more valuable ratings than those obtained when interviewers did not use a linear model (Dougherty, Ebert, and Callander, 1986).

In addition to findings concerning linear models, much literature outside of industrial psychology has supported the use of a decomposition strategy rather than a holistic or global strategy in decision making. Miller (1956) reported that global judgments were not as accurate as judgments made on separate dimensions. Einhorn (1972) also found these results when participants predicted the lifespan of victims with Hodgkin's disease. Armstrong, Denniston, and Gorden (1975) asked one group of subjects to answer a decomposed form of a problem and another group to respond to a direct form of the same problem. They found that those using the decomposed form were more accurate in problem solving and that a decomposition strategy was especially effective when the subject knew little about the problem.

Research demonstrating that subject matter experts can use more information in a decision making situation has been conducted by Phelps and Shanteau (1978). They found that experts judging breeding gilts used up to 11 verbal dimensions in order to reach a final decision, but nonexperts could only use three dimensions effectively. Moreover, experts in an area may show more of an interest in a decision outcome than those not familiar with the area and therefore make better decisions (Winkler & Murphy,

1973). A contrast using expert and non-expert participants was incorporated in the thesis.

In summary, some research concerned with reducing the number of job analysis rating items has been non-supportive of this approach. Other studies have demonstrated that reducing the number of rating items is an effective strategy; however, results obtained from these 'short cut' methods are not as useful as outcomes obtained from more complicated methods for purposes of performance appraisal, job re-design, employee placement test selection and/or development, etc. In the present study, a novel way to reduce the number of PAQ ratings while retaining the present usefulness of the job analysis results was investigated.

Reducing the Number of Rating Scales

Most job analysis techniques employ the use of several rating scales, operating under the assumption that different scales give different results; to date few researchers have questioned this assumption. As the number of rating scales increases, the time involved in completing and scoring the ratings also increases. Two studies have provided evidence suggesting that time and effort may be saved by reducing the number of discrete rating scales for each element. Gael (1983) found that the use of simple checklists offered as much information as the use of a relative time spent rating scale. Wilson and Harvey (1986) collected ratings on duties from 3,589 positions using several rating scales. A continuous scale of time spent on the duty and a dichotomous time scale produced functionally equivalent results (median $r=.80$). High correlations were also obtained between continious time spent and importance rating scales (median $r=.66$).

Introduction

Efforts to reduce the intrusiveness of the job analysis process have included lowering the quantity of rating items, using naive raters instead of expert raters, and reducing the number of rating scales. For the most part, results from studies employing these approaches have been either non-supportive or have produced results that are not as useful as results obtained from traditional methods. In particular, it now seems clear that job-naive raters are not able to provide accurate or reliable job analysis ratings. However, other avenues to reducing the cost and intrusiveness of the job analysis process are worth investigating; this project addressed three methods. Specifically, the similarity of holistic and empirically derived (decomposed) ratings of PAQ dimensions was examined, the possible contribution of PAQ familiarity to the similarity of ratings in the two rating conditions was studied, and the practicality of using three holistic scales was addressed.

The PAQ System I was used to contrast a holistic and decomposed strategy of making job analysis ratings. The holistic method required rating the PAQ dimensions directly. The decomposed method required rating 178 PAQ job elements and empirically deriving the dimension scores using a factor scoring formula. The same four jobs were used in both strategies and students were familiar with the jobs used. The four jobs, which all subjects rated, were chosen because the results of a pilot questionnaire (Appendix B) indicated students were familiar with these jobs (See Table 1 for pilot data means).

Both professional job analysts and graduate students who were familiar with the PAQ, and students who were not familiar with the PAQ rated dimensions holistically using an importance scale, a time spent scale, and a percentile scale. Percentile scale ratings for each job in the holistic condition were converted to standardized scores and were compared to a traditional score profile for that job. Using percentile scale ratings in the holistic condition instead of rating dimensions directly with a standardized z-score

Table 1

Means For Pilot Data Results

Job	Mean
Foodserver	3.66
Counter Clerk	3.31
Homemaker	3.61
Secretary	3.22

Ratings were anchored as follows:

1.....unfamiliar

2.....vaguely familiar

3.....familiar

4.....quite familiar

5.....very familiar

scale was expected to be much easier for students with no exposure to statistics.

Professional job analysts and graduate students who had previous exposure to the PAQ completed ratings using the traditional decomposed method; the factor scoring process, described by Jeanneret (1969), was used to convert the item scores into 32 standardized dimension scores. Professional job analysts' statistically derived dimension profiles were averaged for each job and served as the traditional score profile to which holistic ratings were compared.

Similarity of ratings in the two conditions was assessed using Cronbach's procedure, which is very effective when each rater judges multiple jobs (Harvey and Lozada-Larson, 1985) as they did in this study. Because this procedure is relatively new to the job analysis area, it is descrbed briefly. Cronbach's procedure divides global accuracy into several component parts; therefore, a more precise and informative measure of accuracy is attained. For the purpose of this analysis the traditional score profile, obtained from professional job analysts, served as 'accurate' scores. Accuracy components and sub-components are briefly defined below.

A. Elevation is the component of accuracy due to the overall leniency/severity of the rater.

B. Differential elevation describes how the average rating given to each job across all dimensions approximates the traditional score profile.

C. The differential elevation sub-component assesses the rater's ability to rank order jobs using their overall mean rating.

D. Stereotype accuracy involves collapsing across jobs and includes the rater's ability to predict the norm for each dimension.

E. The sub-component of stereotype accuracy reflects the ability to correctly order the rating dimension averages across jobs.

F. Differential accuracy represents the capability to predict differences between jobs on individual dimensions, averaged across dimensions.

G. The sub-component of differential accuracy is the ability, averaged across dimensions, to correctly order jobs on each dimension.

After component and sub-component accuracy scores for the holistic condition were obtained for each subject, a multiple regression procedure was conducted using the component and sub-component accuracy scores as criteria and group membership (professional job analysts, graduate students, or undergraduate non-expert) as the predictor. The size of the R indicated the extent to which group membership influenced similarity of holistic ratings to the traditional score profile.

Because the main purpose of the study was to investigate methods of simplifying the PAQ job analysis process, it was hypothesized that ratings in the holistic condition would closely approach the traditional score profile. If holistic ratings closely approach the traditional score profile, then the time-consuming process of scoring the PAQ and the intrusiveness of rating many items could be eliminated.

Similarity of ratings in the holistic and decomposed conditions as related to familiarity with the PAQ was also examined. Professional job analysts had extensive exposure to the PAQ, graduate students had some exposure to the PAQ, and non-expert students had no exposure to the PAQ. Although no study has yet investigated this factor, it was expected that familiarity with and training in the use of the instrument would contribute to similarity of holistic and decomposed ratings. Although for all groups the holistic scores are expected to approximate the traditional score profile, experts' holistic ratings should be closer to the traditional score profile than non-experts' holistic ratings. Even though the PAQ job analysis process could be simplified with holistic rating of dimensions, training in and familiarity with the use of the PAQ may still be necessary in order to achieve effective use of the instrument.

Finally, a comparison of importance scale ratings, time spent scale ratings, and percentile scale ratings was made in the holistic condition. Correlations were computed for each combination of the three scales for each dimension, and these correlations were averaged for each of the scales. Ratings on the three scales were expected to be highly

correlated, thereby allowing the use of only one scale to make the dimension ratings.

Method

Subjects

The non-expert group consisted of 63 undergraduates enrolled in an industrial psychology course who participated in the study in order to obtain credit for a class project. Non-experts knew that the PAQ is a method of job analysis, but they had not been exposed to the specific items on the questionnaire, the dimensions, or PAQ development procedures.

Because the graduate student job analyst population is limited at Rice, only nine subjects participated in the graduate student expert group. These graduate students were familiar with the procedures used in developing the PAQ, had read the PAQ training manual, and had completed PAQs on other jobs prior to the study.

A second group of PAQ experts was added to the study. Three trained professional job analysts who were very familiar with the PAQ, had read the training manual and background material, and had attended an intensive item-level training session conducted by a PAQ job analysis consultant composed this group. The professional job analysts were employed by a local consulting firm and routinely completed PAQs in the course of their jobs.

Materials

Unlike the graduate student experts, the professional analysts had used the PAQ System II. System II is very similar to System I; however, to avoid confusion between the two systems, a comparison between Systems I and II was given to the professional job analysts (Appendix C).

Additionally, both professional job analysts and graduate student experts were given a copy of PAQ System I, a scoring sheet, and a copy of the holistic questionnaire containing the PAQ dimension definitions to be rated holistically on three rating scales. Non-experts were given only a copy of the holistic questionnaire. A copy of the holistic questionnaire is included in Appendix D. Job descriptions of secretary, homemaker, foodserver, and counter clerk at fast food restaurant were included in the holistic questionnaire and are included in Appendix E.

The definitions of the PAQ dimensions (Appendix F) were used when rating the dimensions holistically and were adapted from the PAQ manuals (Mecham et al., 1977; Jeanneret, 1969). In the cases where no information was available, the author composed a definition using the information from the PAQ items that loaded highly on that dimension.

Procedure

Holistic condition. All three groups of subjects (non-expert, graduate student expert, and professional job analyst expert) rated the dimensions holistically for all four jobs using three scales - an importance scale, a time spent scale, and a percentile scale. Instructions for rating the dimensions in the holistic condition are included in the holistic condition questionnairre (Appendix D).

Participants were given additional verbal instructions as to how to use the percentile scale, because most students had never made ratings using a percentile scale. It was explained that scores on the percentile scale could range from 0 - 100. Sample jobs and possible percentile ratings were given as illustrations. One example is included below.

> "Consider the dimension 'working in a hazardous environment'. Where do you think the job of coal miner would fall on the scale as compared to all other jobs in the economy? A good answer would be around the 95% range because the job of

coal miner is much more dangerous than most jobs. A 95% rating means that 95% of all the jobs in the economy fall below the job 'coal miner' on the dimension 'working in a hazardous environment'. On the other hand, the job of accountant would fall on the lower end of the scale (possibly at about 15%) because it is not a very dangerous job as compared to all other jobs in the economy."

After this explanation, examples of jobs and dimensions other than those included in the study were given and the students practiced using the percentile rating scale. The sequence in which the jobs appeared was counterbalanced to prevent order effects.

Decomposed condition. Both expert groups rated the 178 items of the PAQ Sytem I for each of the four jobs. Non-experts did not participate in the decomposed condition because they had no exposure to the PAQ. Before completing ratings in the decomposed condition, the professional job analysts, who were accustomed to using PAQ System II read the comparison of PAQ Systems I and II. The professional job analysts indicated that the minor differences between PAQ System I and II did not pose problems in rating the System I version.

Job order was counterbalanced across subjects; however, for the experts, job order was held constant across the two conditions. Experts were instructed to finish rating all four jobs using one strategy (holistic or decomposed) before rating the jobs using the other strategy.

Results

In order to examine the relationships between the three holistic scales, correlations between each possible combination of the three scales were obtained for each dimension and average correlations across dimensions were calculated. Average correlations between the scales were .69 between the importance and time spent scale, .55 between the time spent and percentile rating scale, and .53 between the importance scale and the

percentile rating scale. The few items that required the use of a special scale (because an importance or time scale was not logically related to the item) were excluded from this comparitive analysis.

Interrater reliabilities were calculated by group and rating strategy for each job and are included in Table 2. In the holistic condition, average interrater reliabilities were .26 for the non-expert group, .43 for the graduate students, and .49 for the professional job analysts. In the decomposed condition, average interrater reliabilities were calculated on both the PAQ item and PAQ dimension score level. Graduate students' average interrater reliabilities were moderately high, but they were not high enough to be considered adequate expert interrater reliability coefficients (graduate students' average item-level reliability=.66; graduate students' average dimension-level reliability=.69). As discussed earlier, PAQ reliabilities obtained by job analysis experts are usually much higher, and range from .80 to .90 (Jeanneret, 1985). Moreover, McCormick and Jeanneret (in press) have suggested .75 as a minimum level of acceptable interrater reliability.

Fortunately, professional job analysts' interrater reliabilities are comparable to those obtained by job analysis experts in 'real world' settings (average professional job analysts' item interrater reliability=.87; average professional job analysts' dimension interrater reliability=.86). Consequently, for the professional job analysts, 32 dimension scores were derived from the 178 job element ratings using the factor scoring formula developed by Jeanneret (1969). Professional job analysts' empirically derived dimension scores were averaged across raters for each job and were used as the traditional score profile. The traditional score profile is in Table 3.

To measure the similarity of the holistically rated dimensions for each group and the traditional score profile obtained from the professional job analysts, Cronbach's procedure (discussed earlier) was used. All holistic percentile ratings of the PAQ dimensions were

Table 2

Interrater Reliabilities By Job, Condition & Group

Condition	Job: Counter-Clerk	Home-maker	Secr-etary	Food-server
Non-expert				
Holistic dim.	.21	.21	.34	.28
Graduate Student				
Holistic dim.	.35	.32	.63	.42
Decomposed item	.64	.60	.74	.75
Decomposed dim.	.65	.64	.79	.68
Professional Job Analyst				
Holistic dim.	.46	.48	.58	.44
Decomposed item	.88	.82	.88	.90
Decomposed dim.	.88	.78	.85	.92

Table 3

Traditional Score Profiles (converted to percentile scores)

DIMENSON TITLE	COUNTER-CLERK	HOME-MAKER	SECR-ETARY	FOOD-SERVER
1. DECISION/COMM RESP.	16	69	25	21
2. SKILLED ACTIVITIES	22	34	21	11
3. PHYSICAL/RELATED ENVIRONMENT	65	87	33	59
4. EQUIPMENT/VEHICLE OPERATION	44	65	31	62
5. INFORMATION PROCESSING	67	28	79	65
6. VISUAL INPUT FROM DEVICES	24	46	33	16
7. PERCEPTUAL INTERPRETATION	45	29	35	33
8. INFORMATION FROM PEOPLE	54	73	39	85
9. VIS. INPUT FROM DISTAL SOURCE	30	31	58	52
10. PHYSICAL INFO EVALUATION	64	64	40	38
11. ENVIRONMENTAL AWARENESS	86	98	38	57
12. AWARE OF BODY MOVEMENT	18	27	42	34
13. DECISION MAKING	10	52	14	11
14. INFO PROCESSING	36	26	85	63
15. MACHINE/PROCESS CONTROL	40	26	85	53
16. MANUAL CONTROL ACTIVITIES	42	52	25	32
17. CONTROL/EQUIPMENT OPERATION	28	69	33	22
18. GENERAL BODY ACTIVITY	30	70	33	56
19. HANDLING/MANIPULATING	93	79	61	85
20. FINGER DEXTER/PHYS. ACTIVITY	48	16	74	40
21. SKILLED TECHNICAL ACTIVITIES	25	50	36	32
22. COMM. DECISIONS/JUDGMENTS	16	67	37	20
23. JOB INFO EXCHANGE	81	40	46	81
24. STAFF/RELATED ACTIVITIES	27	77	64	15
25. SUPR/SUBORD RELATIONSHIPS	81	33	18	51
26. PUBLIC RELATED CONTACT	90	64	16	81
27. UNPLEASANT/HAZARDOUS ENV.	29	45	23	30
28. DEMANDING SITUATIONS	35	95	12	17
29. BUSINESSLIKE CONDITIONS	48	17	72	63
30. ATTENTIVE/DISCRIMINATING	09	32	06	09
31. UNSTRUCTURED/STRUCTURED WORK	78	17	60	64
32. VARIABLE/REGULAR SCHEDULE	13	05	62	01

converted into standardized scores. using the SAS probit function so that they could be compared to the traditional score profile which contained standardized scores. Component and sub-component scores of accuracy were computed for each subject from the holistic ratings. Summary statistics obtained for each component and subcomponent of accuracy are included in Table 4.

The association between group membership and similarity of holistic ratings with the traditional score profile was examined for each of the components and subcomponents of accuracy using multiple regression. The component and sub-component scores of accuracy served as dependent measures and group membership served as an independent measure. The size of the R indicated the relationship between group membership and similarity. Only one component of global accuracy, elevation, was significant ($F_{2,75} = 29.97$); $RSQ = .45$; $p < .001$). The differential accuracy subcomponent is a measure of average convergent validity between the traditional score profile and holistic ratings obtained from each group. Average convergent validities were $r = .01$ for the non-experts and graduate student experts and $r = .09$ for the professional job analysts.

To further investigate the similarity of the decomposed and holistic strategies, each experts' empirically derived dimension scores were correlated with his/her holistic dimension ratings for each job. Non experts were not included in this analysis because they only completed ratings in the holistic condition. Average correlations between strategies were .01 for the graduate student experts and .03 for the professional job analyst experts. Table 5 contains average correlations between strategies averaged across raters for each job.

Discussion

Results revealed novel information that can be applied to the area of job analysis; these results are included in this section. Additionally, problems possibly encountered

Table 4

Simple Statistics for Cronbach's Accuracy Components

	Components						
	EL	DE	SA	DA	DEr	SAr	DAr
F	29.97*	.49	.43	.92	.02	1.33	1.26
RSQ	.45*	.01	.01	.01	.03	.00	.04
	Non-expert						
M	.04	.03	.33	.80	-.02	-.01	.01
SD	.04	.02	.07	.18	.62	.16	.12
	Graduate Students						
M	.20	.02	.31	.84	-.03	.05	.01
SD	.15	.02	.04	.20	.75	.17	.11
	Professional Job Analysts						
M	.05	.02	.35	.93	-.10	.11	.09
SD	.03	.02	.07	.07	.61	.25	.01

* $p<.001$

E = Elevation
DE = Differential Elevation
DA = Differential Accuracy
SA = Stereotype Accuracy
DEr = Differential Elevation Sub-component
DAr = Differential Accuracy Sub-component
SAr = Stereotype Accuracy Sub-component

Table 5

Correlations Between the Two Rating Strategies

	Group	
	Job Analyst	Graduate Student
Job		
Counter Clerk	-.11	-.13
Homemaker	.20	.01
Secretary	.07	.11
Foodserver	-.04	.06
Overall Mean	.03	.01

when labeling the dimensions derived from a factor analysis and when rating dimensions holistically using a percentile scale are discussed. In conclusion, the importance of the PAQ item training session to prospective PAQ users is addressed.

Results indicate that future research should investigate the use of rating scales that are not highly correlated and that tap different constructs. Correlations between the three scales used in the holistic condition were only moderately high; therefore, the scales cannot be combined into one score without losing valuable information. Nevertheless, the correlations are high enough to question the value of using scales having this much common information. In particular, importance and time spent scales are frequently used in both job analysis and performance appraisal. If several rating scales are used, efforts should be made to insure that each scale taps different constructs; consequently, more information can be obtained from each rating scale, and the efficiency and usefulness of both job analysis and performance appraisal results can improve.

Both hypotheses regarding the expected similarity between holistic ratings and the traditional score profile were not supported. When comparing the holistic ratings in the three groups to the traditional score profile using Cronbach's procedure, elevation was the only significant component. A significant elevation component indicates that graduate students, on the average, assigned higher holistic dimension ratings than the other two groups. In past studies using Cronbach's procedure, the three sub-components (stereotype accuracy, differential accuracy, and differential elevation) that are most often used to interpret accuracy were not significant; in fact, the means were almost identical across the three groups (See Table 4). Familiarity with the PAQ did not seem to increase the similarity of the holistic ratings to the traditional score profile; all three groups performed poorly.

Moreover, correlations between each expert's traditionally derived (decomposed) ratings and his/her holistic ratings were very low. Low interrater reliabilities and

convergent validities of holistic ratings with the traditional score profile indicate that there is virtually no relationship between the holistic ratings and the traditional score profile. Rating PAQ dimensions holistically is probably not a viable alternative to reducing the costs and intrusiveness of the PAQ job analysis process.

One possible reason for the dissimilarity between the two methods may arise from the subjective procedure used to label factor analysis dimensions. The items loading highest on a factor are used when assigning factor labels. Most PAQ dimensions have several or many items relating to them (Appendix A); therefore, the brief, subjective labels assigned to the dimensions may not reflect all variables involved in a particular dimension. In other words, the job dimension scores obtained from the statistical formula may not actually represent the labels given to the dimensions. Investigation of the actual meaning of the PAQ dimensions needs to be conducted in the future. Because the dimension scores are used extensively, it is imperative that PAQ users understand their meaning in order to interpret PAQ results correctly.

Another possibility for the dissimilarity of the two rating condition responses is that persons may have encountered difficulty pinpointing where a job falls on a particular dimension as compared to all other jobs in the economy. The rating of a job when it is compared to all other jobs in the economy will partially depend on the jobs that the individual thinks of when assigning the rating. Individual differences that can occur in this respect are numerous and may have contributed to both low interrater reliabilities among raters in the holistic condition and the dissimilarity of the holistic ratings to the traditional score profile and to decomposed ratings.

Evidence for the possible importance of a PAQ item training session was an additional finding of this study. Interrater reliabilities in the decomposed condition for the professional job analysts were much higher than those obtained for the graduate student group. One possible reason for the higher interrater agreement among professional job

analysts over that obtained from graduate students is that the professional job analysts had participated in an intensive item training session as a part of their job. In a PAQ item training session, each item on the PAQ is discussed in great detail by a consultant who has used the instrument for several years. Examples of jobs that are rated 'high' or 'low' on each item are given and possible problems encountered when rating each item are discussed. Trainees make practice ratings under the supervision of a professional job analysis consultant who reviews the ratings and gives feedback. Therefore, those who attend an item training session are exposed to additional information and practice above and beyond that obtained from reading PAQ training materials. This additional information may help professional analysts obtain higher levels of interrater reliability and possibly rate jobs more accurately than those with less exposure to the PAQ.

Moreover, professional job analysts participate in review sessions where items having discrepant ratings are discussed in detail. Discrepant ratings may result from different information obtained by different analysts for the same job or result from an analyst rating an item incorrectly. If an analysts rates an item incorrectly (i.e. overweighting or underweighting the importance of the item to jobs), it can be corrected immediately in the review session. Ergo, professional job analysts are being trained continously. Those who are exposed only to the training manuals and do not often use the PAQ may rate less accurately than those who attend an item training session and discuss the occurence of discrepant ratings. Future research should address the contribution of a detailed item training session to rater accuracy.

In conclusion, valuable information regarding the job analysis process resulted from this study. Future research should investigate the use of rating scales that are not highly correlated, the meaning of PAQ dimensions, and the importance of a detailed PAQ item training session to rating effectiveness. Also this study revealed that direct ratings of the dimensions are not similar to dimension scores derived using the traditional method.

Although the traditional method is time-consuming and expensive, the statisically derived dimension scores have been valuable to many organizations when implementing PAQ results. Short-cut substitute methods such as the one investigated will probably not yield results that are valuable to an organization and its employees; to borrow a metaphor, a 'penny saved' using quick methods of job analysis with the PAQ may not be a 'penny earned'.

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Appendix A

PAQ Dimensions and Items Relating to Each Dimension

DIMENSIONS OF INFORMATION INPUT

1. Visual input from devices/materials

002	Pictorial materials
004	Measuring devices
005	Work-aid devices
006	Mechanical devices
007	Materials in progress
008	Materials not in progress
009	Visual displays
021	Near visual discrimination
029	Estimating speed of moving parts
034	Estimating size
035	Inspecting

2. Perceptual interpretaion

004	Mechanical devices
009	Visual displays
016	Sounds
017	Tactual
024	Color discrimination
025	Sound pattern discrimination
026	Sound discrimination
029	Estimating speed of moving parts
030	Estimating speed of moving objects
031	Estimating speed of processes

3. Information from people

001	Written materials
003	Quantitative materials
012	Behavior
015	Verbal sources
189	Job structure

4. Visual input from distal sources

008	Materials not in progress
011	Man-made environment
013	Events or circumstances
022	Far visual discrimination
023	Depth discrimination
030	Estimating speed of moving objects
033	Estimating quantity
034	Estimating size

5. Evaluation of information from physical sources

017	Tactual
024	Color discrimination
031	Estimating speed of processes
032	Judging quality
033	Estimating quantity
034	Estimating size
035	Inspecting

6. Environmental awareness

010 Natural environment
011 Man-made environment
017 Tactual
018 Odor

7. Awareness of body movement/posture
027 Body movement discrimination
028 Postural discrimination

DIMENSIONS OF MEDIATION PROCESSES

8. Decision making
036 Decision making
037 Reasoning in problem solving
038 Synthesizing/integrating
039 Analyzing information or data
045 Education
046 Job-related experience
047 Training
049 Using mathematics
189 Job structure

9. Information processing
038 Synthesizing/integrating
039 Analyzing information or data
040 Grouping/filing
041 Encoding/decoding
042 Transcribing
044 Short-term memory
045 Education

DIMENSIONS OF WORK OUTPUT

10. Using machines/tools/equipment
051 Manually powered gross tools
054 Powered precision tools
058 Measuring devices
061 Machines/equipment
062 Activation controls
063 Detent setting controls
064 Variable setting controls
066 Frequent adjustment hand-opersted controls
068 Continuous hand-operated controls
078 Remote controlled equipment
081 Feeding/off-bearing
082 Material-controlling
085 Setting up
090 Standing
095 Hand-arm manipulation

11. Manual control/coordination activities
051 Manually-powered gross tools
054 Powered precision tools
055 Powered gross tools

057 Applicators
058 Measuring devices
082 Material-controlling
083 Assembling
084 Manually modifying
085 Setting-up
095 Hand-arm manipulation
096 Hand-arm steadiness

12. Control/equipment operation
062 Activation controls
066 Frequent adjustment hand-operated controls
067 Frequent adjustment foot-operated controls
068 Continuous hand-operated controls
069 Continuous foot-operated controls
072 Powered land vehicles
076 Powered mobile equipment
097 Eye-hand-foot coordination
098 Blind positioning

13. General body activity
051 Manually-powered gross tools
052 Manually-powered long-handle tolls
072 Powered land vehicles
075 Man-powered mobile equipment
077 Operating equipment
078 Remote-controlled equipment
087 Mobility
088 Agility
089 Balancing
091 Climbing
092 Walking
093 Moving actions

14. Handling/manipulating activities
053 Manually-powered handling devices
057 Applicators
075 Man-powered mobile equipment
079 Handling objects
080 Arranging/positioning
081 Feeding/offbearing
087 Mobility
092 Walking
095 Hand-arm manipulation
189 Job structure

15. Use of finger controlled devices vs. physical work
052 Manually-powered long-handle tools
056 Drawing and related devices
065 Keyboard devices
075 Man-powered mobile equipment
076 Powered mobile equipment
077 Operating equipment
093 Moving actions

094 Finger positioning
098 Blind positioning

16. Skilled/technical activities
050 Manually-powered precision tools
054 Powered precision tools
056 Drawing and related devices
058 Measuring devices
059 Technical and related devices
189 Job structure

DIMENSIONS OF INTERPERSONAL ACTIVITIES

17. Communication of decisions/judgments
100 Advising
101 Negotiating
102 Persuading
103 Instructing
104 Interviewing
105 Exchanging information
106 Public speaking
107 Writing
113 Job-related personal conduct
114 Executives/officials
115 Professional personnel
116 Middle management personnel
118 Clerical personnel
124 Students/trainees
128 Line management/supervision
130 Supervises assistants
132 Coordinates activities
134 Number of personnel supervised
135 Supervision received
189 Job structure

18. Job-related information exchange
105 Exchanging information
107 Writing
113 Job-related personal contact
116 Middle management personnel
118 Clerical personnel
120 Sales pesonnel
121 Buyers
122 Public customers

19. Staff/related activities
109 Code communications
115 Professional personnel
118 Line management/supervision
130 Supervises assistants
132 Coordinates activities
133 Staff functions

20. Supervisor-subordinate relationships

117 Supervisors
119 Manual and service workers
124 Students/trainees

21. Public/related contact
108 Signaling
122 Public customers
123 The public

DIMENSIONS OF THE WORK SITUATION AND JOB CONTEXT

22. Unpleasant/hazardous physical environment
136 Out-of-door environment
137 High temperature
140 Air pollution
141 Vibration
142 Improper illumination
143 Dirty environment
144 Awkward or confining work space
145 Physical hazards
147 Noise intensity

23. Personally demanding situations
148 Civic obligations
149 Frustrating situations
150 Strained personal contact
151 Personal sacrifice
152 Social value conflicts

DIMENSIONS OF MISCELLANEUOS ASPECTS

24. Businesslike working situations
162 Salary
169 Business suit or dress
176 Time pressure of work situation
183 Working under distractions
184 Updating job knowledge
186 Travel
187 Responsibility for the safety of others
189 Job structure

25. Attentive/discriminating work demands
176 Time pressure of situation
178 Precision
179 Attention to detail
180 Speed of discrimination
181 Vigilance: infrequent events
182 Vigilance: continually changing events
184 Updating job knowledge
187 Responsibility for the safety of others
188 Responsibility for assets

26. Unstructured vs. structured work
162 Salary

175 Specified work pace
177 Repetitive activities
184 Updating job knowledge
186 Travel
188 Responsibility for assets
189 Job structure

27. Variable vs. regular work schedule
156 Regular hours
161 Typical day and night hours
164 Incentive pay

OVERALL DIMENSIONS

28. Decision/communication/social responsibilities
001 Written materials
003 Quantitative materials
012 Behavior
015 Verbal sources
036 Decision making
037 Reasoning in problem solving
038 Synthesizing/integrating
039 Analyzing information or data
045 Education
046 Job-related experience
047 Training
049 Using mathematics
080 Arranging/positioning
090 Standing
095 Hand/arm manipulation
100 Advising
101 Negotiating
102 Persuading
103 Instructing
104 Interviewing
105 Exchanging information
106 Public speaking
107 Writing
113 Job-related personal contact
114 Executives/officials
115 Professional personnel
116 Middle management personnel
118 Clerical personnel
120 Sales personnel
123 The public
124 Students/trainees
128 Line management/supervision
130 Supervises assistants
132 Coordinates activities
133 Staff functions
134 Number of personnel supervised
135 Supervision recieved
148 Civic obligations
149 Frustrating situations

150 Stained personal contacts
151 Personal sacrifice
152 Social value conflicts
162 Salary
169 Business suit or dress
175 Specified work place
176 Time pressure of situation
177 Repetitive activities
180 Speed of discrimination
183 Working under distractios
184 Updating job knowledge
188 Responibility for assets
189 Job stucture

29. Skilled activities
002 Pictorial materials
003 Quantitative materials
004 Measuring devices (information from)
005 Work aid devices
006 Mechanical devices
007 Materials in progress
008 Materials not in progress
009 Visual displays
021 Near visual discrimination
024 Color discrimination
025 Sound pattern discrimination
026 Sound discrimination
029 Estimating speed of moving parts
031 Estimating speed of processes
032 Judging quality
034 Estimating size
035 Inspecting
041 Encoding/decoding
047 Training
049 Using mathematics
050 Manually-powered precision tools
051 Manually-powered gross tools
053 Manually-powered handling devices
054 Powered precision tools
055 Powered gross tools
058 Measuring devices (output devices)
059 Technical and related devices
061 Machines/equipment
062 Activation controls
063 Detent setting controls
064 Variable setting controls
066 Frequent adjustment hand-operated controls
081 Feeding/offbearing
082 Material controlling
083 Assembling
084 Manually modifying
085 Setting up
090 Standing
094 Finger manipulation

095 Hand/arm manipulation
096 Hand/arm steadiness
169 Business suit or dress
178 Precision
179 Attention to detail
181 Vigilance: infrequent events
187 Responsibility for the safety of others

30. Physical activities/related environmental conditions

008 Materials not in progress
010 Natural environment
011 Man-made environment
018 Odor
022 Far visual discrimination
028 Postural discrimination
033 Estimating quantity
034 Estimating size
051 Manually-powered gross tools
052 Manually-powered long-handle tools
053 Manually-powered handling devices
055 Powered gross tools
057 Applicators
072 Powered land vehicles
075 Man-powered mobile equipment
076 Powered mobile equipment
077 Operating equipment
079 Handling objects/materials
080 Arranging/positioning
082 Material-controlling
084 Manually modifying
087 Mobility
088 Agility
089 Balancing
090 Standing
091 Climbing
092 Walking
093 Moving actions
095 Hand/arm manipulation
096 Hand/arm steadiness
097 Eye-hand-foot coordination
119 Manual and service workers
136 Out-of-door environment
137 High temperature
140 Air pollution
141 Vibration
142 Improper illumination
143 Dirty environment
144 Awkward or confining work space
145 Physical hazards
147 Noise intensity
169 Business suit or dress
187 Responsibility for the safety of others

31. Equipment/vehicle operation

009 Visual displays
013 Events or circumstances
016 Sounds
022 Far visual discrimination
023 Depth discrimination
026 Sound discrimination
027 Body movement discrimination
029 Estimating speed of moving parts
030 Estimating speed of moving objects
062 Activation controls
063 Detent setting controls
066 Frequent adjustment hand-operated controls
067 Frequent adjustment foot-operated controls
068 Continious hand-operated controls
069 Continious foot-operated controls
072 Powered land vehicles
076 Powered mobile equipment
078 Remote-controlled equipment
097 Eye-hand-foot coordination
108 Signaling
141 Vibration
156 Regular hours
161 Typical day and night hours
164 Incentive pay
181 Vigilance: infrequent events
182 Vigilance: continually changing events
187 Responsibility for the safety of others

32. Information processing activities

001 Written materials
003 Quantitative materials
015 Verbal sources
038 Synthesizing/integrating
040 Grouping/filing
041 Encoding/decoding
042 Transcribing
044 Short-term memory
056 Drawing and related devices
065 Keyboard devices
077 Operating equipment
080 Arranging/positioning
094 Finger manipulation
098 Blind positioning
105 Exchanging information
109 Code communications
113 Job-related personal contact
118 Clerical personnel
137 High temperature
143 Dirty environment
145 Physical hazards
149 Frustrating situations
161 Typical day and night hours
169 Business suit or dress
176 Time pressure of situation

179 Attention to detail
183 Working under distractions

Appendix B

Pilot Data Questionnaire

Questionnaire

Using the scale below, please indicate your familiarity with the tasks and abilities required for each of the following jobs.

1 = Unfamiliar

2 = Vaguely Familiar

3 = Somewhat Familiar

4 = Quite Familiar

5 = Very Familiar

** Example: As a student, you study, take classes, converse with faculty, go to class, take tests, etc. Therefore, you would rate the job 'college student' as '5' (very familiar).

1. Homemaker 1 2 3 4 5

2. Fire Fighter 1 2 3 4 5

3. Insurance salesman 1 2 3 4 5

4. Counter clerk at fast food restaurant 1 2 3 4 5

5. Bus driver 1 2 3 4 5

6. Professor 1 2 3 4 5

7. Police officer 1 2 3 4 5

8. Custodian 1 2 3 4 5

9. Lawyer 1 2 3 4 5

10. Cook 1 2 3 4 5

11. Nurse 1 2 3 4 5

12. Career counselor 1 2 3 4 5

13. Flight Attendent 1 2 3 4 5

14. Beautician 1 2 3 4 5

15. Dietician 1 2 3 4 5

16. Secretary 1 2 3 4 5

17. Loan officer 1 2 3 4 5

18. Waiter or waitress 1 2 3 4 5

Appendix C

A Comparison of PAQ System I and II

RATING THE PAQ SYSTEM I

The Position Analysis Questionnaire (PAQ) System I is a worker-oriented method of job analysis consisting of 189 job elements, and was derived from the Worker Activity Profile. The PAQ deals with job elements as they imply human behavior and avoids describing specific tasks and duties of the job.

In this study you are asked to read four job descriptions and then rate the jobs using both the PAQ System I and the operational definitions of the PAQ dimensions. The 32 dimensions were derived from a factor analysis applied to 536 jobs that were analyzed using the PAQ System I. Scores obtained from the dimensions have been applied to job classification, compensation, and most other purposes for which the PAQ is used.

Presently, the PAQ System II, an updated version of PAQ System I, is being used at this firm. Although the content of both systems is basically the same, some changes were made when developing System II. An explanation of differences between the two systems follows.

DIVISION COMPARISON

The divisions of the PAQ remain the same in both versions; however, labels are different for three of these divisions.

1. 'Mental Processes' is termed 'Mediation Processes' on System I.
2. 'Job Context' is titled 'Work Situation and Job Context' on System I.
3. 'Miscellaneous Aspects' is termed 'Other Job Characteristics' on System I.

RATING SCALE COMPARISON

The rating scales used in both versions of the PAQ are similar; the Applicability scale is termed a Check scale in System I. For the items corresponding to the Check scale please mark 'N' if the item does not apply or '1' if the item does apply to the job. Several

items on System I (#136-#144) are rated on a check scale instead of a time scale, as in System II.

A Probability of Occurence scale, used for four items on System II, is not included on System I.

ITEM COMPARISON

Corresponding Items on PAQ System I and II

Most job elements on the PAQ System I have corresponding items on System II. A list of the item numbers on System I and corresponding items on System II is included on the following page. Both forms of the PAQ obtain virtually the same information; however, the PAQ System II is more thorough because many of the job elements have more specific terms, up-to-date examples, and a detailed explanation of what is required in rating the job element.

For example, two job elements on System I are divided into the following items on System II, adding even more detail to the newer system. System I item # 145, 'Physical Hazards', is divided into several items on System II:

1. First aid cases
2. Temporary disability
3. Permanent partial impairment
4. Permanent total disability.

Item #128 'Supervision of Line Management Personnel' (System I) is divided into the following job elements on System II:

1. Supervision of supervisory personnel
2. Supervision of non-supervisory personnel.

Corresponding Items on Systems I & II

PAQ I	PAQ II	PAQ I	PAQ II
1	1	48	160
2	3	49*	49
3	2	50	50
4	6	51	51
5	4	52	52
6	7	53	53
7	8	54	54
8	9	55	55
9	5	56	56
10	10	57	57
11	11	58	58
12	12	59	59
13	13	60	60
14	14	61	61
15	15	62	62
16	16	63	63
17	17	64	64
18	18	65	65
19	19	66	66
20	NONE	67	67
21*	20	68	68
22	21	69	69
23	22	70	NONE
24	23	71	70
25	24	72	71
26	25	73	73
27	26	74	74
28	27	75	75
29	28	76	72
30	29	77	76
31	30	78	77
32	31	79	84
33	33	80	82
34	34	81	83
35	32	82	80
36*	36	83	81
37	37	84	79
38	39	85	78
39	40	86	NONE
40	41	87	92
41	42	88	85
42	43	89	86
43	44	90	89
44	45	91	91
45*	46	92	90
46*	47	93	87
47*	48	94	93

Corresponding Items on Systems I & II (Cont'd)

PAQ I	PAQ II
95	94
96	95
97	96
98	97
99	NONE
100	99
101	100
102	101
103	102
104	103
105	104
106	106
107	107
108	108
109	109
110	110
111	111
112	NONE
113	112
114	113
115	116
116	114
117	115
118	118
119	119
120	120
121	121
122	122
123	150
124	124
125	125
126	126
127	127
128*	128,129
129	NONE
130	NONE
131	131
132	132
133	133
134*	130
135*	134
136	135
137	136
138	137
139	NONE
140	138
141	139
142	140
143	141
144	142
145	144,145,146,147
146	NONE
147*	143
148	148
149	149
150	150
151	151
152	152
153	153
154	161
155	162
156	163
157	164
158	165
159	166
160	167
161	168
162	188
163	189
164	190
165	181
166	192
167	193
168	194
169	154
170	155
171	156
172	158
173	NONE
174	159
175	169
176	173
177	170
178	174
179	175
180	NONE
181	177
182	178
183	179
184	180
185	181
186	182
187	183
188	184
189	186

Additional Items on System I

Several items on System I either have no corresponding items on System II or are defined differently in System I. These items are listed below.

Item 87 on System I, 'Mobility', corresponds to an item on System II, but has a different definition that should be used in rating the four jobs. This item involves frequent changes in body position as required by the work to be done (e.g., kneeling, stooping , crawling,and crouching; such positions usually being uncomfortable or awkward).

Item 93 on System I, 'Moving actions', relates to a job element on System II but has a different definition on System I. Item 93 includes the general level of physical exertion during an average work day, not the maximum amount of weight a person must lift (as in System II),

Item #129 ,'Supervises fellow workers' is a Check scale item and involves directing those who are on the same level on an organizational chart.

Item #130 ,'Supervises assistants', is a Check scale item and involves directing both supervisory and non-supervisory personnel.

Item #139 'High humidity' includes working in an environment with high humidity as a defined part of the job (not just working in Houston) and is a Check scale item.

Item #146 'Noise (disturbing/loud)' is a Check scale item involving working in an extremely loud environment.

Item #173 'Apparal style specified (robe,costume, etc...)' is a Check scale item.

Item #180 'Speed of discrimination' involves a need to discriminate more rapidly than normal as a part of the job and is rated on the Importance scale.

Item numbers 20, 70, 86, 99, and 112 include written items and were probably not used often on System I; therefore, they were excluded from System II. These items are self-explanatory.

*** Note: There are items added to System II that are not on System I. See the next page for a complete listing of these items.

ANCHOR COMPARISON

System I items do not allow for .5 ratings as do System II ratings. Ten job elements have different anchors than those on System II. Since you are accustomed to rating items using anchors on System II, these ten items are starred on the PAQ and on the list of corresponding PAQ items; please rate the items using the anchors on System I.

Items Added to System II That Are Not Included in System I

Item 35: Estimating the time required for past or future work activities.

Item 38: Amount of planning/scheduling worker is required to do which affects his/her own activities and the activities of others.

Item 81: Assembling/dissassembling items (dissassembling is not included on System I).

Item 88: Sitting

Item 98: Hand-ear coordination (coordinating hand movements with sounds or instructions (dictation).

Item 105: Non-routine information exchange (the giving of job-related of a non-routine or unusual nature.

Item 117: Semi-professionsl personnel (personal contact with those engaged in activities requiring fairly extensive education or practical experience, but involve a more restricted area of operation than that of professional personnel).

Item 157: Wearing protective clothing or gear on a regular basis (goggles, safety helmets,etc...).

Item 171: Cycled work activities typically occuring on a weekly, daily, or hourly basis.

Item 172: Following set procedures in order to obtain satisfactory outcomes.

Item 176: Recognition ('recognizing' or 'perceiving' certain objects, events, etc... 'Sensing' by vision, hearing, touch etc...).

Item 185: The degree of general or overall responsibility associated with whatever

activities are involved with the job.

Item 187: Criticality of position (the degree to which the performance of activities associated with the job are critical in terms of their possible effects in the organizational operations, assets....).

Appendix D

Sample Holistic Questionnaire (For Homemaker)

INTRODUCTION

This study deals with improving the process of job analysis and involves making a total of 90 ratings on each of four jobs. Before you read the instructions please fill out the information below and answer the questions on the following page.

I understand that this experiment involves no physical or emotional danger and that I may decline to participate if I wish at any time.

Name_____

Date _____

Please answer yes or no beside each question.

Have you ever taken (or are you now taking) the following courses?

Math Science 280 (Elementary Applied Statistics) _____

Psychology 201 (Introduction to Psychology) _____

Psychology 305 (Social Psychology) _____

Psychology 339 (Statisical Methods in Psychology)_____

Psychology 340 (Research Methods) _____

Psychology 429 (Testing & Measurement) _____

Psychology 470 (Engineering Psychology) _____

Have you held the following jobs?

Counter Clerk at Fast Food Restaurant _____

Waiter/Waitress _____

Secretary _____

Homemaker _____

PLEASE FOLLOW THESE INSTRUCTIONS EXACTLY

Read the job description on the next page. Use both the information in the descriptions as well as any past knowledge you have about the job in making the ratings.

Rate all of the items using the importance scale included below. Place your rating on the line beside the item. Several items will require the use of special scales. These scales will be included directly below the items. After you rate the items using the importance scale, rate the items again using the time scale (also included below). If the job does not involve the item, assign a rating of 0 to the item. After rating items on the time scale, rate them using the percentage rating scale described below. Please record the time it takes you to rate the job in the space provided. After you complete all sets of ratings for the first job, go on to the next job and rate it using the same procedure. You will rate a total of four jobs.

IMPORTANCE SCALE

(How important is the item to successful performance on the job ?)

Code_____Importance

0_____Does not apply
1_____Very minor (is of incidental, minor importance to the job)
2_____Low (is of below average importance to the job)
3_____Moderate (is of average importance to the job)
4_____High (is an aspect of substantial importance to the job)
5_____Extreme (is one of the most important aspects of the job)

Time scale

(Approximately how much time is spent on this item in performing the job ?)

Code_____Time

0_____Does not apply
1_____Infrequently/rarely performed
2_____Under one-third of the time
3_____Between one-third and two-thirds of the time
4_____Over two-thirds of the time
5_____Almost continually performed

Percentage rating scale

Compared to all of the jobs in the economy estimate the percentage of jobs that require LOWER levels of this dimension.

Homemaker

Advises family in private home in dealing with problems, such as nutrition, cleanliness, and household utilities; advises and assists family members in planning nutritious meals, purchasing and preparing foods. Participates in keeping private home orderly by engaging in housekeeping duties, such as washing garments or mopping floors. Takes a major part in training and disciplining children, assigns and schedules housekeeping duties to children according to their capabilities, and takes interest in children's schoolwork. Explains fundamental hygiene principles and renders care to individuals who are ill and trains other family members to provide required care. Evaluates needs of individuals who are served.

RATE HOW IMPORTANT EACH ITEM IS TO THE JOB OF HOMEMAKER (Use the importance scale).

1. Visual input from devices/materials
   Visually observing devices and materials which are sources of information in the work environment (patterns, screens, rulers, charts)._____

2. Perceptual interpretation
   Interpretation of information from various sensory systems (touch, hearing, vision)._____

3. Information from people
   Rely on verbal or written information typically generated by other people (publications, lectures, discussions). _____

4. Visual input from distal sources
   Observing objects usually beyond arm's reach (depth perception, estimating size and/or speed of surrounding objects). _____

5. Evaluation of information from physical sources
   Quantitative and qualitative estimation of information derived from physical processes or sources (inspection of objects). _____

6. Environmental awareness
   Continually being aware of various aspects of the individual's work environment, especially various types of events or circumstances: This awareness could relate to man-made features of the environment, or to the natural environment. (landscapes, buildings). _____

7. Awareness of body movement or posture
   Involves body movement or postural discrimination (changes in orientation of body, balancing). _____

8. Decision making
   Includes some type of decision making, problem solving, or the application of experience or training is required. _____

9. Information processing
   Includes any form of processing or using information: Could require decision making or following standard procedures or guidelines (diagnosis, filing materials).
   _____

10. Machine/process control
    Involves the control of machines, processes, and related operations: Control can be executed by use of various control mechanisms or by direct, physical control of the device. _____

11. Manual control/coordination activities
    Execution of controlled and coordinated manual activities involving the use of tools, equipment, or other devices: Also involving the direct use of the hands as when assembling or adjusting tasks (welding torch, knife). _____

12. Control/equipment operation
Use and control over any of a variety of different types of equipment including those involved in operating various types of vehicles. _____

13. General body activity
Performing activities requiring general body movements (climbing, standing, walking) or major parts of the body (arms, legs): Could involve use of tools or equipment.
_____

14. Handling/manipulating activities
Handling or manipulating objects, tools or engaging in physical, mobile activities (walking, changing body position). _____

15. Use of finger controlled devices vs. physical work
A. Finger dexterity. _____

B. Overall physical activity. _____

Use this scale for A and B of item 15

0_____Does not apply
1_____Never
2_____Infrequent
3_____Some
4_____Frequent
5_____Continious

16. Skilled/technical activities
Job activities of a skilled or technical nature: may involve the use of control mechanisms, devices, or related equipment (precision tools, cameras, drawing pens).
_____

17. Communication of decisions/judgments
Communication of decisions, opinions, and information of a non-routine nature: Communication activities include writing, advising, negotiating, and persuading etc.
_____

18. Job-related information exchange
Exchange of information between individuals both within and outside an organization (verbal or written). _____

19. Staff/related activities
Contact with those who provide service or advice to line management. _____

20. Supervisor-subordinate relationships
Personal communication from subordinate to superior or vice-versa. _____

21. Public/related contact
Contacts with persons generally outside the organization (i.e., selling or dealing with special interests groups). _____

22. Unpleasant/hazardous physical environment
Individual is subjected to potentially stressful or unpleasant situations, some of which may involve hazardous or otherwise undesireable conditions. _____

Use this scale for item 22.

0_____Does not apply
1_____Never
2_____Infrequent
3_____Some
4_____Frequent
5_____Continious

23. Personally demanding situations
Includes emotionally demanding situations or situations that require subordination of personal desires for the benefit of the organization or a client. _____

Use this scale for item 23.

0_____Does not apply
1_____Never
2_____Infrequent
3_____Some
4_____Frequent
5_____Continious

Dimensions of miscellaneuos aspects

24. Businesslike work situations
Involves environments that are considered 'businesslike', such as offices, or stores : These people are usually on a salary basis instead of having an hourly wage.

_____

Use this scale for item 24.

1_____yes
2_____no

25. Attentive/discriminating work demands
Involves attention to detail, rapid discrimination and alertness. _____

26. Unstructured vs. structured work
Job activities are predetermined for the worker rather than being at the discretion of the person performing the job. _____

Use this scale for item 26.

1_____yes
2_____no

27. Variable vs. regular work schedule
Working a non-typical day schedule (shift work) or an irregular type of work schedule as opposed to a regular day schedule. _____

Use this scale for item 27.
1_____Regular schedule
2_____Irregular schedule

28. Decision/communication/social responsibilities
Includes communication and interaction with people (including their supervision) as well as responsiblities associatiod with decision making and planning functions.

_____

29. Skilled activities
Use of technical devices: especially emphasizing precise, discriminating, manual activities. _____

30. Physical activities/related environmental conditions
Includes physical activities (climbing or handling objects): Also includes the type of environment in which physical activities are typically performed. _____

31. Equipment/vehicle operation
Operating equipment or vehicles, requiring perceptual and estimation activities (estimating distance, depth perception) _____

32. Information processing activities
Attention to detail such as required for using keyboard devices (computer,typewriter or cash register) or filing. _____

RATE THESE ITEMS USING THE TIME SPENT SCALE FOR THE JOB OF HOMEMAKER

(How much time is spent on the item in performing the job?)

33. Visual input from devices/materials
Visually observing devices and materials which are sources of information in the work environment (patterns, screens, rulers, charts). _____

34. Perceptual interpretation
Interpretation of information from various sensory systems (touch, hearing, vision).
_____

35. Information from people
Rely on verbal or written information typically generated by other people (publications, lectures, discussions). _____

36. Visual input from distal sources
Observing objects usually beyond arm's reach (depth perception, estimating size and/or speed of surrounding objects). _____

37. Evaluation of information from physical sources
Quantitative and qualitative estimation of information derived from physical processes or sources (inspection of objects). _____

38. Environmental awareness
Continually being aware of various aspects of the individual's work environment, especially various types of events or circumstances: This awareness could relate to man-made features of the environment, or to the natural environment. _____

39. Awareness of body movement or posture
Involves body movement or postural discrimination (changes in orientation of body, balancing). _____

40. Decision making
Includes some type of decision making, problem solving, or the application of experience or training is required. _____

41. Information processing
Includes any form of processing or using information: Could require decision making or following standard procedures or guidelines (diagnosis, filing materials).
_____

42. Machine/process control
Involves the control of machines, processes, and related operations: Control can be executed by use of various control mechanisms or by direct, physical control of the device. _____

43. Manual control/coordination activities
Execution of controlled and coordinated manual activities involving the use of tools, equipment, or other devices: Also involving the direct use of the hands as when assembling or adjusting tasks (welding torch, surgical knife). _____

44. Control/equipment operation
Use and control over any of a variety of different types of equipment including those involved in operating various types of vehicles. _____

45. General body activity
Performing activities requiring general body movements (climbing, standing, walking) or major parts of the body (arms, legs): Could involve use of tools or equipment.
_____

46. Handling/manipulating activities
Handling or manipulating objects, tools or engaging in physical, mobile activities (walking, changing body position). _____

47. Skilled/technical activities
Job activities of a skilled or technical nature: may involve the use of control mechanisms, devices, or related equipment (precision tools, cameras, drawing pens).
_____

48. Communication of decisions/judgments
Communication of decisions, opinions, and information of a non-routine nature: Communication activities include writing, advising, negotiating, and persuading.
_____

49. Job-related information exchange
Exchange of information between individuals both within and outside an organization (verbal or written). _____

50. Staff/related activities
Contact with those who provide service or advice to line management. _____

51. Supervisor-subordinate relationships
Personal communication from subordinate to superior or vice-versa. _____

52. Public/related contact
Contacts with persons generally outside the organization (i.e., selling or dealing with special interests groups). _____

53. Attentive/discriminating work demands
Involves attention to detail, rapid discrimination and alertness. _____

54. Decision/communication/social responsibilities
Includes communication and interaction with people (including their supervision) as well as responsiblities associatiod with decision making and planning functions.
_____

55. Skilled activities
Use of technical devices: especially emphasizing precise, discriminating, manual activities. _____

56. Physical activities/related environmental conditions
Includes physical activities (climbing or handling objects): Also includes the type of environment in which physical activities are typically performed. _____

57. Equipment/vehicle operation
Amount of emphasis placed on operating equipment or vehicles, requiring perceptual and estimation activities (estimating distance, depth perception) _____

58. Information processing activities
Attention to detail such as required for using keyboard devices (computer, typewriter, cash register) or filing. _____

RATE THESE ITEMS USING THE PERCENTAGE RATING SCALE FOR THE JOB OF HOMEMAKER

(Compared to all other jobs in the economy, what percentage of jobs require lower levels of this dimension)

59. Visual input from devices/materials
Visually observing devices and materials which are sources of information in the work environment (patterns, screens, rulers, charts). _____

60. Perceptual interpretation
Interpretation of information from various sensory systems (touch, hearing, vision).
_____

61. Information from people
Rely on verbal or written information typically generated by other people (publications, lectures, discussions). _____

62. Visual input from distal sources
Observing objects usually beyond arm's reach (depth perception, estimating size and/or speed of surrounding objects). _____

63. Evaluation of information from physical sources
Quantitative and qualitative estimation of information derived from physical processes or sources (inspection of objects). _____

64. Environmental awareness
Continually being aware of various aspects of the individual's work environment, especially various types of events or circumstances: This awareness could relate to man-made features of the environment, or to the natural environment. _____

65. Awareness of body movement or posture
Involves body movement or postural discrimination (changes in orientation of body, balancing). _____

66. Decision making
Includes some type of decision making, problem solving, or the application of experience or training is required. _____

67. Information processing
Includes any form of processing or using information: Could require decision making or following standard procedures or guidelines (diagnosis, filing materials).
_____

68. Machine/process control
Involves the control of machines, processes, and related operations: Control can be executed by use of various control mechanisms or by direct, physical control of the device. _____

69. Manual control/coordination activities
Execution of controlled and coordinated manual activities involving the use of tools, equipment, or other devices: Also involving the direct use of the hands as when

assembling or adjusting tasks. _____ (welding torch, surgical knife)

70. Control/equipment operation
Use and control over any of a variety of different types of equipment including those involved in operating various types of vehicles. _____

71. General body activity
Performing activities requiring general body movements (climbing, standing, walking) or major parts of the body (arms, legs): Could involve use of tools or equipment.
_____

72. Handling/manipulating activities
Handling or manipulating objects, tools or engaging in physical, mobile activities (walking, changing body position). _____

73. Use of finger controlled devices vs. physical work.
A. Amount of finger dexterity required_____ B. Amount of overall physical activity required_____

74. Skilled/technical activities
Job activities of a skilled or technical nature: may involve the use of control mechanisms, devices, or related equipment (precision tools, cameras, drawing pens).
_____

75. Communication of decisions/judgments
Communication of decisions, opinions, and information of a non-routine nature: Communication activities include writing, advising, negotiating, and persuading.
_____

76. Job-related information exchange
Exchange of information between individuals both within and outside an organization (verbal or written). _____

77. Staff/related activities
Contact with those who provide service or advice to line management. _____

78. Supervisor-subordinate relationships
Personal communication from subordinate to superior or vice-versa. _____

79. Public/related contact
Contacts with persons generally outside the organization (i.e., selling or dealing with special interests groups). _____

80. Unpleasant/hazardous physical environment
Individual is subjected to potentially stressful or unpleasant situations, some of which may involve hazardous or otherwise undesireable conditions. _____

81. Personally demanding situations
Includes emotionally demanding situations or situations that require subordination of personal desires for the benefit of the organization or a client. _____

82. Businesslike work situations
Involves environments that are considered 'businesslike', such as offices, or stores : These people are usually on a salary basis instead of having an hourly wage.

_____

83. Attentive/discriminating work demands
Involves attention to detail, rapid discrimination and alertness. _____

84. Unstructured vs. structured work
Job activities are predetermined for the worker rather than being at the discretion of the person performing the job. _____

85. Variable vs. regular work schedule
Working a non-typical day schedule (shift work) or an irregular type of work schedule as opposed to a regular day schedule. _____

86. Decision/communication/social responsibilities
Includes communication and interaction with people (including their supervision) as well as responsiblities associatiod with decision making and planning functions.

_____

87. Skilled activities
Use of technical devices: especially emphasizing precise, discriminating, manual activities. _____

88. Physical activities/related environmental conditions
Amount of physical activities (climbing or handling objects): Also includes the type of environment in which such physical activities are typically performed. _____

89. Equipment/vehicle operation
Operating equipment or vehicles, requiring perceptual and estimation activities (estimating distance, depth perception) _____

90. Information processing activities
Attention to detail such as required for using keyboard devices (computer or typewriter) or filing

How long did it take you to rate this job? _____

Estimate the yearly salary that a homemaker should earn. _____

Note ***** Identical forms were provided for the jobs of counter clerk, waiter/waitress, and secretary.

Appendix E
Job Descriptions

Appendix E

Job Descriptions

Counter Clerk at Fast Food Restaurant

Serves food, calls order to kitchen, and picks up and serves order when ready. Totals bill and accepts payment. Prepares fast food items, stocks and arranges food, plastic silverware, and other supplies. Cleans counters, tables and, other work areas. Assist workers in serving customers or performing other duties.

Homemaker

Advises family in private home in dealing with problems such as nutrition, cleanliness, and household utilities; advises and assists family members in planning nutritiuos meals, purchasing and preparing foods. Participates in keeping private home orderly by engaging in housekeeping duties, such as washing garments are mopping floors. Takes a major part in training and disciplining children, assigns and schedules housekeeping duties to children according to their capabilities, and takes interest in children's schoolwork. Explains fundamental hygeine principles and renders care to individuals who are ill and trains other family members to provide required care. Evaluates needs of individuals who are served.

Secretary

Schedules appointments, gives information to callers, takes dictation, and otherwise relieves officials of clerical work and minor administrative and business detail. Takes dictation by shorthand or by machine and transcribes information on typewriter or on computer. Files correspondence or other records. Answers telephone and gives information to callers or routes call to appropriate official and places outgoing calls. Greets visitors, ascertains nature of business, and conducts visitors to appropriate person. Schedules appointments for employer and arranges employer's travel schedule and reservations. Makes copies of printed matter. Records minutes of staff meetings.

Waiter/Waitress

Serves food to patrons at tables of dining establishments. Presents menu, answers questions, and makes suggestions regarding food and service. Writes order on check or memorizes it. Relays order to kitchen and serves food from kitchen. Inspects food to insure that it is satisfactory to serve. Observes guests to fulfill any additional requests and to perceive when meal has been completed. Totals bill and accepts payment or refers patron to a cashier. May clear and reset counters or tables at the conclusion of each course.

Appendix F
Dimension Definitions

Dimensions of Information Input

1. Visual input from devices/materials
   Visually observing devices and materials which are sources of information in the work environment (patterns, screens, rulers, charts)

2. Perceptual interpretation
   Interpretation of information from various sensory systems (touch, hearing, vision) **

3. Information from people
   Rely on verbal or written information typically generated by other people (publications, lectures, discussions)

4. Visual input from distal sources
   Observing objects usually beyond arm's reach (depth perception, estimating size and/or speed of surrounding objects)

5. Evaluation of information from physical sources
   Quantitative and qualitative estimation of information derived from physical processes or sources (inspection of objects)

6. Environmental awareness
   Continually being aware of various aspects of the individual's work environment, especially various types of events or circumstances: This awareness could relate to man-made features of the environment, or to the natural environment.** (landscapes, buildings)

7. Awareness of body movement or posture
   Involves body movement or postural discrimination (changes in orientation of body, balancing)

Dimensions of Mediation Processes

8. Decision making
   Includes some type of decision making, problem solving, or the application of experience or training is required **

9. Information processing
   Includes any form of processing or using information: Could require decision making or following standard procedures or guidelines (diagnosis, filing materials)

Dimensions of work output

10. Machine/process control
    Involves the control of machines, processes, and related operations: Control can be executed by use of various control mechanisms or by direct, physical control of the device.

11. Manual control/coordination activities
    Execution of controlled and coordinated manual activities involving the use of tools, equipment, or other devices: Also involving the direct use of the hands as when assembling or adjusting tasks ** (welding torch, surgical knife)

12. Control/equipment operation

Use and control over any of a variety of different types of equipment including those involved in operating various types of vehicles **

13. General body activity
Performing activities requiring general body movements (climbing, standing, walking) or major parts of the body (arms, legs): Could involve use of tools or equipment **

14. Handling/manipulating activities
Handling or manipulating objects, tools or engaging in physical, mobile activities (walking, changing body position)

15. Use of finger controlled devices vs. physical work
A. Amount of finger dexterity required B. Amount of overall physical activity required

16. Skilled/technical activities
Job activities of a skilled or technical nature: may involve the use of control mechanisms, devices, or related equipment (precision tools, cameras, drawing pens)

Dimensions of Interpersonal activity

17. Communication of decisions/judgments
Communication of decisions, opinions, decisions, and information of a non-routine nature: Communication activities include writing, advising, negotiating, and persuading **

18. Job-related information exchange
Exchange of information between individuals both within and outside an organization (verbal or written)

19. Staff/related activities
Contact with those who provide service or advice to line management

20. Supervisor-subordinate relationships
Personal communication from subordinate to superior or vice-versa

21. Public/related contact
Contacts with persons generally outside the organization (i.e., selling or dealing with special interests groups) **

Dimensions of the work situation and job context

22. Unpleasant/hazardous physical environment
Individual is subjected to potentially stressful or unpleasant situations, some of which may involve hazardous or otherwise undesireable conditions **

23. Personally demanding situations
Includes emotionally demanding situations or situations that require subordination of personal desires for the benefit of the organization or a client **

Dimensions of miscellaneuos aspects

24. Businesslike work situations
Involves environments that are considered 'businesslike', such as offices, or stores : These people are usually on a salary basis instead of having an hourly wage

25. Attentive/discriminating work demands
    Involves attention to detail, rapid discrimination and alertness

26. Unstructured vs. structured work
    Job activities are predetermined for the worker rather than being at the discretion of the person performing the job (high score indicates high structure, low score indicates low structure) *

27. Variable vs. regular work schedule
    Working a non-typical day schedule (shift work) or an irregular type of work schedule as opposed to a regular day schedule

OVERALL DIMENSIONS

28. Decision/communication/social responsibilities
    Includes communication and interaction with people (including their supervision) as well as responsiblities associatiod with decision making and planning functions *

29. Skilled activities
    Use of technical devices: especially emphasizing precise, discriminating, manual activities *

30. Physical activities/related environmental conditions
    Amount of physical activities (climbing or handling objects): Also includes the type of environment in which such physical activities are typically performed *

31. Equipment/vehicle operation
    Amount of emphasis placed on operating equipment or vehicles, requiring perceptual and estimation activities (estimating distance, depth perception) *

32. Information processing activities
    Attention to detail such as required for using keyboard devices (computer or typewriter) or filing *

* Taken from PAQ System I ** Taken from PAQ System II