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Job Analysis and Job Evaluation Method Choice: User Qualifications and Implications for Applications and Research

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JOB ANALYSIS AND JOB EVALUATION METHOD CHOICE:
USER QUALIFICATIONS AND IMPLICATIONS FOR
APPLICATIONS AND RESEARCH

by

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ABSTRACT

JOB ANALYSIS AND JOB EVALUATION METHOD CHOICE: USER QUALIFICATIONS AND IMPLICATIONS FOR APPLICATIONS AND RESEARCH

James S. Herndon
Old Dominion University, 1986
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Research interest in the areas of job analysis and job evaluation has been increased recently as a result of attention being given to the comparable worth issue. The purpose of the present study was to assess the effects of job analysis and job evaluation method choice on the outcome of the salary determination process, and to investigate how user qualifications interact with methods.

Within the context of the JAMES Matrix, two job analysis methods (CIT and FJA) were systematically paired with two job evaluation methods (ranking and point). Three groups of participants, representing distinctly different levels of expertise (method experts, content experts, and university students) evaluated four jobs (clerical, trades/craft, technical, and managerial) in order to determine the appropriate salaries.

Data were analyzed using a repeated measures analysis of variance. Results of the salary determinations demonstrated a significant main effect for expertise, along with significant interactions involving job evaluation

method x expertise, job descriptions x expertise and job descriptions x job evaluation method x expertise. Further analysis indicated no effect for incumbents evaluating jobs similar to their own. A three-way analysis of variance, with time as a dependent measure, showed that CIT took significantly more time than FJA.

Results were discussed in terms of their implications for applications within the personnel management and industrial/organizational psychology arenas. Particular attention was given to the implications of the present findings to the direction of the comparable worth debate. Results were further discussed in terms of future research suggestions.

DEDICATION

This work
is dedicated
to the memory of
Mary Elizabeth Herndon (1909-1982)
and
Benjamin G. Herndon, Jr. (1907-1984)

They were both here to see me begin;
and somehow I know they are with me now.

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TABLE OF CONTENTS

	Page
LIST OF TABLESvii
LIST OF FIGURES.	viii
CHAPTER	
1. Introduction.	1
Job Analysis	3
Job Evaluation	11
User Qualifications.	20
2. Method.	23
Participants	25
Materials.	27
Design	31
Procedure.	33
3. Results	37
Analysis of Salary Determination	38
Analysis of Job Incumbency Effects	40
Analysis of Time Requirements.	45
Summary.	47
4. Discussion.	48
Choice of Job Analysis Method.	49
Choice of Job Evaluation Method.	50
Effect of User Expertise	52
Implications for Applications.	54

Implications for Research.	57
Conclusions.	60
REFERENCES	62
APPENDIX A: Identification of Jobs.	74
APPENDIX B: DOT Listings.	76
APPENDIX C: CIT Information	81
APPENDIX D: Packet Contents	92
APPENDIX E: Introduction and Informed Consent	94
APPENDIX F: CIT Training and Job Analysis Information .	98
APPENDIX G: FJA Training and Job Analysis Information .	106
APPENDIX H: Job Descriptions.	113
APPENDIX I: Organization Chart.	118
APPENDIX J: Mission and Function Statements	120
APPENDIX K: Ranking Method Materials.	122
APPENDIX L: Point Method Materials.	131
APPENDIX M: Salary Information.	139
APPENDIX N: Questionnaire	142
APPENDIX O: Participant Characteristics	145
APPENDIX P: Salary Assigned to Each Job by Condition. .	149
APPENDIX Q: Time to Complete Packets by Condition . .	154

LIST OF TABLES

TABLE	PAGE
1. Analysis of Variance Summary Table for Salary. . .	.39
2. Means for Job Evaluation x Expertise Interaction.41
3. Means for Job Descriptions x Expertise Interaction.42
4. Means for Job Descriptions x Job Evaluation x Expertise Interaction.43
5. Analysis of Variance Summary Table for Same Job. . .	.44
6. Analysis of Variance Summary Table for Time. . .	.46

LIST OF FIGURES

FIGURE	PAGE
1. Comparison of Four Job Evaluation Methods	17
2. The JAMES Matrix.	24
3. Point Method Summary.	30
4. Arrangement of Conditions	32
5. Sequence of Conditions within the Packets	35

CHAPTER ONE

Introduction

The economic, political, and social issue of comparable worth (equal pay for work of comparable value) has stimulated a renewed interest in the topics of job analysis and job evaluation (Schwab, 1985). Prior to the late 1970's, the literature was relatively silent on these topics (Landy and Trumbo, 1976). Most of the research done on job analysis and job evaluation occurred shortly after World War II in conjunction with the expansion of the federal establishment (Eyde, 1983b). However, today, as a result of pressure generated by litigation under the Equal Pay Act of 1963 and Title VII of the Civil Rights Act of 1964 (e.g., Gunther vs. County of Washington, 1981), increased attention has been given to the methods and processes of job analysis as well as the soundness of job evaluation.

Comparable worth implies that work requiring equivalent knowledge, skills, and abilities performed under similar working conditions should be compensated equitably without regard to the sex of the job incumbent (Ahmuty, 1983; Remick, 1981). This notion is different from the earlier equal pay concept in the same way that a compensatory model differs from a multiple hurdles model (Hills, 1982). Comparable worth means that the total value

of two or more jobs is the same though they may differ on internal weightings of knowledge, skills, and abilities; thus strength on one factor compensates for weakness on another. In contrast, the equal pay concept requires that two or more jobs have the same weightings on all factors in order to be equal.

Underlying the notion of comparable worth is the more fundamental concept of job worth. Traditionally, job worth has been assessed through some form of job evaluation which attempted to order jobs in accordance with the degree to which they possessed certain compensable factors (Mahoney, 1983). In most cases, a job description, derived through some form of job analysis, served as the basis for job evaluation (Britton, 1975). Owing to this inherent connection between job worth, job evaluation, and job analysis, it is perhaps understandable why the present interest in comparable worth has spawned a renewed examination of job evaluation methods, procedures, and processes as well as the techniques of job analysis (Bellak, Bates, & Glasner, 1983).

In light of the undeniable linkage between job analysis as a data gathering technique and job evaluation as an application of the results of job analysis, the state-of-the-art in job analysis and job evaluation will be discussed in turn below. Additionally, the issue of user qualifications will be introduced as a related factor in assuring effective job evaluation.

Job Analysis

Job analysis has often been considered the cornerstone of personnel management (Cascio, 1982). Indeed, it can be said to be at the heart of industrial/organizational psychology, inasmuch as the job itself is the unit of analysis (McCormick, 1976; Wallace, 1983). Effective job analysis is believed to make a difference in the efficient use of human resources in the work environment (Heneman, Schwab, Fossum, & Dyer, 1983)

Job analysis is a systematic procedure for gathering, documenting, and analyzing information about three basic aspects of a job: Job content, job requirements, and job context (Bemis, Belenky, & Soder, 1983)). Job content refers to the activities (i.e., tasks, duties, processes, etc.) of the job. Job requirements include such factors as education and experience needed, degrees, licenses, and other forms of credentials assumed to be evidence that an individual possesses the qualifications for successful job performance. Job context includes the scope and purpose of the work as well as the accountability and responsibility of the employee, nature of supervision, and working conditions. The primary purpose of job analysis is to gather facts necessary to provide an objective description of the job, rather than the person (incumbent) assigned to it (CSC, 1973).

There are numerous uses for job analysis data in addition to serving to undergird job evaluation (Fine, in

press-b; Gael, 1985). For instance, job analysis can be used in job design, training needs assessment, and performance appraisal as well as in recruitment, selection, and placement decisions. Generally, job analysis data are documented in the form of a job description which serves as a source for the various applications. The format of the job description may vary depending upon the method employed in gathering job data (Commonwealth of Virginia, undated; Henderson, 1975). Some of the more frequently used job analysis methods include the Department of Labor method, functional job analysis, the critical incident technique, the job element method, the position analysis questionnaire, and the task inventory/ comprehensive occupational data analysis program (Bemis et al., 1983). Though not exhaustive, this list serves to suggest that job analysis is susceptible to different approaches and methodologies. An in-depth discussion of the foregoing methods may be found in Sparks' (1982) chapter in the text by Rowland and Ferris, as well as in Bemis et al. (1983). An excellent history of job analysis is provided by Primoff and Fine (in press). For purposes of the present discussion, two methods cited above will be briefly highlighted. (The choice of these two particular methods is defended more explicitly in Chapter Two.)

Functional job analysis (FJA), developed by Sidney A. Fine, is a comprehensive approach which focuses on interactions among the work content, the workers, and the

organization (Fine, 1955; Fine, 1974; Fine, 1983; Fine, Holt, & Hutchinson, 1974; Fine & Wiley, 1974). Five components are involved in FJA: 1) Identification of purpose, goals, and objectives of the organization to provide a basis for describing the job as it "should be" and as it "is"; 2) Identification and description of tasks - what a worker does and what gets done; 3) Analysis of tasks based on level (which vary on an ordinal scale) and orientation toward things, data and people; 4) Development of performance standards to define criteria for assessing the results of a worker's tasks; and 5) Development of training content to distinguish job requirements. For purposes of this research, components 2) and 3) above are of utmost importance. According to Fine (in press-a), the keystone to FJA is its definition of a task which is as follows:

A task is an action or action sequence grouped through time designed to contribute a specified end result to the accomplishment of an objective and for which functional levels and orientation can be reliably assigned. (Page 25)

FJA task statements are written in a standard way, namely: behavior, object of behavior, modifiers of behavior (source of inferences, instructions, and tools, machines, work aids), in order to produce a result. It is this focus upon the task statement which has been the primary reason for selecting FJA for use in the present

research project, amplified by the findings of Levine, Ash, Hall, and Sistrunk (1983), discussed later.

Critical incident technique (CIT), developed by John C. Flanagan, is a method of defining jobs in terms of the concrete and specific behaviors necessary to perform them successfully (Flanagan, 1954). The method involves two basic steps: 1) Identification of critical incidents which reflect behaviors observed to be effective or ineffective in accomplishing the aims of a job; and 2) Classification of behaviors into categories or dimensions according to the intended use to be made of the job analysis. This particular method is noted for the emphasis it places on significant examples of behavior indicative of effective and ineffective performance. According to Flanagan (1954), an incident is any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects. Critical incidents are collected by trained observers for each job under review. Ordinarily, numerous incidents are collected for each job, then they are grouped into categories according to major job duties (see 2 above) (cf. Kirchner and Dunnette, 1974).

As described in general terms above, FJA and the CIT are two of many job analysis methods currently in use today in personnel management and industrial/organizational psychology (Edwards, 1982). They are two of the most widely known methods and have seen widespread use. FJA and CIT appear to take contrasting orientations to the job analysis process; the former is clearly task oriented, while the latter is behavior oriented. It is for these reasons that they were chosen for use in the study.

Apart from the particular methodology employed, the job analyst typically obtains information for use in the analysis from a variety of sources. Questionnaires, incumbent and supervisor interviews, and direct observation of work performance tend to be most frequently used (Morsh, 1964). Other sources of information include historical workload data, job descriptions of record, and organizational charts and mission/function statements. It is, however, in the manner of selecting, combining, and reporting job information that most job analysis methods differ (Rohmert & Landau, 1983).

Three noteworthy reviews have been reported in the job analysis literature. The first, by Zerga (1943), was a resume and a bibliography of 401 references covering the period 1911 to 1941. In the resume, Zerga provided an interesting definition of job analysis which seems to capture the basic concern of the present study. The definition is attributable to Uhrbrock (1934), and is as follows:

Job analysis is a 'method' of gathering pertinent facts about a worker and his work. The method to be used varies, depending upon the objective of the study. Different sources are consulted, and different records result, depending upon whether one is using job analysis to devise a training program, develop a safety plan, prepare employment specifications, or revise a wage payment plan.

This recognition of a variety of methods was made more explicit by Zerga when he listed twenty uses for job analysis information. Among the applications, job grading and classification headed the list.

Prien and Ronan (1971) published a review of research findings on job analysis covering the 1950s and 1960s. They reported primarily on research designed to order and structure the domain of work. The job analysis methods tended to focus upon building taxonomies of work-related behaviors and/or task lists derived through factor analytic studies. The results of their review highlighted the importance of differing methods. However, since most of the reported research was proprietary, the generalizability of their results is difficult to ascertain.

Later, Pearlman (1980) reviewed the literature on the development of job families. Though focused on personnel selection, many of the methodological treatments are applicable to other uses of job analysis. It is worth noting that in this review, taxonomic efforts were considered to reflect one of two general strategies to the study of performance-related variables. One strategy focused on human attributes related to work performance;

herein can be found the abilities requirement scale of Fleishman (1975). The other strategy was concerned with the nature of the work (as is the FJA) or performance itself (as is the CIT).

Recent job analysis research has tended to take one of two approaches: single method studies aimed at generating support for the viability of a particular method; or comparative studies pursuing a multi-methodological approach.

Typical of single method studies is the work of Kryzstofiak, Newman, and Anderson (1979) and Cornelius, Hakel, and Sackett (1979). The former study focused on the procedure known as quantified job analysis and its potential payoffs for personnel and human resources management. The latter study involved the administration of a job inventory to 2023 incumbents across several jobs and several levels of responsibility. Data were factor analyzed in order to identify combinations of jobs and ranks for which separate appraisal instruments could be developed.

Other investigations of particular approaches to job analysis include studies by Arvey, Maxwell, Guttenberg, and Camp (1981) and Arvey and Mossholder (1977). Both of these studies were interested in methodology that could prove useful in detecting job differences and similarities. The trend represented by these studies was put into clear perspective and summarized for ease of application by Lee and Mendoza (1981).

The work of McCormick (1976, 1979) and McCormick, Jeanerret, and Mecham (1972) in developing and testing the position analysis questionnaire is also noteworthy as a major effort in refining one particular approach to job analysis. Similarly, Lopez, Kesselman, and Lopez (1981) tested their trait-oriented job analysis technique as an optimal approach.

The multi-methodological approach, comparing two or more job analysis methods in relation to a specified criterion, was strongly called for by Prien (1977) and was most typically illustrated by Ash (1982) who argued that unique features of individual job analysis methods may tend to restrict their application to a limited range of personnel needs. Earlier work by Cornelius, Carron, and Collins (1979) suggested the need to compare various job analysis methods in terms of their ability to accomplish various objectives.

In a series of related studies, several job analysis methods were empirically compared to assess their utility for personnel selection (Levine, Ash, & Bennett, 1980; Levine, Bennet, & Ash, 1979). Using the job elements method (Primoff, 1975), CIT (Flanagan, 1954), the position analysis questionnaire (McCormick et al., 1972), and task analysis (DOL, 1972), the researchers were unable to demonstrate that the job analysis method made a significant difference in terms of quality of output of examination plans for use in selection. However, cost factors

associated with the different methods did vary, as did user ratings regarding the suitability of the method. Further research was called for.

Following their empirical studies, Levine et al. (1983) and Levine (1981) presented survey results showing that various job analysis methods were perceived as being differentially effective for a variety of organizational purposes and varied in terms of practicality as well.

From the foregoing, it can be seen that there are still unresolved issues regarding which job analysis methods are most suitable for personnel applications. Moreover, there has been no resolution of the debate over single method versus multi-method approaches (Ash, 1982). Owing to the central importance of job analysis to personnel management and industrial/organizational psychology, continued research seems warranted.

Job Evaluation

Job evaluation is the process of assigning value (usually in terms of salary) to a job (Otis & Leukart, 1954; Viteles, 1941). In the general sense, the term refers to a formal procedure for hierarchically ordering a set of jobs or positions with respect to their value or worth (Treiman, 1979). A job evaluation system is a rational method using objectively established facts (obtained from job analysis) to determine the value and

interrelationships of jobs or positions within an organization (McCarthy & Buck, 1977).

Nash and Carroll (1975) point out that the development and installation of a job evaluation system must be performed in a series of identifiable steps: 1) Preliminary planning; 2) Getting accurate job descriptions; 3) Definition and weighting of decision criteria; 4) Selection of an evaluation or decision method; 5) Making the evaluations; and 6) Implementing the results.

For purposes of this discussion, the fourth step has special significance. As with the plethora of job analysis methods, there are also a variety of job evaluation methods. The most-used methods of job evaluation include: ranking; job classification; factor comparison; and point method. Each will be briefly discussed in turn.

According to Bartley (1981), a job evaluation system must approach the task of hierarchically arranging jobs in a specific manner. Prior to discussing the unique features of each method, the general approach will be outlined. Job evaluation systems attempt to:

1. Review the organization of the work group to assure that the proper tasks are assigned to the right employees.
2. Analyze each job to prepare a written job description.
3. Assess systematically and compare each job with other jobs in the relevant work unit.

4. Produce a rank order of jobs in terms of importance to the organization.
5. Assign jobs with similar demands or importance to pay grades.
6. Determine how much money each pay grade is to receive.
7. Keep the system up to date by re-evaluating jobs as content changes, accomodating new jobs into the program, and updating the monetary value of pay grades.

The series of steps discussed by Nash and Carroll has a high degree of overlap with the specific sequence presented by Bartley. However, the former comments were presented in a prescriptive mode; whereas, the latter comments were intended to be descriptive of actual methods. It should be pointed out that within the context of each delineation of the job evaluation process, the job analysis procedure is at least implicit.

The simplest job evaluation method is ranking. This was the first method to be used for comparing jobs for pay purposes (McCarthy & Buck, 1977; Suskin, 1970). In the ranking method, jobs are evaluated as a whole. Raters usually work from their overall knowledge of the job, and for this reason, this method requires extensive knowledge, by the evaluator, of all jobs in the organization. Ranking means that all jobs are ordered from most valuable (or

demanding) to least valuable (or demanding) in an organizational sense, and thus compensated accordingly.

Job classification (also known as position classification) is basically an extension and improvement of the ranking method (Baruch, 1941; Suskin, 1977). This method evaluates the whole job against others utilizing a pre-determined number of pay grades known as classes. Descriptions of classes are prepared, and jobs are assigned to classes based upon a comparison with the description. The best known classification system in use today is that of the federal government established by the Classification Act of 1949 which assigned white collar jobs to classes in the General Schedule (GS) in grades GS-1 through GS-18. In this area, much development has taken place over the years such that classification has become a highly refined methodology for use within the federal establishment (CSC, 1959; CSC, 1963; CSC, 1978; DON, 1959; DON, 1960b; DON, 1984). The Job Evaluation Policy Act of 1970 was passed to improve classification systems within the executive branch.

Ranking and classification are essentially qualitative methods entailing a high degree of subjectivity. Owing to this fact, the factor comparison and point methods were developed to make job evaluation more quantitative and objective (Epperson, 1975).

The factor comparison method is noted for its reliance upon benchmark or key-ranking jobs. These jobs are chosen based on their representativeness within the organization,

and then, they are ranked according to the degree to which they possess each of several factors. It is typical to rank the key jobs in terms of four factors: 1) A skill factor; 2) A responsibility factor; 3) A physical demands factor; and 4) A working conditions factor. The subsequent job evaluation process entails a comparison of the job under consideration with the factor assessments of the key jobs. Point values are assigned based on the amount of each factor present in comparison to the key jobs. Total points are converted to grade or pay level.

The point method, which actually evolved prior to the factor comparison method, utilizes a set of factors which are defined and have various degrees established. Job evaluation is accomplished by determining the point value for each factor for the job under consideration. Unlike the factor comparison method, key jobs are not used as reference benchmarks in this method of evaluation. Rather, total points are determined for each job, and then, the points are converted to a pay level for that job.

Of the four methods, the point method has been used most widely in the private sector (Madden, 1960; Treiman, 1979), and it has seen considerable use in government agencies (Craver, 1977). Moreover, in terms of the comparable worth debate, this method has received the bulk of research attention (Hartmann & Treiman, 1983).

The four methods of job evaluation briefly discussed above are compared in Figure 1 in terms of two character-

istics: portion of job evaluated at one time; and what the job is compared with. This figure was adapted from similar representations depicted in several sources (Bartley, 1981; DON, 1960a; DON, 1960b; Otis & Leukart, 1954).

Until recently, job evaluation has been the focus of less research than job analysis (Schwab, 1980). With the surge of interest created by the comparable worth debate, job evaluation research appears to be on the rise (Beatty & Beatty, 1984). A survey of relevant research in job evaluation reflects a pattern somewhat analogous to the trends in job analysis. Specifically, at least two categories of research can be found in the literature: 1) General or single-method studies; and 2) Comparative or multi-method studies.

In a general consideration of job evaluation, Schwab and Wichern (1983) examined the external bias issues (i.e., bias attributable to sources outside the evaluation instrument) associated with job evaluation, specifically judgmental errors owing to job descriptions generated from job analysis and systematic error in the criterion typically used to validate job evaluations (viz. market surveys of prevailing wages). Looking to sources of internal bias (within the job evaluation instrument), Doverspike and Barrett (1984) examined the prevalence of sex bias in the structure and choice of scales of a job evaluation instrument. Sex-related errors stemming from the sex of the incumbent and the sex of the evaluator

Portion of job evaluated at one time	What the job is compared with	
	Other jobs	Specifications
The whole job	Ranking Method	Classification Method
One or a few factors	Factor Comparison Method	Point Method

Figure 1. Comparison of Four Job Evaluation Methods

were investigated by Schwab and Grams (1985) and Grams and Schwab (1985) with negative results. However, it is expected that research will continue to address such suspected bias in job evaluation.

Comparative job evaluation research has also started to reappear in the literature. Chesler (1948) was among the first to consider the degree to which different types of job evaluation methods produce the same results. He arranged for job analysts on the staffs of several industrial and commercial organizations to rate a set of standard jobs using a point rating method and their own company's methods. Overall, the results indicated a high degree of commonality among different job evaluation methods, which included two factor comparison methods, three point methods, and one ranking method.

Robinson, Wahlstrom, and Mecham (1974) used a policy-capturing approach to compare results obtained from the position analysis questionnaire to the results of job evaluation using several "traditional" methods of job evaluation. Their findings revealed that various methods yielded similar results, but that the use of data obtained with the position analysis questionnaire did tend to reduce the cost of job evaluation compared to using the policy-capturing approach to select and weight compensable factors. More recently, Snelgar (1983) investigated the correlations among various job evaluation methods in their rankings or ratings of jobs in sixteen organizations.

Though he reported high correlations, it is not clear whether in fact the job evaluation procedures actually differed significantly among the organizations surveyed.

Madigan (1985) examined the psychometric qualities of three methods of job evaluation and found them to be deficient in scale reliability and validity. His work suggests the need for further research to assess psychometric qualities. Gomez-Mejia, Page, and Tornow (1982) compared the relative accuracy and practical utility of seven different job evaluation approaches, concluding that there is no "best" method of job evaluation. The results of 657 job evaluations revealed that the traditional and hybrid systems (regression analysis incorporated within the framework of a traditional point-factor method) are at least as accurate, reliable, and objective in predicting grade level as are statistical policy-capturing methods (Zedeck & Cascio, 1984).

As stated previously, current emphasis on the issue of comparable worth has spawned research interest in job evaluation as perhaps the most practical and direct tool for determining job worth (e.g., Jaussaud, 1984; Risher, 1984). In contrast, without any impetus from comparable worth, job analysis research has proceeded on its own course with a view toward improving the various methodologies for a myriad of personnel applications. Based on the hypothesis that the quality and usefulness of any job evaluation is contingent upon the appropriateness

and effectiveness of the chosen job analysis method, it would be useful and informative to examine the outcome of possible pairings of job analysis and job evaluation methods.

There is no definitive empirical research in the literature which addresses the issue of whether or not it makes a difference which method of job analysis is used in the job evaluation process. Moreover, practical experience in the job evaluation field has revealed that the choice of job evaluation method does not pro forma dictate the choice of job analysis method to any appreciable degree. In many cases, the job evaluator is required to operate from the job analysis data supplied by the procedure which has been sanctioned by the organization. At times, job analysis data collected by one individual may be supplied to someone else for purposes of job evaluation. The inherent danger is that there will be a method mismatch to the detriment of the job evaluation process. The present research effort addressed the issue of pairing job analysis and job evaluation methods in terms of the suitability of their match.

User Qualifications

There is an ancillary problem associated with current personnel research which was also addressed in the present design. Specifically, in much personnel research there has been an exclusive reliance upon "trained" university

students to serve as raters in performance appraisal studies and job evaluation studies (e.g., Doverspike, Carlisi, Barrett, & Alexander, 1983). Although such participants may be reasonably familiar with the methods in order to carry out their assignment, the question of generalizability of results is invariably raised.

Within the context of job analysis and job evaluation as applied in real world work situations, it is important to consider who actually conducts the analysis and evaluation. Some evidence exists to suggest that the use of employees themselves rather than professional analysts can produce acceptable results, whether singly (Hoggart & Hazel, 1970) or in committee configuration (Lentini, 1985). However, a recent survey of several non-federal job evaluation systems by the General Accounting Office found some employee evaluations unacceptable to management (GAO, 1985).

The literature on familiarity effects in job evaluation is relevant here. Christal and Madden (1960) and Madden (1962; 1963) conducted a series of studies to show that job content knowledge can influence the outcome of job evaluation ratings. Their research was not conclusive in that the familiarity effect was not consistent for all jobs. Thus, further research was called for. In another study, Fraser, Cronshaw and Alexander (1984) used raters who worked in personnel departments to extend the generalizability of job evaluation research

beyond the academic setting. This, however, represents the exception rather than the rule.

The present study addressed this issue through the notions of method and content expertise. By method expertise is meant a level of skill derived from firsthand experience in applying job analysis and job evaluation techniques as a professional in the field. Content expertise refers to in-depth knowledge of the work being analyzed or evaluated either from an incumbent's point of view or from the vantage point of organizational membership. Both of these forms of expertise are considered to be more amenable to assessment of job analysis and job evaluation research outcomes as opposed to strict reliance upon students having no experience as either analyst/evaluator or incumbent. The present study was designed, therefore, to consider user qualifications along with the choice of job analysis and job evaluation methods.

CHAPTER TWO

Method

The issue of whether or not it makes a difference as to which method of job analysis is used in conjunction with various methods of job evaluation can be assessed from the standpoint of a matrix of possible method pairings. Referred to as the JAMES (Job Analysis Method Evaluation Strategy) Matrix, Figure 2 depicts the manner in which methods can be paired in order to evaluate the usefulness of a particular job analysis method for supplying data applicable to the job evaluation process. In this Figure, CIT and FJA refer to the two methods of job analysis briefly discussed in Chapter One. ARS is the abilities requirements scale of Fleishman (1975); PAQ is the position analysis questionnaire of McCormick et al. (1972); JEM is the job element method of Primoff (1975); and TTA is threshold trait analysis of Lopez et al. (1981). These methods are illustrative of the variety of approaches currently in use. The JAMES Matrix could, however, be expanded to include all relatively well known formal job analysis methods, as well as all basic and hybrid methods of job evaluation.

For purposes of the present study, two particular methods of job analysis were considered in conjunction with two selected methods of job evaluation (See asterisks in

		JOB EVALUATION METHODS			
		RANKING METHOD	CLASSIFICATION	POINT METHOD	FACTOR COMPARISON
JOB ANALYSIS METHODS	CIT	* *		* *	
	FJA	* *		* *	
	ARS				
	PAQ				
	JEM				
	TTA				
	.				
.					
.					
n					

Figure 2. The JAMES Matrix

Figure 2). The critical incident technique (CIT) and functional job analysis (FJA) were chosen as examples of job analysis methods suitable for examination, owing largely to the work of Levine et al. (1983), discussed earlier. In a survey of 93 experienced job analysts, they obtained data reflecting that the critical incident technique was perceived as being least effective for job evaluation purposes, whereas functional job analysis was considered to be highly effective. These findings, however, were based on survey data and are in need of further empirical testing. These two methods of job analysis were therefore selected for use in the present study.

The two methods of job evaluation chosen for this study were the ranking method (a qualitative, subjective approach) and the point method (a quantitative, objective approach). Ranking is quite common in private sector organizations having less sophisticated job evaluation programs; whereas, the point method is fairly typical in those organizations which have implemented formal, quantitative job evaluation programs (McCarthy & Buck, 1977; Treiman, 1979).

Participants

The concern for user qualifications has been addressed in the present study by obtaining participants possessing three distinct levels of expertise. Method experts were chosen to include professional job analysts or job

evaluators who were currently engaged in this line of work and who have had one or more years experience analyzing and evaluating jobs. In the present study, all method experts were Position Classification Specialists employed by a government agency (e.g., Army, DOD, NASA, Navy).

Visits were made to several personnel offices and discussions were held with Principal Classifiers (i.e., senior/supervisory job analysts/evaluators) for the purpose of explaining the study and to recruit participants. Presentations were made at two meetings of the Hampton Roads Chapter of the Classification and Compensation Society in order to generate interest and involvement among classifiers.

Demographic data on the professional analysts can be found in Appendix O.

Content experts were chosen from among incumbents of positions or jobs similar to those being analyzed and evaluated. In this case, the content expert sample was drawn from a pool of state employees working at Old Dominion University. The University's personnel office contacted each employee directly, through the appropriate supervisory channels, to arrange for voluntary participation. Every effort was made to obtain an equal number of participants from clerical, trades/craft, technical, and managerial occupations (see design below).

Demographic data on the content experts are also in Appendix O.

A third sample of participants was chosen to represent the level of expertise typically utilized in studies such as this; specifically, graduate students in the industrial/organizational psychology program at Old Dominion University were chosen to be the participants. This sample turned out to be the most difficult to recruit. Because of academic and program demands, it became necessary to include as participants senior level undergraduate students from industrial/organizational and personnel psychology courses in order to obtain the required number of participants.

Demographic data on this group are reported in Appendix O.

Thirty-two (32) participants were included in each of the three categories of expertise described above, for a total of ninety-six (96) participants. Eight participants were randomly assigned to each of twelve (12) treatment conditions, described below.

Materials

Materials prepared especially for this study include those items listed in Appendix D. Each is commented on below in turn.

The Introduction material was designed for two purposes. The first purpose was to thank the participants for agreeing to serve in the project. The second purpose, and the more important one from a methodological

standpoint, was to describe the project briefly in order to obtain written consent from participants before beginning the project. The Informed Consent form is a standard requirement for all research involving human subjects. This form was obtained directly from the University, and was used without modification. The Introduction and Informed Consent materials are presented in Appendix E.

Appendix F contains material related to the critical incident technique. The CIT training information was designed to provide participants general training in the origin, purpose, and application of this approach to job analysis. CIT data were generated for each of four jobs used in this study. These data are also included in this appendix; however, the procedure for obtaining this information is described later in this report.

Similarly, Appendix G contains functional job analysis training information and FJA data for the four jobs. The procedure for generating the FJA data is discussed later.

Appendix H contains four partial job descriptions which were prepared exclusively for this study. These job descriptions contain contextual and job requirement information, but specific job content has been deleted in order that the appropriate job analysis information could be used to supply the missing details of the jobs. The four jobs described were composites of information obtained in the Dictionary of Occupational Titles (DOL, 1977; Cain & Green, 1983); the pertinent listings appear in Appendix B.

These jobs were used because they represent the range of jobs typically found in many organizations.

Following the descriptions of the four jobs, an Organization Chart was presented (See Appendix I) as well as Mission and Function Statements (see Appendix J). This material was designed to provide additional contextual information for the jobs to aid in analysis and evaluation. The organization referenced in this study, and all jobs therein, was purely fictional, having been designed solely for use in this research.

Appendix K contains information pertinent to the ranking method of job evaluation. Included are training information to familiarize the participants with the ranking method, the ranking method designed purely for this study, and forms for determining the job ranks.

Similarly, Appendix L contains information pertinent to the point method of job evaluation. This includes training information for the point method, a description of the point method developed for this study, and forms for applying this method. Figure 3 summarizes the point method used in this study, following procedures set forth in Benge (1941), Otis and Leukart (1954), and Rock (1984).

Appendix M contains two salary schedules developed for use in this study. One was for use in the ranking process. The other was appropriate for use with the point method, being keyed to point ranges.

				Degree Points			
<u>Factor</u>	<u>Weight</u>	<u>Max Points</u>	<u>Degrees</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
I	20%	100	3	25	50	100	
II	38%	200	4	25	50	100	200
III	14%	75	3	25	50	75	
IV	28%	150	4	25	50	100	150
	-----	-----					
	100%	525					

Figure 3. Point Method Summary

The questionnaire used to gather demographic and additional information is included in Appendix N.

Design

Four experimental factors were considered in a 2x2x3x4 repeated-measures design. There were two levels of job analysis (JA), i.e., CIT and FJA; two levels of job evaluation (JE), i.e., RM and PM; three levels of expertise (E), i.e., method experts (ME), content experts (CE), and university students (US); and four job descriptions (JD), i.e., clerical, trades/craft, technical, managerial. JD was the repeated-measures factor. The arrangement of the design is depicted in Figure 4.

The primary dependent variable consisted of the salary level assigned to each job as a result of the job evaluation conducted. Ninety-six (96) participants evaluated four jobs to yield 384 measures of this dependent variable. A secondary dependent measure included time to complete the job evaluation task. Responses to a reaction questionnaire provided to each participant at the conclusion of the evaluation task were collected for additional analysis (see Appendix N). The items in the questionnaire included demographic information and manipulation checks as well as items addressing prior knowledge of job analysis and job evaluation issues.

FACTORS							NO. OF PARTICIPANTS
<u>JA</u>		<u>JE</u>		<u>E</u>		<u>JD</u>	
CIT	x	RM	x	ME	x	4 JOBS	8
CIT	x	RM	x	CE	x	4 JOBS	8
CIT	x	RM	x	US	x	4 JOBS	8
FJA	x	RM	x	ME	x	4 JOBS	8
FJA	x	RM	x	CE	x	4 JOBS	8
FJA	x	RM	x	US	x	4 JOBS	8
CIT	x	PM	x	ME	x	4 JOBS	8
CIT	x	PM	x	CE	x	4 JOBS	8
CIT	x	PM	x	US	x	4 JOBS	8
FJA	x	PM	x	ME	x	4 JOBS	8
FJA	x	PM	x	CE	x	4 JOBS	8
FJA	x	PM	x	US	x	4 JOBS	8
							96 TOTAL

Figure 4. Arrangement of Conditions

Procedure

The aim of this study was to empirically test the hypothesis that the type of job analysis data provided could have an effect on the outcome of job evaluation. Rather than have participants generate job analysis data, it was decided that such information would be provided as part of the experimental manipulation. Procedures in this regard varied with the job analysis method.

Generation of CIT Data. In order to provide CIT data, it was necessary to call upon the assistance of managers of jobs similar to those used in this study. Working through the University personnel office, managers were obtained as volunteers to generate CIT data. Depending upon the type of jobs they supervised, managers were provided instructions and forms designed to aid them in observing and collecting critical incidents (see Appendix C). Managers were allowed two weeks to observe (or recall) and compile critical incidents for the specified job under their supervision (e.g., clerk-typist; carpenter; programmer; or personnel manager). The critical incidents were provided to the researcher, who selected and compiled them for use in this study (see Appendix F), according to the format suggested by Kirchner and Dunnette (1974).

Generation of FJA Data. Functional job analysis data were generated by studying the appropriate DOT listing (See Appendix B), extracting tasks statements and modifiers, and then, tailoring them to fit the hypothetical organization

designed for this study. Care was taken to assure that task statements conformed to the pattern specified by Fine et al. (1974). Level and orientation values were taken from the ratings assigned for these jobs in the DOT (1977) (cf. Cain & Green, 1983).

It is recognized that in each case, CIT or FJA, the data generated were limited when compared to such data potentially available from real jobs in real organizations. However, the behavior orientation of CIT and the task (work done) orientation of FJA were considered to be sufficiently operationalized for this study.

Administration of Packets. Upon assignment to one of the twelve possible treatment conditions, participants were provided packets containing the following: 1) The introduction material explaining the study in sufficient detail to convey what was expected of them without compromising the underlying experimental hypotheses; 2) Training material for the appropriate method of job analysis, job analysis data pertinent to four job descriptions, and an organization chart and mission/function statements; 3) Training material for the appropriate job evaluation method along with evaluation forms; and 4) A salary schedule. Appendix D lists the contents of packets provided to participants, according to job analysis (CIT or FJA) and job evaluation (RM or PM) manipulations. Figure 5 depicts the sequence of conditions within the packets. In this figure, (a) represents all options taken together; (b) shows the flow

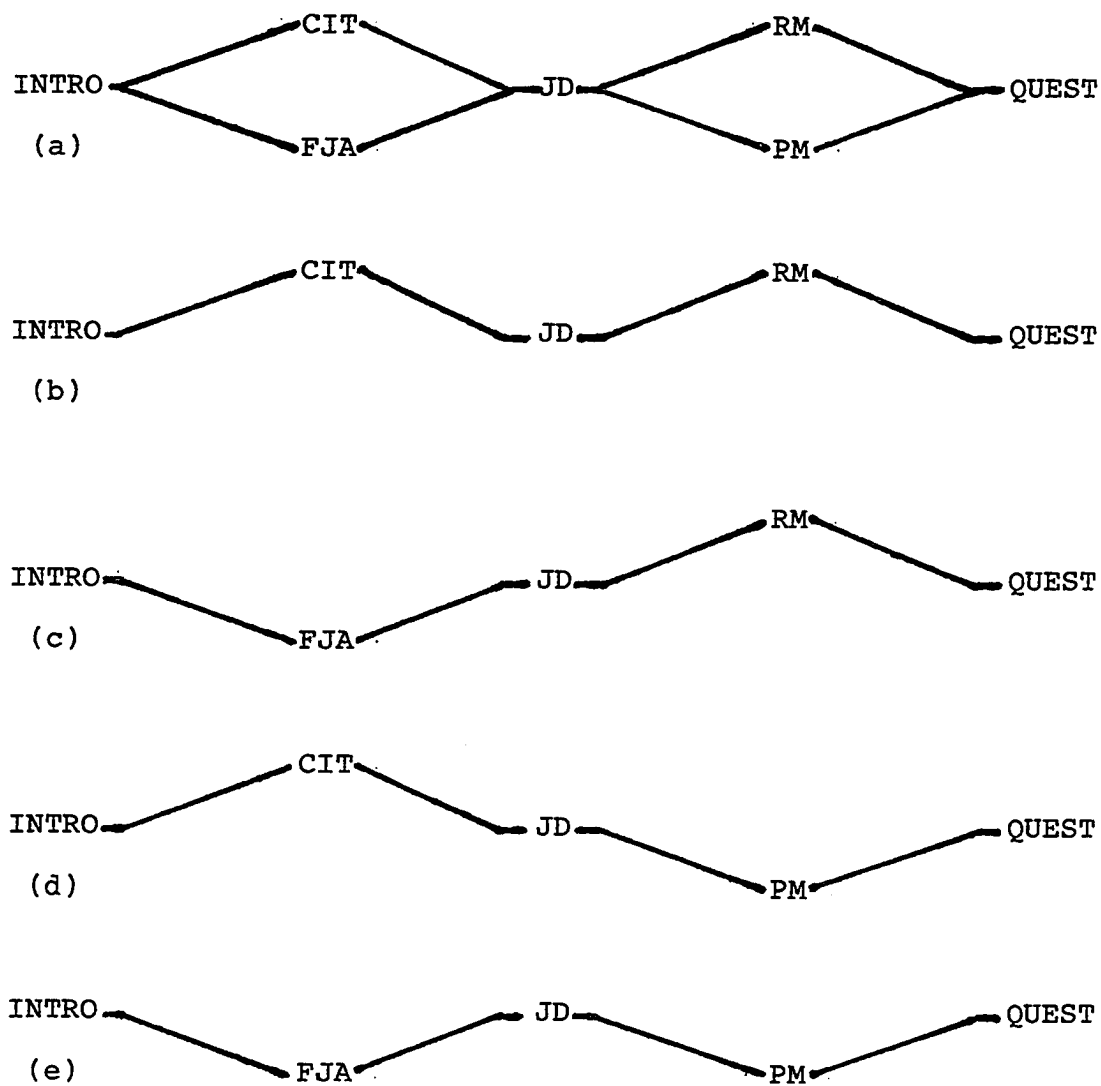


Figure 5. Sequence of Conditions within the Packets

of CIT combined with RM; (c) FJA with RM; (d) CIT with PM; and (e) FJA with PM.

In all treatment conditions, participants were instructed to read the four job descriptions carefully, consider each in turn in light of the job analysis data provided, perform an evaluation based on the job evaluation method, and assign a salary to each job according to the results of the evaluation.

For the purpose of pilot testing the packet material in terms of readability and clarity of instructions, each of the four options was presented to a non-participating co-worker for completion. Modifications were made as necessary prior to actual administration to study participants.

Of necessity, the administration varied somewhat between the groups. Content experts and university students were asked to complete the packets in workshop sessions, during which the experimenter was present to answer questions and resolve problems. However, due to the fact that the professional analysts were from government organizations, and were reluctant to take time off for research, packets were delivered to their places of work, left for four days, then picked up by the experimenter. The professional analysts were asked to complete the packets at their earliest convenience. All participants in all groups were instructed to record the amount of minutes it took to complete the packet of material, and a blank form for recording was provided as a reminder.

CHAPTER THREE

Results

Three analyses were conducted to evaluate the major hypotheses of this study that (a) job analysis method influences the results of the job evaluation process and (b) these results depend upon user qualifications. The first analysis evaluated the effects of job analysis method, job evaluation method, and user qualifications on the determination of salary for four kinds of jobs. The dependent measure of salary level was examined using a repeated measures analysis of variance. Significant findings from this analysis were further examined using Newman Keuls analysis of mean differences. A second analysis assessed the effect of job content knowledge on salary determination. This was carried out using only the content expert participant data. The third analysis pertained to the effect of the three major independent variables on the time required to complete the packets.

Each of these analyses is described in turn below, and the results are presented as appropriate. Following these descriptions and the presentation of tables in support of findings, a brief summary is provided to reinforce the link between the major hypotheses and the obtained results. A discussion of these results and their implications for applications and research appears in Chapter Four.

Analysis of Salary Determination

In the present study 96 participants evaluated four jobs to determine salary; thus, there were 384 measures of job salary in this repeated measures design. The analysis was conducted using the statistical applications software (SAS) system available on the University IBM 4381 (Harris, 1975; Hays, 1973; O'Brien & Kaiser, 1985). Appendix P presents the raw data for all jobs under all conditions of this study.

The results of the analysis are presented in Table 1. An examination of this table indicates that between participants there was a significant main effect for expertise and also a significant expertise x job evaluation interaction. Within participants, the job descriptions effect was significant as were the job descriptions x expertise interaction and the job descriptions x job evaluation x expertise interaction.

To further assess the implications of the main effects of expertise and job descriptions as well as their significant interactions, Newman Keuls analyses of mean differences were conducted (Roscoe, 1975; Winer, 1971). For expertise, the content experts (7.703) and university students (7.345) assigned significantly ($p < .01$) greater salaries than did the method experts (6.563). For job descriptions, the clerical (6.276) and trades/craft (6.513) jobs were assigned significantly ($p < .01$) lower salaries than the technical job (8.822), which was significantly less than the managerial job (11.252) at $p < .01$.

Table 1

Analysis of Variance Summary Table for Salary

Source	df	MS	F-ratio
<u>Between Participants</u>			
Job Analysis (JA)	1	0.103	0.035
Job Evaluation (JE)	1	6.306	2.144
JA x JE	1	2.389	0.812
Expertise (E)	2	23.677	8.053**
JA x E	2	7.656	2.604
JE x E	2	13.026	4.430*
JA x JE x E	2	1.925	0.654
Participants/ JA x JE x E	84	2.940	
<u>Within Participants</u>			
Job Descriptions (JD)	3	519.991	375.988**
JD x JA	3	0.635	0.459
JD x JE	3	1.842	1.331
JD x JA x JE	3	0.558	0.403
JD x E	6	7.338	5.306**
JD x JA x E	6	0.687	0.497
JD x JE x E	6	3.863	2.793*
JD x JA x JE x E	6	0.901	0.651
JD x Participants/ JA x JE x E	252	1.383	

*p < .05. **p < .01.

The means for the job evaluation x expertise interaction are presented in Table 2. As can be seen in this table, the method experts assigned lower salaries using the ranking method than did the university students or the content experts.

The results of the mean comparison tests for the job descriptions x expertise interaction are presented in Table 3 and those for the job descriptions x job evaluation x expertise interaction are presented in Table 4. Table 3 indicates that salary determination varied by job according to level of expertise; most notably in that method experts assigned a significantly lower salary to the clerical and technical jobs than did the content experts and university students. The university students and method experts significantly differed with the content experts on the trades/craft job. Table 4 shows that job evaluation in combination with job descriptions and expertise affected the salary means to the extent that method experts rated the clerical and trades/craft jobs significantly lower when they used the ranking method.

Analysis of Job Incumbency Effects

An analysis was conducted to assess whether the job content knowledge possessed by the content experts biased their salary determinations. Accordingly, a repeated measures analysis was conducted for this sample. The

Table 2

Means for Job Evaluation x Expertise Interaction

<u>Job Evaluation</u>	<u>Expertise</u>		
	<u>ME</u>	<u>US</u>	<u>CE</u>
RM	7.25 ^a	8.48 ^b	8.53 ^b
PM	8.22 ^b	8.22 ^b	8.59 ^b

Note. Abbreviations: Method Expert (ME); University Student (US); Content Expert (CE); Ranking Method (RM); Point Method (PM).

Means with different superscripts are significantly different ($p < .05$).

Table 3

Means for Job Descriptions x Expertise Interaction

<u>Expertise</u>	<u>Job Descriptions</u>			
	<u>C</u>	<u>T/C</u>	<u>T</u>	<u>M</u>
CE	6.906 ^b	7.000 ^d	9.203 ^f	11.141
US	6.358 ^b	6.226 ^c	9.449 ^f	11.365
ME	5.562 ^a	6.312 ^c	7.812 ^e	11.250

Note. Abbreviations: Clerical (C); Trades/Craft (T/C); Technical (T); Managerial (M); Content Expert (CE); University Student (US); Method Expert (ME).

Means with different superscripts are significantly different ($p < .05$).

Table 4

Means for Job Descriptions x Job Evaluation x Expertise
Interaction

		<u>Job Descriptions</u>			
		<u>C</u>	<u>T/C</u>	<u>T</u>	<u>M</u>
<u>JE x E</u>					
PM	CE	6.625	6.875	9.250	11.625
RM	CE	7.188	7.125	9.156	10.656
PM	US	6.375	6.250	9.063	11.543
RM	US	6.341	6.203	9.836	11.543
PM	ME	6.563 ^b	6.875 ^b	7.938	11.500
RM	ME	4.563 ^a	5.750 ^c	7.688	11.000

Note. Abbreviations: Clerical (C); Trades/Craft (T/C); Technical (T); Managerial (M); Job Evaluation (JE); Point Method (PM); Ranking Method (RM); Expertise (E); Content Expert (CE); University Student (US); Method Expert (ME).

Means with different superscripts are significantly different ($p < .05$).

Table 5

Analysis of Variance Summary Table for Same Job

Source	df	MS	F-ratio
<u>Between Participants</u>			
Job Analysis (JA)	1	10.125	1.701
Job Evaluation (JE)	1	0.125	0.021
JA x JE	1	3.125	0.525
Same Job (SJ)	3	3.713	0.623
JA x SJ	3	3.679	0.618
JE x SJ	3	5.547	0.932
JA x JE x SJ	3	1.897	0.318
Participants/ JA x JE x SJ	16	5.952	
<u>Within Participants</u>			
Job Descriptions (JD)	3	130.578	1.594
JD x JA	3	2.858	0.035
JD x JE	3	10.484	0.128
JD x JA x JE	3	1.610	0.020
JD x SJ	9	17.191	0.209
JD x JA x SJ	9	16.222	0.198
JD x JE x SJ	9	32.089	0.257
JD x JA x JE x SJ	9	16.548	0.202
JD x Participants/ JA x JE x SJ	48	81.917	

design for this analysis included factors of job analysis, job evaluation, and job descriptions. In addition, the factor of same job (SJ) was added. This factor categorized each job incumbent as either clerical, trades/craft, technical, or managerial. The results of this analysis are presented in Table 5. As can be seen, there were no significant effects.

Analysis of Time Requirements

In order to test for differences in the amount of time required for participants to complete the job evaluation and salary determination assignments, a three-way analysis of variance was conducted with time as the dependent measure (see Appendix Q for the participants' time completion measures). The three design factors were job analysis, job evaluation, and expertise. The results of this analysis are presented in Table 6. From the information presented in this table, it can be seen that only job analysis was significant. Inspection of the means indicated that the time required to complete packets involving the CIT (46.96 minutes) was significantly greater than that required to complete packets involving FJA (40.33 minutes).

Table 6

Analysis of Variance Summary Table for Time

Source	df	MS	F-ratio
Job Analysis (JA)	1	1053.275	4.60*
Job Evaluation (JE)	1	165.375	0.72
JA x JE	1	26.042	0.11
Expertise (E)	2	462.385	2.02
JA x E	2	300.969	1.31
JE x E	2	160.719	0.70
JA x JE x E	2	69.761	0.30
Participants/JA x JE x E	84	228.899	

*p < .05.

Summary

The above reported analyses can be summarized in the following manner. For the hypothesis that job analysis method influences the outcome of the job evaluation process, significant support was not found for salary determination, but it did take longer to complete CIT packets than FJA packets. In terms of the hypothesis that the level of user expertise makes a difference in the job evaluation process, support was found in the significant main effect for expertise (method experts rated jobs lower overall), the job evaluation x expertise interaction (method experts using the ranking method were the most conservative in assigning salary), the job description x expertise interaction (salaries differed significantly between clerical, trades/craft, and technical jobs depending upon the level of expertise), and in the job descriptions x job evaluation x expertise interaction (clerical and trades/craft jobs were evaluated significantly different with the ranking method and the point method by the method experts). The hypothesis that content experts bias evaluations of their jobs received no support.

CHAPTER FOUR

Discussion

Research in the areas of job analysis and job evaluation is particularly timely in view of the current widespread interest in the issues of comparable worth and pay discrimination (cf. Bloom & Killingsworth, 1982; Buchelle & Aldrich, 1985; Clague, 1973; Cook, 1975; Cooper & Barrett, 1984; Eyde, 1983a; Ferraro, 1984; Fine, 1981; and, Milkovich & Broderick, 1982). From the standpoint of social issue, interest in pay equity is on the rise (H.R. 3008, 1985; Hartmann & Treiman, 1981; Larwood, Stromberg, & Gutek, 1985; Ricardo-Campbell, 1985). Not only have there been recent proposed studies of comparable worth (e.g., Fulghum, 1984; Guion, 1983), but there has also been considerable dialogue on the issue (Gold, 1983; Jacobson, 1974; Sape, 1985; Schonberger & Hennessey, 1981). This frenzy of activity has doubtless been the impetus for the recent flurry of research in the job evaluation arena (cf. Madigan, 1985; Madigan & Hoover, 1986; Rynes & Milkovich, 1986).

The thrust of the present research was basically aimed at methodological issues associated with job analysis and job evaluation. The implications and applications for this research are pertinent to the issues of comparable worth and pay discrimination as well as other concerns of

personnel management and industrial/organizational psychology. Nonetheless, the findings of the present study are important in their own right. It is worthwhile to pursue methodological improvements with or without social, political, or economic incentives.

The present study was built upon hypotheses derived from reviews of the job analysis literature, job evaluation literature, and familiarity effects (in job evaluation) literature. An attempt was made to integrate the various contributions in these areas of research with a view toward generating empirical findings applicable to the underlying mechanisms of job evaluation and job analysis.

Findings presented in Chapter Three will be discussed in turn below. Following this discussion will be a consideration of the implications of the present study for applications and future research.

Choice of Job Analysis Method

An initial question addressed by the present study concerned the degree to which the choice of a particular job analysis method affected the outcome of the job evaluation process. For purposes of the present study, CIT and FJA were chosen as the job analysis methods to investigate. The results presented in Chapter Three revealed that the only statistically significant effect attributable to these two methods was the mean time required to complete the

process of assigning salary levels to jobs. This is consistent with previous research, and it has practical applications.

The research of Levine and his colleagues (Levine et al., 1979; Levine et al., 1980) has demonstrated that the choice of job analysis method did not significantly affect the development of personnel selection examination plans, even though costs associated with various methods did vary. This is somewhat analogous to the present finding that the choice of job analysis method did not affect the salary determined by the job evaluation process; however, mean time to complete the job evaluation process did significantly differ between the CIT and the FJA methods. In the applied setting, time associated with different job analysis methods can be translated into costs of implementation.

In a similar vein, the present finding may also explain why professional job analysts prefer a faster method of job analysis (e.g., FJA) over one which requires more time and is more behavior oriented (e.g., CIT). This would tend to support the survey findings of Levine (1981) and Levine et al. (1983).

Choice of Job Evaluation Method

Findings reported in Chapter Three reveal a complex situation with regard to the choice of job evaluation method. Though there was no overall main effect for job

evaluation, two significant interactions were obtained. First, the job evaluation x expertise interaction demonstrated that when the ranking method was used by method experts, job salaries were lower than when the other two expert groups used either the ranking method or the point method. This finding is important in light of previous research which has tended to show a high degree of commonality among methods of job evaluation (e.g., Chesler, 1948; Robinson et al., 1974; Snelgar, 1983). Thus, the present study calls into question such reported consistency in job evaluation method by taking into account the level of expertise of the user. More will be said about this later.

Secondly, the job description x job evaluation x expertise interaction further restricts the generalizability of prior research. Specifically, this finding shows that not only is it important which method is used by whom, but also to which jobs a given method is applied. The arguments growing out of the comparable worth debate tend to favor the widespread adoption of the point method of job evaluation (Gunther v. County of Washington, 1981; Hartmann & Treiman, 1983; Treiman, 1979). Similarly, recent research has focused on the generalizability of the point method across various settings (Doverspike et al., 1983; Fraser et al., 1984). Given the present findings, there is reason to reconsider whether the point method is the panacea for solving pay equity problems when type of

job is considered along with user expertise. Clearly, other factors need to be taken into account when decisions are made regarding the viability of a particular job evaluation method, especially in such arenas as comparable worth (Charles, 1971; Janes, 1972; Livy, 1975; Pasquale, 1969; Wallace & Fay 1981).

The choice of job evaluation method, then, is not a consideration to be taken lightly. Unlike the straightforward effect on time which job analysis method displayed, job evaluation method appears to interact more complexly with other variables such that the use of one method by all evaluators for all types of jobs could be a self-defeating strategy. Lawton (1962) was one of the first to call for on-going evaluation of the job evaluation process. The results obtained in the present study suggest that the choice of job evaluation method should be made in conjunction with a consideration of other factors. Given the kinds of interactions obtained in this study, the time has not yet come to conclude that one method is always superior to another. Job evaluation methods are not infallible; they are apparently affected by both the jobs to which they are applied and the user's level of expertise.

Effect of User Expertise

An important finding of the present study was the significant main effect for the factor designated as expertise. This factor, reflecting three distinct levels

of qualifications - method expertise, content expertise, and university student - offers new insight into the job evaluation process.

Previous research by Madden (1960; 1962; 1963) laid the groundwork for the notion that familiarity with the job itself could affect the outcome of job evaluation. However, this idea seems to have been set aside by more recent research, which has tended to use university students as rater/participants (e.g., Doverspike et al., 1983; Robinson et al., 1974). No systematic studies have been conducted previously to assess the degree to which job incumbents and university students differ in their evaluation of jobs. Moreover, previous research has not considered the possibility of differences in the way job evaluators would apply job evaluation methods as opposed to job content experts (employees or supervisors) and university students.

Results of the present study indicate that it does, in fact, make a difference who performs the job evaluation. Furthermore, this difference is reflected in the method of evaluation utilized and type of job evaluated. Method experts assigned significantly lower salaries to clerical and trades/craft jobs using the ranking method.

A general trend reflected in the present findings is interesting when the level of user expertise is considered. Whereas the method expert group consistently rated all jobs lower with the ranking method, the content

expert group rated clerical and trades/craft jobs lower with the point method and technical and managerial jobs lower with the ranking method. In just the opposite manner, the university student group rated clerical and trades/craft jobs lower with the ranking method and technical and managerial jobs lower with the point method. This trend suggests that professional evaluators are more consistent in applying certain job evaluation methods than are other users.

Thus, it would appear from the findings reported in this study that user expertise is a very important factor in assessing the outcome of job evaluation, at least in terms of situations where several jobs are being considered and more than one method is available. The implications of this finding for applications and research are discussed below.

Implications for Applications

From an examination of sources such as legal citations (e.g., *Gunther v. County of Washington*, 1981) or texts on compensation (Henderson, 1985; Milkovich & Newman, 1984), the inference might be drawn that conclusive evidence exists to support the use of the point method of job evaluation as the ultimate approach. This impression would be further reinforced by a review of recently published research findings (e.g., Doverspike et al., 1983; Fraser et al., 1984) and special studies such as the NAS project

reported by Treiman (1979). However, the present study does not support the superiority of the point method. This finding raises questions in regards to our pursuit of one best method of job evaluation (Gomez-Mejia et al., 1982).

The first question raised concerns the type of job being assessed. In this study, the clerical and trades/craft jobs were assigned different salary levels with the job evaluation methods. Contrary to what might be commonly expected, the ranking method resulted in lower salaries for these jobs than did the point method. (It would seem that ranking would tend to be more liberal in salary determination since it is not bound by point ranges.) As far as the technical and managerial jobs were concerned, job evaluation method did not result in significantly different salary levels. In other words, in some categories of jobs, the evaluation method does not produce variation in salary determinations. This statement must be qualified by the second question raised by the findings of the present study: Who conducts the evaluation?

Results of this investigation suggest that salary is determined as much by the level of expertise of the user as by the method. The implications of this finding to applications in the real world of salary determination are quite apparent. It is as important to consider the qualifications of those asked to evaluate jobs as it is to determine which method they should use.

In the same vein, another important issue regarding user qualifications becomes clearer as a result of this study. The reliance upon employees or job incumbents as evaluators was feared to be tainted by occupational bias. However, findings reported herein do not support this fear. There was no evidence that job incumbency affected salary determination for any of the four jobs evaluated by participants. This finding argues for reliance upon employees in the process of job evaluation where expertise has not been shown to interact with type of job or method choice. An increased reliance on incumbents could reduce costs associated with evaluation by means of professional analysts as well as enhance the acceptability of the process (cf. Ruckner, 1984).

Regarding job analysis, the present study can only provide evidence that CIT job descriptions take longer to process than do FJA descriptions. In applied settings this may equate to costs of use. Previous research has focused on the applicability of job analysis to particular areas such as content validity (Fine, 1978) or test validation (e.g., Thompson & Thompson, 1982). Researchers have addressed the importance of task difficulty (Leczner, 1971), and whether or not task oriented approaches to job classification are superior to global approaches (Sackett, Cornelius, & Carron, 1981), especially in terms of validity generalization (Cornelius, Schmidt, & Carron, 1984). On the negative side, there are those who view job based

approaches to classification as being a major contributor to organizational ineffectiveness (Penner, 1983). The present findings do not resolve such issues. The number of job analysis techniques available, and the myriad of applications for such methods point out the need for systematic training for job analysts (Sims & Veres, 1985). Whether or not a multi-method approach would serve personnel applications better is yet to be determined. The present study indicates that our understanding of the relationship of job analysis to job evaluation is in need of further research.

Implications for Research

The present study was designed to address basic methodological questions associated with job analysis and job evaluation. Through the use of the JAMES Matrix, two methods of job analysis were considered in combination with two methods of job evaluation. Of particular concern was the effect of these method pairings on salary decision outcomes. The choices of CIT and FJA were supported based on previous research findings (Levine et al., 1983); and, the choices of the ranking method and the point method were based upon consideration of the subjectiveness of the former and the quantitiveness of the latter. Therefore, findings derived from the unique combination of these methods do not represent the entire domain of possible method pairings. It is suggested that future research examine other possible method combinations, as shown in the JAMES Matrix.

The significant finding of an overall main effect for level of expertise is important to the direction of future related research. Although a few studies have attempted to enlist the assistance of trained analysts in studies of job evaluation (e.g., Cornelius & Lyness, 1980; Fraser et al., 1984), the general tendency has been to rely upon university students in industrial/organizational psychology programs to serve as raters or participants. The generalizability of results from studies using only student participants is tenuous. The present findings strongly indicate that it makes a difference who conducts the job evaluation process. Method experts differed significantly from content experts and university students in the results of salary determinations for two of four jobs. This finding should encourage other researchers to give particular attention to the realism of job evaluation studies. Such factors as age and experience differed among the three expertise groups used in the present study. It would indeed be worthwhile to investigate more closely how these variables impact on the validity of job evaluation outcomes.

In terms of the impact of job analysis method on job evaluation process, the present findings were not indicative of any direct effect other than time required to consider job analysis information. This, however, does not conclusively demonstrate that there is no effect. Participants were asked to consider job analysis data in

conjunction with job descriptions and an organization chart with mission/function statements. It is suspected that the additional information provided by this material may have reduced the impact of the job analysis method. Future research should address the issue of job analysis impact more directly by requiring study participants to actually conduct the job analysis (i.e., gather job facts according to the prescribed method) prior to performing the job evaluation. In this way, job analysis method may have a greater impact on the job evaluation process.

Similarly, the impact of the job description on the evaluation process represents another area of potential research. Jones (1984) offers some practical suggestions for preparing job descriptions, as does the Commonwealth of Virginia (undated) and the U.S. Civil Service Commission (1978). Madden and Giorgia (1964) used simulated job descriptions (i.e., score profiles for the compensable factors) in their study to identify job requirements, finding them deficient compared to written job descriptions. The present study relied on job descriptions generated from the DOT (DOL, 1977) which were believed to supply accurate and appropriate information about job content and job context to participants. However, further research is needed to assess the true impact of the job description on the judgment of the individuals tasked with making job evaluation decisions.

By and large, previous job evaluation research has tended to be oriented exclusively on the evaluation method per se, without taking into account the impact of job analysis information or the qualifications typical of users of such methods. The present study was designed to address the impact of the combination of these factors. Based on the findings obtained, it is suggested that research continue to investigate these and other factors.

Conclusion

The areas of job analysis and job evaluation are of central concern to personnel management and industrial/organizational psychology. Each area has its own research agenda, be it single method studies or comparative studies. In general, the early research in these areas was motivated by the desire to improve specific methods. More recently, pressing economic, social, and political issues have rekindled an interest in job evaluation in particular (Brinks, 1985; England & Farkas, 1986; Schuster, 1985; Stencel, 1981; Wittig, Turner, Marso, Bayliff, & Lusher, 1984).

The present study represents a timely contribution to the literature for at least two reasons. First, the basic thrust of the study was aimed at methodological issues associated with the systematic pairing of job analysis methods with job evaluation methods. This is important because of their inherent connection and the consequences

of possible method mis-match on salary determinations. Additionally, by calling into question the importance of user qualifications, this study added to the research in job analysis and evaluation. This points to the second contribution of this study. It seems prudent to consider who uses the various methods when one is attempting to support such arguments as comparable worth through the merits of one particular job evaluation method (e.g., the point method). Given the complex interactions between expertise, methods, and jobs, it is doubtful that methods alone could represent the panacea for wage discrimination and pay disparity. More questions need to be asked before definitive answers are given.

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APPENDIX A:
Identification of Jobs

Identification of Jobs

Job 1	Clerk-Typist	Clerical example
Job 2	Carpenter	Trades/Craft example
Job 3	Programmer	Technical example
Job 4	Personnel Manager	Managerial example

Job Analysis Key

CIT 1	Critical Incident Technique applied to Clerk-Typist
CIT 2	Critical Incident Technique applied to Carpenter
CIT 3	Critical Incident Technique applied to Programmer
CIT 4	Critical Incident Technique applied to Personnel Manager
FJA 1	Functional Job Analysis of Clerk-Typist
FJA 2	Functional Job Analysis of Carpenter
FJA 3	Functional Job Analysis of Programmer
FJA 4	Functional Job Analysis of Personnel Manager

Job Evaluation Key

RM 1	Ranking Method evaluation of Clerk-Typist
RM 2	Ranking Method evaluation of Carpenter
RM 3	Ranking Method evaluation of Programmer
RM 4	Ranking Method evaluation of Personnel Manager
PM 1	Point Method evaluation of Clerk-Typist
PM 2	Point Method evaluation of Carpenter
PM 3	Point Method evaluation of Programmer
PM 4	Point Method evaluation of Personnel Manager

APPENDIX B:
DOT Listings

DOT Listing
for
Clerk-Typist

203.582-066 TYPIST (clerical)

Types letters, reports, stencils, forms, addresses, or other straight-copy material from rough draft or corrected copy. May verify totals on report forms, requisitions, or bills. May be designated according to material typed as ADDRESS-CHANGE CLERK (insurance); ENDORSEMENT CLERK (insurance); POLICY WRITER (insurance); RECORD CLERK (hotel & rest.); STATISTICAL TYPIST (clerical); TICKETING CLERK (finan. inst.). Additional titles: APPLICATION-REGISTER CLERK (insurance); FILING WRITER (insurance); MASTER-SHEET CLERK (insurance); MORTGAGE-PAPERS-ASSIGNMENT-AND-ASSEMBLY CLERK (insurance); STENCIL CUTTER (clerical); TABULAR TYPIST (clerical); TITLE, AUTOMOBILE (clerical).

DOT Listing
for
Carpenter

860.281-010 CARPENTER, MAINTENANCE (any ind.)
carpenter, repair; carpentry
repairer.

Constructs and repairs structural woodwork and equipment in an establishment, working from blueprints, drawings, or oral instructions; Builds, repairs and installs counters, cabinets, benches, partitions, and power tools. Installs glass in windows, doors, and partitions. Replaces damaged ceiling tile, floor tile, and sheet plastic wall coverings. May build cabinets and other wooden equipment in carpenter shop, using woodworking machines, such as powersaws, shaper, and jointer (CABINETMAKER <woodworking>). May install window shades, venetian blinds, curtain rods, and wall fans for tenants. May be designated according to place at which work is performed as CARPENTER, MINE (mining & quarrying); or according to specific items made or maintained as FLUME MAKER (mining & quarrying); FRAME MAKER (leather mfg.); MEAT-CUTTING-BLOCK REPAIRER (any ind.).

DOT Listing
for
Programmer

020.167-022 PROGRAMMER, ENGINEERING AND
SCIENTIFIC (profess, & kin.)

Converts scientific, engineering, and other technical problem formulations to format processable by computer: Resolves symbolic formulations, prepares flow charts and block diagrams, and encodes resultant equations for processing by applying knowledge of advanced mathematics, such as differential equations and numerical analysis, and understanding of computer capabilities and limitations. Confers with engineering and technical personnel to resolve problems of intent, inaccuracy, or feasibility of computer processing. Reviews results of computer runs with interested personnel to determine necessity for modifications or reruns. Develops new sub-routines or expands program to simplify statement, programming, or coding of future problems. For numerical control programming, see (TOOL PROGRAMMER, NUMERICAL CONTROL <any ind.>).

DOT Listing
for
Personnel Manager

166.117-018 MANAGER, PERSONNEL (profess. & kin.)

Plans and carries out policies relating to all phases of personnel activity: Recruits, interviews, and selects employees to fill vacant positions. Plans and conducts new employee orientation to foster positive attitude toward company goals. Keeps record of insurance coverage, pension plan, and personnel transactions, such as hires, promotions, transfers, and terminations. Investigates accidents and prepares reports for insurance carrier. Conducts wage survey within labor market to determine competitive wage rate. Prepares budget of personnel operations. Meets with shop stewards and supervisors to resolve grievances. Writes separation notices for employees separating with cause and conducts exit interviews to determine reasons behind separations. Prepares reports and recommends procedures to reduce absenteeism and turnover. Contracts with outside suppliers to provide employee services, such as canteen, transportation, or relocation service. May keep records of hired employees characteristics for governmental reporting purposes. May negotiate collective bargaining agreement with BUSINESS REPRESENTATIVE, LABOR UNION (profess. & kin.).

APPENDIX C:
CIT Information

CIT Information for Managers

Critical Incident Technnique (CIT) was developed by John C. Flanagan during the mid- to late-forties as an aid to collecting job performance data for use in a variety of personnel actions. CIT has been used over the years in job analysis for job design, recruitment and placement, and performance appraisal. It has also served as a supplemental data gathering method in training development and job evaluation.

According to Flanagan, an "incident" is any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects.

Critical incidents are collected by skilled observers for each job under review. Ordinarily, numerous incidents are collected for each job, then they are grouped into categories according to major job duties. Such incidents may reflect either outstandingly effective or non-effective performance. Effective critical incidents and/or non-effective critical incidents are believed to be more useful for personnel actions than would be examples of so-called normal job performance.

On the next pages, you will find questionnaires designed to help you gather critical incidents pertinent to jobs under your supervision. Along with the questionnaires are lists of areas to consider when recounting critical incidents. With these aids, collect as many incidents as possible. When you have completed this assignment, your examples will be collected for anonymous use in a job analysis/job evaluation research project.

Thank you for your cooperation and assistance.

CIT Questionnaire for Clerk-Typist*

Think back over a period of time (six months or so) long enough for you to have observed the activities of the Clerk-Typist. Focus your attention on any one thing that the Clerk-Typist may have done which made you think of him/her as an outstandingly effective or non-effective employee. In other words, think of a critical incident which had added materially to the overall success or failure of the office. Please do not record any names of persons involved in the following incident.

What were the general circumstances leading up to this incident?

Tell exactly what the Clerk-Typist did that was so effective or non-effective at the time.

How did this particular incident contribute to the overall success or failure of the office?

When did this incident happen?

How long has this Clerk-Typist been in this job?

*Adapted from Kirchner and Dunnette (1974)

Areas to Consider When Recounting Critical Incidents (Clerk-
Typist)

1. Typing a variety of material (e.g., letters, memoranda, reports, etc.).
2. Preparing correspondence according to proper format.
3. Preparing outgoing correspondence for mailing.
4. Receiving incoming correspondence (screening and routing).
5. Filing material.
6. Receiving telephone calls and visitors.
7. Other.

CIT Questionnaire for Carpenter*

Think back over a period of time (six months or so) long enough for you to have observed the activities of the Carpenter. Focus your attention on any one thing that the Carpenter may have done which made you think of him/her as an outstandingly effective or non-effective employee. In other words, think of a critical incident which had added materially to the overall success or failure of the office. Please do not record any names of persons involved in the following incident.

What were the general circumstances leading up to this incident?

Tell exactly what the Carpenter did that was so effective or non-effective at the time.

How did this particular incident contribute to the overall success or failure of the office?

When did this incident happen?

How long has this Carpenter been in this job?

*Adapted from Kirchner and Dunnette (1974)

Areas to Consider When Recounting Critical Incidents
(Carpenter)

1. Constructing and repairing structural woodwork.
2. Building, repairing, or installing counters, cabinets, partitions, etc.
3. Installing glass in windows.
4. Replacing damaged tiles (ceiling and floor).
5. Modifying existing structures.
6. Fabricating wooden equipment in the shop.
7. Other.

CIT Questionnaire for Programmer*

Think back over a period of time (six months or so) long enough for you to have observed the activities of the Programmer. Focus your attention on any one thing that the Programmer may have done which made you think of him/her as an outstandingly effective or non-effective employee. In other words, think of a critical incident which had added materially to the overall success or failure of the office. Please do not record any names of persons involved in the following incident.

What were the general circumstances leading up to this incident?

Tell exactly what the Programmer did that was so effective or non-effective at the time.

How did this particular incident contribute to the overall success or failure of the office?

When did this incident happen?

How long has this Programmer been in this job?

*Adapted from Kirchner and Dunnette (1974)

Areas to Consider When Recounting Critical Incidents
(Programmer)

1. Preparing technical documentation.
2. Reviewing documentation prepared by others.
3. Preparing short items such as user bulletins, memos, etc.
4. Using programming languages to update software.
5. Testing new software.
6. Consulting with users.
7. Other.

CIT Questionnaire for Personnel Manager*

Think back over a period of time (six months or so) long enough for you to have observed the activities of the Personnel Manager. Focus your attention on any one thing that the Personnel Manager may have done which made you think of him/her as an outstandingly effective or non-effective employee. In other words, think of a critical incident which had added materially to the overall success or failure of the office. Please do not record any names of persons involved in the following incident.

What were the general circumstances leading up to this incident?

Tell exactly what the Personnel Manager did that was so effective or non-effective at the time.

How did this particular incident contribute to the overall success or failure of the office?

When did this incident happen?

How long has this Personnel Manager been in this job?

*Adapted from Kirchner and Dunnette (1974)

Areas to Consider When Recounting Critical Incidents
(Personnel Manager)

1. Managing the operational and long-term objectives of the personnel function.
2. Implementing new personnel programs.
3. Providing policy interpretations to managers and employees.
4. Responding to staff problems.
5. Conducting performance evaluation and other related personnel activities.
6. Supervising professional and clerical subordinates.
7. Other.

APPENDIX D:
Packet Contents

PACKET CONTENTS

<u>CIT/RM</u>	<u>CIT/PM</u>	<u>FJA/RM</u>	<u>FJA/PM</u>
Introduction	Introduction	Introduction	Introduction
Inf. Con.	Inf. Con.	Inf. Con.	Inf. Con.
CIT Training	CIT Training	FJA Training	FJA Training
CIT 1	CIT 1	FJA 1	FJA 1
CIT 2	CIT 2	FJA 2	FJA 2
CIT 3	CIT 3	FJA 3	FJA 3
CIT 4	CIT 4	FJA 4	FJA 4
Partial JD	Partial JD	Partial JD	Partial JD
Org Chart	Org Chart	Org Chart	Org Chart
Mis/Fun Stmnt	Mis/Fun Stmnt	Mis/Fun Stmnt	Mis/Fun Stmnt
RM Training	PM Training	RM Training	PM Training
RM 1	PM 1	RM 1	PM 1
RM 2	PM 2	RM 2	PM 2
RM 3	PM 3	RM 3	PM 3
RM 4	PM 4	RM 4	PM 4
Salary Info	Salary Info	Salary Info	Salary Info
Quest.	Quest.	Quest.	Quest.

APPENDIX E:
Introduction and Informed Consent

Introduction

Thank you for participating in this project. Your assistance is greatly appreciated by those of us engaged in personnel research.

Please read carefully the instructions that follow. If you have any questions, or you need clarification, do not hesitate to ask for help.

Instructions:

- 1) Look over the packet of material which has been provided to you.
- 2) Complete the INFORMED CONSENT page.
- 3) Study the Job Analysis information, along with the partial Job Descriptions and Organization Chart and Mission/Function Statements. Develop in your mind a good understanding of the jobs to be evaluated.
- 4) Next, study the Job Evaluation information. When you feel comfortable with your understanding of the Evaluation method, use it to determine the appropriate salary level for each of the four jobs focused on in this project. You should use the salary schedule provided in this packet.
- 5) Take your time and work carefully and thoughtfully.

- 6) After you have evaluated and determined the salary for all four jobs, make sure you have completed the appropriate evaluation form for each job.
- 7) Look over your work, and be satisfied that you have done your best.
- 8) Lastly, complete the Participant Questionnaire.
- 9) Place all material in the envelope provided, and return it to the researcher.

OLD DOMINION UNIVERSITY
Department of Psychology

INFORMED CONSENT

Project Name: PROJECT METHOD

Investigator(s): James S. Herndon

Date: _____

This is to certify that I, _____ hereby agree to participate as a volunteer in a scientific investigation as a part of the educational and research program of Old Dominion University under the supervision of Terry L. Dickinson, Ph.D.

The investigation and the nature of my participation have been described and explained to me, and I understand the explanation.

However, I have been informed and do understand that some details of the study may not have been explained at this time. This procedure is sometimes necessary since advanced knowledge may affect the results. I am aware that the exact nature of the study will be explained to me during a debriefing at the end of the study.

I have been given an opportunity to ask questions, and all such questions have been answered to my satisfaction.

I understand that I am free to withhold any answer to specific items or questions in the questionnaires.

I understand that any data or answers to questions will remain confidential with regard to my identity.

I acknowledge that I was informed about any possible risks to my health and well being that may be associated with my participation in this research.

I further understand that I am free to withdraw my consent and terminate my participation at any time, without penalty.

I have been informed that I have the right to contact the Psychology Department Committee for the Protection of Human Subjects and/or the University Committee should I wish to express any opinions regarding the conduct of this study.

Date: _____

Signature: _____

Witnessed by: _____

Date of Birth: ____ / ____ / ____

APPENDIX F:
CIT Training and Job Analysis Information

CIT Training Information

Critical Incident Technnique (CIT) was developed by John C. Flanagan during the mid- to late-forties as an aid to collecting job performance data for use in a variety of personnel actions. CIT has been used over the years in job analysis for job design, recruitment and placement, and performance appraisal. It has also served as a supplemental data gathering method in training development and job evaluation.

According to Flanagan, an "incident" is any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects.

Critical incidents are collected by skilled observers for each job under review. Ordinarily, numerous incidents are collected for each job, then they are grouped into categories according to major job duties. Such incidents may reflect either outstandingly effective or non-effective performance. Effective critical incidents and/or non-effective critical incidents are believed to be more useful for personnel actions than would be examples of so-called normal job performance.

On the next pages you will find examples of critical incidents which were collected on four distinct jobs. Review these examples carefully, and consider them in the job evaluation process you have been asked to complete.

Other information in the form of an organization chart and mission/function statements have also been provided on the following pages. Use these in your decision making; but, remember that the critical incidents are real examples of job performance.

Job Analysis

CIT 1

The following incidents were collected on the job:

A. Typing

An incumbent consistently demonstrated superior typing skill by completing error-free assignments in minimal time.

Another incumbent chose to "delegate" typing to friends in a nearby office, with the result that backlogs often occurred.

Typed work from one incumbent was barely acceptable, and always required re-typing several times before it could leave the office in the form of correspondence.

B. Filing

One incumbent established a unique filing system that departed drastically from the conventional system of alphabetization; items became lost forever.

Filing meant putting everything in the "pending" stack, to this employee.

There was never any large amount of filing to be done, since the incumbent stayed on top of this chore.

C. Communicating

An incumbent established an office newsletter that went out to the entire organization; other departments and offices were complementary.

Callers were repeatedly frustrated by the fact that they could not understand what the incumbent was saying.

Visitors found one incumbent to be very knowledgeable about office functions, and able to communicate important information in a clear, succinct fashion.

D. Dealing with Others

An incumbent displayed a negative attitude which affected the morale of the entire staff.

When there were problems in the office, this employee seemed to be able to calm everyone down.

Job Analysis

CIT 2

The following incidents were collected on this job:

A. Building and Constructing

Recently, a contractor was tasked to build a sign for the department. Somehow it never got done. This employee took on the task and completed the job in a very brief time. The sign looks great, and we saved much money by cancelling the contract.

Bookcases were installed in the office which added to the appearance and effectiveness of the division office. Clearly, the work of this employee is a cut above.

Everything this employee built seemed to self-destruct in thirty days or less. We always had to re-do the job.

B. Repairing

The number of service calls increased dramatically. This was not because of increased trouble, but was because the word got out what a good job this employee was doing on trouble calls.

This employee could fix anything; Even things which others said were beyond repair.

It seemed as if for everything the incumbent was sent to fix, he returned to report two broken items. Work was going in the wrong direction.

C. Modifying and Fabricating

The incumbent had a unique ability to come up with modifications no one else could imagine. The ideas worked well, and generated praise from the staff.

Rather than order many items from manufacturers, we relied on the incumbent to fabricate all sorts of wooden structures and equipment. There was nothing we could imagine that he couldn't make.

This incumbent repeatedly damaged equipment and tools whenever assigned to modify any building structure.

Job Analysis

CIT 3

The following incidents were collected on this job:

A. Programming

The incumbent developed a program that could be used by the entire staff to produce documentation.

The incumbent failed to check program for errors prior to releasing it to the user. The image of the branch suffered.

The incumbent became familiar with the program and indicated where changes would be necessary, without being so directed. This put the branch in a favorable position with the user.

B. Consulting

An incumbent reviewed the documentation prepared by a user, and provided insightful comments which saved considerable time and money. The user's office sent praise.

This incumbent provided incorrect information to the user, thereby causing damage to the program.

One employee is continually sought out for consultation because of the high quality advice rendered. The word has spread.

C. Testing

The employee did not keep track which tests had been run with which versions of the program. Subsequently, an error was made when putting the programs into production and could not be traced.

In testing a new program, the incumbent neglected to follow all the instructions and failed to do some tasks because she "felt" they were not necessary.

Usually, new programs are brought to this employee for testing and debugging because no one does the job better.

D. Dealing with Others

The incumbent was very professional and polite when the user called asking for additional changes that were outside the specifications.

Users prefer not to rely on this employee because of the rude manner in which questions are answered.

Job Analysis

CIT 4

The following incidents were collected on this job:

A. Carrying out Existing Programs

This employee conducted extensive research into the problem, and was able to report that a solution was within program capabilities.

A plan to contract out part of a function called for a detailed management implementation plan, which was expertly done by this employee. As a result, the transition was much smoother than expected.

B. Implementing New Programs

The incumbent did not manage the task well, making the office look bad.

The incumbent made extensive contacts, did the necessary research, and thereby brought about an effective implementation of the new program.

C. Working with Others

In responding to a request to establish a special panel, the incumbent did an excellent job of coordinating the talents of the key members. The panel was highly effective because of this leadership.

A problem employee needed counselling. The incumbent mis-handled the situation and the outcome was a grievance. The department has had to respond to numerous inquiries.

D. Providing Policy Interpretations

Clear guidance was provided to other managers on a controversial program which was causing much concern. The incumbent showed expert program knowledge and great skill in conveying same.

The incumbent apparently did not understand the program in principle, provided incorrect advice, and therefore was directly responsible for a law suit.

APPENDIX G:
FJA Training and Job Analysis Information

FJA Training Information

Functional Job Analysis (FJA) was developed and refined by Sidney A. Fine, with initial development beginning shortly after World War II. FJA is a task-focused job analysis procedure which requires that facts be collected on jobs in terms of level and orientation with respect to Things, Data, and People. This approach served as the rudiment for the information collected and compiled in the Dictionary of Occupational Titles (DOT) available from the U.S. Department of Labor.

Fine states that workers in every job are involved somewhat physically, mentally, and interpersonally with three general categories of objects: Things, Data, People. Tasks can be described in terms of a small number of patterns of behavior (functions) that in turn describe how workers perform in relation to Things, Data, and People. As hierarchies, these categories provide a means of measuring and comparing tasks in terms of level -- relative complexity of a task in comparison to other tasks, and orientation -- relative involvement with Things, Data, and People.

Trained analysts collect numerous tasks for each job under study. Task banks have been established in many occupational areas. Along with task information, analysts develop level and orientation scores for each job on the Things, Data, and People hierarchies. This facilitates occupational comparison and classification.

On the next pages you will find examples of task statements which were collected on four distinct jobs. Review these examples carefully, and consider them in the job evaluation process you have been asked to complete. You may also use the organization chart and mission/function statements provided; but, remember the task statements are real examples.

Job Analysis

FJA 1

The following task statements pertain to this job:

- A. Typing a variety of material such as letters, memoranda, technical reports, technical notes, tabular data, and similar material, from handwritten drafts prepared by various office personnel.
- B. Preparing correspondence and reports in proper format, adding attachments and back-up information, if needed; returning typed correspondence to originator for signature.
- C. Preparing outgoing correspondence for mailing, following all routing and security guidelines.
- D. Receiving all incoming correspondence; reviewing and screening to determine action office; routing as appropriate, marking for action, and establishing tickler file for control.
- E. Filing material to be retained in the office; researching files to locate specific documents and/or information at the request of the office personnel; assisting in the establishment of new files, as appropriate.
- F. Receiving telephone calls and visitors; utilizing sound judgment and good familiarity with programs and functions in responding to a variety of questions.

In relation to THINGS, the primary orientation of this job is:

operating-controlling .

In relation to DATA, the primary orientation of this job is:

copying .

In relation to PEOPLE, the primary orientation of this job is:

taking instructions-helping .

Job Analysis

FJA 2

The following task statements pertain to this job:

A. Constructing and repairing structural woodwork, working from blueprints, drawings, and oral instructions.

B. Building, repairing, or installing counters, cabinets, benches, partitions, floors, doors, framework, and trim, using handtools and power tools.

C. Installing glass in windows, doors, and partitions.

D. Replacing damaged ceiling tile, floor tile, and sheet plastic wall covering.

E. Modifying existing structures according to work requests, or in order to improve structural integrity.

F. Fabricating cabinets and other wooden equipment in the shop, using woodworking machines, such as power saws, sharpner and jointer.

In relation to THINGS, the primary orientation of this job is:

precision working .

In relation to DATA, the primary orientation of this job is:

analyzing .

In relation to PEOPLE, the primary orientation of this job is:

taking instructions-helping .

Job Analysis

FJA 3

The following task statements pertain to this job:

A. Preparing technical documentation to assist users in performing specific tasks on two operating systems, calling upon a variety of software packages.

B. Reviewing documentation prepared by others for technical accuracy, suggesting revisions as necessary.

C. Preparing miscellaneous short documents, such as memos, user bulletins, newsletter articles.

D. Using a variety of programming languages to update existing software in order to modify the way it operates, or to convert it to a different system.

E. Testing new software packages to determine whether they perform as expected or appropriately.

F. Consulting with users regarding technical issues associated with either operating systems or any of the available software.

In relation to THINGS, the primary orientation of this job is:

handling_____.

In relation to DATA, the primary orientation of this job is:

coordinating_____.

In relation to PEOPLE, the primary orientation of this job is:

speaking-signaling_____.

Job Analysis

FJA 4

The following task statements pertain to this job:

A. Managing the operational and long-term objectives of the personnel function, including recruitment/selection/placement, classification/compensation, and records management.

B. Implementing new personnel programs through assignment of staff responsibility, and monitoring implementation efforts.

C. Providing policy interpretations to managers and employees on all personnel program matters.

D. Responding to staff problems by researching laws/policies, securing financial and staff resources, and providing input to suggested ideas.

E. Conducting performance evaluation and related personnel activities in order to increase staff productivity.

F. Supervising four professionals and one clerical employee assigned to the personnel function.

In relation to THINGS, the primary orientation of this job is:

handling_____.

In relation to DATA, the primary orientation of this job is:

coordinating_____.

In relation to PEOPLE, the primary orientation of this job is:

negotiating_____.

APPENDIX H:
Job Descriptions

Job Description

No 1

- I. Introduction. This job is organizationally located in the office of the Director, Center for Strategic Studies, Bureau of Land Reclamation, Department of Natural Resources. The primary purpose of this job is to provide typing and clerical support to the Director and his/her staff.
- II. Major Duties. The incumbent of this job is responsible for the following duties:

(The information pertinent to this section is contained in the Job Analysis material included in this packet.)

- III. Supervisory Controls. The incumbent works under the general supervision of the Center Director. Day-to-day assignments are carried out independently, with only a cursory review of finished products such as reports, letters, files, etc. Wide latitude for independent judgment is allowed.
- IV. Qualifications. The incumbent must be a skilled typist; must have previous experience in office work of the type described above; and must be capable of dealing with a wide array of people in a variety of positions, including the general public.

Job Description

No 2

- I. Introduction. This job is located in the Maintenance Shop, Public Works Branch, Engineering Division, Bureau of Land Reclamation, Department of Natural Resources. The primary purpose of this job is to perform minor construction and repair of wooden structures and facilities.
- II. Major Duties. The incumbent(s) of this job is (are) responsible for the following duties:

(The information pertinent to this section is contained in the Job Analysis material included in this packet.)

- III. Supervisory Controls. The incumbent(s) work(s) for the Shop Foreman. Supervision is of a general nature. Projects and assignments are expected to be completed with minimal guidance and without need for inspection.
- IV. Qualifications. Incumbent(s) must possess skill in the use of handtools, as mentioned above, and must be experienced in carpentry and woodworking. Incumbent(s) should be able to carry out project-type assignments without the need for close supervision.
-

Job Description

No 3

- I. Introduction. This job is located in the Programming Branch, Operations Division, Bureau of Land Reclamation, Department of Natural Resources. The primary purpose of this job is to support departmental computing activities through programming, consulting, and documentation.
- II. Major Duties. The incumbent(s) of this job is (are) responsible for the following duties:

(The information pertinent to this section is contained in the Job Analysis material included in this packet.)

- III. Supervisory Controls. The supervisor of this job is the head of the Programming Branch, a Systems Analyst. The incumbent(s) is (are) expected to set daily schedules without prior approval, decide upon best programming solution, make consulting decisions, and decide upon particulars of documentation development. The supervisor sets priorities and the due dates for projects. The supervisor is available for advice, when asked.
- IV. Qualifications. The incumbent(s) should be familiar with inter-active computing, be proficient in at least two programming languages, and be able to interact in a professional manner with the user community. A degree in computer science is preferred.

Job Description

No 4

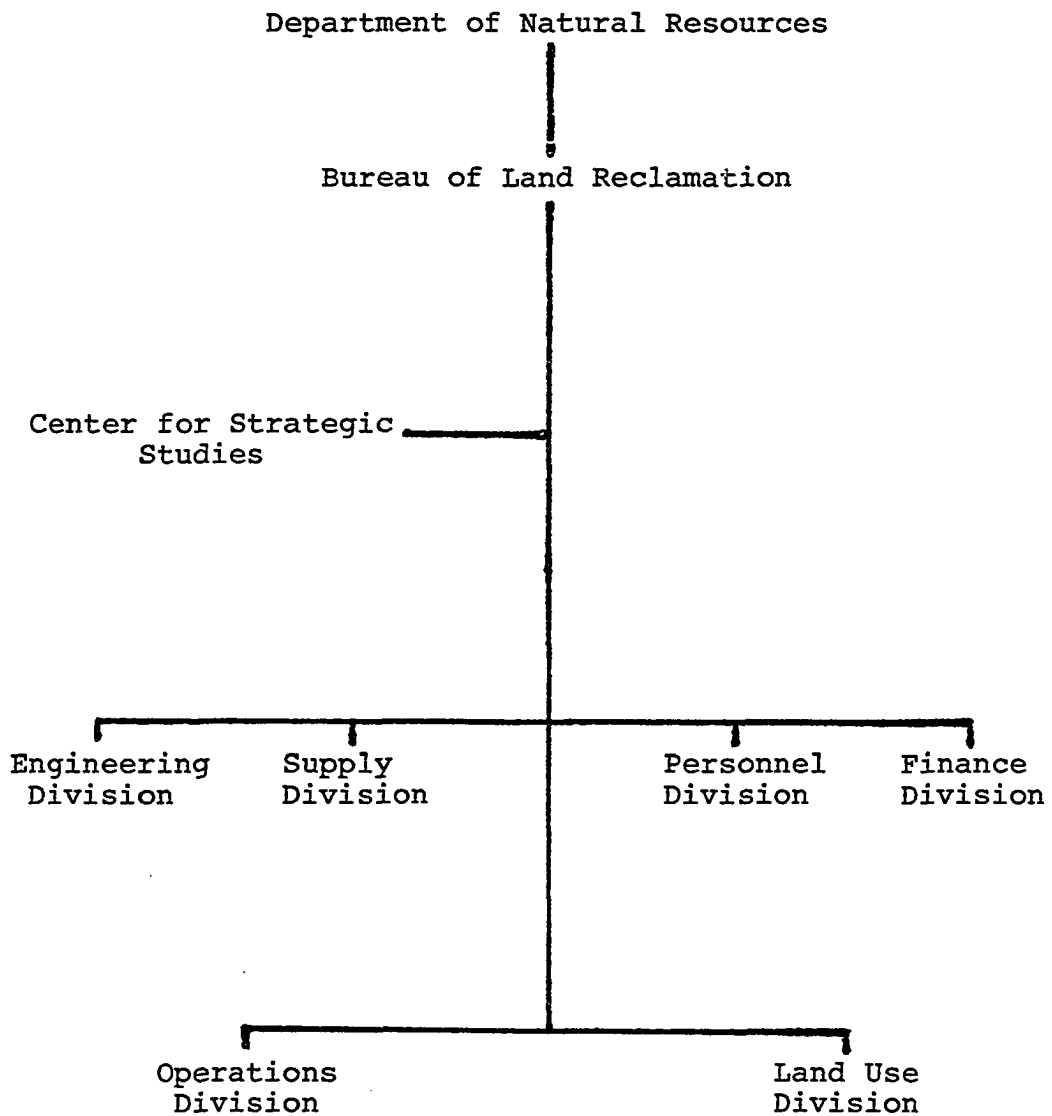
- I. Introduction. This job is located in the Personnel Division, Bureau of Land Reclamation, Department of Natural Resources. The primary purpose of this job is to provide direction and management to the personnel function for the bureau.
- II. Major Duties. The incumbent of this job is responsible for the following duties:

(The information pertinent to this section is contained in the Job Analysis material included in this packet.)

- III. Supervisory Controls. The supervisor of this job is the Deputy Bureau Chief. The incumbent, as a functional manager, is expected to operate independently, subject only to overall policy guidance and applicable laws. Work is assessed based on program outcomes.
- IV. Qualifications. The incumbent must possess advanced education in management or administration; a master's degree in personnel administration, or related field, is preferred. Thorough knowledge of personnel practices sufficient to solve unusual work problems is a requisite. Exceptional oral and written communications skills are required. Extensive experience in personnel is also required.

APPENDIX I:
Organization Chart

Organization Chart



APPENDIX J:
Mission and Function Statements

Mission and Function Statements

Mission: The mission of the Department of Natural Resources is to manage the use and preservation of all natural resources such as rivers, lakes, forests, grasslands, and wildlife reserves. The Bureau of Land Reclamation is charged with managing the orderly process of returning to its natural state land which has been depleted of its resources by such operations as strip mining, lumber harvesting, excess crop planting, and similar occurrences.

Functions:

- 1) Center for Strategic Studies: Conducts planned studies focusing on the use and misuse of land resources; issues reports, with recommendations for action; establish timeframes and milestones for reclamation action.
- 2) Engineering Division: Responsible for all design, construction, and maintenance functions within the Bureau; serves as facility manager; conducts all public works tasks including emergency service calls.
- 3) Supply Division: Receives, controls, and issues all supplies (material and equipment) required in the operation of the Bureau; keeps accurate records; issues periodic reports on usage factors.
- 4) Personnel Division: Manages the recruitment, selection, and placement program for new employees; manages the employee compensation program; attends to labor relations issues; responsible for employee welfare programs.
- 5) Finance Division: Manages the Bureau budget process and all financial accounting records; maintains time and attendance records; carries out the payroll function.
- 6) Operations Division: Manages the computer system and data processing capability of the Bureau; carries out all management information system support functions; maintains up-to-date data files for strategic planning and tactical operations.
- 7) Land Use Division: Responsible for land use program management; action office for carrying out projects recommended by the Center for Strategic Studies; manages contracts related to land use and reclamation.

APPENDIX K:
Ranking Method Materials

RM Training Information

The Ranking Method (RM) of job evaluation is a qualitative, whole-job approach to assessing the worth of any job within a given organization. Application of the RM requires the evaluator to call upon a thorough knowledge of all jobs to be ranked. Each job is compared against the other jobs, and all jobs are ranked as a group.

The RM has one distinct advantage over all other methods of job evaluation in that it is the simplest method of evaluation. Jobs are considered as a whole. Ranking comparisons consider whether one job is more demanding, as demanding, or less demanding than other jobs within the same organization. The RM has seen widespread application in many small companies and organizations.

The result of any method of job evaluation is ultimately the determination of a salary level. Oftentimes, this is accomplished through the assignment of a grade level to the job; but, it can also be accomplished by means of rank order. The highest ranked jobs receive the greatest compensation, the lowest ranked receive the smallest compensation. This works well when the total salary budget is fixed and must be divided on the basis of worth to the organization.

On the following pages you will be asked to rank order several jobs in the organization under study. Use the job information given, along with organizational information, then rank the four specific jobs along with the remaining jobs in the organization and set a salary level in dollars per hour for the four jobs. Use all information provided to you for this purpose.

RANKING METHOD

Review the job information available to you in this packet, then decide upon a title for each of the four jobs requiring evaluation.

Job No 1 _____.

Job No 2 _____.

Job No 3 _____.

Job No 4 _____.

Next, consider the above jobs in relation to the following jobs located in the same organization:

Civil Engineer Engineering Division

Systems Analyst. Operations Division

Budget Officer Finance Division

Supply Clerk Supply Division

Land Management Specialist . Land Use Division

Program Analyst. Center for Strategic
Studies

Considering all that you know about all of the above jobs,
rank order them as provided for on the following pages.

Job Evaluation

RM 1

Facts to Consider:

Proposed Job Title: _____.

Ranking: Enter the title and salary for this job.

<u>Rank</u>	<u>Job Title</u>	<u>Salary</u>
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

Job Evaluation

RM 2

Facts to Consider:

Proposed Job Title: _____.

Ranking: Enter the title and salary for this job.

<u>Rank</u>	<u>Job Title</u>	<u>Salary</u>
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

Job Evaluation

RM 3

Facts to Consider:

Proposed Job Title: _____.

Ranking: Enter the title and salary for this job.

<u>Rank</u>	<u>Job Title</u>	<u>Salary</u>
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

Job Evaluation

RM 4

Facts to Consider:

Proposed Job

Title: _____.

Ranking: Enter the title and salary for this job.

<u>Rank</u>	<u>Job Title</u>	<u>Salary</u>
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

APPENDIX L:
Point Method Materials

PM Training Information

The Point Method (PM) of job evaluation is a quantitative, analytical approach to assessing the worth of any job within a given organization. Application of the PM requires that the evaluator have a good working knowledge of the factors considered important in evaluating jobs, along with the point system used in assigning worth.

In general, the PM is the most widely used method of job evaluation. It has proven to be the most appropriate method for assuring that jobs are credited for their full worth.

There are many variations upon the PM theme. Most systems use four to eight factors which have been weighted in terms of overall job importance, and are divided into two to four levels of gradation.

The result of any method of job evaluation is ultimately the determination of a salary level. This can be accomplished through the use of a PM by converting total points to an equivalent salary level. Thus, through the process of evaluating a job, factor by factor, the evaluator is determining, step by step, the worth of the job as reflected by the total point/salary relationship given in the applicable salary schedule.

On the following pages you will apply the PM, which has been prepared especially for this study, to four specific jobs. Use the job information given, along with organizational information, to assign points to each factor for each job. Total the points assigned to each factor for each job, then equate this value to a salary level using the point conversion chart provided.

POINT METHOD

Factor I	Organizational Level of Job	(20%)
	Degree Three 100 Points	Management Structure
	Degree Two 50 Points	Staff Level
	Degree One 25 Points	Functional Level
Factor II	Nature of Assignments	(38%)
	Degree Four 200 Points	Program Management
	Degree Three 100 Points	Full Performance Level
	Degree Two 50 Points	Trainee Level
	Degree One 25 Points	Helper Level
Factor III	Nature of Supervision	(14%)
	Degree Three 75 Points	Policy Guidance
	Degree Two 50 Points	Normal Controls
	Degree One 25 Points	Close Supervision
Factor IV	Skill Level Required	(28%)
	Degree Four 150 Points	Master's Degree or Extensive Experience
	Degree Three 100 Points	Bachelor's Degree or Some Experience
	Degree Two 50 Points	Specialized Training
	Degree One 25 Points	No Formal Requirements

Job Evaluation

PM 1

Factor I

Comments:

Points: _____

Factor II

Comments:

Points: _____

Factor III

Comments:

Points: _____

Factor IV

Comments:

Points: _____

Total: _____

Proposed Title: _____ Salary: _____

Job Evaluation

PM 2

Factor I

Comments:

Points: _____

Factor II

Comments:

Points: _____

Factor III

Comments:

Points: _____

Factor IV

Comments:

Points: _____

Total: _____

Proposed Title: _____ Salary: _____

Job Evaluation

PM 3

Factor I

Comments:

Points: _____

Factor II

Comments:

Points: _____

Factor III

Comments:

Points: _____

Factor IV

Comments:

Points: _____

Total: _____

Proposed Title: _____ Salary: _____

Job Evaluation

PM 4

Factor I

Comments:

Points: _____

Factor II

Comments:

Points: _____

Factor III

Comments:

Points: _____

Factor IV

Comments:


Points: _____

Total: _____

Proposed Title: _____ Salary: _____

APPENDIX M:
Salary Information

Salary Schedule for RM

Highest Rank	\$12.75 Per Hour
	\$11.75 Per Hour
	\$10.75 Per Hour
	\$ 9.75 Per Hour
	\$ 8.75 Per Hour
	\$ 7.75 Per Hour
	\$ 6.75 Per Hour
	\$ 5.75 Per Hour
	\$ 4.75 Per Hour
	\$ 3.75 Per Hour
	Lowest Rank

Salary Conversion for PM

Grade	Point Range	Hourly Rate	Annual Salary
1	001 - 100	\$ 3.75	\$ 7800
2	101 - 155	4.75	9880
3	156 - 210	5.75	11960
4	211 - 265	6.75	14040
5	266 - 320	7.75	16120
6	321 - 375	8.75	18200
7	376 - 430	9.75	20280
8	431 - 485	10.75	22360
9	486 - 540	11.75	24440
10	541 - 595	12.75	26520

APPENDIX N:
Questionnaire

PROJECT METHOD

Participant Questionnaire

Instructions: Please answer the following questions designed to provide the researcher with pertinent information about your background and your reactions to this study. THANK YOU FOR YOUR COOPERATION AND ASSISTANCE.

1. What is your age? _____. 2. What is your sex? _____.
3. If you are now, or have been, a job analyst/evaluator, how many years experience do you have in this profession?
_____.
4. Have you ever held a job similar to one of those you were asked to evaluate in this study? _____. If yes, what was the job title? _____.
5. Other than the brief training information provided in this study, have you ever been exposed to:
 - (a) the Critical Incident Technique? _____.
 - (b) Functional Job Analysis? _____.
 - (c) the Ranking Method? _____.
 - (d) the Point Method? _____.
6. Are you generally familiar with the issue of Comparable Worth? _____. If yes, do you think this issue had any effect on your decisions regarding job worth in this study?
_____.

7. Do you have any ideas or suggestions about improving the job evaluation process in general? _____. If yes, please explain. _____

APPENDIX 0:
Participant Characteristics

Characteristics
of
Professional Analyst Sample
(Method Experts)

Gender:

Male = 16

Female = 16

Race:

White = 30

Black = 2

Other = 0

Age:

Range = 31 - 55 years

Mean = 39.16 years

Experience:

Range = 1 - 19 years

Mean = 7.13 years

Characteristics
of
ODU Employee Sample
(Content Experts)

Gender:

Male = 20

Female = 12

Race:

White = 27

Black = 4

Other = 1

Age:

Range = 19 - 55 years

Mean = 34.27 years

Experience:

Clerical = 6

Trades/Craft = 9

Technical = 10

Managerial = 7

Characteristics
of
University Student Sample*

Gender:

Male = 8

Female = 24

Race:

White = 30

Black = 1

Other = 1

Age:

Range = 19 - 40 years

Mean = 25.10 years

Category:

Graduate = 12

Undergraduate = 20

*See categories above (explanation in Chapter Two.)

APPENDIX P:
Salary Assigned to Each Job by Condition

Salary Assigned to Each Job by Condition

<u>Condition</u>	<u>Participant</u>	Job 1	Job 2	Job 3	Job 4
CIT/RM	ME 1	\$4.75	\$5.75	\$8.75	\$6.75
	2	4.75	3.75	6.75	9.75
	3	3.75	5.75	6.75	11.75
	4	5.75	4.75	6.75	11.75
	5	6.75	6.75	7.75	12.75
	6	3.75	5.75	7.75	9.75
	7	4.75	5.75	8.75	12.75
	8	3.75	5.75	8.75	9.75
	CE 1	9.75	4.75	6.75	7.75
	2	3.75	5.75	6.75	9.75
	3	8.00	7.50	13.00	15.00
	4	5.75	5.75	5.75	9.75
	5	7.50	9.00	10.00	12.00
	6	10.75	9.75	11.75	10.75
	7	10.75	8.75	10.75	10.75
	8	5.75	11.75	8.75	10.75
	US 1	5.75	6.75	10.75	9.75
	2	4.75	4.75	9.75	9.75
	3	6.75	5.75	10.75	11.75
	4	5.75	8.75	10.75	12.75
	5	5.75	4.75	9.75	11.75
	6	7.21	6.25	9.13	12.95
	7	6.75	8.75	10.75	12.75
	8	5.75	3.75	7.75	10.75

		Job 1	Job 2	Job 3	Job 4
<u>Condition</u>	<u>Participant</u>				
CIT/PM	ME 1	\$6.75	\$6.75	\$7.75	\$11.75
	2	6.75	6.75	7.75	11.75
	3	5.75	6.75	7.75	11.75
	4	6.75	6.75	7.75	11.75
	5	7.75	7.75	7.75	10.75
	6	6.75	6.75	7.75	11.75
	7	6.75	6.75	7.75	11.75
	8	6.75	6.75	7.75	11.75
	CE 1	6.75	8.75	8.75	11.75
	2	6.75	6.75	8.75	11.75
	3	6.75	5.75	8.75	9.75
	4	5.75	5.75	10.75	12.75
	5	5.75	7.75	9.75	11.75
	6	6.75	6.75	10.75	11.75
	7	6.75	6.75	9.75	11.75
	8	7.75	8.75	8.75	11.75
	US 1	4.75	5.75	7.75	11.75
	2	4.75	4.75	10.75	11.75
	3	6.75	6.75	7.75	11.75
	4	6.75	5.75	8.75	9.75
	5	5.75	5.75	4.75	6.75
	6	6.75	6.75	8.75	11.75
	7	6.75	6.75	8.75	11.75
	8	6.75	6.75	9.75	11.75

		Job 1	Job 2	Job 3	Job 4
<u>Condition</u>	<u>Participant</u>				
FJA/RM	ME 1	\$4.75	\$5.75	\$6.75	\$11.75
	2	3.75	5.75	6.75	12.75
	3	3.75	5.75	6.75	11.75
	4	5.75	4.75	6.75	12.75
	5	3.75	8.75	9.75	11.75
	6	4.75	5.75	9.75	7.75
	7	3.75	5.75	7.75	10.75
	8	4.75	5.75	6.75	11.75
	CE 1	7.75	5.75	9.75	10.75
	2	5.75	4.75	8.75	11.75
	3	4.75	5.75	9.75	7.75
	4	7.75	9.75	10.75	11.75
	5	6.75	5.75	3.75	10.75
	6	8.75	5.75	9.75	8.75
	7	5.75	4.75	7.75	9.75
	8	5.75	8.75	10.75	12.75
	US 1	4.75	5.75	9.75	12.75
	2	6.75	5.50	10.75	10.25
	3	5.75	6.75	12.75	12.75
	4	7.75	5.75	9.75	11.75
	5	7.75	5.75	6.75	8.75
	6	6.75	4.75	7.75	11.75
	7	7.75	6.75	10.75	12.75
	8	5.75	8.75	9.75	11.75

		Job 1	Job 2	Job 3	Job 4
<u>Condition</u>	<u>Participant</u>				
FJA/PM	ME 1	\$7.75	\$7.75	\$7.75	\$ 7.75
	2	6.75	6.75	8.75	11.75
	3	5.75	6.75	7.75	10.75
	4	6.75	6.75	9.75	11.75
	5	4.75	6.75	7.75	11.75
	6	6.75	6.75	7.75	11.75
	7	6.75	6.75	7.75	11.75
	8	5.75	6.75	7.75	11.75
	CE 1	6.75	6.75	8.75	11.75
	2	6.75	5.75	7.75	10.75
	3	6.75	6.75	8.75	11.75
	4	6.75	6.75	10.75	11.75
	5	6.75	7.75	7.75	11.75
	6	7.75	8.75	9.75	11.75
	7	5.75	5.75	9.75	11.75
	8	5.75	4.75	8.75	11.75
	US 1	7.75	6.75	10.75	11.75
	2	6.75	6.75	11.75	9.75
	3	6.75	5.75	7.75	11.75
	4	7.75	6.75	10.75	11.75
	5	4.75	5.75	8.75	11.75
	6	6.75	5.75	8.75	11.75
	7	5.75	6.75	11.75	11.75
	8	6.75	6.75	7.75	11.75

APPENDIX Q:

Time to Complete Packets by Condition

Time to Complete Packets by Condition

<u>Condition</u>	<u>Participant</u>	<u>Time to Complete</u>	
CIT/RM	ME	1	60 minutes
		2	40 minutes
		3	30 minutes
		4	50 minutes
		5	60 minutes
		6	90 minutes
		7	40 minutes
		8	55 minutes
	CE	1	55 minutes
		2	45 minutes
		3	47 minutes
		4	45 minutes
		5	60 minutes
		6	63 minutes
		7	60 minutes
		8	55 minutes
	US	1	30 minutes
		2	75 minutes
		3	30 minutes
		4	35 minutes
		5	57 minutes
		6	32 minutes
		7	27 minutes
		8	30 minutes

<u>Condition</u>	<u>Participant</u>	<u>Time to Complete</u>	
CIT/PM	ME	1	45 minutes
		2	50 minutes
		3	60 minutes
		4	45 minutes
		5	90 minutes
		6	24 minutes
		7	33 minutes
		8	45 minutes
	CE	1	47 minutes
		2	44 minutes
		3	43 minutes
		4	40 minutes
		5	40 minutes
		6	65 minutes
		7	75 minutes
		8	20 minutes
	US	1	45 minutes
		2	35 minutes
		3	65 minutes
		4	35 minutes
		5	30 minutes
		6	40 minutes
		7	37 minutes
		8	30 minutes

<u>Condition</u>	<u>Participant</u>	<u>Time to Complete</u>	
FJA/RM	ME	1	60 minutes
		2	60 minutes
		3	40 minutes
		4	35 minutes
		5	45 minutes
		6	35 minutes
		7	28 minutes
		8	40 minutes
	CE	1	40 minutes
		2	30 minutes
		3	40 minutes
		4	45 minutes
		5	30 minutes
		6	45 minutes
		7	68 minutes
		8	50 minutes
	US	1	31 minutes
		2	35 minutes
		3	48 minutes
		4	68 minutes
		5	40 minutes
		6	27 minutes
		7	25 minutes
		8	22 minutes

<u>Condition</u>	<u>Participant</u>	<u>Time to Complete</u>	
FJA/PM	ME	1	55 minutes
		2	28 minutes
		3	30 minutes
		4	20 minutes
		5	30 minutes
		6	60 minutes
		7	20 minutes
		8	30 minutes
	CE	1	33 minutes
		2	35 minutes
		3	35 minutes
		4	25 minutes
		5	46 minutes
		6	85 minutes
		7	35 minutes
		8	50 minutes
	US	1	35 minutes
		2	30 minutes
		3	60 minutes
		4	45 minutes
		5	60 minutes
		6	30 minutes
		7	45 minutes
		8	27 minutes

AUTOBIOGRAPHICAL STATEMENT

James S. Herndon was born on December 6, 1946 in Norfolk County, Virginia. Following graduation from Great Bridge High School in 1965, he attended The American University in Washington, D.C. for one semester prior to enlisting in the U.S. Air Force in September 1966. Upon discharge from the Air Force in June 1970, he attended Macon Junior College, Macon, Georgia where he received an Associate in Arts degree (psychology) in June 1971. Returning to Virginia, he attended Old Dominion University, earning a Bachelor of Science degree in Psychology (Summa Cum Laude) in June 1973.

James S. Herndon began a career in personnel with the Department of the Navy in July 1973, working in job analysis and evaluation. He began graduate work part-time in November 1976 and earned his Master's degree (M.A.) in Human Resources Management from Pepperdine University in April 1978. He began his doctoral studies in May 1978 at Old Dominion University while continuing to work in personnel for the Navy. In order to satisfy the internship requirement, he left the Navy for a position with the Army as a Personnel Psychologist. Upon completion of the internship, he resigned from government service in order to complete a year in residency at Old Dominion University (1983), during which he served as a Teaching Assistant.

Following the residency, he returned to the Navy as a Management Analyst, and began work toward his dissertation in 1984. He also began teaching at The George Washington University (Tidewater Center) and the Golden Gate University Norfolk Resident Center.

James S. Herndon is a member of the Tidewater Chapter, Human Factors Society; Hampton Roads Chapter, Classification and Compensation Society; American Psychological Association; and the Society for Industrial and Organizational Psychology (Division 14 of the APA). His publications include the following:

- Derlega, V. J., Chaikin, A. L. and Herndon, J. (1975). Demand characteristics and disclosure reciprocity. Journal of Social Psychology, 97, 301-302.
- Herndon, J. S. (1982). An annotated bibliography of item writing technology. Army Training Support Center, Fort Eustis, VA.
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