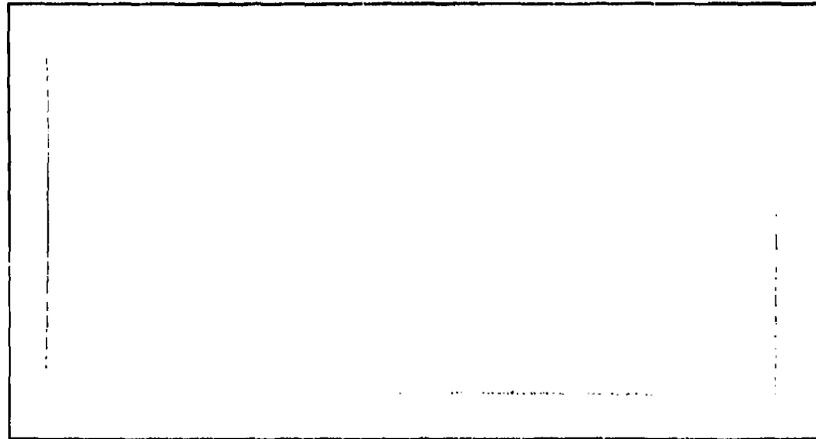


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## NORMS FOR THE JOB DIAGNOSTIC SURVEY

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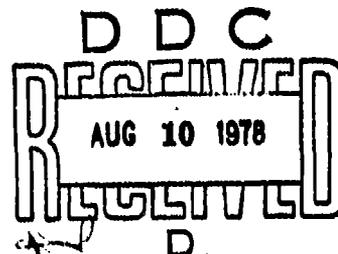
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Technical Report No. 16  
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July, 1978



### Abstract

This report provides normative data for the Job Diagnostic Survey (JDS). Data were obtained from 6930 employees working on 876 jobs in 56 organizations. JDS scale reliabilities, means, and standard deviations are reported for the sample as a whole as well as for several categories of various employee, job, and organizational properties. Results using data from the entire sample indicate that some JDS means and standard deviations differ from those presented in an earlier report by Hackman and Oldham (1974). Moreover, results show that the JDS measures vary significantly with many of the aforementioned properties. Uses of the norms and directions for future research are discussed.

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## Norms for the Job Diagnostic Survey<sup>1</sup>

The Job Diagnostic Survey (JDS) (Hackman and Oldham, 1974, 1975) is an instrument designed to be useful both in the diagnosis of jobs prior to their redesign, and in research and evaluation activities that attempt to assess the effects of redesigned jobs on the employees who perform them. The instrument itself is completed by employees who work on any given job, and provides measures of (a) several specific job characteristics, (b) the degree to which employees are psychologically "ready" to respond to these characteristics and (c) several personal and work outcomes (e.g., general satisfaction). When the instrument was initially developed it was hoped that it would enable practitioners of work redesign to more wisely plan and conduct job redesign projects. Moreover, it was expected that the instrument could facilitate efforts by behavioral scientists to understand how and why job redesign works when it does work--and what has gone wrong when it does not (Hackman and Oldham, 1974).

Since 1974, numerous researchers and practitioners have used the JDS for the purposes described above (Pierce and Dunham, 1976). Unfortunately, use of the instrument in diagnosis and evaluation activities has sometimes been difficult because of the absence of normative data for the JDS scales. The results presented in the Hackman and Oldham (1974) report were based on data from a relatively small sample of 658 employees who worked on 62 different jobs in seven organizations. These data do not represent a cross-section of organizations, jobs, or employees in the United States. Thus, comparisons involving JDS scores from a given organization with those

reported in the 1974 paper often will be misleading. Such comparisons would not indicate if the target organization's JDS scores were substantially above, below, or about the same as those based on a representative population. This implies that it may be difficult to determine if work redesign activities are desirable in the target organization based on the JDS data collected from the organization.

This report attempts to alleviate the problem identified above. JDS data are reported that were obtained from a large number of employees who worked on a wide variety of jobs in numerous organizations. It is believed that these data provide relatively stable norms for the JDS scales.

To further enhance the diagnostician's ability to evaluate the desirability of a work redesign project, JDS scale data are subdivided according to a number of organizational, job, and employee characteristics. For example, JDS data are provided for organizations of different sizes, for employees with different educational backgrounds, and for jobs at different levels. These normative data should enable the JDS user to determine if results obtained in a focal organization are out of line with JDS norms based on organizations and jobs with similar properties. This comparison can be helpful in determining if work redesign is in order.

Before presenting the JDS norms, brief descriptions of the JDS and of the organizational, job and employee characteristics measured in this research are necessary. These are provided below.

#### The Job Diagnostic Survey (JDS)

Any measuring device is based on some underlying theory of what is important regarding the phenomena under consideration. In this section brief descriptions of the theory underlying the JDS as well as the variables

measured by the instrument are provided. A more complete discussion of the theory and of the content and format of the JDS scales may be found elsewhere (i.e., Hackman and Oldham, 1974, 1975, 1976; Oldham, Hackman and Pearce, 1976).

The job characteristics theoretical model is shown diagrammatically in Figure 1. It proposes that positive personal and work outcomes (high internal motivation, high work satisfaction, high quality performance, and low absenteeism and turnover) are obtained when three critical psychological states are present (experienced meaningfulness of the work, experienced responsibility for the outcomes of the work, and knowledge of the results of the work activities). All three of the critical psychological states must be present for the positive outcomes to be realized.

The theory proposes that the three critical psychological states are created by the presence of five "core" job dimensions. Experienced Meaningfulness of the Work is enhanced primarily by three of the core dimensions: Skill Variety, Task Identity, and Task Significance. Experienced Responsibility for Work Outcomes is increased when a job has high Autonomy. Knowledge of Results is increased when a job is high on Feedback. Following the theory diagrammed in Figure 1, it is possible to compute a score reflecting the overall "motivating potential" of a job in terms of the core job dimensions. This score (which is discussed in detail by Hackman and Oldham, 1976) is computed as follows:

$$\text{Motivating Potential Score (MPS)} = \left[ \frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \right] \times \left[ \text{Autonomy} \right] \times \left[ \text{Feedback} \right]$$

The theory is not expected to "work" with equal effectiveness under all conditions. Individuals who strongly value and desire personal feelings of accomplishment and growth should respond very positively to a job high in motivating potential; individuals who do not value personal growth and accomplishment may find such a job anxiety-arousing and may be uncomfortably "stretched" by it. Therefore, growth need strength is shown in Figure 1 as a moderator of the other relationships specified by the theory.

Employee satisfaction with the work context also is shown as a moderator in the theoretical framework. When employees are not satisfied with work context (i.e., with their pay, job security, co-workers, and/or supervisors), their ability to respond positively to a job high in motivating potential should be diminished. The reason is that active dissatisfaction with such contextual factors may distract the attention of employees from the work itself and orient their energy instead toward coping with the experienced problems. Only when employees are relatively satisfied with the work context should they become able to experience, appreciate, and respond to a job rich in motivating potential.

Previous research (e.g., Hackman and Oldham, 1976; Oldham et al., 1976; Umstot, Bell and Mitchell, 1976) has shown that the variables in Figure 1 relate to one another generally as predicated by the theory. In particular, the core dimensions relate positively and substantially to the three psychological states, general satisfaction, growth satisfaction, internal motivation, and (to a lesser extent) behavioral measures of attendance and performance. Relationships between the job dimensions and outcomes tend to be stronger for individuals who are well-satisfied with the work context and who have strong growth needs than for employees low on these variables.

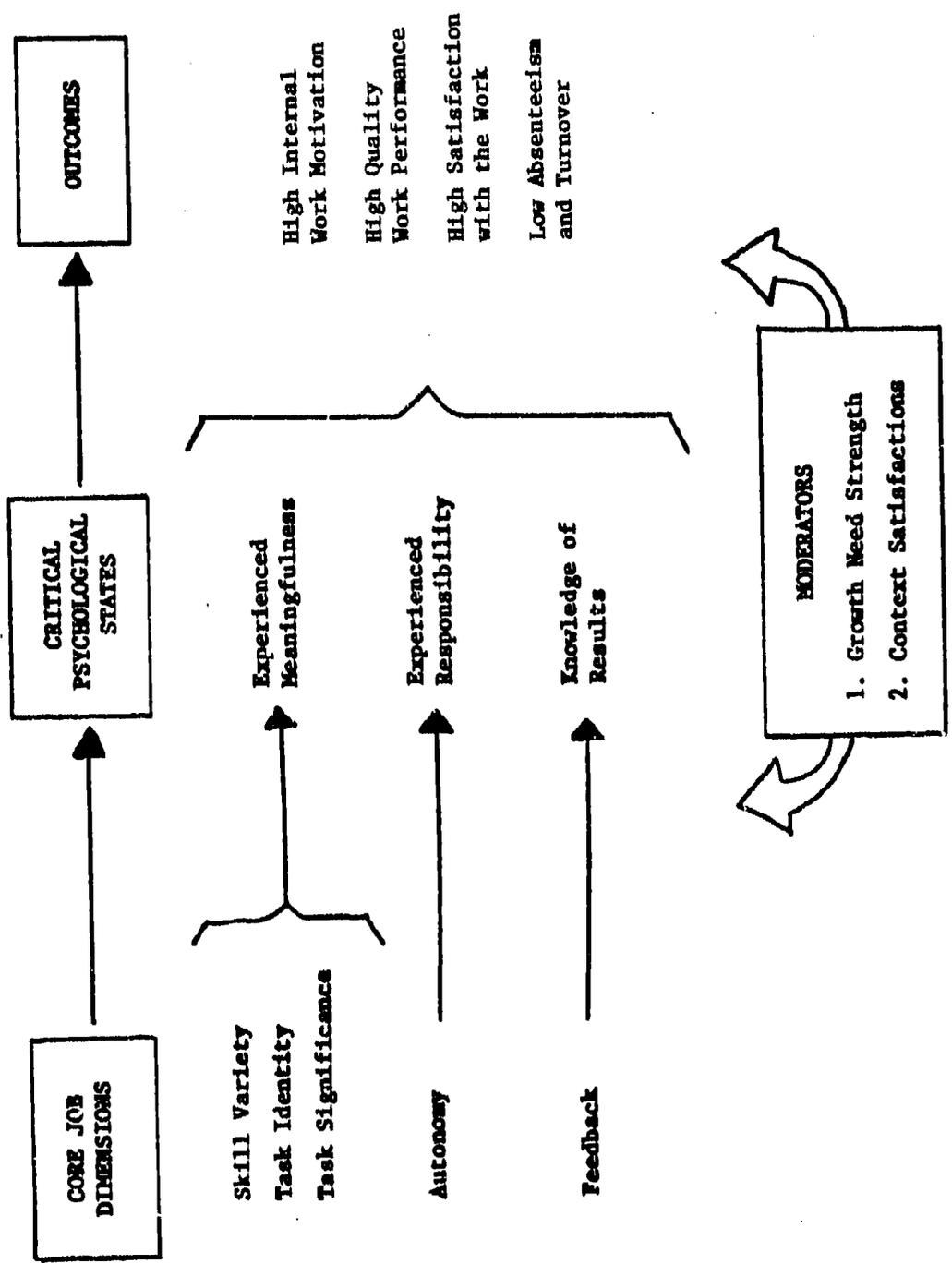


Figure 1

The Job Characteristics Model of Work Motivation

The JDS is completed by employees who work on any given job, and provides measures of each of the concepts in the model sketched above for that job. The specific measures obtained from the JDS are described below.

Job dimensions. The JDS provides measures of the five core dimensions shown in Figure 1.

**Skill Variety.** The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the employee.

**Task Identity.** The degree to which the job requires completion of a "whole" and identifiable piece of work--i.e., doing a job from beginning to end with a visible outcome.

**Task Significance.** The degree to which the job has a substantial impact on the lives or work of other people--whether in the immediate organization or in the external environment.

**Autonomy.** The degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out.

**Feedback from the Job Itself.** The degree to which carrying out the work activities required by the job results in the employee obtaining direct and clear information about the effectiveness of his or her performance.

In addition, measures are obtained for two additional dimensions which have been found to be helpful in understanding jobs and employee reactions to them. These are:

**Feedback from Agents.** The degree to which the employee receives clear information about his or her performance from supervisors or from co-workers.

**Dealing with Others.** The degree to which the job requires the employee to work closely with other people in carrying out the work activities (including dealings with other organization members and with external organizational "clients.")

Critical psychological states. The JDS provides measures of each of the three psychological states which are shown in Figure 1 as mediating between the core job dimensions and the outcomes of the work. These are:

**Experienced Meaningfulness of the Work.** The degree to which the employee experiences the job as one which is generally meaningful, valuable, and worthwhile.

**Experienced Responsibility for Work Outcomes.** The degree to which the employee feels personally accountable and responsible for the results of the work he or she does.

**Knowledge of Results.** The degree to which the employee knows and understands, on a continuous basis, how effectively he or she is performing the job.

Personal outcomes. The JDS provides measures of a number of personal outcomes or reactions a person obtains from performing the job. These are:

**General Satisfaction.** An overall measure of the degree to which the employee is satisfied and happy with the job.

**Internal Work Motivation.** The degree to which the employee is self-motivated to perform effectively on the job--i.e., the employee experiences positive internal feelings when working effectively on the job, and negative internal feelings when doing poorly.

**Growth Satisfaction.** The degree to which the employee is satisfied with opportunities for personal growth and development on the job.

Satisfaction with the work context. The JDS provides several measures of employees' satisfaction with the work context. Context satisfactions are expected to affect how positively an employee will respond to a job high on the core dimensions (see Figure 1). Satisfactions with four elements of the work context are measured:

- (a) job security
- (b) pay and other compensation
- (c) peers and co-workers ("social satisfaction")
- (d) supervision

Individual growth need strength. The JDS taps the strength of the respondent's desire to obtain "growth" satisfactions from his or her work. This measure is viewed as a malleable individual difference characteristic

which (as shown in Figure 1) is predicted to affect how positively an employee will respond to a job with high motivating potential.

Growth need strength is measured in two separate sections of the instrument. In the "would like" section, respondents are asked to indicate the degree to which they would like several growth relevant conditions (e.g., opportunities to learn new things, opportunities to be creative and imaginative) present in their work. In the "job choice" section, respondents are asked to indicate their relative preferences for pairs of hypothetical jobs. In each item a job with characteristics relevant to growth need satisfaction is paired with a job which has the potential for satisfying one of a variety of other needs. Finally, scores derived from both of these sections are averaged to form a total growth need strength index.

#### Organizational Properties

For each organization from which JDS data were obtained, a number of characteristics were evaluated relevant to the organization as a unit. JDS normative data are provided for each category of the organizational characteristics. The organizational properties assessed in this research are described briefly below.

Organization size. The number of full-time employees in the organization.

Number of organizational levels. The number of levels within the organization's hierarchy. For example, an organization with one president, five supervisors, and 18 rank and file employees would have three levels.

Dispersion of facilities. The degree to which the physical facilities of the organization are all in one location, or dispersed throughout the region, country or world.

Geographic location. The location (i.e., urban, suburban, rural) of the organizational unit.

Self-containment. The degree to which the organizational unit is part of a larger organization.

Organization "type." The organization's primary function (e.g., economic, social service, etc.).

### Job Properties

For each job for which JDS data were obtained, a number of descriptive features of the job were measured. JDS norms were then created for each of the categories in this classification. The job categories are described below.

Job level. The level of the job in the organizational hierarchy (i.e., upper level management, staff, etc.) for which JDS data were obtained.

Job collar color. Whether the job is classified as a white or blue collar position.

Payment type. Whether the employees who perform the job are paid on an hourly or salary basis.

Union representation. Whether or not the employees who perform the job are unionized.

DOT category. The Dictionary of Occupational Titles' description of the target job (e.g., clerical, managerial, service, etc.).

### Employee Demographics

Each employee completing the JDS indicated his or her sex, age, and highest level of education attained.

## Method

### Sample

The results reported in this paper are based on data obtained from approximately 6,930 employees working on 876 jobs in 56 organizations. The jobs were highly heterogeneous, including professional, sales, clerical, and managerial work. Governmental, service, and productive organizations were included in the sample. The organizations were located in all geographic sections of the United States.

### Procedure

Data for this study were collected by a multiplicity of individuals for a variety of purposes. Approximately 75 percent of the data were collected by members of the Roy W. Walters consulting firm for use in organizational diagnoses. Consultants administered the JDS to employees who were guaranteed anonymity. Key informants within the organization (e.g., personnel director, president) provided information on the job and organizational properties outlined earlier.

The remainder of the data were collected by academicians using the JDS for research purposes. This group of researchers included the authors of this report as well as academicians from universities and research institutes throughout the United States. Once again, key informants within the organizations studied provided data on job and organizational properties.

### Measures

JDS variables. The content and format of the items composing the JDS scales are reported elsewhere (i.e., Hackman and Oldham, 1974) and are not reported in this paper. All JDS items are measured on seven-point Likert-type scales with the exception of the "job choice" growth need strength

variable. This is measured on a five-point scale but is converted to a seven-point scale by the following formula: job choice seven-point scale =  $\left[ 1.5 \times \text{five-point scale score} \right] - 0.5$ .

For each variable seven reflects the "high" end of the scale. Thus, a score of seven on the pay satisfaction measure would indicate high pay satisfaction; a one on the autonomy dimension would indicate low autonomy.

Organizational properties. Informants rated each of the organizational variables on the following scales:

1. Organization size. Number of organization members was indicated. Three organizational size categories were then formed: small (1-120 employees); medium (121-1700 employees); and large (1,701-99,999 employees).
2. Organization levels. Number of levels in the organization's hierarchy was indicated. Two categories were then formed: few (1 to 4 levels) and many (5 to 20 levels).
3. Dispersion of facilities. Informants indicated whether the physical facilities of the organization were: (a) all in one location; (b) mostly in one location, a few in other places; (c) dispersed throughout this region of the country; (d) dispersed throughout the country; or (e) dispersed throughout the world.
4. Geographic location. Informants indicated if the location of the organizational unit where the JDS data were collected was: (a) an urban area; (b) a suburban area; or (c) a rural area or country town.
5. Self-containment. Respondents indicated whether the organizational unit was entirely self-contained or part of a larger organization.
6. Organization "type." Respondents indicated whether the general type of organization was: (a) productive or economic, profit making; (b) human or social service, non-profit; or (c) governmental.

Job properties. Key informants rated each of the job variables on the following scales:

1. Job level. Informants indicated if the job category for which JDS data were obtained was: (a) upper-level management; (b) middle-level management; (c) first-line management; (d) staff; or (e) non-management.

2. Job collar color. Informants indicated whether the employees who performed the job for which JDS data were obtained were best characterized as white collar or blue collar.

3. Payment type. Respondents indicated whether the employees who performed the job for which JDS data were collected were salaried or hourly.

4. Union representation. Informants indicated whether the employees who performed the job for which JDS data were obtained were union or non-union.

5. DOT category. Respondents indicated the DOT category which best described the kind of work done by employees for whom JDS data were obtained. The categories are: (a) professional or technical; (b) managerial; (c) clerical; (d) sales; (e) service; (f) processing; (g) machine trades; (h) bench work; or (i) structural work.

Employee demographics. Employees who completed the JDS provided data on three demographic characteristics.

1. Sex. Male or female.

2. Age. Employees were asked to check one of the following categories: (a) under 20; (b) 20 to 29; (c) 30 to 39; (d) 40 to 49; (e) 50 to 59; or (f) 60 or over.

3. Education. Employees indicated the highest level of education attained by checking one of the following categories: (a) grade school;

(b) some high school; (c) high school degree; (d) some business college or technical school experience; (e) some college experience; (f) business college or technical school degree; (g) college degree; (h) some graduate work; or (i) master's or higher degree.

### Results

Results are reported in four sections. In the first section, means, standard deviations, reliabilities, and intercorrelations among the JDS scales are presented for the sample as a whole. JDS means and standard deviations are reported separately for various types of organizations in section two, and for various types of jobs in section three. Means and standard deviations for the various demographic categories are presented in section four.

#### Reliabilities, Means, Standard Deviations and Intercorrelations Among the JDS Scales

Table 1 presents the internal consistency reliabilities of the JDS scales. The reliabilities range from a high of .88 to a low of .58. In general, the results are comparable to those reported in previous studies (e.g., Dunham, 1976; Hackman and Oldham, 1975; Katz, 1978; Pierce and Dunham, 1978) but tend to be somewhat lower than reliabilities previously obtained. This is especially the case for the core job dimensions, whose reliabilities range from .58 to .68.

These results support the point made by Hackman and Oldham (1974)—namely, that the JDS is not recommended for use in diagnosing the jobs of single individuals. Reliabilities of the job characteristic scales may not be high enough to warrant job changes on the basis of individual scale scores.

Table 1  
Internal Consistency Reliabilities of the JDS Scales

JDS Scale	N <sup>a</sup>	Reliability <sup>b</sup>
Skill variety	3	.68
Task identity	3	.61
Task significance	3	.58
Autonomy	3	.64
Feedback from job	3	.68
Feedback from agents	3	.75
Dealing with others	3	.62
Experienced meaningfulness	4	.71
Experienced responsibility	6	.67
Knowledge of results	4	.71
General satisfaction	5	.77
Internal motivation	6	.69
Pay satisfaction	2	.86
Security satisfaction	2	.73
Social satisfaction	3	.64
Supervisory satisfaction	3	.87
Growth satisfaction	4	.84
Would like GNS	6	.87
Job choice GNS	12	.71
Total GNS	18	.88

Note. N throughout about 6930 with small variations due to missing data.

<sup>a</sup>Number of items composing each scale.

<sup>b</sup>Reliabilities were calculated by obtaining the average interitem correlation for all items which are scored on each scale and then adjusting the median by Spearman-Brown procedures to obtain an estimate of the reliability of the scale score.

Instead, the JDS is recommended for diagnostic purposes only when several individuals work on a given job. When average scores of a group of employees are obtained, JDS job dimension scale reliabilities are more than adequate.

Means and standard deviations of the JDS scale scores across all 6,930 respondents are presented in Table 2. The table also shows the means and standard deviations of the JDS scales across the 876 jobs in the sample (i.e., the scores of respondents who worked on each job were averaged, and the mean of these averages was computed across the 876 jobs for each scale). The scale means obtained across all employees are very similar to those obtained when averages were computed across all jobs. This indicates that the different numbers of respondents who held the various jobs did not substantially affect the mean scale scores.

Means of several of the scales reported in Table 2 deviate from those presented in the 1974 report. Means of the following variables are somewhat higher in this report than in Hackman and Oldham (1974): skill variety, feedback from agents, dealing with others, general satisfaction, internal motivation, and would like GNS. Means of the following variables are somewhat lower in this report than in the 1974 article: task identity, feedback from job, knowledge of results, social satisfaction, and supervisory satisfaction.

Intercorrelations among the JDS scales are presented in Tables 3 and 4. The correlations reported in Table 3 were computed across all 6,930 respondents; in Table 4, respondent scores were averaged for each job, and these mean scores were intercorrelated across the 876 jobs.<sup>2</sup>

Table 2  
 JDS Means and Standard Deviations  
 Across Respondents and Jobs

Variable	Across Respondents		Across Jobs	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Skill variety	4.53	1.57	4.66	1.15
Task identity	4.65	1.44	4.72	.90
Task significance	5.49	1.25	5.51	.79
Autonomy	4.78	1.39	4.87	.93
Feedback from job	4.81	1.34	4.87	.79
Feedback from agents	4.06	1.58	4.11	.95
Dealing with others	5.46	1.31	5.58	.94
MPS	122.10	69.41	127.76	48.74
Experienced meaningfulness	5.10	1.14	5.16	.74
Experienced responsibility	5.40	.96	5.47	.59
Knowledge of results	5.04	1.14	5.00	.68
General satisfaction	4.65	1.27	4.70	.82
Internal motivation	5.50	.89	5.58	.52
Pay satisfaction	4.16	1.66	4.30	1.07
Security satisfaction	4.76	1.48	4.86	.96
Social satisfaction	5.31	1.02	5.36	.62
Supervisory satisfaction	4.79	1.57	4.93	.90
Growth satisfaction	4.74	1.33	4.83	.85
Would like GNS	5.64	1.22	5.70	.74
Job choice	4.23	.81	4.32	.55
Total GNS	4.93	.86	5.05	.59
N (approx.)	6930		876	

Table 3  
Intercorrelations among JMS Scale Scores (Across 6930 Respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Skill variety	.22																				
2. Task identity	.42	.19																			
3. Task significance	.44	.30	.32																		
4. Autonomy	.34	.23	.34	.39																	
5. Feedback from job	.18	.16	.18	.27	.38																
6. Feedback from agents	.39	-.01	.29	.25	.19	.14															
7. Beating with others	.61	.46	.51	.79	.76	.37	.29														
8. MFS	.45	.22	.45	.42	.39	.29	.28	.52													
9. Experienced meaningfulness	.34	.27	.32	.39	.36	.23	.14	.47	.58												
10. Experienced responsibility	.15	.19	.22	.29	.49	.39	.64	.43	.40	.34											
11. Knowledge of results	.33	.20	.29	.42	.35	.32	.13	.46	.66	.49	.42										
12. General satisfaction	.34	.16	.33	.31	.32	.25	.22	.40	.57	.59	.23	.43									
13. Internal motivation	.09	.06	.10	.21	.20	.25	.87	.22	.27	.24	.22	.42	.22								
14. Pay satisfaction	.21	.14	.18	.29	.27	.27	.12	.33	.33	.30	.31	.48	.25	.45							
15. Security satisfaction	.26	.14	.26	.33	.27	.27	.25	.36	.41	.37	.26	.47	.35	.28	.38						
16. Social satisfaction	.15	.12	.15	.31	.29	.52	.10	.33	.36	.36	.35	.58	.30	.41	.47	.44					
17. Supervisory satisfaction	.48	.24	.38	.54	.43	.36	.23	.59	.65	.51	.39	.69	.48	.43	.51	.57	.55				
18. Growth satisfaction	.12	.06	.12	.08	.11	.02	.17	.17	-.00	.12	.02	-.06	.14	-.05	.05	.07	.02	-.03			
19. Would like CMS	.14	.05	.02	.07	.06	-.08	.14	.14	-.07	.07	-.04	-.09	.03	-.02	.05	-.01	.00	-.08	.42		
20. Job choice CMS	.15	.07	.09	.09	.11	.02	.19	.19	-.03	.12	-.01	-.08	.11	-.05	.06	.04	.01	-.07	.90	.77	
21. Total CMS																					

Note: N = 6930.

Table 4  
Intercorrelations Among JCS Scale Scores (Across 876 Jobs)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1. Skill variety	—																					
2. Task identity	.26	—																				
3. Task significance	.47	.21	—																			
4. Autonomy	.59	.36	.43	—																		
5. Feedback from job	.42	.31	.41	.51	—																	
6. Feedback from agents	.23	.13	.25	.28	.25	—																
7. Dealing with others	.37	-.05	.32	.29	.21	.50	—															
8. MFS	.60	.42	.48	.75	.69	.28	.28	—														
9. Experienced meaningfulness	.32	.08	.40	.32	.26	.57	.32	—														
10. Experienced responsibility	.23	.08	.30	.27	.24	.54	.58	.25	.90	—												
11. Knowledge of results	.08	.05	.25	.17	.25	.56	.47	.19	.80	.81	—											
12. General satisfaction	.37	.22	.38	.48	.39	.29	.12	.46	.39	.24	.28	—										
13. Internal motivation	.41	.23	.42	.44	.42	.25	.22	.46	.38	.31	.17	.47	—									
14. Pay satisfaction	.14	.08	.23	.25	.23	.27	.16	.28	.26	.20	.17	.48	.37	—								
15. Security satisfaction	.19	.10	.28	.32	.29	.26	.23	.34	.28	.23	.23	.54	.41	.59	—							
16. Social satisfaction	.19	.12	.25	.32	.28	.24	.31	.36	.28	.21	.17	.50	.42	.46	.56	—						
17. Supervisory satisfaction	.10	.11	.13	.22	.19	.33	.11	.44	.24	.17	.15	.46	.35	.41	.46	.51	—					
18. Growth satisfaction	.45	.25	.39	.54	.36	.36	.30	.58	.42	.28	.23	.71	.56	.57	.63	.74	.57	—				
19. Would like CMS	.07	-.02	.14	.08	.09	.38	.56	.13	.56	.64	.58	.80	.16	.15	.23	.32	.16	.22	—			
20. Job choice CMS	.12	-.05	.09	.11	.11	.38	.58	.16	.58	.64	.56	.82	.14	.13	.26	.33	.18	.25	.88	—		
21. Total CMS	.07	.00	.09	.10	.08	.19	.30	.39	.37	.41	.34	.82	.16	.11	.20	.26	.43	.18	.60	.60	—	

Note: N=876.

The patterns of the intercorrelations in Tables 3 and 4 are similar—although the overall level of relationship in the across-job analysis is higher than in the across-respondent analysis. One possible explanation for this result is that the reliability of many of the JDS scales in the across-job analysis was undoubtedly higher than the reliability of the scores used in the analysis across all 6930 respondents—simply because the reactions of all individuals who held a given job were averaged prior to computing correlations across jobs.

Results in Tables 3 and 4 show that the five core job dimensions (i.e., skill variety, task identity, task significance, autonomy, and job feedback) are moderately intercorrelated, as has been found in previous research (e.g., Dunham, 1976; Hackman & Lawler, 1971; Hackman & Oldham, 1974). With the exception of task identity, there are substantial relationships between the core job dimensions and the corresponding psychological states. In addition, the core dimensions and the psychological states are substantially and positively related to the outcome measures (e.g., general satisfaction).

As was the case in the Hackman and Oldham (1974) report, the across-respondent analysis indicates that the job dimensions, psychological states, and outcome measures are generally independent of the growth need strength measures. These relationships are substantially higher in the across-job analysis—which may reflect the emergence of a congruence between the needs of employees and the psychological composition of jobs.

JDS Means and Standard Deviations  
by Organizational Property Categories

In this section, JDS data are reported according to category of organization variables. Respondent scores were averaged for each job and these mean scores were used in the analyses. One way analyses of variance (ANOVA) were conducted across organization categories.

Organization size. Table 5 reports JDS means and standard deviations for organizations of various sizes. Results generally indicate that employees in small organizations perceive their jobs as more complex and challenging than do employees in large organizations. MPS scores are approximately 132 for small organizations, 127 for medium organizations, and 117 for large organizations.

Results involving the outcome measures (e.g., general satisfaction, growth satisfaction, and internal motivation) show that employees in smaller organizations are generally more satisfied. This is most clearly evidenced by differences between the outcome measures for the large organizations compared to small and medium organizations. Few substantial differences exist between small and medium sized organizations.

Number of organizational levels. Table 6 presents JDS means and standard deviations for organizations having few (i.e., 1-4) vs. many (i.e., 5-20) organizational levels. Results show few significant differences between the two categories. Only dealing with others, pay satisfaction, and the GNS measures differed significantly according to number of levels. Results indicate that employees in organizations with few levels have higher growth need strength, higher pay satisfaction and jobs requiring greater

Table 5

## JDS Means and Standard Deviations by Organization Size

Variable	Small Organizations		Medium Organizations		Large Organizations		F	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill variety	4.79	1.13	4.72	1.18	4.28	1.30	14.37	.000
Task identity	4.69	1.16	4.69	1.20	4.77	1.30	.51	.600
Task significance	5.57	1.03	5.52	1.02	5.36	1.18	4.67	.010
Autonomy	4.96	1.11	4.79	1.15	4.73	1.25	5.29	.005
Feedback from job	4.93	1.15	4.89	1.19	4.69	1.20	6.47	.002
Feedback from agents	4.12	1.33	4.04	1.34	4.15	1.42	.76	.465
Dealing with others	5.68	.98	5.54	.98	5.34	1.06	8.34	.000
MPS	132.49	56.98	127.01	60.12	116.87	58.93	6.73	.001
Experienced meaningfulness	5.19	.94	5.19	.99	4.96	.98	7.05	.001
Experienced responsibility	5.48	.81	5.48	.83	5.38	.84	1.87	.155
Knowledge of results	5.02	.99	5.03	.99	4.91	1.11	1.92	.146
General satisfaction	4.70	1.02	4.84	1.06	4.53	1.11	7.85	.000
Internal motivation	5.62	.75	5.55	.74	5.48	.79	4.90	.008
Pay satisfaction	4.33	1.29	4.31	1.40	4.22	1.47	.73	.478
Security satisfaction	4.83	1.19	5.04	1.17	4.69	1.31	7.16	.001
Social satisfaction	5.33	.84	5.44	.85	5.30	1.01	2.86	.057
Supervisory satisfaction	4.86	1.33	5.08	1.30	4.84	1.39	4.92	.007
Growth satisfaction	4.85	1.09	4.91	1.14	4.68	1.22	4.20	.015
Would like GNS	5.05	1.02	4.98	1.00	5.09	1.12	.05	.980
Job choice GNS	4.37	.65	4.28	.65	4.22	.70	4.93	.007
Total GNS	5.05	.68	4.98	.68	5.09	.74	1.74	.176
N (approx.)	448		223		177			

Note. Small organizations: 1-120 employees  
 Medium organizations: 121-1700 employees  
 Large organizations: 1701-99999 employees

df = 2,845.

Table 6

## JDS Means and Standard Deviations by Number of Levels in the Organization

Variable	Few Levels		Many Levels		F	P
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill variety	4.69	1.16	4.59	1.21	1.50	.221
Task identity	4.72	1.17	4.71	1.26	.08	.771
Task significance	5.51	1.04	5.51	1.10	.00	.948
Autonomy	4.86	1.12	4.87	1.21	.02	.884
Feedback from job	4.89	1.16	4.82	1.19	1.32	.251
Feedback from agents	4.12	1.34	4.08	1.38	.33	.565
Dealing with others	5.62	.99	5.49	1.02	3.96	.047
MPS	128.39	55.93	126.51	62.31	.28	.595
Experienced meaningfulness	5.14	.98	5.15	.93	.00	.974
Experienced responsibility	5.45	.83	5.47	.80	.17	.673
Knowledge of results	4.98	.98	5.03	1.07	.80	.369
General satisfaction	4.71	1.04	4.67	1.07	.57	.448
Internal motivation	5.59	.75	5.54	.76	1.65	.198
Pay satisfaction	4.39	1.30	4.12	1.46	11.79	.001
Security satisfaction	4.89	1.17	4.78	1.29	2.60	.107
Social satisfaction	5.35	.85	5.36	.94	.05	.810
Supervisory satisfaction	4.92	1.31	4.91	1.38	.02	.871
Growth satisfaction	4.83	1.12	4.82	1.15	.02	.882
Would like GNS	5.73	1.01	5.62	1.08	4.14	.042
Job choice GNS	4.35	.65	4.25	.68	5.24	.022
Total GNS	5.09	.67	4.95	.73	10.69	.001
N (approx.)	295		581			

Note. Few levels: 1-4.  
Many levels: 5-20.

df = 1,874.

interaction with others than do employees who work in organizations with many levels.

Dispersion of facilities. Table 7 presents JDS means according to the degree to which the organization's physical facilities are dispersed. In general, results indicate that employees in organizations with physical facilities dispersed throughout the region or country perceive their jobs as higher on the core dimensions than do employees in organizations with facilities in one location or dispersed throughout the world. GNS scores follow the same pattern.

Geographic location. Table 8 presents JDS means according to the geographic location of the organization unit. Results indicate that perceived job characteristics do not differ substantially by the location of the organization. However, results for the outcome and GNS measures do differ by location. Employees who work in rural organizations are more generally satisfied and motivated than employees who work in suburban or urban organizations, and individuals in suburban organizations are more satisfied than employees in urban organizations.

Means for the GNS measures reflect yet another pattern. Employees who work in suburban organizations have the highest GNS scores, and employees who work in rural organizations have the lowest.

Self-containment. Table 9 presents JDS scale means for organizations which are entirely self-contained and for organizations that are part of larger organizations. Results show that individuals in organizations which are part of larger organizations perceive their jobs as more complex and challenging than do employees in organizations which are self-contained. The

Table 7  
JDE Means and Standard Deviations by Dispersion of Facilities

Variable	All in one location		Mostly in one location		Dispersed throughout this country		Dispersed throughout the world		$\bar{X}$	S		
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.				
Skill Variety	4.57	1.19	4.44	1.21	4.94	1.12	4.87	1.12	4.71	1.23	3.30	.011
Task Identity	4.65	1.20	4.81	1.20	4.52	1.17	5.08	1.02	4.43	1.37	4.20	.002
Task Significance	5.51	1.02	5.43	1.11	5.21	1.14	5.24	1.10	5.59	1.15	3.33	.010
Autonomy	4.78	1.16	4.69	1.17	5.05	1.16	5.04	1.10	4.82	1.32	2.72	.028
Feedback from Job	4.84	1.14	4.73	1.16	4.90	1.19	5.02	1.29	4.75	1.22	1.41	.226
Feedback from Agents	3.97	1.32	4.19	1.34	4.09	1.36	4.20	1.33	3.74	1.47	2.66	.032
Dealing with Others	5.42	1.04	5.28	1.02	6.25	.78	6.37	.68	5.78	.97	22.28	.000
MFS	124.49	55.78	117.67	60.92	131.65	62.95	139.05	65.81	123.24	61.39	2.11	.078
Experienced Meaningfulness	5.18	.90	4.96	.94	5.01	1.25	5.05	1.25	5.05	.98	2.48	.043
Experience Responsibility	5.44	.80	5.42	.76	5.40	1.02	5.47	.97	5.30	.87	.53	.712
Knowledge of Results	5.02	1.03	4.87	1.00	4.74	1.03	4.79	1.18	5.02	.99	3.46	.008
General Satisfaction	4.63	1.01	4.51	1.04	4.62	1.22	4.81	1.13	4.90	1.15	2.55	.038
Internal Motivation	5.59	.74	5.48	.73	5.56	.81	5.61	.81	5.41	.92	1.85	.118
Pay Satisfaction	4.25	1.38	4.07	1.40	4.26	1.16	3.98	1.41	4.53	1.47	2.33	.055
Security Satisfaction	4.74	1.21	4.82	1.26	4.96	1.18	4.55	1.19	4.89	1.40	1.61	.169
Social Satisfaction	5.33	.89	5.27	.97	5.53	.80	5.24	.78	5.41	.88	2.83	.024
Supervisory Satisfaction	4.83	1.30	4.98	1.36	4.97	1.43	4.84	1.47	4.84	1.47	.93	.445
Growth Satisfaction	4.77	1.13	4.70	1.16	4.82	1.28	4.78	1.25	4.89	1.16	.59	.666
World Life CMS	5.64	1.03	5.81	1.00	5.83	.95	5.87	.87	5.41	1.29	3.54	.007
Job Choice CMS	4.24	.55	4.33	.67	4.64	.64	4.74	.56	4.10	.73	13.06	.000
Total CMS	4.94	.67	5.11	.68	5.23	.66	5.70	.57	4.80	.85	18.66	.000
N (approx.)	297		181		85		37		46			

$\bar{X} = 4.641$ .

Table 8

JDS Means and Standard Deviations by  
Geographic Location of Organization

Variable	Urban		Suburban		Rural		F	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill Variety	4.59	1.17	4.71	1.47	4.50	1.07	.58	.557
Task Identity	4.72	1.20	4.58	1.29	4.50	1.17	2.41	.091
Task Significance	5.38	1.08	5.65	1.07	5.59	1.06	4.73	.009
Autonomy	4.76	1.18	4.85	1.23	4.95	1.05	1.38	.251
Feedback from Job	4.80	1.17	4.70	1.27	4.98	1.04	2.15	.117
Feedback from Agents	3.98	1.33	4.02	1.49	4.36	1.28	5.02	.007
Dealing with others	5.52	.99	5.68	1.04	5.49	.98	.81	.444
MPS	123.61	59.99	122.32	59.81	126.44	51.57	.13	.873
Experienced								
Meaningfulness	5.01	1.00	5.10	.97	5.42	.85	9.36	.000
Experienced								
Responsibility	5.37	.85	5.52	.79	5.59	.77	4.91	.008
Knowledge of Results	4.91	1.01	4.86	1.12	5.12	1.05	3.54	.029
General Satisfaction	4.55	1.08	4.72	1.06	4.98	1.00	9.89	.000
Internal Motivation	5.50	.77	5.61	.80	5.76	.70	7.54	.001
Pay Satisfaction	4.07	1.36	4.41	1.43	4.86	1.33	19.31	.000
Security Satisfaction	4.74	1.24	4.91	1.25	4.96	1.18	2.08	.125
Social Satisfaction	5.29	.89	5.48	1.02	5.55	.84	7.44	.001
Supervisory Satisfaction	4.84	1.37	4.93	1.30	5.17	1.24	3.99	.019
Growth Satisfaction	4.70	1.17	4.79	1.33	5.15	.99	9.24	.000
Would Like GNS	5.70	1.01	5.92	1.08	5.52	1.07	4.70	.009
Job Choice GNS	4.37	.65	4.43	.71	3.99	.64	16.76	.000
Total GNS	5.09	.68	5.23	.71	4.75	.68	12.75	.000
N (Approx.)	501		59		78			

df = 2,635.

JDS Means and Standard Deviations by Degree  
To Which Organization is Self-Contained

Variable	Entirely Self- Contained		Part of a Larger Organization		F	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill Variety	4.22	1.32	4.77	1.13	31.09	.000
Task Identity	4.77	1.23	4.65	1.19	2.51	.113
Task Significance	5.35	1.15	5.47	1.04	2.81	.094
Autonomy	4.62	1.26	4.88	1.13	9.74	.002
Feedback from Job	4.69	1.26	4.87	1.12	6.48	.011
Feedback from Agents	3.93	1.39	4.07	1.32	2.68	.102
Dealing with others	5.26	1.12	5.64	.94	19.94	.000
MPS	116.79	60.24	127.52	58.39	6.57	.011
Experienced						
Meaningfulness	4.88	.98	5.15	.98	15.67	.000
Experienced						
Responsibility	5.31	.84	5.46	.83	6.48	.011
Knowledge of Results	4.88	1.10	4.95	.99	1.07	.301
General Satisfaction	4.38	1.09	4.73	1.05	24.82	.000
Internal Motivation	5.42	.80	5.60	.75	13.07	.000
Pay Satisfaction	3.95	1.46	4.32	1.32	16.14	.000
Security Satisfaction	4.58	1.30	4.88	1.21	12.32	.000
Social Satisfaction	5.18	1.01	5.41	.85	17.42	.000
Supervisory Satisfaction	4.81	1.43	5.02	1.32	26.11	.000
Growth Satisfaction	4.52	1.24	4.87	1.13	22.44	.000
Would like GNS	5.71	1.08	5.70	1.00	.07	.787
Job Choice GNS	4.29	.70	4.34	.64	1.03	.309
Total GNS	5.13	.73	5.02	.66	4.41	.036
N (Approx.)	198		435			

df = 1,631.

satisfaction and internal motivation measures essentially duplicate this result--i.e., employees who work for organizations that are a part of large firms experience higher satisfaction and motivation than employees who work for self-contained organizations. Employees' GNS do not differ by degree of self-containment.

Organizational "type." Table 10 presents JDS means for organizations that are economic, non-profit, or government. Results indicate few significant trends. The significant differences that were obtained (i.e., skill variety, dealing with others, security satisfaction, and supervisory satisfaction) are probably due in large part to very low scores for non-profit organizations and higher scores for both government and economic organizations.

JDS Means and Standard Deviations  
by Job Property Categories

In this section, JDS results are reported according to job properties. Once again, respondent scores have been averaged for each job and these mean scores used in the analyses.

Job level. JDS data were partitioned according to the job's position in the organizational hierarchy (i.e., upper level management, middle level management, first line management, staff, and non-management). Results in Table 11 indicate that there are only slight differences in JDS scores between staff and first line management jobs. However, the remaining results suggest that the higher the job's level the higher the job on the core dimensions. This general trend also exists for the satisfaction, motivation, and GNS measures: the highest scores are found at the top levels of management and the lowest in the non-management areas.

Table 10

JDS Means and Standard Deviations by  
Organizational Type

Variable	Economic		Non-profit		Government		F	P
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill Variety	4.64	1.17	4.20	1.34	4.75	1.38	3.82	.002
Task Identity	4.68	1.19	4.79	1.34	4.76	1.37	.36	.695
Task Significance	5.41	1.06	5.58	1.19	5.64	1.12	2.08	.126
Autonomy	4.81	1.15	4.75	1.35	4.84	1.29	.11	.899
Feedback from Job	4.83	1.15	4.68	1.28	4.91	1.29	1.06	.347
Feedback from Agents	4.03	1.32	3.23	1.50	4.86	1.50	1.57	.208
Dealing with Others	5.59	.96	5.00	1.30	5.56	1.03	9.15	.000
MPS	125.35	58.61	115.45	63.10	127.84	58.51	1.14	.319
Experienced Meaningfulness	5.09	.97	5.01	1.07	4.99	1.07	.47	.624
Experienced Responsibility	5.44	.83	5.34	.87	5.25	.93	1.80	.166
Knowledge of Results	4.93	1.01	4.94	1.19	5.05	1.00	.51	.603
General Satisfaction	4.64	1.05	4.52	1.16	4.71	1.17	.61	.544
Internal Motivation	5.57	.75	5.47	.80	5.39	.98	1.97	.141
Pay Satisfaction	4.23	1.34	4.12	1.57	4.11	1.54	.38	.685
Security Satisfaction	4.84	1.21	4.26	1.44	4.87	1.43	8.68	.000
Social Satisfaction	5.35	.89	5.29	1.06	5.37	.90	.25	.782
Supervisory Satisfaction	4.94	1.32	4.47	1.60	4.71	1.51	6.45	.002
Growth Satisfaction	4.80	1.15	4.54	1.30	4.67	1.31	2.28	.103
Would like GNS	5.70	1.01	5.79	1.03	5.70	1.33	.34	.712
Job Choice GNS	4.35	.65	4.23	.70	4.17	.72	2.30	.101
Total GNS	5.07	.68	5.01	.72	4.99	.79	3.26	.722
N (Approx.)	562		53		33			

df = 2,645.

Table 11  
JMS Means and Standard Deviations by Job Level

Variable	Upper Level Mgmt.		Middle Level Mgmt.		First Line Mgmt.		Staff		Non. Mgmt.		F	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill Variety	6.65	.56	5.95	.76	5.37	1.03	4.99	1.10	4.30	1.28	63.41	.000
Task Identity	5.07	.50	4.93	1.10	4.61	1.15	5.11	1.20	4.65	1.24	5.84	.000
Task Significance	6.46	.51	5.90	.75	5.62	.94	5.62	.92	5.39	1.15	11.21	.000
Autonomy	6.13	.54	5.72	.68	5.22	1.03	5.18	1.10	4.61	1.24	35.14	.000
Feedback from Job	5.61	.55	5.35	.82	5.09	1.12	5.09	1.14	4.70	1.23	16.86	.000
Feedback from Agents	4.43	.81	4.63	1.14	4.37	1.30	4.22	1.37	3.97	1.39	9.29	.000
Dealing with Others	6.30	.44	6.52	.61	6.35	.65	5.68	1.06	5.23	1.10	68.37	.000
NPS	217.30	29.05	175.58	47.82	146.65	59.21	146.70	55.04	113.38	60.00	47.16	.000
Experienced Meaningfulness	6.00	.49	5.75	.75	5.25	1.02	5.24	.95	5.00	.99	17.48	.000
Experienced Responsibility	6.19	.48	5.91	.64	5.58	.83	5.64	.78	5.33	.86	19.18	.000
Knowledge of Results	5.15	.53	5.02	.84	4.89	1.02	5.10	.92	4.99	1.06	1.29	.273
General Satisfaction	5.25	.46	5.19	.87	4.75	1.07	4.82	1.08	4.58	1.08	8.70	.000
Internal Motivation	6.07	.48	5.92	.49	5.69	.71	5.68	.72	5.47	.81	13.24	.000
Pay Satisfaction	5.01	.80	4.66	1.13	4.40	1.35	4.30	1.49	6.16	1.42	4.41	.002
Security Satisfaction	5.75	.69	4.97	1.08	5.12	1.21	4.94	1.30	4.71	1.21	7.83	.000
Social Satisfaction	5.55	.36	5.76	.51	5.54	.79	5.46	.90	5.25	.96	12.10	.000
Supervisory Satisfaction	5.40	.90	5.43	.93	5.10	1.27	4.93	1.42	4.82	1.39	7.05	.000
Growth Satisfaction	5.90	.45	5.57	.76	5.08	1.07	4.98	1.23	4.63	1.19	24.69	.000
Would Like CMS	6.46	.57	5.99	.86	5.96	.83	5.94	.90	5.57	1.12	13.63	.000
Job Choice CMS	5.20	.33	4.92	.63	4.62	.60	4.61	.67	4.15	.68	55.38	.000
Total CMS	5.83	.30	5.46	.62	5.30	.56	4.74	.61	4.89	.74	37.00	.000
N (approx.)	11		45		131		74		500			

df = 4,756.

Job collar color. Table 12 presents JDS means for white collar and for blue collar jobs. The results suggest that employees in white collar positions perceive their jobs as higher on the core dimensions than individuals in blue collar positions. Measures of internal motivation, GNS, and supervisory satisfaction show a similar trend. However, employees in blue collar positions show higher general and pay satisfaction scores.

Payment type. Table 13 contrasts JDS means for employees who are paid on a salaried basis with individuals who are paid on an hourly system. Results indicate that employees who are paid on a salaried basis see their jobs as higher on the core dimensions than do individuals who are paid on an hourly basis. Individuals in salaried positions also have higher motivation and GNS scores and, for the most part, score higher on the satisfaction indices.

Union representation. JDS means for unionized and for non-unionized employees are reported in Table 14. Results indicate that employees who are non-unionized rate their jobs higher on the core dimensions, experience greater motivation and satisfaction, and have higher GNS scores than employees who are unionized.

DOT category. Table 15 presents JDS means and standard deviations for each of the job classifications in the Dictionary of Occupational Titles. Results for two of the classifications (i.e., sales and structural work) are based on small samples, and should be interpreted with caution.

Results indicate that jobs in the managerial, professional, and service categories are rated highest on the core dimensions. Clerical, bench work, and processing jobs are rated lowest on the job dimensions. Results for

Table 12

JDS Means and Standard Deviations by  
Job Collar Color

Variable	White collar		Blue Collar		F	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill Variety	4.74	1.15	4.49	1.28	6.09	.014
Task Identity	4.76	1.16	4.60	1.32	4.23	.040
Task Significance	5.47	1.01	5.55	1.19	1.23	.268
Autonomy	4.85	1.12	4.83	1.25	.08	.778
Feedback from Job	4.88	1.15	4.76	1.23	3.11	.078
Feedback from Agents	4.15	1.32	3.97	1.46	4.93	.027
Dealing with Others	5.68	.95	5.23	1.11	30.50	.000
MPS	129.10	57.30	121.44	61.50	3.22	.073
Experienced						
Meaningfulness	5.10	.97	5.14	1.01	.34	.561
Experienced						
Responsibility	5.46	.84	5.38	.84	2.34	.126
Knowledge of Results	4.93	.99	5.09	1.13	6.86	.009
General Satisfaction	4.60	1.05	4.80	1.10	7.78	.005
Internal Motivation	5.59	.74	5.45	.85	7.70	.006
Pay Satisfaction	4.19	1.34	4.40	1.51	4.80	.029
Security Satisfaction	4.83	1.20	4.76	1.33	.83	.362
Social Satisfaction	5.33	.88	5.40	.94	1.54	.216
Supervisory Satisfaction	4.95	1.29	4.79	1.48	3.87	.050
Growth Satisfaction	4.78	1.16	4.83	1.14	.41	.520
Would like GNS	5.82	.96	5.46	1.21	32.90	.000
Job Choice GNS	4.46	.63	4.00	.70	101.65	.000
Total GNS	5.19	.65	4.74	.78	84.14	.000
N (Approx.)	514		184			

df=1,696.

Table 13

JDS Means and Standard Deviations by  
Payment Type

Variable	Salaried		Hourly		F	P
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill Variety	4.91	1.12	4.29	1.26	48.59	.000
Task Identity	4.74	1.15	4.72	1.29	.04	.842
Task Significance	5.51	1.00	5.45	1.18	.79	.374
Autonomy	4.95	1.10	4.73	1.25	8.63	.003
Feedback from Job	4.89	1.13	4.83	1.23	1.19	.276
Feedback from Agents	4.18	1.32	4.03	1.42	3.71	.054
Dealing with Others	5.79	.89	5.15	1.16	74.68	.000
MPS	133.08	57.30	118.81	62.20	14.31	.000
Experienced Meaningfulness	5.16	.96	5.08	.99	1.73	.189
Experienced Responsibility	5.50	.82	5.34	.86	10.44	.001
Knowledge of Results	4.90	.99	5.12	1.07	16.39	.000
General Satisfaction	4.68	1.03	4.69	1.10	.00	.936
Internal Motivation	5.63	.73	5.45	.82	15.61	.000
Pay Satisfaction	4.23	1.34	4.23	1.48	.00	.991
Security Satisfaction	4.88	1.19	4.68	1.33	7.26	.007
Social Satisfaction	5.40	.84	5.27	.97	5.88	.016
Supervisory Satisfaction	5.07	1.26	4.76	1.47	18.38	.000
Growth Satisfaction	4.87	1.11	4.73	1.19	4.71	.030
Would like GNS	5.82	.94	5.48	1.17	32.42	.000
Job Choice GNS	4.47	.64	4.07	.70	95.53	.000
Total GNS	5.19	.65	4.82	.76	64.75	.000
N (Approx.)	436		242			

df=1,676.

JDS Means and Standard Deviations by  
Union Representation

Variable	Union		Non-Union		F	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill Variety	4.15	1.33	4.72	1.18	17.02	.000
Task Identity	4.21	1.34	4.79	1.20	29.87	.000
Task Significance	5.23	1.26	5.51	1.05	8.37	.004
Autonomy	4.30	1.41	4.91	1.13	28.92	.000
Feedback from Job	4.49	1.33	4.88	1.16	16.25	.000
Feedback from Agents	3.27	1.45	4.20	1.36	65.61	.000
Dealing with Others	5.43	1.11	5.57	.99	1.33	.249
MPS	97.21	62.30	129.32	58.20	31.53	.000
Experienced						
Meaningfulness	4.72	1.19	5.16	.96	21.81	.000
Experienced						
Responsibility	5.05	1.04	5.49	.81	34.38	.000
Knowledge of Results	4.90	1.07	4.99	1.03	1.25	.264
General Satisfaction	4.50	1.23	4.70	1.06	4.11	.043
Internal Motivation	5.23	.98	5.60	.74	29.04	.000
Pay Satisfaction	4.00	1.28	4.25	1.41	3.54	.060
Security Satisfaction	4.60	1.36	4.84	1.21	4.29	.039
Social Satisfaction	5.25	.91	5.38	.90	2.83	.093
Supervisory Satisfaction	4.38	1.58	4.98	1.32	28.71	.000
Growth Satisfaction	4.32	1.34	4.85	1.14	26.91	.000
Would like GNS	5.50	1.23	5.72	1.01	5.87	.016
Job Choice GNS	4.14	.72	4.35	.64	8.78	.003
Total GNS	4.85	.81	5.08	.67	9.69	.002
N (approx.)	74		584			

df = 1,656.

Table 15  
JMS Means and Standard Deviations by DOJ Category

Variable	Professional		Technical		Managerial		Clerical		Sales		Service		Processing		Mechanics Trades		Beach Work		Structural Work	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Skill Variety	5.36	1.00	5.57	.94	4.79	1.33	4.78	1.15	5.01	1.26	4.15	1.24	5.00	1.51	4.24	1.24	5.20	1.09	35.92	.000
Task Identity	5.06	1.16	4.72	1.08	4.70	1.24	4.43	1.37	4.72	1.24	4.34	1.31	4.92	1.30	4.52	1.27	5.11	1.24	3.05	.002
Task Significance	5.62	.95	5.81	.85	5.29	1.11	5.49	1.25	5.74	1.04	5.32	1.23	5.61	1.19	5.78	1.19	5.51	1.20	6.41	.000
Autonomy	5.35	1.05	5.37	.92	4.47	1.25	4.85	1.43	5.01	1.25	4.50	1.29	4.93	1.34	4.64	1.11	5.04	1.15	15.64	.000
Feedback from Job	5.00	1.11	5.15	1.04	4.61	1.27	5.42	1.02	5.08	1.21	4.68	1.22	4.92	1.15	4.39	1.28	4.90	1.19	7.47	.000
Feedback from Agents	4.21	1.37	4.45	1.22	4.02	1.38	3.56	1.17	3.84	1.58	3.60	1.47	3.76	1.37	4.21	1.38	4.49	1.21	5.49	.000
Dealings with Others	5.83	.96	6.42	.58	5.16	1.11	6.40	.84	6.05	1.00	5.26	1.08	5.28	1.04	5.05	1.15	5.34	1.21	30.16	.000
NRS	153.46	55.21	155.93	54.70	105.91	58.91	146.00	93.42	151.65	70.10	105.09	57.11	135.81	64.13	199.78	57.31	148.60	63.30	20.32	.000
Experienced	5.40	.87	5.47	.96	4.87	1.02	4.90	1.32	5.16	1.06	5.00	1.03	5.28	.89	5.27	1.05	5.19	1.04	8.03	.000
Meaningfulness	5.75	.72	5.73	.81	5.28	.88	5.50	.73	5.61	.86	5.19	.92	5.63	.94	5.39	.89	5.13	.90	9.81	.000
Expertise of Results	5.00	.99	4.97	.97	4.88	1.08	4.99	1.17	5.04	1.14	5.00	1.15	5.31	.99	4.91	1.16	5.16	.96	1.22	.282
General	4.88	.99	4.93	1.01	4.50	1.09	4.43	1.24	4.56	1.17	4.62	1.21	4.91	1.08	4.72	1.12	4.90	1.16	3.93	.070
Satisfaction	5.77	.65	5.80	.64	5.41	.83	5.73	.59	5.68	.76	5.34	.89	5.59	.80	5.51	.91	5.56	.89	7.51	.000
Internal Motivation	4.40	1.51	4.59	1.25	4.02	1.46	4.18	1.15	4.10	1.50	4.48	1.39	4.23	1.38	4.36	1.68	4.53	1.31	3.64	.000
Pay Satisfaction	4.96	1.16	5.20	1.03	4.75	1.31	4.80	1.46	4.90	1.31	4.57	1.32	5.02	1.25	4.68	1.49	4.96	1.29	3.91	.000
Security Satisfaction	5.44	.85	5.65	.68	5.21	1.00	5.41	.71	5.45	1.03	5.34	.95	5.53	.75	5.12	1.06	5.14	1.04	6.17	.000
Social Satisfaction	4.89	1.29	5.20	1.14	4.89	1.41	4.60	1.74	4.73	1.62	4.57	1.44	4.64	1.48	4.49	1.49	4.87	1.29	3.49	.001
Super. Satisfaction	5.06	1.09	5.27	.97	4.55	1.25	4.48	1.38	4.90	1.37	4.66	1.15	4.77	1.03	4.43	1.18	4.99	1.05	9.66	.000
Growth Satisfaction	6.11	.82	5.92	.77	5.63	1.11	6.47	.30	6.08	.96	5.27	1.24	5.51	1.18	5.58	1.36	4.93	1.34	10.13	.000
Would like CMS	4.76	.64	4.67	.58	4.18	.67	4.92	.61	4.59	.74	3.87	.71	4.13	.70	3.95	.68	4.16	.68	26.13	.000
Job Choice CMS	5.59	.57	5.30	.54	4.95	.74	5.70	.39	5.38	.68	4.57	.79	4.82	.78	4.88	.87	4.54	.81	24.11	.000
Total CMS																				

N (approx.) 72 133 255 6 22 65 16 18 5

df = 8,551.

growth satisfaction, general satisfaction, and internal motivation reveal a similar pattern: individuals in managerial or professional positions rate highest on these variables, and persons in clerical or processing jobs rate lowest. Individuals in sales and professional positions have the highest GNS, while persons in structural and processing jobs score lowest.

#### JDS Means and Standard Deviations

##### by Employee Demographic Characteristics

In this section, JDS means and standard deviations are reported for categories of several demographic variables. Since demographics are characteristics of individuals, JDS scales scores are reported across all 6930 employees. One-way ANOVA's were used to examine differences among categories.

Employee sex. Table 16 presents JDS scores for males and for females. Results indicate that, in general, males perceive their jobs as significantly more complex than do females. With the exceptions of task identity and agent feedback, men had significantly higher scores on the job dimensions than women.

Males also scored highest on several measures of satisfaction (i.e., growth, general, security, and social). However, females rated highest on internal motivation, pay satisfaction, and supervisory satisfaction. Males scored significantly higher than females on the GNS measures.

Employee age. Table 17 presents JDS means for several age categories. Results show that employees who score highest on the job dimensions are over the age of 40. There are few differences in job dimension scores for individuals in the age groups of 40-49, 50-59, and 60+. The lowest job dimension scores were obtained for employees in the below 20 age category.

Table 16

## JDS Means and Standard Deviations by Sex

Variable	<u>M a l e s</u>		<u>F e m a l e s</u>		F	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Skill Variety	4.92	1.48	4.06	1.53	525.1	.0
Task Identity	4.66	1.46	4.67	1.40	0.0	.92
Task Significance	5.53	1.24	5.45	1.25	6.0	.01
Autonomy	4.96	1.38	4.59	1.38	112.3	.00
Feedback from Job	4.88	1.32	4.75	1.36	14.6	.00
Feedback from Agents	4.01	1.55	4.19	1.61	22.0	.00
Dealing with Others	5.62	1.28	5.28	1.31	106.7	.00
MPS	131.54	71.50	112.29	66.09	125.0	.00
Experienced						
Meaningfulness	5.16	1.15	5.03	1.13	20.7	.00
Experienced						
Responsibility	5.43	.96	5.38	.94	4.1	.04
Knowledge of Results	5.09	1.12	5.00	1.16	9.2	.00
General Satisfaction	4.73	1.30	4.55	1.22	33.8	.00
Internal Motivation	5.47	.92	5.55	.85	11.6	.00
Pay Satisfaction	4.14	1.69	4.21	1.62	2.3	.13
Security Satisfaction	4.82	1.49	4.72	1.45	7.3	.00
Social Satisfaction	5.37	.98	5.25	1.06	23.9	.00
Supervisory Satisfaction	4.75	1.58	4.88	1.55	10.1	.00
Growth Satisfaction	4.84	1.33	4.65	1.34	34.0	.00
Would like GNS	5.70	1.19	5.59	1.23	14.1	.00
Job Choice GNS	4.31	.82	4.13	.79	73.4	.00
Total GNS	5.00	.85	4.86	.86	44.7	.00
N (approx.)	3533		2958			

df= 1,6489.

Table 17  
 JDS Means and Standard Deviations by Age

Variable	<20		20-29		30-39		40-49		50-59		60+		F	P
	$\bar{X}$	S.D.												
Skill variety	3.18	1.42	4.11	1.55	4.90	1.46	5.09	1.37	4.97	1.46	4.08	1.40	149.5	.00
Task identity	4.32	1.51	4.59	1.45	4.76	1.43	4.73	1.38	4.74	1.40	4.77	1.29	7.0	.00
Task significance	5.06	1.33	5.36	1.31	5.58	1.19	5.79	1.10	5.62	1.11	5.35	1.36	27.5	.00
Autonomy	4.02	1.37	4.54	1.41	4.98	1.34	5.09	1.30	5.12	1.31	5.14	1.29	61.3	.00
Feedback from job	4.58	1.29	4.69	1.39	4.85	1.32	5.04	1.24	5.01	1.30	5.15	1.27	16.9	.00
Feedback from agents	4.13	1.58	4.02	1.60	4.12	1.54	4.20	1.54	4.16	1.61	4.30	1.70	3.1	.00
Beating with others	5.03	1.29	5.33	1.36	5.62	1.24	5.63	1.24	5.60	1.22	5.15	1.44	22.4	.00
MS	83.99	52.02	108.93	65.93	131.90	70.23	142.39	70.63	140.01	70.78	139.43	41.36	73.3	.00
Experienced meaningfulness	4.44	1.18	4.81	1.20	5.24	1.06	5.52	0.92	5.48	0.99	5.64	0.86	113.3	.00
Experienced responsibility	5.02	1.08	5.20	0.98	5.51	0.94	5.69	0.80	5.67	0.82	5.92	0.76	80.1	.00
Knowledge of results	4.96	1.12	4.97	1.17	5.06	1.13	5.12	1.11	5.17	1.12	5.40	0.87	7.7	.00
General satisfaction	4.25	1.26	4.32	1.26	4.73	1.26	5.08	1.10	5.18	1.12	5.44	0.86	108.9	.00
Internal motivation	5.28	0.92	5.31	0.96	5.60	0.84	5.75	0.70	5.72	0.75	5.96	0.72	62.6	.00
Pay satisfaction	3.94	1.67	3.89	1.66	4.23	1.67	4.53	1.61	4.64	1.48	4.77	1.58	42.4	.00
Security satisfaction	4.62	1.32	4.59	1.48	4.75	1.50	5.01	1.40	5.15	1.42	5.47	1.34	29.7	.00
Social satisfaction	5.24	1.39	5.15	1.06	5.38	1.01	5.50	0.93	5.55	0.85	5.54	0.91	32.0	.00
Supervisory satisfaction	4.80	1.42	4.60	1.59	4.74	1.62	5.15	1.41	5.15	1.50	5.67	1.03	34.7	.00
Growth satisfaction	4.18	1.36	4.44	1.40	4.86	1.28	5.19	1.13	5.20	1.07	5.41	1.11	92.0	.00
Would like CMS	5.55	1.16	5.78	1.17	5.74	1.19	5.56	1.19	5.23	1.27	5.10	1.34	33.3	.00
Job choice CMS	6.01	0.74	6.25	0.81	6.27	0.78	6.25	0.84	6.12	0.84	6.11	0.89	8.8	.00
Total CMS	4.78	0.81	5.02	0.85	5.01	0.84	4.91	0.85	4.67	0.89	4.60	0.91	26.8	.00
N (approx.)	269		2,741		1,641		971		740		112			

$df = 5, 6468$ .

Results involving the internal motivation and satisfaction measures reflect a similar pattern. The highest scores are typically found in the older age groups, while the lowest scores are found in the younger age categories.

Employee GNS scores are highest for the 20-29 and 30-39 age groups. Lowest GNS scores were obtained for the 50-59 and 60+ age categories.

Employee education. Table 18 presents JDS means and standard deviations for several categories of employee education. Results involving the job dimensions indicate that, in general, higher levels of education are associated with higher job dimension scores. Individuals who had completed some high school or less perceived their jobs as lowest on MPS, while employees who had either completed some graduate work or who had received a graduate degree scored highest on MPS. The GNS measures also followed this general pattern. The higher the employee's educational attainment, the higher his or her GNS score.

Results involving the internal motivation and satisfaction measures did not follow the pattern described above. The highest scores on many of the satisfaction scales were found in the grade school education or "some high school" categories. While persons with grade school education received the lowest internal motivation scores, persons with some high school ranked second to individuals with a graduate degree on this measure. Individuals scoring lowest on the satisfaction scales were typically those with some college or some graduate education.

#### Discussion

This report has presented means, standard deviations, and intercorrelations among the Job Diagnostic Survey (JDS) scales. The five core job

Table 10  
JOS Means and Standard Deviations by Education

Variable	Grade School		High School		Some High School Degree		Some Business School or Technical School Degree		Some College Degree		Business School or Technical College Degree		Some Graduate Work		Graduate Degree					
	M	S.D.	M	S.D.	M	S.D.	M	S.D.	M	S.D.	M	S.D.	M	S.D.	M	S.D.				
Skill Variety	4.48	1.21	4.31	1.50	4.33	1.55	4.70	1.61	4.51	1.59	4.83	1.50	4.88	1.48	5.04	1.51	5.46	1.29	20.4	.00
Task Identity	4.73	1.05	4.65	1.36	4.59	1.40	4.75	1.47	4.68	1.49	4.85	1.52	4.72	1.38	4.81	1.59	4.99	1.50	2.6	.01
Task Significance	5.12	1.33	5.44	1.18	5.51	1.23	5.63	1.20	5.47	1.31	5.47	1.24	5.38	1.22	5.48	1.38	5.51	1.24	2.9	.00
Autonomy	4.89	1.11	4.70	1.37	4.74	1.35	4.89	1.42	4.69	1.45	4.77	1.28	4.92	1.40	4.97	1.47	5.49	1.23	6.7	.00
Feedback from Job	4.63	1.18	4.79	1.35	4.78	1.33	4.93	1.34	4.79	1.40	4.83	1.26	4.90	1.30	4.87	1.34	4.97	1.40	1.9	.06
Feedback from Agents	4.22	1.28	4.17	1.54	4.10	1.59	4.11	1.61	3.92	1.61	4.05	1.64	4.21	1.53	4.25	1.39	4.38	1.41	3.3	.00
Dealing with Others	5.21	1.35	5.18	1.34	5.36	1.32	5.48	1.29	5.51	1.30	5.37	1.28	5.83	1.18	5.92	1.17	6.09	1.08	19.1	.00
TOT	111.53	48.11	115.30	62.65	117.73	68.00	131.32	72.03	120.63	70.24	124.45	64.83	130.18	72.47	137.48	80.99	153.64	76.34	9.5	.00
Experienced	5.16	0.87	5.29	1.06	5.15	1.06	5.19	1.09	4.96	1.18	5.08	1.26	4.94	1.29	4.90	1.42	5.27	1.02	8.7	.00
Meaningfulness	5.58	0.84	5.44	0.96	5.38	0.97	5.42	0.92	5.40	0.91	5.45	1.05	5.44	0.95	5.42	1.03	5.75	0.82	2.6	.01
Expertise of Results	5.03	1.15	5.08	1.14	5.12	1.11	5.09	1.14	4.98	1.16	5.02	1.16	4.94	1.19	4.86	1.16	4.90	1.12	3.7	.00
General	5.33	0.91	4.95	1.19	4.71	1.23	4.70	1.26	4.51	1.26	4.50	1.32	4.44	1.35	4.40	1.48	4.75	1.22	12.3	.00
Satisfaction	5.15	0.97	5.60	0.82	5.49	0.88	5.53	0.86	5.46	0.94	5.54	0.88	5.54	0.87	5.51	0.91	5.74	0.84	3.5	.00
Internal Motivation	4.65	1.44	4.46	1.62	4.22	1.60	4.17	1.70	3.93	1.75	4.14	1.64	4.24	1.61	3.90	1.71	4.51	1.60	7.4	.00
Pay Satisfaction	5.18	1.50	4.87	1.54	4.80	1.42	4.72	1.54	4.61	1.52	4.67	1.52	4.92	1.38	4.79	1.52	5.04	1.31	4.3	.00
Security Satisfaction	5.47	0.86	5.37	1.01	5.35	0.98	5.39	0.95	5.16	1.11	5.39	1.02	5.29	1.07	5.29	1.04	5.21	0.92	5.4	.00
Social Satisfaction	5.42	1.35	4.99	1.54	4.81	1.55	4.86	1.57	4.58	1.66	4.83	1.62	4.92	1.42	4.76	1.58	5.06	1.55	5.8	.00
Super. Satisfaction	5.25	0.91	4.96	1.27	4.80	1.25	4.81	1.28	4.54	1.42	4.76	1.44	4.64	1.44	4.52	1.59	4.99	1.27	8.9	.00
Growth Satisfaction	4.92	1.26	5.17	1.32	5.43	1.24	5.68	1.16	5.90	1.13	5.90	1.02	6.13	0.99	6.20	0.99	6.12	1.02	54.7	.00
Would like CMS	3.76	0.74	3.82	0.72	4.02	0.73	4.24	0.78	4.39	0.78	4.35	0.73	4.72	0.79	4.89	0.76	5.03	0.84	123.5	.00
Job Choice CMS	4.34	0.86	4.50	0.82	4.72	0.83	4.96	0.81	5.15	0.81	5.12	0.72	5.42	0.76	5.55	0.70	5.58	0.82	110.5	.00

M (approx.) 51 553 2,415 1,052 1,187 283 595 231 111

df = 8,469.

dimensions were found to be moderately intercorrelated, as has been found previously (Dunham, 1976; Hackman & Oldham, 1975; Pierce & Dunham, 1978). This is not unexpected if one assumes that complex, challenging jobs often are complex in a number of ways. There is really no reason to expect that the job dimensions would or should be completely independent. Moreover, the interrelationship among the dimensions does not detract from their usefulness as separate dimensions in diagnostic and evaluation activities.

The lack of empirical independence among the job dimensions is consistent with recent factor analytic studies which have demonstrated that the JDS scale items sometimes collapse empirically to form two, three or four job dimensions (Dunham, 1976; Dunham, Aldag, & Brief, 1977). Differences in the dimensionality of the job characteristics seem to depend upon the nature of the sample investigated. However, the specific sample characteristics responsible for dimensionality differences have not as yet been established.

The changing dimensionality of job characteristics has implications for the MPS measure. If a five factor solution to the core job dimensions is obtained for a given sample, it is then appropriate to form the multiplicative MPS score--since the calculation of MPS assumes the five dimensions are empirically distinct. However, if correlations among the job characteristic scales indicate that there may be fewer than five empirically independent dimensions, forming and using a multiplicative MPS score may be inappropriate. In this situation, it may be wise to simply add the five core dimension scores to form a summary index. Regardless of the dimensionality of the job characteristics, the additive measure has been found to be

just as effective as the MPS index (or more so) in predicting personal and work outcomes (Hackman and Oldham, 1976; Umstot et al., 1976).

Means and standard deviations of the JDS scales were provided for a number of categories of organizational, job, and employee properties. These means and standard deviations can be used by practitioners to determine if a target job's characteristics are out of line with the appropriate norms. All that is required is that the investigator obtain scores for the target job's characteristics—by averaging the JDS scores for all job incumbents. These scores are then compared with the appropriate norms provided in this report. If the target job's scores are less than one standard deviation away from the normative mean, this suggests that there is an insignificant difference between the two scores. If the target score is (plus or minus) two or more standard deviations from the focal norm, it suggests that the target job is quite discrepant from the normative base. For example, assume that a target job in an urban organization has a skill variety score of 2.10. Consulting Table 8, it is clear that this score is more than two standard deviations away from the reported mean. This result suggests that action to improve the skill variety of the job might be appropriate.

Results also show that JDS scale scores vary substantially across the organizational, job, and employee properties. For example, jobs perceived by employees as challenging and complex (high MPS) typically were found: (a) in small organizations, (b) in organizations in which the physical facilities were dispersed throughout the region or country, (c) in organizations that were part of larger organizations, (d) for jobs high in the organizational hierarchy, (e) for non-unionized jobs, and (f) for salaried

jobs. Moreover, high MPS jobs tended to be populated by highly educated males over 40 years of age. Satisfaction and internal motivation scores often followed a pattern similar to that for the core dimension measures. Growth need strength scores differed according to geographic location of the organization, job level, payment type, employee unionization, and the sex, age, and education of the employee.

The results of this investigation suggest several ways that properties of the organization, job, and employee can influence employee outcomes, such as satisfaction and motivation. One possibility is that organization, job and demographic properties influence employee reactions through their impact on the characteristics of employees' jobs. Another possibility is that employee growth need strength and/or contextual satisfactions are affected directly by the demographic, job, and organization properties, which then influence how employees perceive their jobs. A third possibility is that job characteristics, growth need strength, and/or contextual satisfactions interact with organization, job, and employee properties to determine personal and work outcomes. For example, it might be that well-educated female employees are most satisfied when working on a complex, high MPS job in a small organization. Or specific job and organizational properties might interact with one another to determine employee outcomes and/or perceived job characteristics. These several alternatives will be explored and contrasted in a subsequent report.

Footnotes

1. The authors express their great appreciation to members of the Roy W. Walters Associates consulting firm and to other JDS users who graciously provided much of the data used in this report.
2. Aggregating individual difference measures in across-job analyses may not be conceptually appropriate, and results involving these aggregated measures should be interpreted with caution in Table 4 and in subsequent tables reporting across-job analyses.

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