THE VALIDITY OF THE JOB CHARACTERISTICS
MODEL: A REVIEW AND META-ANALYSIS

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The validity of Hackman and Oldham's Job Characteristics Model was assessed by conducting a comprehensive review of nearly 200 relevant studies on the model as well as by applying meta-analytic procedures to a large portion of the data. The evidence indicated that the available correlational results are reasonably valid in light of the issues examined. Results tended to support the multidimensionality of job characteristics, but there was less agreement on the exact number of dimensions. The corrected correlational results of the meta-analysis indicated that job characteristics related both to psychological and behavioral outcomes. Concerning psychological states, the results tended to support their mediating (e.g., intervening) role between job characteristics and personal outcomes. The pattern of correlations between the job characteristics and psychological states was less supportive of the model. Meta-analytic results demonstrated that most of the cross-study variance was due to statistical artifacts. True variance across studies was found for the job characteristics-performance relationship, however, and subsequent analyses suggested that growth-need strength moderates this relationship. Implications for potential revisions of the model and for practice are discussed.

The past decade has witnessed a substantial increase in research interest in the area of job design. Earlier work (i.e., Turner & Lawrence, 1965; Hackman & Lawler, 1971) influenced the development of a conceptual framework proposed by Hackman and Oldham (1975, 1976, 1980) that has served as the impetus for much research. Their Job Characteristics Model (JCM) argued that, essentially, enriched or complex jobs are associated with increased job satisfaction, motivation, and work performance. More specifically, they assumed that five core job characteristics (i.e., skill variety, task identity, task significance, autonomy, and feedback from job)
influence three critical psychological states (i.e., experienced meaningfulness of the work, experienced responsibility for outcomes of the work, and knowledge of the actual results of the work activities), which in turn affect work outcomes (i.e., internal work motivation, growth satisfaction, overall job satisfaction, work effectiveness, and absenteeism). Additionally, they proposed three factors (i.e., knowledge and skill growth, need strength, and context satisfaction) as moderators of both the job characteristics–critical psychological states relationships and the critical psychological states–work outcomes relationships. Finally, the model states that the five core job characteristics can be combined into a single index of motivating potential score (MPS) that reflects the overall potential of a job to influence the individual’s feelings and behaviors. The formula for the MPS is as follows:

$$MPS = \frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \times \text{Autonomy} \times \text{Job Feedback}$$

**Empirical Assessment of the Job Characteristics Model**

The principal assessment tool developed for purposes of measuring job characteristics is the Job Diagnostic Survey (JDS—Hackman & Oldham, 1974), which provides for the measurement of the five core job characteristics, the critical psychological states and work outcomes, and two of the proposed moderator variables [i.e., growth need strength (GNS) and context satisfaction].

While the JDS is the most frequently used instrument for the measurement of job characteristics, at least two other self-report questionnaires are available: The Yale Job Inventory (YJI), developed by Hackman and Lawler (1971), and the currently more popular Job Characteristics Inventory (JCI), developed by Sims, Szilagyi, and Keller (1976).

It appears that the development of the above self-rated measures for assessment of the model, as well as the existence of many other self-rated measures to assess the individual’s attitudinal response, has led researchers to rely mainly on self-rated questionnaires as the most convenient way to evaluate the various parts of the model. Therefore, most of the data from studies of job characteristics are correlational in nature, derived from a single questionnaire.

Because of the large amount of research that has been generated on the JCM, it is important to review and assess the evidence for conceptual linkages periodically. Therefore, the purpose of this study is to assess the extent to which the empirical evidence supports the JCM. A number of reviews have been published over the past decade on job characteristics research (e.g., Aldag, Barr, & Brief, 1981; Pierce & Dunham, 1976; Roberts
However, these previous reviews contain several limitations, which this study attempts to overcome. Specifically, there are three major differences between this study and previous reviews.

First, previous reviews have argued that most of the available data in the area of job design cannot serve as a valid basis for assessing the objective characteristics of a job as well as evaluating the relationships between job characteristics and individual responses. More specifically, the fact that job characteristics typically have been measured through the perceptions of job incumbents, and not through the use of more objective measures, has led to methodological concerns about (1) the construct validity of the self-report measures and (2) the interpretation of the relationships between job characteristics and the other variables of the model. Although these criticisms of self-report correlational data have received some support, (e.g., O'Reilly & Caldwell, 1979; White & Mitchell, 1979), a definite statement based on a systematic and more comprehensive analysis of the available data has not been made. This issue can be divided into three sub-issues, which are here analyzed separately:

1. To what extent are individuals' perceptions of job characteristics similar to the objective characteristics of the job?
2. To what extent do irrelevant cues (e.g., social or situational cues) influence employee job perceptions?
3. Are the perceived job characteristics–work outcomes relationships similar to or substantially different from the objective (manipulated) job characteristics–work outcomes relationships?

The analysis of the first two sub-issues refers to the construct validity of the self-report measures, while the analysis of the second and particularly the third sub-issues refers to the internal validity of the model.

Second, previous reviews have failed to conduct sufficiently comprehensive and systematic reviews and analyses of the available data concerning different aspects of the JCM. Moreover, none of these reviews has provided a comprehensive summary of the model as a whole. This study provides such a comprehensive summary of the model through the analysis of the following issues: dimensionability of job characteristics; nature of the job characteristics–work outcomes relationships; mediating effect of the critical psychological states on the job characteristics–work outcomes relationships; and influence of moderator variables in the JCM.

Third, except for three recent studies (i.e., Loher, Noe, Moeller, & Fitzgerald, 1985; Spector, 1985; Stone, 1986), all of the published reviews on job characteristics research are narrative in nature. Recently, researchers have become interested in more sophisticated review techniques, primarily because narrative reviews can lead to vague or erroneous conclusions (e.g., Cooper & Rosenthal, 1980; Jackson, 1978). This has prompted the
emergence of a set of review strategies referred to as *meta-analysis*. Meta-
alysis is considered to be less subject to distortion if, of course, it is
appropriately conducted (e.g., Hunter, Schmidt, & Jackson, 1982).

A close examination of the above three studies, all based on meta-
analytic procedures, reveals serious methodological shortcomings that can
illustrate the potential danger in relying on inappropriate analytical proce-
dures. For example, Spector (1985) combined different summary indices
of job characteristics (e.g., multiplicative and unweighted indices of job
characteristics) without differentiating among them. Similarly, Loher et
al. (1985) analyzed overall job satisfaction and growth satisfaction as one
construct instead of conducting separate analyses for each of these crite-
rria. Moreover, neither study rigorously corrected the results of observed
variance across studies' for statistical artifacts—another potential source
of erroneous conclusions. Specifically, both studies failed to correct the
observed variance for range variation, and Spector also failed to correct the
results for error of measurement in the independent and dependent vari-
ables. Stone's (1986) study was somewhat limited in scope and utilized
the Rosenthal (1978) method of combining results across studies. Thus,
his approach did not correct for statistical artifacts either.

In the present study the examination of the JCM was accomplished by
a comprehensive and systematic narrative analysis in conjunction with a
rigorous meta-analytic procedure.

*Method*

Of the seven issues investigated, the first four (i.e., the similarity be-
tween objective and perceived job characteristics, the influence of irrel-
evant cues on job perceptions, the similarity between the perceived job
characteristics—work outcomes relationships and the objective job charac-
teristics—work outcomes relationships and the dimensionality of the JDS)
were evaluated on the basis of narrative review. The relatively small num-
ber of studies and the nature of the methodological and statistical proce-
dures used to explore these issues dictated that a simple narrative aggre-
gation of results across studies be used. The other three issues (i.e., the
job characteristics—work outcomes relationships, the mediating effects of
the critical psychological states, and the influence of moderator variables)
were examined using the Hunter-Schmidt meta-analytic procedure (e.g.,
Hunter et al., 1982; Schmidt & Hunter, 1977).
Research Description

The meta-analysis was based on relevant correlational data from 76 studies. Additional studies were examined in the narrative review, bringing the total number of studies reviewed overall to nearly 200. In addition to correlational studies, research that provided factor-analytic solutions concerning the core job dimensions was also examined—thus permitting investigation of JDS dimensionality across studies.

Several additional points need to be emphasized for purposes of more completely understanding the review and meta-analysis presented:

1. The meta-analytic procedure of Hunter and Schmidt was used to control for the following statistical artifacts: sampling error, predictor and criterion unreliability, and range variation. Research has indicated that these four artifacts tend to account for most of the artifactual variation (see Pearlman, Schmidt & Hunter, 1980; Terborg, Lee, Smith, Davis, & Turbin, 1982).

2. The analysis is based primarily on published studies. A few unpublished studies familiar to the authors were also included; however, a thorough search for unpublished results was not undertaken. An argument can be made that unpublished studies differ in results from published studies. Even if that is true in some cases, Rosenthal's study (1979) appears to suggest that when the mean effect size ($r$) is moderate or even relatively weak and is based on more than just a few samples, many studies with zero effect size would be needed to invalidate the results and conclusions (see also Fisher & Gitelson, 1983).

3. Some of the studies have reported on-the-job characteristics—satisfaction relationships for high and low GNS groups but not for the combined sample. In such cases each GNS group is treated as if it were a separate study. This seems appropriate because research has shown that GNS is uncorrelated with job characteristics and affective responses (see, e.g., Loher et al., 1985; Oldham, Hackman, & Stepina, 1979).

4. Some articles on job design were based on the same data sources. Good examples (although not the only one) of this phenomenon are the four studies by Abdel-Halim (1978, 1979, 1980, 1981), all of them based fully or partially on the responses of the same 89 managerial personnel. Thus it was decided to use a given data set only once, although all of the relevant publications are listed in the References section.

5. Following Pearlman et al. (1980), it was decided to use the 90% credibility value as the estimate for the true validity coefficient in the population. That is, the estimated "true" validity coefficient above which 90% of all values in the distribution lie will be computed in each of the examined relationships.
It was also decided to adopt Pearlman et al.'s (1980) rule of thumb on how to determine the significance level of the unexplained variance across studies' correlations. According to this rule, the ratio between the unexplained variance and the observed variance should be more than .25 (in other words, the unexplained variance should be more than 25% of the total observed variance) in order for the unexplained variance to be considered significant.

6. It was decided to estimate the reliabilities of the different measures using Cronbach's (1951) coefficient alpha, which is the most popular measure, and to ignore other reliability estimation techniques, which tend to operate under different mathematical assumptions. Using all of them without differentiation might confound the analysis. Moreover, coefficient alpha seems to be most preferable because, unlike other measures (e.g., Spearman-Brown), it takes into account the effect of each item in estimating the overall reliability.

7. In order to be able to correct for range variation of a given independent variable, it is necessary to have an estimate of the population standard deviation of this variable. With regard to the JDS data, it was decided to estimate the population standard deviation of the independent variables using the data reported by Oldham, Hackman, and Stepina (1979). The data in this study were based on 6,930 employees who worked in 876 jobs in 56 organizations, and thus the study seems appropriate as an estimation of the population. Specifically, the relevant standard deviations in the present analysis, as reported by Oldham et al., are: skill variety = 1.57; task identity = 1.44; task significance = 1.25; job autonomy = 1.39; job feedback = 1.34; MPS = 69.41; simple job summation = 14.16; experienced meaningfulness = 1.14; experienced responsibility = .96; knowledge of results = 1.14.

Other statistical information on the data used for the analysis in the present study is presented in Table 1.

8. Although Hunter et al. (1982) have not limited the number of studies that can serve as a basis for meta-analysis, it was decided that there should be a minimum of three samples. Under this constraint, it was possible to analyze the relationships between the various job characteristics and the following outcomes: overall job satisfaction, growth satisfaction, internal work motivation, job performance, and absenteeism. Actually, absenteeism and performance (only as correlates of the psychological states) were the only dependent variables for which the meta-analysis was based on three samples.

9. Generally, it was possible to correct the observed mean sample correlation or the observed mean variance of a sample of correlations for the effects of error of measurement both in the independent and dependent
<table>
<thead>
<tr>
<th>Variable</th>
<th>Range of $r_{yy}$</th>
<th>Median $r_{yy}$</th>
<th>Variance of $r_{yy}$</th>
<th># of Samples</th>
<th>Median $SD$</th>
<th>Variance of $SD$</th>
<th># of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill variety</td>
<td>.20–.91</td>
<td>.69</td>
<td>.020</td>
<td>46</td>
<td>1.37</td>
<td>.063</td>
<td>33</td>
</tr>
<tr>
<td>Task identity</td>
<td>.31–.90</td>
<td>.69</td>
<td>.014</td>
<td>47</td>
<td>1.47</td>
<td>.079</td>
<td>33</td>
</tr>
<tr>
<td>Task significance</td>
<td>.38–.87</td>
<td>.67</td>
<td>.014</td>
<td>42</td>
<td>1.25</td>
<td>.099</td>
<td>33</td>
</tr>
<tr>
<td>Autonomy</td>
<td>.35–.90</td>
<td>.69</td>
<td>.011</td>
<td>48</td>
<td>1.36</td>
<td>.065</td>
<td>34</td>
</tr>
<tr>
<td>Job feedback</td>
<td>.36–.94</td>
<td>.70</td>
<td>.023</td>
<td>46</td>
<td>1.26</td>
<td>.055</td>
<td>32</td>
</tr>
<tr>
<td>Motivating potential score</td>
<td>.71–.89</td>
<td>.80</td>
<td>.007</td>
<td>2</td>
<td>57.17</td>
<td>120.96</td>
<td>18</td>
</tr>
<tr>
<td>Unweighted additive index</td>
<td>.54–.93</td>
<td>.82</td>
<td>.014</td>
<td>5</td>
<td>9.78</td>
<td>30.53</td>
<td>21</td>
</tr>
<tr>
<td>Internal work motivation</td>
<td>.63–.88</td>
<td>.73</td>
<td>.006</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall job satisfaction</td>
<td>.65–.95</td>
<td>.82</td>
<td>.006</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth satisfaction</td>
<td>.69–.95</td>
<td>.86</td>
<td>.005</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job performance</td>
<td>.78–.96</td>
<td>.85</td>
<td>.005</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experienced meaningfulness</td>
<td>.74–.81</td>
<td>.78</td>
<td>.002</td>
<td>2</td>
<td>1.09</td>
<td>.015</td>
<td>7</td>
</tr>
<tr>
<td>Experienced responsibility</td>
<td>.57–.77</td>
<td>.67</td>
<td>.020</td>
<td>2</td>
<td>.89</td>
<td>.012</td>
<td>7</td>
</tr>
<tr>
<td>Knowledge of results</td>
<td>.72–.84</td>
<td>.78</td>
<td>.007</td>
<td>2</td>
<td>1.02</td>
<td>.031</td>
<td>7</td>
</tr>
</tbody>
</table>
variables and for range variation. It was also generally possible to correct the observed variance across a sample of correlations for these three artifacts as well as for sampling error. In any of the correlational analyses where absence served as the dependent variable, however, a lack of information on the reliability of absenteeism prevented correcting for the error of measurement in the dependent variable.

10. With regard to the focal dependent variables, researchers appear to have used different measures to assess these constructs. Nevertheless, some measures have been more popular than others, as the following brief review indicates:

Overall job satisfaction was assessed in many of the studies through the 5-item measure of the JDS. Also used, however, were measures developed by Brayfield and Rothe (1951), Hackman and Lawler (1971), and Quinn and Shepard (1974).

Growth or work satisfaction was assessed primarily by four measures: the JDS growth satisfaction, the JDI work satisfaction scale (Smith, Kendall, & Hulin 1969), the MSQ work satisfaction scale (Weiss, Davis, England, & Lofquist, 1967), and the Hackman and Lawler job satisfaction scale (1971).

Internal work motivation was assessed in most of the studies by the 6-item measure of the JDS.

Work performance was assessed in most of the studies by supervisor ratings, although some studies used objective data provided by the organization.

Absenteeism was assessed by the time-lost-absence measure or by the frequency measure. In this study it was decided to combine these measures in the process of analysis. The fact that Johns (1978) and Terborg et al. (1982) found correlations of .51 and .90 respectively between the two measures of absence provides support for such an analysis.

Narrative Review Results

The results of this study are categorized and reported by the four issues investigated.

Validity of Job Characteristics Self-Report Data

Objective Versus Perceived Job Characteristics

This issue is explored through two types of analysis. The first analysis refers to whether objective changes in the job affect the perception of job characteristics in the direction of the change.
There is evidence from both laboratory and field research that objective manipulations of jobs produce changes in the perceptions of job characteristics. Terborg and Davis (1982) reported that the manipulation of job characteristics (i.e., using the JDS) produced significant changes in the perceived level of most of the core job dimensions (except task significance) in the hypothesized direction. Similarly, Farr (1976) found that people working under manipulated, highly enriched job conditions (i.e., JDS) perceived job characteristics as significantly higher than did persons in the manipulated, low job-enrichment condition. In focusing on job autonomy, Farh and Scott (1983) found that subjects working in a manipulated, high autonomy condition reported significantly higher autonomy (i.e., JDS) present in the task than did subjects working in the low autonomy condition. O'Reilly and Caldwell (1979) found that skill variety, job feedback, autonomy, task significance, and the MPS index were significantly higher in the enriched condition than in the unenriched condition, using both the JDS and the JCI to assess job characteristics. Similarly, Kim (1980), Weiss and Shaw (1979), and White and Michell (1979) found that the MPS scores (the first two studies), or the levels of the five job characteristics, were significantly higher for those who worked in the stimulating job conditions than for those who worked in unstimulating job conditions. The study by O'Connor, Arnold, and Bhagat (1981) also provides support for the convergence between objective and perceptual task characteristics.

Field studies also have tended to show the expected linkage between objective task manipulation and its perception by people. Greene (1981) found that scores on the five job characteristics (i.e., JDS) increased substantially after the manipulation. Also, most job dimension scores were significantly higher in the experimental group than in two control groups. Similarly, Orpen (1979) found that manipulating job enrichment significantly influenced the scores on skill variety, task identity, autonomy, and the MPS index. Griffin (1983) found that the objective manipulation of the task explained 42% of the variance in task variety, 53% in autonomy, 56% in feedback, and 52% in identity, using the JCI.

Several quasi-experimental studies have also provided support for the expected linkage between objective and perceived job characteristics. Specifically, the studies by Billings, Klimoski, and Breaugh (1977), Lawler, Hackman, and Kaufman (1973), and Wall and Clegg (1981) indicated that a change in job dimensions tended to change individuals’ job perceptions in the direction of the change. In two other studies (Hackman, Pearce & Wolfe, 1978; Frank & Hackman, 1975), it appears that the focal organizations failed to actually make real changes in the job—which is consistent with the fact that perceptions of job characteristics generally were not significantly different after the change.
### TABLE 2

**Average and Median Correlations Between Incumbents' Ratings and Supervisors', Peers', or Observers' Rating of Job Characteristics**

<table>
<thead>
<tr>
<th>Study</th>
<th>Simple correlations</th>
<th>Median correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algera (1983)</td>
<td>.54</td>
<td>.54</td>
</tr>
<tr>
<td>Brass (1981)</td>
<td>.79</td>
<td>.79</td>
</tr>
<tr>
<td>Brief &amp; Aldag (1978)</td>
<td>.16</td>
<td>.16</td>
</tr>
<tr>
<td>Gould (1979)</td>
<td>.48</td>
<td>.48</td>
</tr>
<tr>
<td>Griffin (1981)</td>
<td>.91</td>
<td>.91</td>
</tr>
<tr>
<td>Hackman &amp; Lawler (1971)</td>
<td>.71</td>
<td>.71</td>
</tr>
<tr>
<td>Hackman &amp; Oldham (1975)</td>
<td>.57</td>
<td>.57</td>
</tr>
<tr>
<td>Hackman et al. (1978)</td>
<td>.49</td>
<td>.49</td>
</tr>
<tr>
<td>Jenkins et al. (1975)</td>
<td>.33</td>
<td>.33</td>
</tr>
<tr>
<td>Oldham (1976)</td>
<td>.50</td>
<td>.50</td>
</tr>
<tr>
<td>Oldham et al. (1976)</td>
<td>.85</td>
<td>.85</td>
</tr>
<tr>
<td>Stone (1975)</td>
<td>.63</td>
<td>.63</td>
</tr>
<tr>
<td>Stone &amp; Porter (1975)</td>
<td>.76</td>
<td>.76</td>
</tr>
<tr>
<td>Stone (1976)</td>
<td>.80</td>
<td>.80</td>
</tr>
<tr>
<td>Stone &amp; Porter (1978)</td>
<td>.56</td>
<td>.56</td>
</tr>
</tbody>
</table>

*a Median of simple correlations = .63
*b Median of median correlations = .56; Median for JDS studies only = .54

A second means of evaluating the level of accuracy of incumbents' job ratings might be to compare their ratings with those of peers, supervisors, or observers. It is true that using the ratings of others as criteria for the validity or accuracy of incumbents’ ratings might be challenged because those ratings are vulnerable to human error. Despite this legitimate concern (which will be discussed more later on), it seems that the job perceptions of others might represent useful ratings because of the others' lower personal interest and involvement.

The literature, as can be seen in Table 2, shows moderate to good overlap between ratings of job characteristics made by incumbents and those made by others. Additional support for this similarity in job rating is provided by Pokorney, Gilmore, and Beehr (1980). They found the factor structures of the job characteristics as measured by the JDS and the Job Rating Form generally to be similar to each other. One could further expect that the correlations between incumbents’ ratings and others’ rating of incumbents’ level of job characteristics probably would have been higher if these correlations had been corrected for error of measurement and range variation. Unfortunately, it was not possible to compute these correlations because of lack of sufficient information in the literature.

**Irrelevant Cues and Job Perceptions**

Several studies indicated that social cues tend to affect the perception of job characteristics at work (Ferris, 1983; Ferris, Fedor, Rowland, & Porac, 1985; Ferris & Mitchell, in press; Griffin, 1983; O'Connor & Barrett, 1980; O'Reilly & Caldwell, 1979; Weiss & Shaw, 1979; White & Mitchell, 1979).
O'Reilly, Parlette, and Bloom (1980) further indicated that personal factors such as age, income, tenure in the unit, father's income, education, or attitudes toward one's profession affect how employees perceive their task characteristics. In another study, Caldwell and O'Reilly (1982) indicated that level of job satisfaction also affects perceptions of job characteristics. These results led the researchers to conclude that perceptions of task characteristics vary with the employee's frame of reference and job attitudes. However, the effect of these cues does not exclude the potential influence of objective characteristics of the job (Griffin, 1983; O'Connor & Barrett, 1980).

Recent studies conducted in the field appear to suggest that the perception of job characteristics is largely unaffected by irrelevant cues such as the above (see Gerhart, 1986; Glick, Jenkins, & Gupta, 1986; James & Tetrick, 1986; Taber, Beehr, & Walsh, 1985). Two of these studies have used competitive tests of alternative models of the relationships between job characteristics and attitudinal measures. Specifically, James and Tetrick (1986) reported that confirmatory analyses supported the postcognitive model, in which job satisfaction occurs after job perceptions in the causal order—although, they also found that the two variables demonstrated evidence of being reciprocally related. Glick, Jenkins, and Gupta (1986) concluded, after comparing five alternative models, that even though method variance can influence the magnitude of obtained relationships, "job characteristics and outcomes are related to each other independent of method effects" (p 456). Gerhart (1986) reported that incumbent-based perceived job complexity is moderately related to an alternative measure (derived from the fourth edition of the Dictionary of Occupational Titles), which is based on judgments of trained occupational analysts. Moreover, discriminant validity was assessed by exploring the association between the perceived measure of job complexity and various individual and situational variables (e.g., education, pay), controlling for complexity. The evidence provides support for discriminant validity. Finally, Taber et al. (1985) found that employees' perceptions of job characteristics were associated with the jobs' skills requirements, based on the company job evaluation system, while being unrelated to the physical demands of the jobs or to the environmental conditions of the work.

Some scholars, such as Salancik and Pfeffer (1977, 1978), have also suggested that the order in which parts of the questionnaire are administered has a significant effect on subjects' responses. However, this potential problem has not been demonstrated in the empirical literature. Studies have indicated both in field research (Arnold & House, 1980; Brief & Aldag, 1977; Spector & Michaels, 1983) and in laboratory experiments (O'Reilly & Caldwell, 1979; Stone & Gueutal, 1984; Terborg & Davis 1982) that varying the order of questions does not influence subjects' responses.
Objective and Perceived Job Characteristics–Work Outcomes Relationships

In order to examine this issue as fully as possible, the research in two areas will be examined. Presented first is a review of the literature examining differences in job characteristics–work outcomes relationships when tasks are rated by job incumbents, peers, or supervisors. Following is an investigation of the differences and similarities between objective (manipulated) job characteristics–work outcomes relationships and perceived job characteristics–outcomes relationships.

In the first area, Kiggundu (1980) found that the median correlation of core job dimensions with job satisfaction, internal work motivation, job involvement, growth satisfaction, and propensity to leave was .31 when the JDS was completed by incumbents, .14 when the JDS was rated by supervisors, and .17 when peers served as raters. Stone and Porter (1978) reported a correlation of .54 between job scope and work satisfaction when incumbents rated the tasks, .77 when peers rated the task, and .71 when supervisors rated the tasks, using a measure of job characteristics developed by Stone. Using the JDS, Oldham, Hackman, & Pearce (1976) found that the correlations between MPS and performance effectiveness, internal work motivation, and salary corrected for tenure were .16, .36, and .22 respectively when MPS was rated by incumbents, and .23, .37, and .40 respectively when MPS was rated by supervisors. Employing a measure of job characteristics other than the JDS or JCI, Algera (1983) found similarity in the patterns of correlations among 24 task characteristics and 17 dependent variables when task characteristics were rated by task performers and when task characteristics were rated by nontask performers. Jenkins, Glick, and Gupta (1983) found through confirmatory factor analysis that both observers' and incumbents' ratings of job characteristics (i.e., Hackman & Lawlers', 1971, measure) demonstrated similar relationships with incumbents' overall job satisfaction and perceived effort at work. In contrast to these five studies, Brief and Aldag (1978), using the JCI, failed to find similarities between the pattern of correlations between job characteristics and job satisfaction supplied by supervisors and the pattern supplied by incumbents. As a single example, however, this study does not seem to challenge the consistent picture provided by the other five studies. Overall, these studies demonstrate a trend toward similarity in the relationships of incumbents' job ratings and others' job ratings to potential criterion variables. It is true that there have been some differences in the magnitude of correlations between job characteristics and outcomes when job characteristics were rated by incumbents rather than others. However, these differences in magnitude have not been shown to be systematically biased against or in favor of any specific groups of raters or any specific set of correlations and, thus, do not seem to challenge the conclusion.
Other studies have compared the effects of objective manipulation of job characteristics versus perceived job characteristics on attitudinal outcomes. In a field experiment, Orpen (1979) found that the objective manipulation of job enrichment (based on the JDS dimensions) significantly influenced the level of subjects' job satisfaction, job involvement, and intrinsic satisfaction. Similarly, perceived job characteristics were related to those outcomes. Umstot, Bell, and Mitchell (1976), in a laboratory experiment, reported that the objective manipulation of job characteristics and the perceived measure of the MPS respectively controlled 18% and 50% of the variance of work (growth) satisfaction. In a similar study, Ganster (1979) found that the objective manipulation of job conditions and perceived job characteristics (consisting of items from the JDS and JCI) accounted respectively for 58% and 71% of the variance in work satisfaction. These studies imply similar directions for the relationship of objective task manipulation and incumbents' task ratings to outcomes. However, a question might be raised in regard to the differences in magnitude of results in both of the studies cited, where perceived job characteristics accounted for substantially more variance in work satisfaction than did the objective task manipulation. A possible answer might be that these differences were largely related to a statistical artifact, restriction of variance in the measure of objective manipulation compared to greater potential variation in the measure of perceived job characteristics. It is also possible that the differences resulted from method variance inflating the obtained relationship between perceived job characteristics and outcomes. Several other studies have provided data supporting the impact of objective manipulation or objective rating of job characteristics on attitudinal responses (Griffin 1983; O'Reilly & Caldwell, 1979), behavioral responses regarding productivity, absenteeism, and turnover (Locke, Sirota, & Wolfson, 1976), and both affective and behavioral outcomes (Johns, 1978; Wall & Clegg, 1981).

The analysis of the foregoing issues appears to suggest that the problems potentially associated with self-rated data are less serious than initially believed. That is, although the evidence suggests that one should be concerned with various methodological problems when interpreting self-report data in the area of job design, the present review seems to increase the confidence in the substance of this data.

**Dimensionality of the Core Job Dimensions**

Eighteen studies have examined the dimensionality of the JDS, and the results indicate inconsistent factor solutions. Specifically, Abdel-Halim (1978), Brass (1979), Dunham, Aldag, and Brief (1977—in part of 20 examined samples), Ferrat and Reeve (1977), Ivancevich (1978), Katz (1978a), and Lee and Klein (1982) confirmed in their empirical studies
the a priori five scales of the JDS. In contrast, Champoux (1978), Dunham (1976), Dunham et al., (1977— in part of the examined 20 samples in the study), Fried and Ferris (1986— in part of the nine examined samples), Gaines and Jermier (1983), O'Reilly et al. (1980), Pierce and Dunham (1978), Pokorney et al. (1980), Rousseau (1977), and Sekaran and Trafton (1978) failed to support the a priori scales of the JDS. The Harvey, Billings, and Nilan (1985) and Idaszak and Drasgow (1987) studies both examined factor solutions of the JDS, but they represent methodological critiques as well. That is, both suggested that negatively worded items introduced additional variance not shared in common with the proposed JDS structure.

The general trend of the factor solutions in the above studies tends to support the conclusion of Dunham et al. (1977), that “some sort of multidimensional solution appears to be most appropriate” (p.222). However, those studies that failed to support the model tend to suggest smaller numbers of dimensions than are predicted by the model. Moreover they suggest that skill variety, task significance, and job autonomy might be part of one dimension because of high possible cross-factor loadings among the items of these dimensions (see Champoux, 1978; Dunham, 1976; Dunham et al., 1977; Fried & Ferris, 1986).

Meta-analytic Results

Job Characteristics–Work Outcomes Relationships

As can be seen in Table 3 (last column), the job characteristics measured by the JDS tend to show moderate to strong relationships with psychological (personal) outcomes. A comparison among the five job characteristics as to their relationships with a focal psychological outcome reveals that, after corrections for error of measurement and range variation, job feedback appears to have the strongest relationship with overall job satisfaction; autonomy is most strongly related to growth satisfaction; and skill variety has the strongest relationship with internal work motivation.

As indicated in Tables 3 and 4, the examined job characteristics appear to show much weaker (although meaningful) relationships with the behavioral measures of job performance and absenteeism. Specifically, after the corrections for statistical artifacts, task identity appears to show the strongest relationship with performance (90% credibility value of .13) followed by job feedback (90% credibility value of .09). In comparison, the results indicate a relatively stronger relationship between job characteristics and absenteeism. Despite the fact that it was not possible to correct the observed frequency mean correlation between the individual job
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*Results for overall job satisfaction.
*Results for growth satisfaction.
*Results for internal work motivation.
*Results for job performance.
TABLE 4
Information on JDS Job Characteristics as Correlates of Absenteeism and Psychological States

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*Results for absenteeism.
*bResults for experienced meaningfulness.
*cResults for experienced responsibility.
*dResults for knowledge of results.
dimensions and absence for error of measurement in the dependent variable (absence), the 90% credibility values for the correlations of autonomy and job feedback with absenteeism are −.29 and −.19 respectively. Skill variety is another job characteristic that appears to exhibit a relatively strong relationship with absence (90% credibility value of −.24). If this finding is examined using regression analysis, however, the tendency toward relatively high cross-factor loadings between the items of skill variety and autonomy might imply that it is largely artificial. Tables 3 and 4 further indicate that the MPS, as a summary index of the individual job characteristics, has demonstrated stronger relationships with the psychological states and work outcomes than have any of the individual job dimensions. In regard to performance, however, job feedback shows a similar relationship and task identity a stronger relationship with this outcome, in comparison to the MPS. One possible explanation for this unexpected result is methodological in nature. That is, the number of correlational studies on the MPS–performance relationship that were based on active manipulation of the job characteristics appears to be higher than the number of such manipulative studies in the group of investigations that have focused on individual job characteristics–performance relationship. Correlational results provided by the manipulative studies were shown to be noticeably less consistent than correlational results provided by nonmanipulative studies. That is, the sign of the relationship between the examined job characteristics and performance in the manipulative studies appears to be at times negative and at times positive. This, in turn, is expected to increase the level of the unexplained variance and, consequently, to reduce the 90% credibility value (see, e.g., Pearlman et al., 1980). In our case, the above was expected to occur in particular with respect to the MPS–performance relationship because these findings rely heavily on manipulative studies. A reanalysis of the data after the removal of the manipulative studies (i.e., 10 samples instead of 13) showed the 90% credibility value of the MPS–performance relationship to be .23. This coefficient appears to be higher than any of the other estimated true coefficients of the individual job characteristics with performance, regardless of whether results were cumulated across the total number of available studies or just across those studies that were not based on interventions.

A related issue is the question whether the MPS is a better summary index of the core job dimensions than a simple additive index. A comparison between the two (Table 3) shows that the simple additive job-complexity index tends to have stronger relationships with psychological outcomes and performance. It should be noted, however, that the difference between the two indexes in regard to their relations with performance can be reduced substantially if one excludes those data based on interventions. In this case, as was stated above, the estimated true validity of MPS with performance
was .23. Such a comparison between the two indexes in regard to performance seems to be a more valid one because of the fact that all of the data on the simple additive job summation–performance relationships were collected with no manipulation of variables occurring during the research.

Psychological States as Mediators of the Job Characteristics–Work Outcomes Relationships

Only a few studies (i.e., Arnold & House, 1980; Hackman & Oldham, 1976; Wall, Clegg, & Jackson, 1978) have focused directly on the issue of whether the psychological states mediate the relationships between the core job dimensions and criterion variables. The results of these studies are inconclusive, probably because of the different statistical methods used. Between three and five studies have provided indirect information on this topic through correlational data on the relationships between psychological states and work outcomes. Although bivariate correlational analysis cannot provide a specific test of the mediating hypothesis and is less appropriate than other more sophisticated statistical techniques, one cannot ignore such suggestive information. Basically, the JCM suggests that (1) the correlations between the specified core job dimensions and their specified psychological states will be substantially higher than the correlations between core job dimensions and unspecified psychological states and (2) the correlations between the psychological states and outcomes will be substantially higher than the correlations between the core job dimensions and these outcomes.

With regard to the relationships between the core job characteristics and the critical psychological states, the results seem to provide only partial support for the theory. Specifically, the corrected correlational data (as shown in Table 4) fail to provide support for the theory by showing that the relationship of job feedback to its psychological state, knowledge of results, was similar to its relationships to the other two unspecified psychological states (i.e., experienced meaningfulness and experienced responsibility).

Experienced responsibility and, in part, experienced meaningfulness, appear also to have mixed relationships with their specified and unspecified job dimensions. Specifically, job autonomy demonstrated the same level of association with both experienced meaningfulness and experienced responsibility. In a similar manner, task identity showed a stronger relationship with experienced responsibility than with experienced meaningfulness or knowledge of results. In contrast, skill variety and task significance appear to support the theory by showing stronger relationships with experienced meaningfulness than with the other two psychological states.

The differences among knowledge of results, experienced meaningfulness, and experienced responsibility in their relationships with the core job
dimensions can be explored from a different perspective by comparing the correlations of each of the five core job dimensions with a focal psychological state. This analysis tends to support the idea that knowledge of results is related mainly to its specified dimension (i.e., job feedback), whereas experienced meaningfulness and experienced responsibility tend to relate also to unspecified job dimensions. More specifically, the results indicate that the average correlation between knowledge of results and job feedback (90% credibility value of .58) is noticeably higher than the estimated coefficient between this psychological state and any of the other four job dimensions. In contrast, experienced meaningfulness related highly to skill variety and task significance. Unlike the prediction of the model, however, this psychological state does not tend to relate highly to task identity, whereas it does show unexpectedly high average correlations with job autonomy and job feedback. Similarly, experienced responsibility exhibits a high average correlation not just with its specific dimension (i.e., job autonomy), but also with the remaining four core job dimensions. Note that, as was stated before, part of these confounded results might be due to possible dimensional overlap of skill variety, task significance, and autonomy. Even if this is so, however, it cannot explain the unpredicted tendency for there to be relationships between the psychological states, experienced meaningfulness and experienced responsibility, and the job characteristics, task identity and job feedback.

The results also support the idea that the relationships between the psychological states and psychological (personal) outcomes are stronger than the relationships between the core job dimensions and those outcomes. Specifically, the corrected correlational data reveal that each of the three psychological states exhibits a noticeably stronger correlation with overall job satisfaction than do any of the core job dimensions, and that two out of the three psychological states (experienced meaningfulness and experienced responsibility) show noticeably stronger correlations with growth satisfaction and internal work motivation than do any of the individual job characteristics. Experienced meaningfulness also demonstrates stronger relationships with all of the above personal outcomes than did the MPS, whereas experienced responsibility demonstrated stronger relationships with overall job satisfaction and internal work motivation than did than the MPS.

In contrast to the model’s prediction, however, the relationships between the critical psychological states and performance appear to be negligible in comparison to the relationships between job characteristics and this outcome. Thus, whereas task identity, job feedback, MPS, and the simple job summation show meaningful relations with work performance, experienced meaningfulness and experienced responsibility appear to show no relationships, and knowledge of results indicates a very low association.
The question of whether all three psychological states are necessary to maximize prediction of outcomes was examined only by two studies (Arnold & House, 1980; Hackman & Oldham, 1976), and they reported contradictory results. More research is clearly needed in order to conclude on this issue.

**Moderating Effects on the Examined Relationships of the Model**

As in Hunter et al. (1982), the question of whether the observed variance across correlations represented true variance across studies' results or whether this observed variance was due to sampling error, error of measurement in the independent and dependent variables, and range variation was examined. As stated previously, if the potential artifacts do not account for at least 75% of the observed variance in results across studies, the remaining unexplained variance is considered to be true variation, suggesting that there may be moderator variables that account for it.

Tables 3 and 4 contain the information necessary for examining this issue. The results indicate that the effects of potential moderators should be explored with regard to the relationships of both skill variety and autonomy to overall job satisfaction, and also the relationships of absenteeism to both task identity and task significance. It appears, however, that only in the case of job performance is there consistent statistical legitimacy for examining moderating influences. More specifically, it can be seen in Table 3 that the ratio scores between the unexplained variance and the observed variance are substantially higher than .25 in the cases of task significance, job feedback, MPS, and knowledge of results, and in the cases of autonomy, experienced meaningfulness, and experienced responsibility, the ratio scores are even greater than or equal to one. The reason these scores are greater than or equal to one seems to be that the correlations of performance with task significance, job feedback, MPS, and knowledge of results tend to be both positive and negative. Because the corrections of the observed variance due to error of measurement and range variation tend to increase the absolute values of the coefficients, and because coefficients between these focal variables and performance have been shown to be both positive and negative, the unexplained variance in these cases is equal to or greater than the observed variance.

Except for Arnold and House (1980) and Hackman and Oldham (1976), who examined the moderating effect of GNS on the psychological states-job performance relationships, none of the studies in the literature have examined the effects of this or any other potential moderator on the psychological states-performance relationships. However, five studies have examined the moderating effect of GNS on the MPS-performance relationships, all using subgroup correlational analysis.
TABLE 5
Moderating Effect of GNS on MPS—Performance Relationship

<table>
<thead>
<tr>
<th>Study</th>
<th>Grouping</th>
<th>Low GNS</th>
<th>High GNS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>r</td>
</tr>
<tr>
<td>Hackman &amp; Oldham (1976)</td>
<td>Quartiles</td>
<td>186</td>
<td>.20</td>
</tr>
<tr>
<td>Hackman et al. (1978)</td>
<td>Thirds</td>
<td>16</td>
<td>.49</td>
</tr>
<tr>
<td>Oldham et al. (1976)</td>
<td>Quartiles</td>
<td>49</td>
<td>.00</td>
</tr>
<tr>
<td>Orpen (1979)</td>
<td>Quartiles</td>
<td>18</td>
<td>.01</td>
</tr>
<tr>
<td>Umstot et al. (1976)</td>
<td>Thirds</td>
<td>12</td>
<td>0.5</td>
</tr>
</tbody>
</table>

- Observed mean of sample correlations: .11, .35
- Corrected mean of sample correlations: .14, .45
- Observed variance in sample correlations: .0288, .0131
- Unexplained variance in sample correlations: .00059237, -.0005651
- 90% credibility value: .10, .45

The results concerning moderators are presented in Table 5. Note that although the model does not specify a possible effect of moderators on the direct relationship between the job characteristics and work outcomes, an examination of such an effect seems to be compatible with the model. This is because of the mediating role of the psychological states, which basically implies that the job characteristics can serve as indicators or proxies for the psychological states, as well as that job characteristics–outcomes relationships can serve as substitutes for the psychological states–outcomes relationships.

Following Hunter et al. (1982), the possible moderating effect of GNS on the MPS–job performance relationship was examined in two stages. First, the high and low GNS groups were examined for unexplained variance remaining after the removal of variance due to sampling error, range variation, and measurement error. (Note that although the literature has failed to provide the necessary information on the error of measurement and range variation for the separate subgroups, the fact that the literature has indicated that GNS is uncorrelated with job characteristics enables one to use range variation and error of measurement of the MPS in the total population in order to correct the results from the subgroups for these sources of artifacts.) The analysis indicated that the examined sources of artifacts explained all of the variance, both in the high and low GNS groups.

The lack of true variance within both the high and low GNS groups enabled further examination of whether the estimated correlations were different in the two subgroups. As hypothesized, the relationship of MPS with performance appeared to be stronger among people with high GNS than among people with low GNS. That is, the 90% credibility value between the MPS and performance was .45 in the high GNS group and .10 in the low GNS group. Few studies have examined the moderating effect of contextual satisfaction on the relationship between job characteristics and
outcomes. Thus, more research is needed in order to reach any conclusions concerning the moderating potential of contextual satisfaction. With regard to the third specified moderator, knowledge and skills, none of the available studies have examined its moderating effect on the relationships between the core job dimensions and any of the examined outcomes.

Discussion and Conclusions

The general picture that has emerged from this review and meta-analysis indicates that Hackman and Oldham's JCM has received modest support. Whereas some aspects of the model have been supported, there is some evidence that corrections or modifications are needed.

In the past several years, some criticism has emerged about several aspects of the JCM that questioned its validity (e.g., O'Brien, 1982; Roberts & Glick, 1981). Although perhaps some of the points raised have substance, this review and meta-analysis failed to support some of the more fundamental criticisms leveled at the model.

One issue that has been the target of much discussion, controversy, and criticism is the relationship between objective and perceived job characteristics. Our results by no means resolve this issue. Nevertheless, the comprehensive nature of the review does allow, perhaps in a more informed sense, for some conclusions to be drawn. The data clearly suggest that objective and perceived job characteristics are related. Thus, one might legitimately conclude that it is inappropriate to totally dismiss perceptual and correlational results as simply artifactual in nature. Because not all of the reliable variance in job perceptions is explained by objective job conditions, however, other factors (e.g., social cues, method variance, etc.) must be acknowledged as potential sources of variation. In light of the evidence to date, the most reasonable overall conclusion seems to be that both the JCM and the Social Information Processing approach to job characteristics have overstated their respective cases. The evidence suggests a blending of the two perspectives.

The results of the meta-analysis lend further support to the relationships between job characteristics and employee responses suggested by the JCM. It appears that the relationships between job characteristics and behavioral outcomes are more meaningful and more consistent than has been suggested by critics in the literature (e.g., Aldag et al., 1981). Concerning absenteeism, it should be noted that although the analysis in this study was based on only three studies, the trend of results based on these three studies was further supported by Orpen (1979) and Johns (1978). Thus, although the overall number of studies that have examined the JDS–absenteeism relationship is relatively small, the obtained results seem to support the linkage proposed by the JCM.
The relationship between job characteristics and turnover was not analyzed in this study. However, a recent meta-analysis by McEvoy and Cascio (1985) on the effects of realistic job previews versus job enrichment indicates that job enrichment interventions have modest but meaningful effects on turnover and that they are about twice as effective at reducing turnover as realistic job previews. Two recent field studies by Oldham, Kulik, Ambrose, Stepina, and Brand (1986) and Wall and Clegg (1981) appear to provide additional support for job-enrichment influences on turnover.

With regard to performance, the results indicate that task identity, in comparison to the other measured job characteristics, shows the highest relationship with work performance. The JDS job feedback, MPS, and in particular, the unweighted additive summation were also found to be associated with performance. Although the estimated relationships of task identity, job feedback, and MPS to performance are not high in reference to absolute value, one should recall that the 90% credibility value used in this study is a conservative estimate of the true validity (e.g., Pearlman et al., 1980). Also, it might be that the estimated effect of job characteristics on performance in the total population was artificially reduced due to methodological problems associated with the research design. That is, the estimated association between MPS and performance was significantly higher when the data included only nonmanipulative correlational studies than when the data also included manipulative studies. The estimated association between the unweighted additive job summation and performance appeared to be relatively high also, possibly because it was based only on nonmanipulative, correlational studies. A major problem with the manipulative studies was that they were not longitudinal, or sufficiently longitudinal in nature to assure that the involved employees would fully adjust to and understand the complexity and requirements of the job. This notion was supported by Kozlowski and Hults (1986), who showed that time is an important factor in the perceived task complexity–performance relationship.

Moreover, even if the estimated associations between job characteristics and performance in the total population are relatively low, these relationships have the potential to be meaningful. Schmidt, Pearlman, Hunter, and Shane (1979) indicated that substantial gains in productivity were likely to occur even if test validity were low.

Perhaps most important, the results of this study indicate that the effects of job characteristics on work performance vary as a function of individual or situational differences. This further suggests that analyses of the job characteristics–performance relationships in different circumstances or different subgroups in the population would provide more valid and accurate results than an analysis based on the total population. For example, we
found that although the estimated association between MPS and performance among the low GNS people appeared to be only .10, the estimated association between these variables among the high GNS people was .45, which implied an estimated common variance of .20.

A comparison of the relationships of the examined job characteristics to the psychological versus the behavioral outcomes raises an interesting question. One might question why job characteristics relate more strongly to psychological than to behavioral outcomes. One partial explanation for the stronger relationships found between job characteristics and psychological outcomes than between job characteristics and behavioral outcomes is common method variance, because in most studies both sets of variables are measured with a single questionnaire. However, one might propose another possible explanation for such results as a function of contextual factors both inside and outside the organization. There seems to be a high potential for job characteristics to influence psychological outcomes, whereas it could be argued that contextual factors such as economic conditions, marital status, performance norms of peer groups at work, and so forth could substantially influence the relationship between job factors and behavioral outcomes (cf., Stone, 1986).

Two recent meta-analytic studies provided support for this notion of a low relationship between an individual’s internal feelings and his or her behavior at work. Specifically, Iaffaldano and Muchinsky (1985) and Hackett and Guion (1985) indicated that various facets of satisfaction at work were not related or only weakly related to both performance (the first study) and absenteeism (the second study).

Our meta-analysis, however, appears to support the proposed mediating effects of critical psychological states on the relationship between job characteristics and psychological outcomes. Results indicated that core job dimensions were highly correlated with psychological states, whereas generally the psychological states exhibited substantially stronger correlations with the psychological outcomes than did the core job characteristics.

Roberts and Glick (1981) indicated that similarity in the wording of items in the JDS was particularly strong with respect to the job characteristics and critical psychological states items. If this is so, the method variance explanation would suggest that stronger relationships would be obtained between job characteristics and critical psychological states than between critical psychological states and psychological/personal outcomes. Our results not only do not support this perspective, they provide evidence to suggest that the psychological states–outcomes relationships are stronger. Moreover, there is no rationale for the notion that common variance shared between psychological states and outcomes would be stronger than the common method variance between job characteristics and outcomes. Yet, these results suggest that the correlations between critical psychological
states and psychological outcomes are generally much stronger than the job characteristics—psychological outcomes relationships, as articulated by the JCM. Thus, the correlational data on the mediating effects of the psychological states seem to provide additional support for the notion that common method variance in the job characteristics research has less effect than was previously assumed.

It appears, however, that the results fail to support the mediating effect of the core psychological states on the job characteristics—work performance relationships. This might suggest that there are possibly other psychological states unspecified by the model that mediate the relationships between job characteristics and performance. Another possibility is that work performance is affected mainly by organizational motivators associated with the job. For example, higher level of job complexity tends to be linked with higher organizational pressure for quality work or higher compensation potential. Finally, the very nature of job characteristics might have a direct effect on individual performance.

Another issue examined in this study was the dimensionality of job characteristics. The review results tend to confirm the model’s assumption concerning the multidimensionality of the job. Yet, there are a number of studies that failed to support the five a priori dimensions predicted by the model. Three recent studies suggest some possible explanations for the obtained inconsistency across factor results. Fried and Ferris (1986) found in a study based on 6,930 employees across 876 jobs that only management and staff, young workers, and educated workers produced five-factor solutions as the model predicts. In contrast, nonmanagers, older people, and less-educated employees failed to produce the predicted five-factor solutions. The fact that the research examined in the present review was conducted within jobs or across a relatively restricted range of jobs might suggest that these studies produced different factor solutions on the basis of the unique characteristics of their samples.

An additional reason for the inconsistent factor solutions across studies might be methodological in nature. Idaszak and Drasgow (1987) suggested that the fact that one of every three items that measure each job dimension in the JDS is reverse scored might affect people’s trend of response. When these reverse items were rewritten to match the scoring pattern of the other items, the respondents appeared to produce the a priori five job dimensions. Similarly, Harvey et al. (1985) indicated that the negatively worded items in the JDS had less variance in common with the underlying JDS factors than the positively worded items.

The model also appears to be supported with regard to the proposal that MPS, as a multiplicative summary index of the five core job dimensions, is a better predictor of the dependent variables than is any of the individual job dimensions alone. However, a simple additive index was found to be
a better predictor of outcomes than the MPS. This might imply a need for revision of the model, suggesting an additive index of job complexity rather than a multiplicative combinatorial strategy. Ferris and Gilmore (1985) recently examined three different job complexity combinatorial strategies and their relative predictive power and found that moderator effects were more likely to be detected when using the multiplicative job complexity index (i.e., MPS) than when using either an unweighted additive or a weighted additive strategy.

White (1978) has questioned the wisdom of further exploration of the effects of potential moderators in the area of job design. The meta-analytic results suggest that only when the relationships of both core job characteristics and critical psychological states to job performance were of concern was true variance across studies detected in the most clear and consistent way, and thus, that examinations of potential moderator variables were required to explain this variance in the results. With regard to some of the examined relationships, however, additional data is needed as a basis for more confident conclusions concerning when there is justification for examining the potential moderators of the job characteristics–outcomes relationships. Thus, it may be premature to suggest a definitive course of action concerning moderator variables. Nevertheless, even at this stage one can conclude that job design researchers should continue to explore the effects of potential moderators, at least with regard to some of the examined relationships where variance has been detected across numerous studies.

The following is a summary of the major findings and conclusions based on this review and meta-analysis:

1. The dimensionality of job characteristics seems to be best represented by more than one dimension, yet a number of studies have failed to support the five-factor solution proposed by the model. Recent data appear to suggest possible explanations for the obtained inconsistency in factor solutions across studies.

2. The relationships between job characteristics and psychological outcomes are generally stronger and more consistent than the relationships between job characteristics and behavioral outcomes, although the latter do exist.

3. A simple additive index of job complexity is a better predictor of work outcomes than the multiplicative MPS index.

4. The intervening effect of the psychological states is partially supported by the finding that job characteristics relate strongly to the three critical psychological states, and these states correlate more highly with psychological (personal) outcomes than do the job characteristics. However, the results fail to support the intervening effect of the psychological states on the job characteristics–work performance relationships. More adequate tests of this notion should be conducted in the future.
5. The data suggest the possibility of reducing the number of critical psychological states from three to two, integrating experienced meaningfulness and experienced responsibility into a single dimension.

6. Instead of influencing only the knowledge-of-results psychological state, job feedback seems to affect all three of the critical psychological states.

7. Moderator effects were found to be largely artifactual, although there appears to be evidence that GNS moderates the job characteristics—job performance relationship. More studies applying more adequate tests of this notion should be conducted in the future.

Implications for Practice

The foregoing findings seem to suggest some practical implications. These implications are discussed in regard to the practical implications suggested by the JCM.

The JCM has suggested that in order to improve psychological and behavioral outcomes at work, all five core job characteristics should be developed. The present results appear to suggest that although all of the five core job characteristics are associated with positive outcomes, specific outcomes are associated only or primarily with some of these job characteristics rather than with others. This further implies that different organizational goals could be operationalized through the development of specific task dimensions. In order to improve performance, the organization might choose to allocate resources for the development of task identity and job feedback. Absenteeism may be reduced through the development of skill variety, autonomy, and job feedback. Finally, attitudinal or psychological outcomes could be improved by focusing primarily on skill variety, task significance, autonomy, and job feedback. Furthermore, because job feedback is associated with all of the psychological and behavioral measures investigated, the development of this task dimension potentially could benefit the organization more than the development of any one of the remaining task dimensions.

The JCM implies that the success of a job design intervention is contingent upon both contextual factors in the work environment and job content factors—as well as whether the job characteristics meet the individual’s personal desire to grow (i.e., GNS). Our results provide partial support for this implication. Specifically, although the influence of contextual variables on the success of job design interventions has not been systematically explored, the results of this study indicate that such variables are potentially important facilitators concerning the influence of job characteristics on employee performance (not on employee satisfaction or motivation, however). This finding seems to support the claim that organizational decisions to
enrich jobs should be contingent upon whether contextual factors, such as the reward system or management policy, support such an intervention. The present results further indicate that GNS influences the relationship between job enrichment and employee performance. This finding seems to emphasize the important role that such human resource practices as selection/staffing and employee development programs might serve in improving the match between the job and the individual.

Finally, the job design literature has recognized the difficulties associated with introducing change in jobs (e.g., Hackman & Oldham, 1980). Although this issue was not directly examined in this study, the narrative review and the meta-analysis appear to indicate that weak effects of job design interventions on employee attitudes and behaviors might be due to unsuccessful implementation. A recent study by Fried and Ferris (1986) across nearly 60 organizations and 900 jobs implied that job design interventions might require different strategies of implementation, contingent upon characteristics of the employees, in order to be effective.

REFERENCES


*An asterisk denotes studies used in the meta-analysis


