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THE IMPORTANCE OF THE CRITICAL PSYCHOLOGICAL STATES IN THE JOB CHARACTERISTICS MODEL: A META-ANALYTIC AND STRUCTURAL EQUATIONS MODELING EXAMINATION

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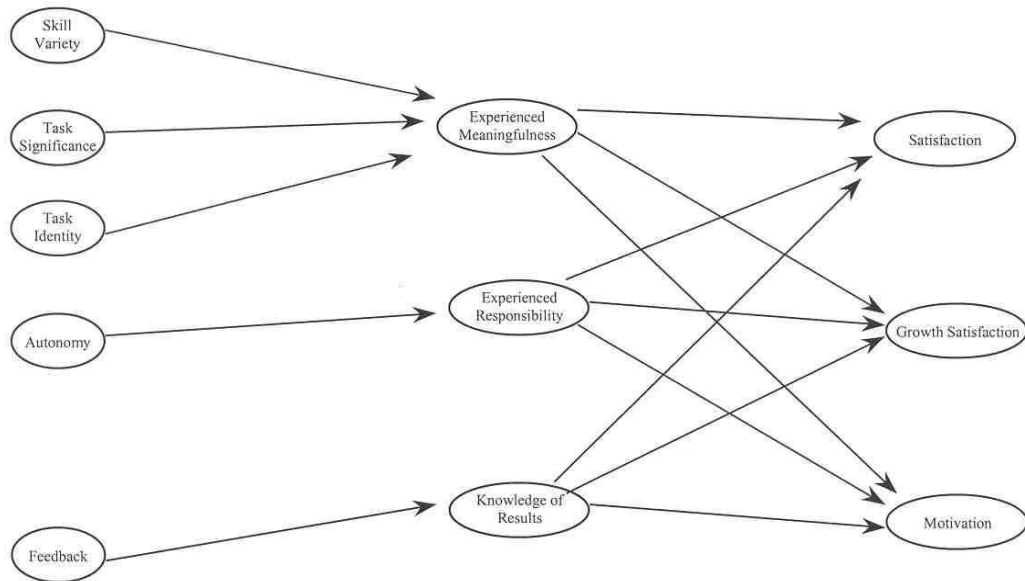
ABSTRACT

Hackman and Oldham (1976) originally proposed their Job Characteristics Theory as a three-stage model, in which a set of core job characteristics impact a number critical psychological states, which, in turn, influence a set of affective and motivational outcomes (see Figure 1). Interestingly, most subsequent research has omitted the critical psychological states, focusing, instead, on the direct impact of the core job characteristics on the outcomes (i.e., a two-stage model). Meta-analytic data from the thirteen studies that have investigated the full, three-stage Job Characteristics Model was used as input into a structural equations modeling analysis (Viswesvaran & Ones, 1995) to examine competing versions of the Job Characteristics Model and to determine the importance of the critical psychological states. Results suggest that, while the two-stage model demonstrates adequate fit to the data, information on the critical psychological states is important for both theoretical and practical reasons.

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Figure 1. Hackman & Oldham's (1976) Job Characteristics Model



RESEARCH ON THE JOB CHARACTERISTICS MODEL

Hackman and Oldham's (1975, 1976, 1980) Job Characteristics Model (JCM) is one of the most influential theories ever presented in the field of organizational psychology. It has served as the basis for scores of studies and job redesign interventions over the past two decades, and this research has been extensively reviewed (Fried & Ferris 1987; Loher, Noe, Moeller & Fitzgerald, 1985; Taber & Taylor, 1990). The majority of research has supported the validity of the JCM, although critiques and modifications have been offered (Roberts & Glick, 1981; Salancik & Pfeffer, 1978).

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Interestingly, an evaluation of the research that has been conducted on the JCM suggests that few researchers have tested the model the way in which it was originally proposed. According to Hackman and Oldham (1976, 1980), the critical psychological states (CPS) make up the "causal core of the model" and should fully mediate the effects of the core job characteristics (CJC) on relevant individual outcomes. Hackman and Oldham developed the model by identifying psychological states important for job satisfaction and motivation, and then worked backwards to identify job characteristics that could elicit these psychological states. Thus, the model is centered around the critical psychological states, and "the core job characteristics were identified to serve the critical psychological states, not the other way around" (Johns, et al., 1992, p. 658).

Although much of the earliest research into the validity of the JCM (e.g., Arnold & House, 1980; Wall, Clegg, & Jackson, 1978) explicitly examined all of the linkages within the JCM, most subsequent investigations have omitted the CPS, and have instead investigated only the direct relationships between the CJC and a number of outcomes. "One of the most critical gaps in JCM research involves how infrequently the total model has been tested . . . the rarity of studies that incorporate the mediating psychological states is remarkable" (Johns, et al., 1992, p. 658). Further, "since few studies have included the CPS, one could question whether the motivational

underpinnings of this theory have been adequately examined or represented in JCM evaluations" (Renn & Vandenberg, 1995, p. 280).

The omission of the CPS from JCM investigations could be warranted if there were theoretical or practical rationale for this practice. However, "virtually no empirical evidence has accumulated supporting the practice of excluding the CPS from tests of the theory. The practice of excluding the mediating role appears to have occurred without empirical or theoretical justification" (Renn & Vandenberg, 1995, p. 280; see also Fried & Ferris, 1987; Hogan & Martel, 1987).

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Most importantly, the omission of the CPS from empirical investigations of the JCM could lead to erroneous predictions (Fox & Feldman, 1988). For example, the fact that skill variety has been found to be positively correlated with job satisfaction could lead practicing managers to believe that satisfaction can be improved simply by increasing this CJC. However, according to the JCM, skill variety should only lead to positive outcomes to the extent that this increase results in a corresponding increase in experienced meaningfulness of the work. If an increase in variety does not result in increased feelings of meaningfulness, it is reasonable to hypothesize that this would result in a negative or non-significant change in satisfaction. The increased variety might only reflect more boring, meaningless things to do. In short, without measuring the CPS, our understanding of how CJC affect work outcomes can be incomplete or misleading. Due to the prominence of the JCM, the lack of data regarding the relationships between the CPS and the other elements of the JCM can have far-reaching consequences.

Further, this lack of available data has prevented the major meta-analytic reviews of the JCM from making definitive statements about the CPS. While Fried and Ferris (1987) included 76 studies in their meta-analysis of the JCM, they could find only eight studies that examined the entire JCM (i.e., including the CPS) and only three that tested the mediating effects of the CPS. Thus, Fried and Ferris (1987) were unable to make definitive conclusions as to the validity or importance of the CPS, although they stated in their qualitative discussion that there was suggestive evidence that the CPS are critical to the model. The Lohrer et al. (1985) meta-analysis did not address the critical psychological states at all. Rather, it focused solely on the relationships between the CJC and satisfaction. Thus, despite over two decades of active research on the JCM, there has yet to be a comprehensive statement made concerning the role of the CPS in the JCM, and there has yet to be a quantitative review of the JCM examining all the relationships within the JCM.

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Recently, however, several researchers have called for, and conducted research on, the full JCM model, with particular emphasis on the CPS. In general, these more recent studies have utilized sophisticated analytic techniques such as structural equations modeling, as opposed to bivariate correlation analysis. While the results and conclusions of these investigations have varied, there is general consensus that (a) the original JCM represents an adequate, but imperfect model, (b) the inclusion of the CPS in the investigation of the JCM explains additional variance in the

outcome measures, and (c) that the CPS may represent partial, not complete, mediators of the CJC-outcome relationships. Due to the renewed interest in examining the CPS, we feel that there are a sufficient number of studies to warrant a summary analysis. Thus, the goals of this paper are to: (a) quantitatively summarize the findings of all existing studies which have examined the complete JCM, (b) test the adequacy of the original Hackman and Oldham model against the more commonly researched two-stage model, and (c) provide evidence to judge the importance of the CPS to the JCM.

The two competing models tested in this study are: (1) The original Job Characteristics Model, as proposed by Hackman and Oldham (1976) and (2) A modified JCM in which the critical psychological states are omitted. The original model will be tested to provide a test of the adequacy of the original model among the studies that have measured the JCM in its entirety. It is expected that the original model will provide an adequate fit for the data. The modified model represents the vast majority of studies that have measured the links between CJC and outcomes, while omitting the intervening CPS. It is expected that this model will not be as adequate as the models that encompass all three stages of the JCM (Renn & Vandenberg, 1995; Hogan & Martel, 1987). Please note that moderator variables, such as Growth Need Strength, were not incorporated into the tested models. This decision is discussed later in the paper.

The present study utilizes both meta-analytic and structural equation modeling techniques (see Viswesvaran & Ones, 1995) to provide a comprehensive test of the JCM based on the collected results of past research. "Another need for future research is to continue to utilize structural equation modeling to analyze data already collected. Numerous JCM data sets have been analyzed with less sophisticated techniques; such data could be re-analyzed using causal modeling. . . . The resulting group of analyses, taken as a whole, might then be subjected to meta-analysis" (Hogan & Martel, 1987; p. 261-2).

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This approach for studying the JCM seems appropriate for several reasons (Hogan & Martel, 1987). First, structural equations modeling is appropriate for testing competing interpretations of the same model. Second, structural equations modeling can handle the simultaneous and multiple-stage nature of the mediated job characteristics model better than traditional regression analytic techniques. Further, the use of meta-analytic data also helps us avoid problems such as small sample size, low power, and homogeneous samples of jobs and organizations.

In addition, our analysis has been able to avoid the most common concerns that have been expressed regarding the use of the procedures as laid out in Viswesvaran and Ones (1995). First, the use of meta-analytic input could lead to vastly different sample sizes for each cell in the input matrix. This does not appear to be a problem for the current analysis because all values were gathered from meta-analytic samples ranging from 8,016 to 8,964 individual subjects.

Second, some are concerned that widely discrepant operationalizations could be combined as indicators of the same latent variable. All of the studies included in the meta-analysis used the measurement scales from the Job Diagnostic Survey (JDS) (see Hackman & Oldham, 1975,

1980), obviating this concern. Finally, some researchers caution that the use of these procedures could result in a correlation matrix in which there are missing values. In this analysis, there are no missing values in the meta-analytic correlation matrix.

METHOD

Relevant studies were gathered through a variety of sources: (a) a computer-based search of JCM keywords using Psychlit and Dissertation Abstracts dating back to 1976, (b) a reference list search of found articles and existing JCM meta-analyses, and (c) a hand search of five prominent organizational psychology/management journals (*Academy of Management Journal*, *Journal of Applied Psychology*, *Journal of Management*, *Organizational Behavior and Human Decision Processes/Human Performance*, and *Personnel Psychology*), from 1976 to 1998. The literature search yielded a total of thirteen independent studies appropriate for inclusion in the meta-analysis. Inclusion criteria for studies were (a) the study must contain information regarding the full JCM, including the CPS, and (b) the study must report correlations between CPS and CJC and/or outcome measures.

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Studies were divided among the three authors and coded independently. To insure reliability, articles were divided again and re-coded by a different author. Disagreements were resolved by discussion. Table 1 provides a list of all the studies included in the meta-analysis, their sample size, sample, measure used, and whether the study supports the importance of the CPS in the JCM. Please note that no study that explicitly examined the CPS found them to be entirely unimportant to the JCM model.

Table 1. Characteristics of Studies Included in the Meta-Analysis

	N	Samples	Measures	Support for CPS?
Arnold & House (1980)	120	Engineers	JDS	Did Not Test
Barnabe & Burns (1994)	247	Teachers	JDS	Yes
Becherer, Morgan, & Lawrence (1982)	211	Sales	JDS	Yes
Champoux (1991)	247	State Agency	JDS	Partial
Fox & Feldman (1988)	119	Variety of Jobs	JDS/JDI	Partial
Griffeth (1985)	76	Work Study	JDS	Did Not Test
Hackman & Oldham (1975)	658	Variety of Jobs	JDS	Partial
Hogan & Martell (1987)	208	NAVY-Variety of Jobs	JDS	Yes
Johns, Xie, & Fang (1992)	300	Managers	JDS	Yes

Kiggundu (1980)	138	Financial Company	JDS	Did Not Test
Renn & Vandenberg (1995)	188	Variety of Jobs	JDS/JDS-R	Yes
Tiegs, Tetrick, & Fried (1992)	6405	Variety of Jobs	JDS	Did Not Test
Wall, Clegg, & Jackson (1978)	47	Sales	JDS	Partial

Studies were coded for three potential moderator variables: sample type (white collar, blue collar, mixed), research design (experiment, quasi-experiment, non-experiment), and instrument used (JDS, JDS-Revised, other). The analyses for type of sample revealed no consistent pattern of differences. Analyses were not conducted for the other two variables, due to the lack of variation among primary studies.

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The meta-analytic correlations between each of the elements are displayed in Table 2. Each of the effect sizes were based upon between nine and thirteen independent samples and upon between 8,016 and 8,964 participants. The mean sample size of each of the studies included in the meta-analysis was 690 and the median sample size was 208. Effect sizes were not corrected for unreliability at this stage of the analysis. This correlation matrix was transformed into a covariance matrix using the standard deviations calculated by Oldham, Hackman, and Stepina (1979), which are based on 6,930 respondents from 876 different jobs in 56 organizations and were previously used to represent population parameters by Arnold and House (1980), Fried and Ferris (1987) and Hackman and Oldham (1980). The reader should note that the standard deviations used in this analysis are based on normative data, and were not meta-analytically derived from the included studies.

Table 2. Meta-Analytic Correlations and Mean Reliabilities

	SD	1	2	3	4	5	6	7	8	9	10	11
1. Skill Variety	1.57	.70										
2. Task Significance	1.25	.41	.59									
3. Task Identity	1.44	.22	.20	.65								
4. Autonomy	1.39	.43	.32	.32	.67							
5. Feedback	1.34	.35	.34	.26	.39	.71						
6. Experienced Meaningfulness	1.14	.46	.45	.24	.42	.38	.75					
7. Experienced Responsibility	0.96	.34	.33	.27	.39	.34	.59	.71				
8. Knowledge of Results	1.14	.16	.23	.28	.29	.49	.40	.34	.72			

9. Satisfaction	1.07	.35	.29	.22	.42	.36	.65	.49	.42	.80		
10. Growth	1.15	.50	.38	.26	.54	.44	.65	.51	.40	.69	.81	
11. Internal Satisfaction	0.77	.35	.33	.17	.30	.42	.57	.59	.25	.43	.50	.69

Note. Mean reliabilities are reported on the diagonal.

Note. All 95% confidence intervals did not include zero.

Note. Standard deviations from Oldham, Hackman & Stepina (1979)

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Next, the procedures outlined by Viswesvaran and Ones (1995) for using meta-analysis to create a covariance matrix to be used as input to a structural equations analysis were employed. The seven-step process is shown in Table 3. Similar procedures have been employed by Carson, Carson, and Rowe (1993), Horn, Caranikas-Walker, Prussia and Griffeth, (1992), and Premack and Hunter (1988), among others. Our meta-analysis is consistent with these procedures, except that (a) a LISREL 8.0 analysis was performed instead of traditional path analysis and (b) the correlations used in the analysis were not corrected for attenuation due to unreliability. This decision will be discussed later in the paper.

Table 3. Steps for Combining Psychometric Meta-Analysis and Structural Equations Modeling

<p>Measurement Model</p>	<ol style="list-style-type: none"> 1. Identify important constructs and relationships. 2. Identify different measures used to operationalize each construct. 3. Obtain all studies reporting either (a) correlations between conceptually distinct operational measures or (b) artifact information on any of the conceptually distinct operational measures (identified in step 2). 4. Conduct psychometric meta-analyses and estimate true score correlations between the measures (identified in step 2). 5. Use factor analysis to test the measurement model.
<p>Causal Model</p>	<ol style="list-style-type: none"> 6. Estimate the correlations between the constructs (forming composites for the different operationalizations of the same construct). 7. Use LISREL with the estimated true score correlations to test proposed theory.

Note. Adapted from framework presented by Viswesvaran and Ones (1995).

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For the LISREL 8.0 analyses, the parameter estimates were based on a sample covariance matrix and a maximum likelihood solution. The median sample size, 208, was used in this stage of the analysis because the χ^2 statistic is biased against large sample sizes (Jaccard & Wan, 1996).

The fit of the data to the model was assessed using several indices, including: the χ^2 statistic, the Goodness of Fit Index (GFI), the Root Mean Square Error of Approximation (RMSEA), and the Comparative Fit Index (CFI). The χ^2 statistic, and the GFI are indices of absolute fit which measure how far the model deviates from a model of perfect fit. The CFI is an index of comparative fit that measures how far a model deviates from a model of good fit. The RMSEA is a test of parsimony that takes the number of paths into account when determining fit. Model adequacy is also assessed by examining the amount of variance explained in the outcome measures and the ratio of predicted to significant paths.

The GFI, CFI, and RMSEA statistics are useful for assessing the fit of the individual models; however, they cannot be used to compare across models. The χ^2 statistic can be used to compare the relative fit of competing models, but only if these models are nested within each other. However, the two models being compared in this study are not nested. Therefore, two commonly used statistical indices, the Akaike Information Criterion (AIC) and the CIAC (an extension of the AIC, which more strongly penalizes models for lack of parsimony), were used to compare these two non-nested models on a common metric. These statistics are seen as most appropriate when comparing two non-nested models (see Lin & Dayton, 1997).

RESULTS

First, the original JCM model (Model 1) was tested (see Table 4). The fit indices for this model were: $\chi^2 (25) = 124.25, p < .05$, GFI = .91, RMSEA = .14, and CFI = .89. The CFI and GFI indicate acceptable levels of model fit, while the RMSEA and the χ^2 value are less supportive of good model fit. However, χ^2 is influenced by sample size, and the RMSEA index penalizes models for lack of parsimony. Therefore, these findings are not unexpected.

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Table 4. Results of Tests of Goodness of Fit for the Various Models

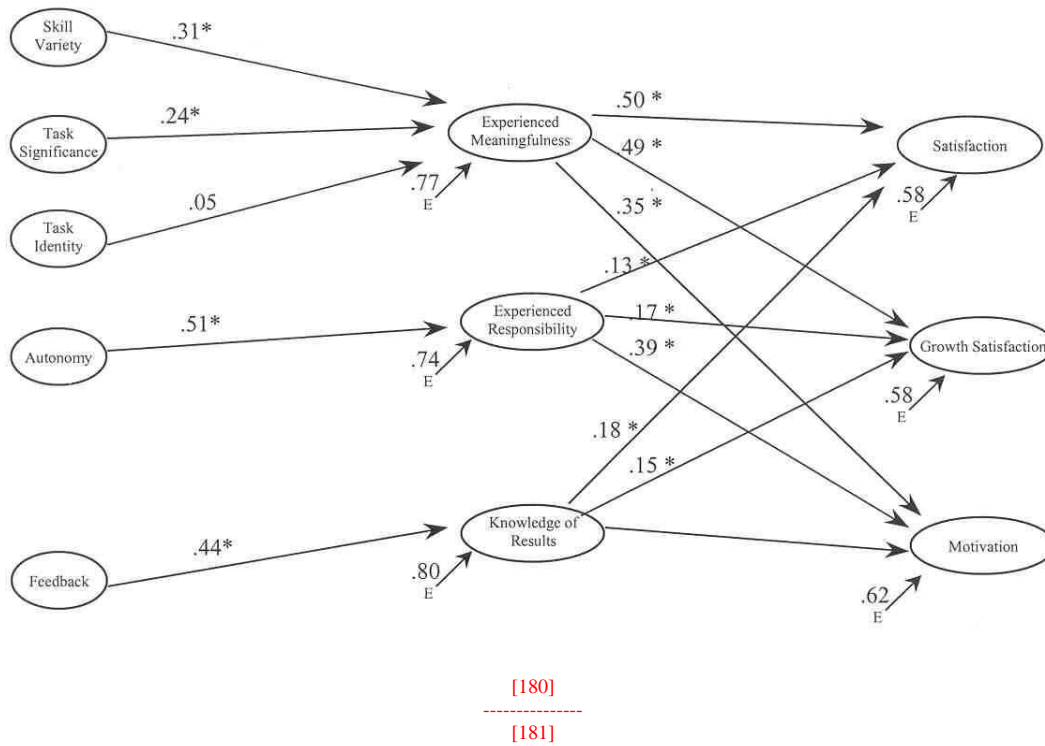
Statistic	χ^2	df	Ratio of explained paths	RMSEA	GFI	CFI	Explained variance in DV	Model AIC	Model CIAC
Rules of Thumb for "Good Fit"	ns	-	-	<.08	>.90	>.90	-	-	-
1. Original Job Characteristics Model	124.25*	25	12/14	.14	.91	.89	.42 sat. .42 growth .38 mot.	294.48	446.29

2. Normally Tested JCM (excluding CPS)	12.09*	3	7/15	.16	.99	.98	.37 sat .43 growth .32 mot	80.09	227.56
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Note. * indicates result was statistically significant at $p < .05$

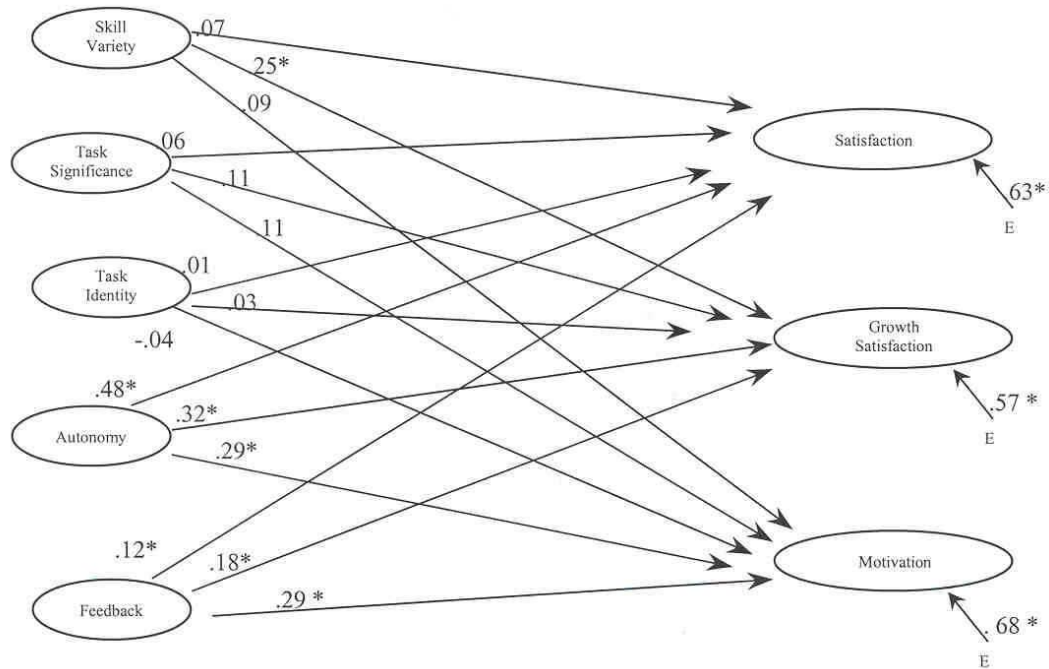
Figure 2 shows the estimates of the structural coefficients for Model 1. Standardized estimates appear on each path. Twelve of the fourteen paths in this model were statistically significant, and the variables in the model were able to account for approximately 42% of the variance in satisfaction, 42% of the variance in growth satisfaction, and 38% of the variance in motivation.

Figure 2. SEM of the Original JCM



Next, the two-stage model normally tested in the literature was explored (Model 2). The results of the goodness of fit indices were: $\chi^2(3) = 12.09$, $p < .05$, GFI = .99, RMSEA = .16, and CFI = .98. All of these values, except for the RMSEA, indicate good model fit. Seven of the fifteen paths were statistically significant in this model (see Figure 3). The model was able to account for approximately 37% of the variance in satisfaction, 43% of the variance in growth satisfaction, and 32% of the variance in motivation.

Figure 3. SEM of the JCM Normally Tested in the Literature



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In short, the original JCM can be seen to (a) explain more variance in the dependent variables, and (b) have a greater percentage of statistically significant causal pathways than the abridged version of the JCM. The two-stage JCM, however, attained greater model fit, as indicated by the GFI, CFI and chi-squared indices. Neither model showed an acceptable level of parsimony according to the RMSEA index.

Finally, in order to compare the models with a common metric, the AIC and CIAC statistics were used. When comparing two or more models, the model of best fit is the one with the lowest values (Lin & Dayton, 1997). Both the AIC and the CAIC indicate that the normally tested two-stage model demonstrates superior fit (see Table 4).

DISCUSSION

The quantitative results of this analysis suggest that the two-stage model normally tested in the literature may provide a better fit to the available data than the three-stage model originally proposed by Hackman and Oldham (1976). However, adequate comparison among competing models requires more than comparing fit ratios. The reasonableness of values contained in a model and a model's correspondence with relevant theory are equally, if not more, important. Thus, while the two stage model may result in more adequate model fit, a closer examination of the two models support, rather than refute, the contention that the CPS are indeed critical to the JCM.

Several path coefficients in Model 2 run counter to well-established theory regarding the design of work. In particular, eight of the nine paths between skill variety, task significance, and task

identity and the three outcome variables are not statistically significant (see Figure 2). In comparing these path coefficients with those of Model 1, the importance of the CPS to the JCM becomes clear. In Model 1, both skill variety and task significance demonstrate statistically significantly positive indirect relationships with the outcome variables, as mediated by experienced meaningfulness. These relationships provide evidence that, while skill variety and task significance may not be directly related to job affect and motivation, they can be important in eliciting experienced meaningfulness of the work. It is this psychological state, however, that is crucial for the beneficial outcomes of job redesign. Thus, the comparison between the path coefficients in these two competing models accentuates the importance of the CPS to job redesign. The non-significant paths in Model 2 provide evidence that increasing job characteristics may have little or no impact if the employee does not experience the CPS. This underscores the importance of the CPS as the "causal core of the model" (Hackman & Oldham, 1976, p. 255).

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Our results also lead to several other interesting observations. For instance, in both of the competing models, autonomy is the CJC with the strongest relationships with outcome variables. This finding is consistent with several recent streams of research into work motivation, including Ajzen's (1991) Theory of Planned Behavior and Deci and Ryan's Cognitive Evaluation Theory (e.g., Deci & Ryan, 1991), which stress the importance of autonomy and self-determination. Further, recent practitioner-oriented research on organizational development and change has established that allowing personal control is a key to successful change in employee attitudes, behaviors, and value orientation (e.g., Parker, Wall & Jackson, 1997).

In addition, it should be noted that neither model tested in this study demonstrated exceptional fit to the data. It was certainly expected that the JCM, in either form, would not be particularly parsimonious. However, this study does provide some suggestions for avenues of future research. In particular, research aimed at trimming the model and balancing parsimony and variance explanation concerns is clearly warranted. Again, autonomy is seen as a particularly crucial construct for this purpose.

The limitations of the present study also warrant discussion. First, the meta-analytic data was derived from only 13 primary studies, and some have argued that this relatively low k could lead to unstable meta-analytic results (Oswald & Johnson, 1998). However, this number of primary studies is not uncommonly low, given recent publications (e.g., Donovan & Radosevich, 1998). Further, our data was derived from a large number of subjects (n varied from 8,016 to 8,964) across a wide variety of occupations and job settings. Thus, one can be reasonably confident in the external validity of our results.

Another potential criticism of this research is that a large proportion of our sample was derived from one primary study (Tiegs, et al., 1992). To address this concern, we ran our analyses both with and without this study included in our sample, and found no significant differences. In fact, in comparing the two resultant correlation matrices, only one of the fifty-five pairs of correlations differed by more than .05.

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The combined use of meta-analysis and SEM is a relatively new analytic strategy. While this technique is promising, its validity hinges on a number of statistical assumptions. Efforts were made to address some commonly voiced concerns regarding this technique. However, more psychometric and simulation-based research regarding the limits and potential drawbacks of this approach is clearly needed.

In addition, we did not include any information on moderating variables, such as Growth Need Strength (GNS), in our analysis. This decision was made for several reasons, including: (a) the fact that few of the studies selected for our meta-analysis included information on GNS, (b) Tieg, Tetrick & Fried (1992) offer compelling evidence that GNS is not, in fact, a significant moderator of the relationships in the model, (c) that the analysis of the GNS moderator in the manner originally proposed by Hackman and Oldham (moderation at two stages) is troublesome and would either require the addition of 14 additional paths to Model 1 or the splitting of continuous variables into categorical ones (Jaccard & Wan, 1996), and (d) the effects of moderators are tangential to the specific purpose of the present paper.

Finally, the correlations used as input to the structural equations analysis were not corrected for unreliability at either the meta-analytic stage or the SEM stage, although techniques for such corrections are commonly employed. There were two reasons for this decision. First, research on the JCM and the JDS have long acknowledged that common method variance and multicollinearity serve to inflate the correlations among the JCM constructs (Roberts & Glick, 1981; Taber & Taylor, 1990). While unreliability serves to attenuate correlations, correcting for this attenuating effect while ignoring the factors which serve to artificially inflate variable correlations would result in biased correlations which overstate the strength of the relationships among the JCM variables. Second, when the analyses were conducted using corrected correlations as input, several statistical problems were encountered. In particular, the inflated correlations led to suppressor effects among the independent variables in Model 2 (the abridged model). This led to several statistically troubling results, including a standardized path coefficient greater than 1.0 (1.41 between autonomy and satisfaction) and negative causal paths between variables whose zero-order correlations are positive.

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Two potential causes of these suppressor effects are that the average reliabilities calculated from the primary studies were consistently lower than acceptable standards for scale reliability (along the diagonal in Table 2), and that multicollinearity may exist among the variables in the model. Our findings are consistent with Roberts and Glick's (1981) and Taber and Taylor's (1990) conclusions that the JDS is a useful, albeit limited, instrument, but that additional and alternate measures and methodologies are required in order to advance the field of job redesign. Thus, due to statistical anomalies and our desire to remain conservative in our analyses, no corrections for attenuation were made.

In sum, the central finding of the present analysis is that, while the abridged two-stage model demonstrates adequate fit, JCM researchers need to pay more attention to the CPS. The results of our meta-analysis support recent contentions that "researchers and practitioners who are interested in the impact of jobs on employees might consider measuring psychological states more often than is commonly done" (Johns, et al., 1992, p. 672). Thus, this paper contributes quantitative evidence to support those who have criticized how research has commonly been conducted on the JCM (see Fried & Ferris, 1987; Fox & Feldman, 1988; Hogan & Martel, 1987; Renn & Vandenberg, 1995).

Failure to incorporate CPS into the JCM could lead to unexpected results and misdirected organizational interventions. This classic theory is quite complex and rich, and has implications for many of the workplace change initiatives (e.g., JIT, TQM, MBO) in use in organizations today. Even though the two-stage model represents a more parsimonious model, important information may be lost if the CPS are not included.

REFERENCES

Ajzen, I. (1991). "The theory of planned behavior." *Organizational Behavior and Human Decision Processes*, 43:179-211.

Arnold, H.J. & House, R.J. (1980). "Methodological and substantive extensions to the job characteristics model of motivation." *Organizational Behavior and Human Decision Processes*, 25:161-183.

[185]

[186]

Barnabe, C. & Burns, M. (1994). "Teachers' job characteristics and motivation." *Educational Research*, 36:171-185.

Becherer, R.C., Morgan, F.W. & Richard, L.M. (1982). "The job characteristics of industrial salespeople: Relationship to motivation and satisfaction." *Journal of Marketing*, 46:125-135.

Brief, A.P. & Aldag, R.J. (1975). "Employee reactions to job characteristics: A constructive replication." *Journal of Applied Psychology*, 60:182-186.

Carson, P.P., Carson, K.D. & Roe, C.W. (1993). "Social power bases: A meta-analytic examination of interrelationships and outcomes." *Journal of Applied Social Psychology*, 23:1,150-1,169.

Champoux, J.E. (1991). "A multivariate test of the job characteristics theory of work motivation." *Journal of Organizational Behavior*, 12:431-446.

Deci, E.L. & Ryan, R.M. (1991). "Intrinsic motivation and self-determination in human behavior." In Steers, R.M. & Porter, L.W. (Eds.) *Motivation and Work Behavior, 5th Edition*. New York: McGraw-Hill, Inc., pp. 44-58.

Donovan, J.J., & Radosevich, D.J. (1998). "The moderating role of goal commitment on the goal difficulty-performance relationship: A meta-analytic review and critical reanalysis." *Journal of Applied Psychology*, 83:308-315.

Evans, M.G., Kiggundu, M.N. & House, R.J. (1979). "A partial test and extension of the job characteristics model of motivation." *Organizational Behavior and Human Performance*, 24:354-381.

Fox, S. & Feldman, G. (1988). "Attention state and critical psychological states as mediators between job dimensions and job outcomes." *Human Relations*, 41:229-245.

[186]

[187]

Fried, Y. & Ferris, G.R. (1987). "The validity of the job characteristics model: A review and meta-analysis." *Personnel Psychology*, 40:287-322.

Griffeth, R.W. (1985). "Moderation of the effects of job enrichment by participation: A longitudinal field experiment." *Organizational Behavior and Human Decision Processes*, 35:73-93.

Hackman J.R. & Oldham, G.R. (1976). "Motivation through the design of work: Test of a theory." *Organizational Behavior and Human Performance*, 16:250-279.

Hackman J.R. & Oldham, G.R. (1980). *Work Redesign*. Reading, MA: Addison-Wesley Publishing Company Inc.

Hackman J.R. & Oldham, G.R. (1975). "Development of the job diagnostic survey." *Journal of Applied Psychology*, 60:159-170.

Hogan E.L. & Martell, D.A. (1987). "A confirmatory structural equations analysis of the job characteristics model." *Organizational Behavior and Human Decision Processes*, 39:242-263.

Horn, P.W., Caranikas-Walker, F., Prussia, G.E. & Griffeth, R.E. (1992). "A meta-analytical structural equations analysis of a model of employee turnover." *Journal of Applied Psychology*, 77:890-909.

Jaccard, J. & Wan, C.K. *LISREL Approaches to Interaction Effects in Multiple Regression*. Thousand Oaks, CA: Sage Publications.

Johns, G., Xie, J.L. & Fang, Y. (1992). "Mediating and moderating effects in job design." *Journal of Management*, 18:657-676.

Kiggundu, M.N. (1980). "An empirical test of the theory of job design using multiple job ratings." *Human Relations*, 33:339-351.

Lin, T.H & Dayton, C.M. (1997). "Model selection information criteria for non-nested latent class models." *Journal of Educational and Behavioral Statistics*, 22:249-264.

[187]

[188]

Loher, B.T., Noe, R.A., Moeller, N.L. & Fitzgerald, M.P. (1985). "A meta-analysis of the relation of job characteristics and job satisfaction." *Journal of Applied Psychology*, 70:280-289.

Oldham, G.R., Hackman, J.R. & Stepina, L.P. (1979). "Norms for the Job Diagnostic Survey." *JSAS Catalog of Selected Documents in Psychology* (Ms. No. 1819), 9, 14.

Oldham, G.R. & Rotchford, N.L. (1983). "Relationships between office characteristics and employee reactions." *Administrative Science Quarterly*, 28:542-556.

Oswald, F.L. & Johnson, J.W. (1998). "On the robustness, bias, and stability of statistics from meta-analysis or correlation coefficients: Some initial monte carlo findings." *Journal of Applied Psychology*, 83:164-178.

Premack, S.L. & Hunter, J.E. (1988). "Individual unionization decisions." *Psychological Bulletin*, 103:223-234.

Renn, R.W. & Vandenberg, R.J. (1995). "The critical psychological states: An underrepresented component in job characteristics model research." *Journal of Management*, 21:279-303.

Roberts, K.H. & Glick, W. (1981). "The job characteristics approach to task design: A critical review." *Journal of Applied Psychology*, 66:193-217.

Salancik, G.R. & Pfeffer, J. (1978). "A social information processing approach to job attitudes and task design." *Administrative Science Quarterly*, 23:224-253.

Taber, T.D. & Taylor, E. (1990). "A review and evaluation of the psychometric properties of the job diagnostic survey." *Personnel Psychology*, 43:467-500.

Tiegs, R.B., Tetrick, L.E. & Fried, Y. (1992). "Growth need strength and context satisfaction and moderators of the relations of the Job Characteristics Model." *Journal of Management*, 18:575-593.

[188]

[189]

Viswesvaran, C. & Ones, D.S. (1995). "Theory testing: Combining psychometric meta-analysis and structural equations modeling." *Personnel Psychology*, 48:865-885.

Wall, T.D., Clegg, C.W. & Jackson, P.R. (1978). "An evaluation of the job characteristics model." *Journal of Occupational Psychology*, 51:183-196.

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