

The Job Characteristics Approach to Task Design: A Critical Review

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This article reviews the development of the job characteristics approach of Hackman and Lawler and of Hackman and Oldham to task design and evaluates subsequent research relevant to that model. Theoretical statements of the model are not entirely clear, and the associated empirical work frequently fails to test the relations discussed by the researchers. In addition, adequate multimethod instruments have not been developed to assess several constructs. It is suggested that future task design research would benefit considerably from attention to alternative theoretical perspectives that distinguish between situational attributes of tasks and incumbent cognitions about those attributes. Both types of task-relevant constructs are needed for a truly useful theory of task design. It is further suggested that tasks and employee responses to them be examined in the organizational contexts in which they occur.

By far the most popular approach to task design research emanates from the job characteristics model (Hackman & Lawler, 1971; Hackman & Oldham, 1975, 1976). The purposes of this article are to show that research in this area has not moved beyond an exploratory stage, to offer some possible explanations for this, and to indicate future directions task design theory and research might take. This article treats only the job characteristics approach; a review of all task design literature is beyond its scope. Like most good exploratory research, the job characteristics approach has suggested numerous relations among important variables, such as objective job characteristics, perceptions, satisfaction, turnover, needs, and so on. Important distinctions among variables, however, are frequently overlooked or weakly conceptualized.

In the job characteristics approach, three kinds of relations are often inappropriately assumed to be isomorphic: *within-person* relations, among perceptions of tasks and of

other attitudinal and behavioral characteristics of the individual; *person-situation* relations, linking independently assessed characteristics of jobs or situations with characteristics of individuals; and *situational* relations, which involve only characteristics of objective jobs or situations that are invariant across people. The task design literature often fails to maintain distinctions among these three types of relations in purported tests of person-situation hypotheses. Logical inconsistencies of this nature have limited the development of strong task design models.

A second kind of problem in this literature is that the tentative conclusions derived from early studies have not been sufficiently scrutinized over the years. Thus, this review begins by briefly reexamining these early studies. The basic tenets of the job characteristics approach are then reviewed and critiqued in light of this reexamination. Problems and contributions of current research are discussed and directions for future theoretical development and research are examined. Unfortunately, many of the problems discussed in this review also apply to other areas of organizational research. The task design literature should proceed vigorously beyond the stage of loose exploratory research.

The helpful comments of George Strauss and Bruce McCain are gratefully acknowledged.

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Work Underlying the Job Characteristics Approach

Although some of the ideas found in the job characteristics approach can be traced back as far as Karl Marx, the present review is restricted to more recent and influential works (Blood & Hulin, 1967; Hulin & Blood, 1968; Turner & Lawrence, 1965). These studies frequently have been misinterpreted in more recent task design literature. Both involve person-situation relations. In other words, in both studies attempts were made to assess the effects of objectively defined job characteristics on individual job incumbents.

Turner and Lawrence (1965) were interested in the relationship of objective task characteristics to job satisfaction and absenteeism. Although tasks were initially defined using multiple indicators for seven dimensions (motor variety, object variety, required interaction, knowledge and skill, autonomy, optional interaction, and responsibility), these task attributes were sufficiently interrelated to combine into one scale, the Requisite Task Attribute (RTA) scale (cf. Cooper, 1973). A single dimension is more parsimonious than multiple dimensions but is unlikely to capture all important differences across jobs. Further, single items that appear to be reliable and valid in relation to one of the seven task attributes may be unrelated to overall RTA. Common variance across all RTA items may merely reflect a rater halo effect. These two problems recur throughout the task design literature.

Objective task characteristics were measured with supervisory ratings for 47 job classifications in 11 companies under an assumption of homogeneity within job classifications (Turner & Lawrence, 1965). This assumption simplifies measurement of objective task characteristics, but it is only valid if the companies studied have rigorous job classification systems. Many organizations are unlikely to have carefully defined job classifications and duties.

Although the objective job was discussed as a contextual determinant of individual attitudes and behavior, individual-level job incumbent data were aggregated to the level of the job classification prior to analysis

(Turner & Lawrence, 1965). Aggregating measures of absenteeism and satisfaction inflates the absolute value of person-situation correlations (Glick, 1980). Although aggregate-level correlations were insignificant for the total sample, they were positively significant for jobs done in towns and negatively significant for jobs done in cities. Thus, a characteristic that differentiated town and city workers moderated the relations between task characteristics and worker absence and satisfaction.

In this exploratory research (Turner & Lawrence, 1965), it was suggested that religious background conditions employee responses to jobs because town settings are associated with a high incidence of Protestantism and cities with high Catholicism. Although this insightful post hoc explanation may be valid, it is an ecological fallacy (e.g., Hannan & Burstein, 1974; Robinson, 1950) to infer an individual-level person-situation relationship using aggregate-level correlations. The data are also consistent with inferences based either on cultural differences between towns and cities or on differences that are associated with the 11 non-randomly selected plants and whether they happened to be in cities or towns. Thus, additional research is needed before task design researchers may claim that individuals' religious backgrounds moderate the task-job response relation.

The impact of community characteristics on job characteristics - worker response relations was further explored by Blood and Hulin (Blood & Hulin, 1967; Hulin & Blood, 1968). Community alienation from middle-class norms, rather than the religious composition of the community, was advanced as a moderator of the job characteristics - worker response relation (Blood & Hulin, 1967). Twenty-one plants were indexed on community data thought to assess alienation, such as urbanization, slum conditions, cost of living, and so on (for discussions of these measures of alienation, see Hulin, 1973; Schuler, 1973; Shepard, 1969, 1970, 1973; Susman, 1973; Wild & Kempner, 1972). Two measures of job characteristics, job level and skill level, were apparently derived from company records. Thus, as in prior and subsequent job characteristics

research, the quality of the objective measure of job characteristics depends on the consistent classification of jobs in various plants.

In this study (Blood & Hulin, 1967), community alienation indices were negatively correlated with the within-plant correlations between job level and work satisfaction. This was interpreted as showing that individual alienation attenuates the effect of job level on work satisfaction. Unfortunately, the analyses were also compatible with several different interpretations. Community alienation may be the actual moderator of the job level – work satisfaction relationship. For example, workers in communities low on alienation may only be satisfied with high-level jobs, regardless of the individual's level of alienation. Further, the within-plant correlations between job level and work satisfaction should not be interpreted as solely due to the effect of job level on work satisfaction. The observed correlation between community alienation and the within-plant correlation may have been caused by an inverse relation of community alienation to within-plant variation in job level or work satisfaction. For example, within-plant variation in job level may be negatively associated with community alienation due to a heavy predominance of unskilled jobs in alienated communities. Within-plant variation on work satisfaction may also be negatively associated with community alienation if workers in alienated communities fraternize with their co-workers and develop common perceptions about their jobs. Unfortunately, correlations were not presented for the association between community alienation and within-plant variation in job level or work satisfaction.

Both studies described above investigated the effect of objectively defined job characteristics on individual responses to jobs. Although these studies are widely cited in the literature, the alternative interpretations suggested here have not been seriously considered. Some of the analytical and interpretational problems in these studies recur in more recent studies using the job characteristics approach. These shortcomings are quite acceptable in good exploratory research. However, alternate interpretations

of results should have been identified and addressed in subsequent research.

Developing a theory is a necessary but not a sufficient condition for moving a field beyond exploratory research. The job characteristics model (Hackman & Lawler, 1971; Hackman & Oldham, 1975) is currently the most influential theoretical statement about task design. A brief summary of the theory is presented below, followed by an examination of how the problems discussed above have been perpetuated in specification of the theory and in research stimulated by it.

The Job Characteristics Approach

The Model

Consistent with previous task design research, the job characteristics model examines individual responses to jobs as a function of job characteristics moderated by individual characteristics. In other words, the interaction of job and individual characteristics determines job responses. The model states that task characteristics – job response relations are moderated by the job incumbent's needs.

Job responses included in the theory were the typical variables usually studied by industrial/organizational psychologists—satisfaction, turnover, absenteeism, and performance. At first, four (Hackman, Lawler, 1971) and then five (Hackman & Oldham, 1974, 1975, 1976) core task characteristics were posited: variety, autonomy, task identity, feedback, and task significance. It was argued that jobs must be high on all five dimensions for positive outcomes to occur (Hackman & Lawler, 1971). However, these five dimensions were reduced to a single Motivating Potential Score (MPS), that can be moderately high despite low positive values on one or more of the five dimensions. The MPS is defined as

$$\text{MPS} = \frac{\text{Skill variety} + \text{Task identity} + \text{Task significance}}{3}$$

× Autonomy × Feedback.

Drawing loosely on expectancy theory and

Maslow's (1943) need hierarchy, an individual characteristic, higher-order growth need strength (GNS) was postulated to moderate the MPS – job response relationship. This relationship should be strong for high-GNS individuals but weak or nonsignificant for low-GNS workers. The process linking the independent and dependent variables was further explicated by specifying three intervening psychological states: experienced meaningfulness of work, experienced responsibility for outcomes, and knowledge of results.

Theoretical, Analytical, and Operational Problems

There are a number of problems with the job characteristics theoretical model and the analytical and operational strategies employed in the initial research related to it. The approach lacks consistency across the types of relations hypothesized, observed, and discussed; is ambiguous about the appropriate measurement and analyses of job characteristics; and ignores substantial common method variance among observed variables. Many of these problems were apparent in earlier research and are discussed below in hopes that future research will take the necessary remedial steps.

Inconsistencies in types of relations. The expectancy theory of motivation, on which the job characteristics model is based (Hackman & Lawler, 1971, p. 262), is currently under serious attack (Connolly, 1976; Salancik & Pfeffer, 1977; Starke & Behling, 1975). Expectancy theory, as well as the job characteristics approach, focuses on within-person relations. Neither approach adequately specifies the determinants of individual needs or perceptions of tasks. Although tasks are assumed to exist independently of the job incumbent's perceptions, situational and social influences on perceptions are merely suggested but not specified in the model. With the exception of some minor random variation, task perceptions are assumed to be equivalent to objectively defined tasks. The job characteristics approach would greatly benefit from clear specification of particular situational and social influences on task perceptions.

Social psychological theories of attitudes could contribute significantly to a theory of task design.

Person–situation relations between task characteristics and job responses were discussed as if they were interchangeable with within-person relations. Based on the observation of within-person relations between task perceptions and job responses, researchers often jumped to the conclusion that a person–situation relation also held and suggested objective job changes to change job responses. Objective job changes should not be recommended unless person–situation or situational relations are observed.

This confusion appears to be a direct consequence of the lack of a clear distinction among within-person, person–situation, and situational relations in the job characteristics model. The model is concerned with both objective and perceived job characteristics, as evidenced by the collection of independent job ratings from researchers, superiors, and job incumbents (Hackman & Lawler, 1971; Hackman & Oldham, 1974, 1975). In the early studies, moderate intercorrelations among sets of respondents were observed. However, these independent measures of tasks were dropped rather than being used to analyze person–situation relations. Nonetheless, the researchers concluded that changing objectively defined jobs should change job responses. The possible lack of homology (Hannan, 1971; Roberts, Hulin, & Rousseau, 1978) between sociological community characteristics and the psychological moderator, individual GNS, was recognized (Hackman & Lawler, 1971), but no attempt was made to compare empirically these alternative constructs. In sum, then, the job characteristics model failed to maintain the distinction between within-person and person–situation relations.

Measurement and analysis of job characteristics. Functionally speaking, the job characteristics model is useful only to individuals high on GNS. The theory makes no attempt to identify desirable task attributes for low-GNS individuals. Consistent with expectancy theory, inclusion of additional job characteristics associated with positive outcomes for low-GNS workers would im-

prove the utility and generalizability of the model. The composite measure of job characteristics, the MPS, is parsimonious but neglects important aspects of jobs such as pay, security, social status, safety, and so on, and fails to account for individual differences in valences associated with each outcome.

To assess the utility of GNS as a moderator of task-response relations, correlations between task characteristics and responses were compared for the top and bottom third of the original sample on GNS. This elimination of data reduces the generalizability of findings. Although more appropriate data analyses have appeared in the literature (Zedeck, 1971), similar data elimination has occurred in more recent task design research.

The algorithm for computing the MPS was not based on a very strong theoretical rationale. To demonstrate the validity of this strategy for combining task characteristics, the predictive utilities of five different combinations (MPS, multiplicative, additive, multiple regression, and cross-validated regression) of task characteristics were compared (Hackman & Oldham, 1976). Note, however, that the job characteristics model was not represented by any of these analyses because the moderating influence of GNS was ignored in the comparisons. No real differences were reported across combinatorial strategies in proportions of explained variation in job responses. Given the moderate intercorrelations of the five job characteristics, almost any reasonable combinatorial strategy would produce similar results (Anderson & Shanteau, 1977; Dawes, 1979; Dawes & Corrigan, 1974; Wainer, 1976; Wilks, 1938). Thus, a simple additive model (as in the RTA) would have been equally consistent with the data and more parsimonious and elegant.

Interitem scale reliabilities were presented for each of the five task dimensions. However, the MPS, not the five dimensions, was used to predict job responses. Thus, items should have been selected on the basis of MPS scale reliability. Some items are likely to be highly correlated with a single task dimension but weakly correlated with MPS.

These items primarily contribute error variance in the calculation of MPS.

Research guided by the job characteristics model is plagued with other problems that were apparent in the pioneering work of Turner and Lawrence (1965) and Blood and Hulin (1967). Existing company documents defining job classifications were accepted as valid and reliable (Hackman & Lawler, 1971; Hackman & Oldham, 1975, 1976). Individuals in the same job classification are assumed to perform the same objective tasks. More systematic assessments of each individual's job by researchers and superiors would have provided more objective evidence of homogeneity within job classifications.

Hackman and Lawler (1971) asserted that variation in the incumbent's perceptions was greater between than within job classifications. Rather than being caused by objective differences among jobs, this observation may have been caused by assignment/selection, differential turnover, social construction of task perceptions, and so on.

Common method variance. Research on within-person relations is often plagued by common method variance in independent and dependent variables. Questionnaires are frequently used for all data collection. This problem is exacerbated when questions are similarly phrased and formatted. Given the usual attempts by respondents to remain consistent in answering questionnaires, it is highly likely that some relations exist.

Job characteristics research has focused largely on within-person relations (often unwittingly) and many of its conclusions may be questioned on the basis of common method variance in independent and dependent variables. With the exception of researchers' and superiors' job ratings and a small subset of job response measures, all data used to develop the model were collected using a single questionnaire. Further, several variable sets were worded similarly, such as GNS, MPS, and psychological states. As might be expected, correlations between similarly worded variables and between variables from the single questionnaire were much greater than correlations involving multiple methods.

A psychological state construct was ap-

parently introduced as an intervening variable to increase the explanatory power of the model. Intervening, independent, and moderating variables, however, must be assessed by independent methods to increase explanatory power. In fact, all constructs were operationalized with the same questionnaire, and items assessing psychological states were highly similar to items assessing other constructs in the model.

Multicollinearity was undoubtedly a problem, given the similarity in assessment across variable sets. Factor or canonical analyses of the original data sets might have been interesting. There may have been only one or two underlying factors reflecting common method variance.

Summary

The formulation of a theory is crucial in the shift from exploratory to confirmatory research. As the first strong theoretical statement in the task design area, the job characteristics model has received proper attention and praise. However, the model has not been sufficiently scrutinized and alternative explanations of research findings have not been explored. As originally stated, the model was overly ambiguous on a number of points. More important, the three types of relations inherent in the model (within-person, person-situation, and situational) are often used interchangeably, resulting in considerable confusion.

Many theoretical, analytical, and operational problems that were apparent in exploratory task design research have been perpetuated in the initial formulation and assessment of the job characteristics approach. These include the ecological fallacy, the use of job classifications from existing organizational documents having unknown validity, the measurement of several distinct job characteristics with multiple indicators for each characteristic but the arbitrary combination of these characteristics into a unidimensional job description, the use of this unidimensional job description as the sole descriptor of tasks, the failure to indicate the interitem reliability of the unidimensional scale, and the failure to contrast competing explanations in a single study.

Several additional problems occurred in the development of the job characteristics approach: inconsistency across the type of relations hypothesized and observed; the use of moderator variables in some, but not all, analyses; the neglect of social and situational influences on task perceptions and job responses; the presence of common method variance in almost all measures due to heavy reliance on questionnaire data; the use of similar wording across several variables; and the disregard of multicollinearity in all data analyses.

Subsequent Research

Prior to 1971, a considerable amount of research examined influences of organizational characteristics and tasks on individual responses (e.g., Beer, 1968; Bishop & Hill, 1971; Campbell, 1971; Cummings & El Salmi, 1970; El Salmi & Cummings, 1968; Farris, 1969; Porter & Lawler, 1965). This research was typified by a variety of task characteristic measures. Hackman and Lawler's (1971) publication stimulated a considerable amount of task design research based on a particular motivational approach, a single set of task characteristics and kinds of responses, and a specific method of measurement. Most current task design research borrows or modifies the Hackman and Oldham (1975) measure, and instrument development in this area is limited to the comparison of responses to questionnaire items.

Two issues relevant to the job characteristics approach are used here to organize the discussion of subsequent research. They are the use of moderator variables and the consistency of types of relations across theory and measurement. Problems of instrumentation are discussed separately. Although the job characteristics model posits job responses as a function of the interaction of task and individual characteristics (in other words, the effects of task characteristics on responses is supposedly moderated by individual need strength) numerous studies in this literature have reported only the main effects of task characteristics on responses. These investigations of main effects cannot specifically address the job characteristics model because of the primary role of a mod-

erator variable in that model (i.e., because of the interaction term).

Studies in Table 1 and the following discussion are arrayed according to whether they involve main or interaction effects. They are further categorized by the particular moderator variables used and by whether organizational as well as task characteristics were included. Studies are cross-classified in terms of consistency in types of relations conceptualized and those actually observed by their authors. Not all studies here are derived directly from the job characteristics model, though they do show knowledge of that work and focus on closely related variables. Perceptual assessments of tasks that are borrowed or modified from some version of Hackman, Lawler, and Oldham's work are labeled JDS (Job Diagnostic Survey). Other perceptual measures are ascribed to their authors. Questions of the differential utility of the measures and various rules of combination are taken up later.

Main Effects on Job Responses

Studies of main effects due to task characteristics and other variables (columns 1 and 2) operationalized task characteristics with job incumbent questionnaires (cells 2, 3, 5, and 6), experimental manipulations, or a firm's job classifications (cells 1 and 4). Only a small number of investigations were concerned with the impact on job responses of both task and organizational attributes (column 1). Only two of these investigations simultaneously examined differential variance in responses accounted for by task and organizational attributes (Rousseau, 1977, 1978), despite the growing plea in the literature for investigations that do so (Herman, 1973; Herman, Dunham, & Hulin, 1975; Herman & Hulin, 1972; Newman, 1975; O'Reilly & Roberts, 1975; Roberts et al., 1978; Rousseau, 1977).

In a slightly higher number of investigations of main effects on responses, measurement was more consistent with the conceptualization of the study (cells 4 and 6 compared with cell 5) than in the more complex examinations of both organizational and task characteristics on responses (cells 1 and 3 compared with cell 2). This suggests that as the number of variables in an inves-

tigation increases, the correspondence between theory and measurement may decrease.

Both task and organizational characteristics (column 1). In the only study of both organizational and task attributes that hypothesized and observed a person-situation relation (cell 1), Hall, Goodale, Rabinowitz, and Morgan (1978) followed objective changes in both these attributes over a 10-month period. Three waves of data were collected from 153 supervisors in 10 departments of a government ministry undergoing change from the top down. In this study, jobs and departments (independently) underwent more, less, or no enrichment. Departmental changes were rated by both researchers and administrators. Perceptual assessments of jobs were obtained from incumbents on four core dimensions. These authors found no direct relation between job change (or job stimulation) and GNS (GNS was not conceptualized as a moderator variable as it is in the job characteristics model). Changes in job incumbents' attitudes over time were unrelated to task assessments and negatively related to organizational changes. Very little information was provided about the synchronicity (Kenny, 1975) or temporal sequencing of job change, researcher rating, and incumbent perceptions of jobs. This information is necessary to develop an understanding of appropriate time lags between objective and perceptual changes and the utility of each in predicting job responses.

Moch's (1980) investigation of organizational, task, and individual attributes (cell 3) was also consistent in theory and assessment, focusing on task perceptions rather than objective task characteristics. A sociometric measure of network membership was associated with task perceptions and other attitudes as hypothesized. Thus, perceptions of tasks, if not the tasks themselves, should be embedded in organizational contexts to fully understand task-response relations.

The fit between organizational and task characteristics was examined in several studies in which person-situation relations were conceptualized but within-person relations were observed (cell 2; Keller, Szilagyi, & Holland, 1976; Rousseau, 1977, 1978; Schu-

(text continued on page 202)

Table 1
Main and Interaction Effects of Task and Other Characteristics on Job Responses

Main effects of task & other variables		Interaction effects of task & other variables
		Organizational & task
1. Organizational & task	2. Task only	3. Effects moderated by GNS
Person-situation relations in both theory and observations		
Cell 1	Cell 4	Cell 7
Hall, Goodale, Rabinowitz, & Morgan (1978) organizational-task-various responses (task = manipulations and JDS)	Hill (1975) task-boredom (task = recorded job information) Baird (1976) task-satisfaction (task = manipulation) Farr (1976) task-internal motivation, attribution of performance (task = manipulation) Locke, Sirota, & Wolfson (1976) task-absence, productivity, attitudes (task = manipulation) Robey & Baker (1978) task-motivation (task = manipulation) O'Connor (Note 1) task and individual differences-satisfaction, task perceptions (task = manipulation) O'Reilly & Caldwell (1979) task and social cues-task perceptions, satisfaction performance (task = manipulation) White & Mitchell (1979) task and social cues-ambiguity, satisfaction, job perceptions (task = manipulation) Orpen (1979) task-satisfaction, involvement, internal motivation (task = manipulation) Weiss & Shaw (1979) task-task perception (task = manipulation) O'Reilly, Parlette, & Bloom (1980) task-satisfaction (task = held constant)	
Person-situation relation in theory but observed a within-person relation		
Cell 2	Cell 5	Cell 8
Keller, Szilagyi, & Holland (1976) boundary spanning-task satisfaction (task = JDS) Rousseau (1977, 1978) technology-task satisfaction (task = JDS) Schuler (1977) task/organizational congruence-role ambiguity, conflict (task = JDS) Rousseau (1978) departmental, positional, characteristics-tasks-individual differences-responses (task = JDS)	Pritchard & Peters (1974) task-interests, satisfaction (task = Position Analysis Questionnaire) Frank & Hackman (1975) task-satisfaction (task = manipulation and JDS) Hackman, Oldham, Janson, & Purdy (1975) task-performance, satisfaction, company savings (task = JDS) Stone and Porter (1975) task-various responses (task = JDS) Keller, Szilagyi, & Holland (1977) task-response (task = JDS)	Pierce, Dunham, & Blackburn (1979) system structure-task-GNS-satisfaction, motivation, performance (task = JDS)

(cell continued on page 202)

Interaction effects of task & other variables

Task only

4. Effects moderated by GNS

5. Effects moderated by GNS & other

6. Effects moderated by other

Person-situation relations in both theory and observations

Cell 10	Cell 13	Cell 16
<p>Lawler, Hackman, & Kaufman (1973) task-GNS-satisfaction, involvement, intrinsic motivation (task = manipulation)</p> <p>Farr (1976) task-GNS-internal motivation, attributions of performance (task = manipulation)</p> <p>Umstot, Bell, & Mitchell (1976) task-GNS-satisfaction, intrinsic motivation (task = manipulation)</p>		<p>Robey (1974) task-work values, performance, satisfaction (task = manipulation)</p> <p>Orpen (1976) job scope-urbanization-satisfaction</p> <p>Gould (1979) task-career stage-performance, satisfaction (task = observation)</p> <p>Mowday, Stone, & Porter (1979) task-personality-turnover (task = observation)</p> <p>Kim (1980) task-extroversion, neuroticism-satisfaction, performance (task = manipulation)</p>

Person-situation relation in theory but observed a within-person relation

Cell 11	Cell 14	Cell 17
<p>Brief & Aldag (1975) task-GNS-satisfaction (task = JDS)</p> <p>Kidron (1977) task-GNS-satisfaction (task = JDS)</p> <p>Hackman, Pearce, & Wolfe (1978) task-GNS-satisfaction, intrinsic motivation (task = manipulation)</p> <p>Arnold & House (1980) task-GNS-satisfaction, performance (task = JDS)</p>	<p>Wanous (1974) task-GNS, Protestant ethic, area of socialization-satisfaction, performance (task = JDS)</p> <p>Aldag & Brief (1975b) task-GNS, educational level, authoritarianism job tenure, area of socialization/congruence, area of socialization/current residence-satisfaction (task = JDS)</p> <p>Oldham (1976) task-GNS, co-worker and supervisory satisfaction-performance, internal motivation (task = JDS)</p>	<p>White & Ruh (1973) task-work values-job attitudes (task = participation in decision making)</p> <p>Steers (1975) task-nAchievement-performance (task = perceived task goal attributes)</p> <p>Stone (1975) task-work values-satisfaction (task = Stone, 1974 measure)</p> <p>Stone (1976) task-work values-satisfaction (task = Stone, 1974 measure)</p> <p>Dunham (1977a) task-functional speciality-satisfaction (task = JDS)</p>

(cell continued on page 203)

(cell continued on page 203)

(table continued)

Table 1 (continued)

Main effects of task & other variables		Interaction effects of task & other variables
		Organizational & task
1. Organizational & task	2. Task only	3. Effects moderated by GNS
Person-situation relation in theory but observed a within-person relation (continued)		
Cell 2	Cell 5	Cell 8
	Ivancevich (1978, 1979) task-satisfaction, performance (task = JDS) Oldham & Brass (1979) task-satisfaction (task = JDS)	
Within-person relations in both theory and observations		
Cell 3	Cell 6	Cell 9
Moch (1980) network-task responses (task = Michigan Organizational Assessment Package)	Dunham (1977b) task-abilities, job values (task = JDS, Position Analysis Questionnaire) Schmitt, Cole, White, & Rauschenberger (1978) task-satisfaction (task = JDS) Walsh, Taber, & Beehr (1980) task-challenge, role clarity-satisfaction (task = JDS)	

Note. GNS = growth need strength; JDS = Job Diagnostic Survey (Hackman & Oldham, 1975).

ler, 1977). Organizational attributes were sometimes assessed independently of respondents, but task characteristics were only measured with job incumbent question-

naires. Organization-task fits were positively related to job responses, but this may have been due to the fact that the composite of variables used to measure organization-

Interaction effects of task & other variables

Task only

4. Effects moderated by GNS 5. Effects moderated by GNS & other 6. Effects moderated by other

Person-situation relation in theory but observed a within-person relation (continued)

Cell 11

Cell 14

Cell 17

Oldham, Hackman, & Pearce (1976) task-GNS, satisfaction with work context-performance, salary, internal work motivation (task = JDS)
 Sims & Szilagyi (1976) task-GNS, locus of control, job level, self-actualization-satisfaction (task = own measure)
 Armenakis, Field, & Holley (1977) task-GNS, protestant ethic-satisfaction (task = JDS)
 Katz (1978a, 1978b) task-GNS, locus of control, longevity, self - actualization - satisfaction (task = Sims & Szilagyi, 1976, measure)

Steers & Spencer (1977) task-nAchievement-attitudes (task = JDS)
 Stone, Mowday, & Porter (1977) task-nAchievement, nAutonomy-satisfaction (task = Stone, 1974, measure)
 Brief, Van Sell, & Aldag (1978) task-pay-satisfaction, commitment, involvement (task = JDS)
 White (1978a) participation-73 moderators-satisfaction, performance, absence (participation = Vroom, 1959)
 Gould (1979) task-career stage-performance, satisfaction (task = Beach, 1975, measure)
 Katerberg, Hom, & Hulin (1979) task-satisfaction-involvement, commitment, retention (task = JDS)
 Kim & Schuler (1979) task-feed-back-satisfaction (task = JDS)
 Oldham & Miller (1979) task-other's job complexity-satisfaction, performance (task = JDS)
 O'Reilly & Caldwell (1979) task-nAchievement- satisfaction, performance (task = JDS)
 Cherrington & England (1980) task-work values, desire for enrichment-satisfaction, performance (task = own measure)

Within-person relations in both theory and observations

Cell 12

Cell 15

Cell 18

task fit shared common method variance with response variables.

Task characteristics only (column 2). Most main effect investigations examined

impacts of tasks on responses or sets of responses without regard to organizational context (column 2). In the studies in cell 4, tasks were manipulated (or held constant in

one case). Observed person-situation relations were generally negligible in five investigations (Baird, 1976; Farr, 1976; Hill, 1975; O'Reilly & Caldwell, 1979; O'Reilly, Parlette, & Bloom, 1980) and positive in six other studies (Locke, Sirota, & Wolfson, 1976; Orpen, 1979; Robey & Baker, 1978; Weiss & Shaw, 1979; White & Mitchell, 1979; O'Connor, Note 1). However, the results were mixed, even in these more supportive studies.

Four studies in cell 4 addressed the relative importance of social cues versus objective task characteristics in predicting either task perceptions or job responses (O'Reilly & Caldwell, 1979; O'Reilly et al., 1980; Weiss & Shaw, 1979; White & Mitchell, 1979). Social cuing information (provided by perceptual task assessment devices as well as from other sources) consistently accounted for a significant proportion of variance in job responses. Although all four studies demonstrated the effect of social cues on task perceptions and job responses, the relative importance of social cues versus objective cues was tied to the relative strength of the experimental manipulations in three studies and in the fourth (O'Reilly et al., 1980), to factors peculiar to the single job classification observed. The relative importance can only be decided by investigations done in randomly selected field settings. Social cues might be tapped by network membership, and objective job characteristics could be measured with researcher and/or supervisor ratings.

Other studies of main effects of task characteristics on employee responses used job incumbent questionnaires for all data collection (cells 5 and 6). With only three exceptions (cell 6), person-situation relations were inferred from these observed within-person relations. Although most studies in cell 5 used more objective assessments of task characteristics (Frank & Hackman, 1975; Hackman, Oldham, Janson, & Purdy, 1975; Ivancevich, 1978, 1979; Keller, Szilagyi, & Holland, 1977; Oldham & Brass, 1979; Stone & Porter, 1975), all studies in this cell based their task-outcome relations on perceptual assessments of tasks that were similar to the five core task characteristics (Hackman & Lawler, 1971). Here, only

Frank and Hackman (1975) found negative relations between task characteristics and job responses; jobs changed very little in this study.

Dunham (1977b) reported positive correlations among perceptual task characteristics, ability requirements, and job values. Schmitt, Cole, White, and Rauschenberger (1978) and Walsh, Taber, and Beehr (1980) developed path analytic models to predict satisfaction (see cell 6). One path analytic model supported a linear relation from background characteristics, to need strength, to job perceptions, to satisfaction (Schmitt et al., 1978). The authors noted that the model was underspecified, and data for three of the four sets of variables were perceptual assessments provided by one set of respondents, albeit at two points in time. Walsh et al. (1980) modeled the effects of task perceptions (characterized by action and information components) on global satisfaction through intervening psychological states of challenge and role clarity. A number of samples were used to develop the model, which included only perceptual measures by job incumbents. Challenge emerged as the most important intervening construct.

Summary. Studies in columns 1 and 2 of Table 1 found main effects of tasks on responses. However, the most supportive studies assessed both tasks and responses perceptually, providing more evidence for a within-person or cognitive consistency model than for a person-situation theory of task design. The one study in which task and organizational characteristics were both changed offered no support for the notion that tasks and organizational characteristics influence responses. However, a number of investigations (those in cells 2 and 3 and O'Reilly & Caldwell, 1979; O'Reilly et al., 1980; Weiss & Shaw, 1979; White & Mitchell, 1979) suggested the importance of examining tasks in social milieus.

Although the job characteristics approach is directed to questions of changing jobs, most of the investigations of task-response relations did not address this question. Tasks were not assessed independently of individuals providing response data. This research is only useful for predicting changes in job responses following changes in task percep-

tions. Very little has been revealed about person-situation relations and the effects of objective job changes.

Interaction Effects on Job Responses

In some respects it is inefficient to search for moderated relations of tasks and responses until the existence or nonexistence of main effects is clearly established (Zedeck, 1971). However, since the job characteristics model includes a moderated relation, it can only be tested using the moderator. Studies of moderated relations or interaction effects of organizations, tasks, and responses are listed in columns 3, 4, 5, and 6 of Table 1.

Both organizational and task characteristics (column 3). Pierce and Dunham (1976) noted that "the study of task design must be framed within complex nomological networks which include relevant individual, technological, and organizational factors" (p. 95). Yet only one investigation has appeared that examines tasks in organizational contexts and includes the moderator effects specified in the job characteristics model. Pierce, Dunham, and Blackburn (1979; cell 8) provided an eight-cell congruency framework in which mechanistic versus organic department structures, simple versus complex job designs, and high- versus low-GNS job incumbents were used to predict employee satisfaction, motivation, and performance. Only the organizational variables were assessed independent of respondents providing the rest of the data. Job characteristics and GNS were assessed using the JDS. Thus, as in much of the job characteristics research, heavy reliance on job incumbent questionnaire data introduced a high probability of correlated response error.

Task characteristics moderated by GNS (column 4). None of the three studies (note that Farr, 1976, is indexed twice since it examined both main and interaction effects) in which GNS and objective tasks were assessed (cell 10) provided strong evidence for the positive role of GNS as a moderator variable. Farr manipulated task characteristics but found no interaction of GNS and tasks for job responses. Lawler, Hackman, and

Kaufman (1973) used the JDS both before and after job enrichment to assess task characteristics, GNS, and satisfaction, thereby introducing several reactive effects into their research design. The net effects of job change on outcomes were negative (consistent with Frank & Hackman, 1975). Lawler et al. (1973) reported that satisfaction of high-GNS employees, whose jobs were enriched, did not differ from satisfaction of low-GNS employees on enriched jobs.

Umstot, Bell, and Mitchell (1976) provided the only investigation in cell 10 to offer any support for the positive role of GNS as a moderator of task-response relations. The five core dimensions were systematically manipulated between an experimental and a control group. The manipulation check was the JDS, which was correlated with group productivity and satisfaction. It was concluded that "the objective experimental manipulations controlled only 18% of the variance in JDI [Job Descriptive Index, a measure of satisfaction, Smith, Kendall, & Hulin, 1969] scores, while the MPS controlled 50% of the variance for this criterion" (Umstot et al., 1976, p. 388). This may be due to the existence of common method variance between the JDS and satisfaction measures but not between the task manipulation and satisfaction measures.

Umstot et al. (1976) was the first investigation that compared objective and subjective task assessments as predictors of job responses. The analyses provided weak support for a person-situation model of job characteristics and strong support for a cognitive consistency model but did not reveal the degree of overlap between these two models. Rather than using separate analyses of the direct effects of perceptual and objective task assessments, the job characteristics model should have been tested using path analysis with job incumbent perceptions mediating the relation between the objective job and individual responses. Further, the generalizability of the analysis was compromised by comparing task-outcome correlations for only the top and bottom third of the sample on GNS.

Cell 11 contains four investigations that used GNS as a moderator but failed to maintain consistency between conceptualization

and measurement. Person-situations relations were hypothesized, but within-person relations were observed. These investigations relied exclusively on job incumbent questionnaires for testing task characteristics-job response relations, thereby capitalizing on common method variance. In Hackman, Pearce, and Wolfe's (1978) study, tasks were objectively changed, but incumbent responses to the JDS were the only means of assessing the directionality (enriched or deenriched) of these changes. Despite the reactive effects of questionnaire data collection, the studies in this cell reported partial support for GNS as a moderator variable.

Task characteristics moderated by GNS and other variables (column 5). The studies in cell 14 were potentially more efficient investigations than those in cell 11 because sets of moderator variables were examined simultaneously. In several studies in cell 14, GNS was related explicitly to Protestantism, anomie, alienation, and similar constructs emanating from Turner and Lawrence (1965) and Blood and Hulin (1967). Moderators measured in conjunction with GNS included educational level, authoritarianism, job tenure, area of socialization, and congruence of the area of socialization and current residence (Aldag & Brief, 1975b); Protestant ethic (Armenakis, Field, & Holley, 1977; Wanous, 1974); satisfaction with work contexts (Oldham, Hackman, & Pearce, 1976); co-workers' and supervisors' satisfaction (Oldham, 1976); self-actualization, locus of control, and job level (Sims & Szilagyi, 1976); and job longevity (Katz, 1978a, 1978b). Of these variables, only the area of socialization, education, authoritarianism, Protestant work ethic, and locus of control failed to positively moderate task characteristic - job response relationships. Job longevity and job level both moderated perceived task-response relations. In the case of longevity, the moderating effect was greatest for new employees, and different aspects of tasks were more important at different stages in an individual's integration into the social organization (Katz, 1978a, 1978b).

The alternative moderators examined in studies in cell 14 appear to be related to GNS. Although several studies have ob-

served correlations between these variables (as discussed below in the section on instrumentation), little effort has been devoted to comparing them as alternative moderators. It is possible that all of these moderators explain the same small percentage of variation in task-response relations.

Task characteristics moderated by other variables (column 6). There were four investigations of moderators other than GNS in which tasks were assessed independently of respondents providing other data (cell 16). The job characteristics model received mixed support. Robey (1974) manipulated tasks along a simple-complex dimension, assessed work values (using Friedlander, 1965) similar to GNS, and examined the simultaneous impact of task design and job values on employee attitudes and performance. Only a weak interaction effect was observed. Weak results were also reported in a study of black workers in South Africa (Orpen, 1976). Gould (1979) found that career stage moderated the task-performance relationship, but only when tasks were assessed by the researcher (he used both job incumbent perceptions and researcher assessments of tasks). This was consistent with the view (O'Reilly & Caldwell, 1979; White & Mitchell, 1979) that task assessments provided by job incumbents may reflect a different construct than is measured by independent sources.

Four studies in cell 17 (O'Reilly & Caldwell, 1979; Steers, 1975; Steers & Spencer, 1977; Stone, Mowday, & Porter, 1977) argued that GNS is related to need achievement and need autonomy (McClelland, 1961) and used personality tests to assess these needs. Need achievement moderated perceived job scope-commitment and satisfaction relations, but need autonomy did not. Unfortunately, this method of needs assessment was not empirically contrasted with GNS. Three similar studies (Stone, 1975, 1976; White & Ruh, 1973) failed to support the hypothesis that the job incumbent's work values moderated the task characteristics-job response relation. Future research should compare the psychometric properties of various sets of needs, values, and personality traits as alternative moderator variables.

Only two studies (Brief, Van Sell, & Aldag, 1978; Dunham, 1977a) examined the

impact of organizational moderators on task–response relations. These studies only partially support pay (Brief et al., 1978), organizational climate, managerial style, work assignment, and career description (Dunham, 1977a) as moderators of task–response relations. Seven studies, including these two, were the only ones in which the moderator variable was not a psychological state (Aldag & Brief, 1975b; Brief et al., 1978; Dunham, 1977a; Gould, 1979; Katz, 1978a, 1978b; Sims & Szilagyi, 1976; White, 1978a).

Summary. Overall examination of studies of moderator effects is instructive. First, if theory strictly guided research, either GNS would be widely accepted as a moderator or alternative moderators would be empirically contrasted. Most moderator studies did focus on GNS, but studies in columns 5 and 6 of Table 1 attempted to find a better moderator. Unfortunately, the predictive utility of alternative moderators was rarely compared within particular investigations. Many studies (e.g., Stone, 1975, 1976; Wanous, 1974) assumed that the alternative individual-level moderator variables were logical extensions on the early aggregate-level moderators (Blood & Hulin, 1967; Turner & Lawrence, 1965). Thus, the issue of homology of constructs across levels of analysis was ignored in these later studies, as illustrated by the following quote: “PE [Protestant work ethic] is considered to be conceptually equivalent to what Hulin and Blood (1968) call ‘middle class work norms and values’” (Stone, 1976, p. 158).

The more complex interaction effects studies examined alternative moderators (columns 5 and 6). Only four investigations exist that simultaneously extended on the moderator construct and assessed tasks independently of individuals providing the rest of the data (cell 16). As with studies of main effects, it appears that as investigators introduced more constructs, they forgot entirely about correspondence between conceptualizations of tasks and their assessments.

Note that tasks were never posited as perceptual. All moderator variable studies discussed here implied causation from objective task to task perception to other responses.

Yet in only 8 of the 37 investigations (cells 10 and 16) are anything but within-person correlations offered. Most of the investigations in columns 3, 4, 5, and 6 used some variant of Hackman and Lawler’s (1971) assessment of both GNS and tasks, thereby capitalizing on common method variance and ignoring objective situational characteristics. Therefore, the studies were destined to be uninformative in terms of changing tasks.

Instrumentation

Construct measurements cannot be evaluated independently of the models underlying those constructs. The job characteristics model proposed that task perceptions are a function of objective task characteristics and that an individual’s responsiveness to tasks is a function of his or her need strength. Unfortunately, there have been no systematic attempts to develop task assessments consistent with such a model. Much of the instrument development in the job characteristics approach has neglected the theoretical implication of various analytical strategies.

Task dimensions. Despite the obvious importance of construct validity, there is only one convergent validity study of task characteristics (assuming that convergence is demonstrated by using different kinds of raters). Jenkins, Nadler, Lawler, and Cammann (1975) used interviews with job incumbents and direct observations by researchers to assess jobs on 11 dimensions. They provided convergent validity data for variety, skills, autonomy, and pace control dimensions, and found that the observer method was better than the interview method. No investigations have added the discriminant aspects of convergent–discriminant validity (Campbell & Fiske, 1959).

Since Turner and Lawrence’s (1965) original concern with combining task perceptions into a composite RTA, research occasionally has compared methods of reducing the number of dimensions used to describe jobs. The job characteristics model posits that employees must be high on at least two core task dimensions (Hackman & Oldham,

1980) before positive relations between GNS and other responses can be expected. Such a disjunctive model is not entirely compatible with the expectancy theory tenets underlying the job characteristics model. This inconsistency is readily resolved if the only salient job characteristic is job complexity.

Following Hackman and Oldham (1976), numerous other investigators have attempted to demonstrate the superiority of particular algorithms for combining task dimensions into a unidimensional predictor of job outcomes (Arnold & House, 1980; Brief, Wallace & Aldag, 1976; Dunham, 1976; Hackman & Lawler, 1971; Peters & Champoux, 1980; Peters & Bhagat, Note 2). As discussed above, the predictive utilities of various combinatorial strategies are unlikely to be substantially different.

The dimensionality of the JDS has been assessed by factor analyses of the set of job characteristics measures (Dunham, 1976; Dunham, Aldag, & Brief, 1977; Green, Armenakis, Marber, & Bedeian, 1979). Although JDS responses (perceptions) were the only task assessments in these studies, discussions of the analyses treated tasks as situational characteristics. In one study, a single-factor solution was favored (Dunham, 1976), and in another study, involving 20 job categories, the authors found that "in most cases . . . some sort of multidimensional solution appears to be most appropriate" (Dunham et al., 1977, p. 222). This conclusion was based on factor analyses within each of the 20 job categories. The JDS, however, is designed to assess variation *across* jobs. Factorial invariance of the JDS should be demonstrated with a random sample of jobs, not a sample of individuals within job categories. Task design theory was also neglected in discussing the appropriateness of a single-factor as opposed to a multifactor structure (Dunham, et al., 1977). Yet another factor analytic investigation of the JDS (Green et al., 1979) suggested that inconsistencies in JDS factor structures emerging across studies may be partially dependent on the overly complex response format of many items.

Factor analytic studies have focused on the narrow question of the dimensionality of the set of task characteristic items in the

JDS, while ignoring other relevant variables in the job characteristics model. This method of research is supported by the following argument: "Before the researcher can understand a worker's responses to a stimulus (task design), it is imperative that the researcher first define and understand the stimulus itself" (Dunham, 1976, p. 404). Although this is a reasonable approach, an inadequately explored alternative (Burt, 1976) asks the question, How many task dimensions are needed to account for the covariation between task characteristics and job responses? This seems to be a much more interesting question, which can be addressed with canonical correlation or structural equations analyses.

Task scale development. Sims, Szilagyi, and Keller (1976) developed a perceptual measure of six job attributes, the Job Characteristics Index (JCI). It appears that the basic JDS dimensions were only slightly modified in the JCI and were assumed to be inclusive of all important task dimensions. The JCI included 22 Likert-type items that were subjected to an orthogonal factor analysis within each of a number of occupational categories. The factor congruency scores were then compared across subsamples. Thus, variance within occupational categories was examined rather than variance across jobs. If the JCI or JDS are truly measures of general task characteristics, factoring should have been based on the pooled sample of 1,161 job incumbents. The analytic strategy used here suggested that the measure was not intended to be generally applicable, but limits to generalizability were not elucidated.

The correspondence of the theoretical model that guided instrument development to either the orthogonal factor analytic model or the assumptions of the factor congruency estimates were not discussed in the development of the JCI (Sims et al., 1976). However, it appears that the theoretical framework was borrowed directly from the original exploratory study (Hackman & Lawler, 1971). The development of the unidimensional MPS was a clear indication that orthogonality was no longer assumed. Although no statistical tests are available, the factor congruency scores presented in this

study were generally low by conventional standards (Sims & Szilagyi, 1976). This may have been due to a failure to rotate solutions to achieve factorial similarity (Meredith, 1964; Mulaik, 1972) and/or to a restriction of range within samples.

Job specialty classifications were assumed to reflect rather homogeneous job activities, but no confirmatory evidence was presented (Sims et al., 1976). These classifications were then used as categories in analyses of variance (ANOVAS) and for multidimensional analyses (MDAs) to assess discriminant validity of the JCI. The ANOVAS were redundant with the MDAs (Kerlinger & Pedhazur, 1973). Split-half Spearman-Brown coefficients were presented as evidence of scale reliability. Cronbach alphas may have been more appropriate (Lord & Novick, 1968) and were used by these authors on a different sample of respondents.

A purportedly convergent-discriminant validity matrix, based on a single method of measurement, was presented for the job characteristic measures and assessments of task competitiveness, adequacy of authority, role ambiguity, and warmth (Sims et al., 1976). Evaluation of convergent validity requires multimethod assessments of constructs but only job incumbent questionnaires were used. Further, because of problems inherent in the original data reductions, it is impossible to draw valid inferences from data in the convergent-discriminant validity matrix.

Pierce and Dunham (1978) compared the JDS and JCI on their supposedly overlapping scales, using a sample of 155 insurance company employees. Cronbach alphas were higher for JCI than for the JDS scales, a predictable result given the greater number of items per scale in the JCI. A four-factor oblique rotation confirmed the four a priori dimensions (variety, autonomy, feedback, and identity) of the JCI but not the JDS. Convergent-discriminant validity of the constructs was purportedly demonstrated, something that is impossible to do in the absence of a multimethod approach and assessments of variables other than task characteristics. Independent observations of tasks and determinants of task perceptions were not included. However, the use of perceptual task

assessment was consistent with the authors' conceptualization and provided a way to observe a within-person model of task characteristics. Brief and Aldag (1978) also evaluated the JCI, noting acceptable internal consistencies for the scale, but found only moderate correspondence of the JCI and their own perceptual task measure.

GNS. The psychometric properties of the GNS have been given even less attention than those of perceptual task assessments. Aldag and Brief (1975a, 1979) found high correlations among work motivation, growth satisfaction, and endorsement of the Protestant work ethic. Low correlations were observed between the two original formats of the GNS scale, suggesting that they measure different constructs.

Stone, Ganster, Woodman, and Fusilier (1979) compared responses to the Personality Research Form (Jackson, 1967), the Survey of Work Values (Wollack, Goodale, Wijting, & Smith, 1971), and the two formats (preference and job choice) of the GNS measure. Internal consistencies (Cronbach alphas and Kuder-Richardson 20s) were not striking across the scales. The two GNS scales were uncorrelated with the Study of Work Values scales, and there were significant but low correlations of both scales with scales in the Personality Research Form. The correlation between the GNS formats was low. All in all, reliability evidence for the most frequently used GNS assessments was unimpressive. Furthermore, these studies did little to address questions of validity.

Summary

Given the existence of more than 80 empirical studies relevant to the job characteristics approach to task design, little progress has been made since the original development of the model:

1. Several investigations suggest that changing characteristics other than tasks might be beneficial to organizations because of the effect these changes might have on task perceptions and other responses valued in organizations (such as satisfaction).

2. The research provides little evidence about how to change tasks. Tasks were generally not changed in the research and the

mere act of having one's job changed may have different influences on a person than does his or her signing on to do impoverished or complex tasks.

3. There is strong support for a within-person cognitive consistency model of task-response relations, but that support is not complemented by research assessing person-situation or situational models of task design.

4. In only 20 of the 61 reviewed studies of task-job response relations were tasks assessed independently of job incumbents who provided other responses that were correlated with task perceptions.

5. There is a general inconsistency between the conceptualization of the model as stated by researchers and their operationalizations of it.

6. Though moderators were frequently assumed to cause task-response relations, existing research cannot demonstrate causality and provides only minimal evidence to task-moderator-response associations.

7. Little attempt has been made to provide strong inference research (Platt, 1964) in which various theories of task design are compared (e.g., need theoretic approaches vs. social information processing vs. technological approaches to work design).

8. Investigations have become narrower over time. A restricted set of task characteristics and moderator variables has been focused on, and there has been heavy reliance on one form of task and moderator variable assessment.

9. Some of the analytical strategies employed in earlier studies (Hackman & Lawler, 1971; Hackman & Oldham, 1975) are still employed in more recent research despite an increasing awareness of their flaws. For example, the dropping of the middle third of samples for tests of moderator effects (e.g., Brief & Aldag, 1975; Umstot et al., 1976) should be abandoned, and more appropriate statistical analyses should be used (e.g., Zedeck, 1971).

10. Most research failed to examine the relationships of task characteristics and job responses to their organizational contexts.

11. The more complex investigations—those including organizational attributes or extending on the GNS construct—entirely

ignored questions of perceptual versus objective task assessments. There was a greater tendency in these studies to ignore conceptual-operational consistency than in simpler designs. In some cases conceptual and operational consistency may have been due to chance, since several of the same authors are represented in both consistent and inconsistent cells in Table 1, suggesting that they may not have been conscious of the need for consistency.

There has also been little progress recently in instrument development relevant to the job characteristics model:

1. The appropriateness and comprehensiveness of the four or five perceptual task dimensions has gone unquestioned.

2. There is no agreement about whether an overall job complexity score is desirable and, if so, what combinatorial strategy to use. If an overall score is appropriate, time given to arguing over definitions of components seems misspent. If task dimensions are of interest, theoretical tests of the job characteristics model should be based on the independent task dimensions.

3. Common method variance has undoubtedly inflated observed relations among perceptions of task dimensions, MPS, GNS, and satisfaction.

4. The validity of task dimension measures has been assessed by exploratory factor analysis. However, the convergent-discriminant validity of these measures should also be investigated with multitrait/multimethod research (Bagozzi, 1978, 1980; Campbell & Fiske, 1959).

5. Construct validity research in this area is sparse. Organizationally based job classification systems, rather than more empirical methods, have been used to assess antecedents of job characteristics. A few recent studies have examined additional determinants of JDS responses (O'Reilly & Caldwell, 1979; White & Mitchell, 1979). The results of these studies emphasize that incumbent responses to the JDS reflect incumbents' task perceptions and only indirectly measure task characteristics. Thus, the construct validity of the JDS as a measure of job characteristics appears to be less than ideal.

Conclusion

A number of writers have advocated the job characteristics approach to task design (e.g., Hackman, 1975a, 1975b, 1978; Hackman & Oldham, 1980; Hackman & Suttle, 1977; Lawler, 1974a, 1974b). Though generally accepting the validity of the model, one recent discussion (Oldham & Hackman, 1980) was pessimistic about its application because job enrichment is often incompatible with organizational technology, control, and personnel systems.

Both the available research and the reviews of this approach only vaguely recognized the need for comprehensive theoretical development. Such development necessitates the simultaneous examination of situational, within-person, and person-situation relations and careful maintenance of the distinctions among these types of relations. A dominant theme in reviews concerns perceptual versus objective task assessments (Cummings, Malloy, & Glen, 1977; O'Connor, Rudolf, & Peters, 1980; Pierce & Dunham, 1976; Salancik & Pfeffer, 1977; Schwab & Cummings, 1976; Shaw, 1980; Steers & Mowday, 1977). Schwab and Cummings (1976) are representative of these writers:

An objective definition of task scope allows for the unambiguous differentiation between variations in task scope and employee perceptions of it. If one is interested in psychological perceptions of task scope, they can be viewed as dependent on task scope. (p.31)

Most criticisms of the job characteristics approach have been mild. Yet they do note that existing research has yielded inconsistent results, is primarily correlational, fails to consider contextual characteristics, and usually does not include actual job changes. One reviewer (White, 1978b) called for a moratorium on research that searches for moderators of job scope-response relations, but other writers (Cherrington & England, 1980; O'Connor et al., 1980) argue against a premature closing off of the search for moderator variables.

This review shows that there are substantial inconsistencies in the task design area across the theory, operationalizations, analyses, and interpretations. In the initial development of the job characteristics approach (Hackman & Lawler, 1971;

Hackman & Oldham, 1975, 1976), there was some slippage between the conceptualization of tasks and their assessments and some question about the utility of a moderator variable in explaining task-outcome relations. After nearly a decade of research, this slippage has expanded rather than contracted. In fact, additional kinds of inconsistencies have been introduced. This suggests that research based on the job characteristics approach is still exploratory.

A good theory of task design should deal simultaneously with definitions of task content, how to change jobs in the interests of improving responses people make to those jobs, whether perceptions or other aspects of tasks contribute more to responses, how tasks and responses to them are influenced by contexts in which they are done, and so on. It is our contention that a complete theory in this area will model simultaneously situational (taxonomic), within-person (cognitive consistency), and person-situation (task-incumbent response and environment-incumbent response) relations. It should also maintain distinctions among these relations in terms of consistency between the kinds of relations studied and inferences drawn from the analyses of those relations. Currently, the job characteristics model does not accomplish these objectives nor do any other theories of task design. With some guidance in terms of defining pressing issues and indicating the kinds of perspectives needed to address these issues, research can proceed simultaneously on a number of fronts, and there will be the possibility of integrating the results into a complete theory of task design.

The question of what tasks are and how they should be measured is still a major issue in task design research. Because of the pervasive use of job complexity scores as indicators of task content, it appears that researchers are comfortable with a unidimensional construct. If this is true, as argued earlier, time seems misspent in discussing separate task dimensions. Greater clarity about desired outcomes of tasks would probably diminish the emphasis on unidimensional task complexity (or job enrichment) and increase research attention on more diverse outcomes than those usually considered in organizational research.

Unidimensional measures of tasks should be replaced by variegated task taxonomies, and the differential association of task components with people, jobs, and environments should be investigated. Much of the task design research assumes that tasks are invariant across people in particular job categories. Testing this assumption requires the development of much stronger task taxonomies. Empirical studies of relations among task components are currently a missing aspect of task design research. However, the demonstration of situational relations among task components is sterile without a more general theory of task design.

Within-person (cognitive consistency or perception-behavior) relations can address questions of how cognitions vary, how they influence behavior, and how behavior influences cognitions. Most task design research only analyzes relations among cognitions and consequently does not fully address the job characteristics approach. To the degree that people's behaviors are shaped by their perceptions, studying within-person relations is important. The overwhelming amount of task design research has been aimed at testing such relations, despite the fact that most writers think they are testing person-situation relations (see Table 1). The vast amount of existing research would only be justified if we had evidence that task cognitions uniquely absorb an overwhelming amount of the variance in responses.

A different kind of within-person relation is more appropriate to questions of whether perceptions of tasks have important impacts on responses. Some social cuing experiments suggest that task cognitions may be determined by social information as well as by objective task characteristics and that these two antecedents to task perceptions have different relations to outcomes. More of this kind of research is needed.

Questions about how to change tasks in the interests of altering a person's behavior and cognitions can only be investigated through the examination of person-situations relations. Inherent in this issue is the notion that tasks are independent of people and might be tinkered with to alter individual responses to them. Although this issue

appears to be of primary importance to task design researchers, it is almost never addressed empirically.

There is an appropriate call in the literature for the examination of tasks in their environments (e.g., Pierce & Dunham, 1976). Environments probably impinge on tasks and influence how people respond to those tasks. An interesting start is offered by Oldham and Miller (1979), who examined how individual task perceptions were related to the combined task perceptions of work group members (perceptions that form one aspect of the environment in which a person works).

It may well be that environments do not influence tasks assessed independently of job incumbents but do influence task perceptions. It may then be that task perceptions influence behaviors. Actually, any combination of environment-task-cognition-behavior relations may exist. Disentangling them requires the development of a more general theory and situationally based task taxonomies followed by simultaneous examination of within-person and person-situation relations.

Oldham and Miller (1979) and Rousseau (1977, 1978) show an initial interest in comparing sociotechnical and job characteristic approaches to task design (strong inference research). These approaches, along with an information-processing view, are currently growing in popularity in the task design literature. In the final analysis, the testing of such competing theories requires the simultaneous investigation of situational, within-person, and person-situation relations.

Though it is our contention that these are appropriate strategies for future task design research, many experiences in past research should serve as warnings of what to avoid in the future. The most obvious methodological problem concerns the assessment of causation. Although we urge a move toward longitudinal designs, such a move would have to be accompanied by the incorporation of time into task theories. Issues such as instrument decay, developing notions about how long it takes jobs to influence people, extraneous influences on variables under study, handling low base rate phenomena, and so on all fall under the time rubric (e.g.,

Feldman, 1975; Hulin & Rousseau, 1980; Kenny, 1975; Roberts et al., 1978). Task design research is meaningless unless these issues are properly addressed.

A second methodological issue emanating from this review is that as studies become more complex (usually by adding more variables), the slippage increases across constructs, their assessments, and analytic strategies. Assessments are often inappropriate to the posed question; analyses are inappropriate to assessments and design. As an example, the rural-urban dichotomy (e.g., Cherrington & England, 1980; White, 1978a) is still tested alongside various psychological constructs (e.g., Katerberg, Hom, & Hulin, 1979; Katz, 1978a, 1978b; Mowday, Stone, & Porter, 1979) as a possible moderator of task outcome relations. The rural-urban dichotomy is a sociological construct attached to communities. It is not clear what, if any, relationship it has to GNS or any other psychological construct attached to individuals. It is well and good to plead for more multivariate research, but if such pleas result in such enormous inconsistencies, they are to no avail.

A third major problem is that a majority of studies only report simple correlations or ANOVAS. It would not seem at all difficult to move to regression analyses by using the dimensional rather than categorical definitions of variables (e.g., Peters & Champoux, 1980). One suspects this has not been done because of the desire by researchers to make their investigations comparable to previous studies. Unfortunately, this conservative tendency can have debilitating effects on scientific progress.

A few disparate points about instrumentation and data handling were also revealed by this review. The current heavy reliance on questionnaires should be reduced, and similarly worded questions should be avoided if they are intended to assess different variables. Since there is evidence that format influences responses, format convergence as well as other forms of reliability and validity assessment of questionnaires should be included in research. A real effort should be made at convergent-discriminant validity research. Within-, between-, and across-job

classification analyses should be very carefully reasoned. The elimination of data, a common practice, should be abandoned completely.

In conclusion, increasing calcification and acceptance of a number of questionable propositions describes most task design research subsequent to the development of the job characteristics model. The ubiquity of the core dimensions is unquestioned. Too often it is assumed that the task domain is appropriately and completely measured perceptually and that GNS is the moderator of task-response relations.

We are reminded here of the theory of the hammer (Kaplan, 1964). The invention of the hammer is followed by considerable search for ways to use hammers; everything that can be pounded is pounded. At the moment we need better information about what constitutes tasks and tight theoretical, and empirical linkages need to be constructed between tasks and other variables. Great care needs to be taken so that the move from theory to operation to data analysis is logically consistent. The development of theoretical constructs and their linkages, like the construction of chain mail, proceeds quickly when many hammers pound. At this point, we cannot attest to the superiority of the tack hammer; the claw hammer; or the bricklayer's, machinist's, or shoemaker's hammer. We can only note the need to hammer away at the task.

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