Chapter 2

JOB DESIGN

Greg R. Oldham
University of Illinois at Urbana-Champaign

During the past 25 years, few topics in the field of organizational psychology and behavior have attracted as much research attention as job design. The purpose of the current chapter is to review the theory and research in this area. The chapter begins by defining job design and summarizing the early work that focused on this topic. Contemporary theory and research involving the design of jobs both for individuals and for teams is then reviewed. The chapter concludes with a discussion of several new topics for possible future research.

INTRODUCTION

At its most basic level, job design refers to the content and structure of jobs that employees perform. The focus of job design research, then, is on the nature of the work itself—that is, on the tasks and activities that individuals complete in their organizations on a daily basis.

The earliest work in the area of job design can be traced to the writings of Babbage (1835) and Smith (1850). These theorists argued that the principle of division of labor was the vehicle for enhancing individuals’ efficiency at work. In essence, this principle suggests that if jobs are simplified and specialized to the greatest extent practicable, maximum work efficiency will be achieved. The notion is that highly simplified jobs permit people to hone their skills and abilities for doing a particular part of the work. When people perform only one simple operation, it is argued, they become quite expert in completing it. And when jobs have been segmented and simplified, employees can devote their full attention to very few objects, minimizing the degree to which extraneous objects divert their attention and reduce efficiency.

The division of labor principle was an important part of the Scientific Management approach (Taylor, 1911) which clearly influenced early efforts to
design and arrange jobs in manufacturing organizations. Scientific Management not only advocated the simplification of work but also suggested that management explicitly assume responsibility for the design of jobs. Thus, management was to determine the way jobs were partitioned and how each segment of the work should be completed. Training, incentive and control systems were then to be introduced to make certain that employees performed their jobs as required.

Although job simplification and specialization were expected to result in enhanced employee efficiency and improved profitability for the organization, early research studies indicated that there were often unexpected consequences when jobs were designed according to these criteria (Vernon, 1924; Walker & Guest, 1952). These studies demonstrated that employees were often quite vocal in their disaffection with simplified work. Employees restricted their productivity on such jobs and frequently took breaks beyond those authorized. And they often sabotaged their work and equipment. In all, employees simply did not behave like the ‘good and productive soldiers’ they were supposed to be (Walker & Guest, 1952).

The problems described above led to a number of early efforts to design jobs in a way that achieved high productivity without incurring the human costs associated with simplified work (Davis & Taylor, 1972). Most of these attempts involved expanding the scope and content of jobs by providing employees with increased opportunities for personal responsibility and control over their work activities. Early experiments were quite successful, demonstrating that enriched, expanded jobs often enhanced employee productivity and satisfaction (e.g. Davis & Canter, 1956; Kilbridge, 1960).

Unfortunately, early approaches to job design lacked a clear theoretical focus and direction. This was to change after Herzberg and his colleagues (1959, 1966) developed an approach to job design entitled Motivation-Hygiene Theory. In its most general form, this theory proposes that the primary determinants of employee motivation and satisfaction are factors called motivators that are intrinsic to the work itself—recognition, achievement, responsibility, advancement, and personal growth in competence. Dissatisfaction, on the other hand, is caused by hygiene factors that are extrinsic to the work (e.g. company policies, salary, co-worker relations, and supervisory practices). Herzberg’s theory argues that job changes will enhance motivation and productivity only to the degree that motivators are designed into the work. Changes that deal only with hygiene factors are expected to reduce dissatisfaction, but not to generate motivational gains.

Herzberg’s theory prompted a great deal of research and inspired a large number of successful change projects (Herzberg, 1976). Results of these projects demonstrated, for a diversity of jobs and organizations, that increasing a job’s standing on motivators such as recognition, responsibility, and achievement can lead to numerous beneficial outcomes for the employees and for the organization. However, despite its considerable merit, there were several difficulties with Herzberg’s theory that compromised its usefulness. First, research failed to provide support for the core of the theory—the motivator/hygiene dichotomy (House & Wigdor, 1967; King, 1970). Specifically, results demonstrated that some aspects of the workplace can serve as times as motivators and at other times as hygiene factors. Second, Herzberg did not provide a technology for measuring the presence or absence of motivating factors in existing jobs. Thus, it is difficult to diagnose systematically the status of jobs on the motivators prior to introducing job changes, or to measure the effects of job design activities on the jobs after the changes have been carried out. Finally, the theory did not provide for differences in how responsive people will be to jobs that are high on the motivators. Herzberg’s theory suggests that all individuals will respond similarly and positively to the presence of motivators in jobs. Yet numerous research studies have demonstrated that some people respond more positively to well-designed jobs than do others (Fried & Ferris, 1987).

**CONTEMPORARY APPROACHES TO JOB DESIGN**

Partly as a result of difficulties associated with Motivation-Hygiene Theory, a number of new approaches to job design have been developed in recent years. In this section of the chapter, we focus on three contemporary approaches. Two of these, Job Characteristics Theory and Campion’s Integrated Framework, focus on the design of jobs for individuals. The third approach focuses on the design of work for teams. The research examining each of these approaches is reviewed separately below.

**Job Characteristics Theory**

The approach to job design that has attracted the most research attention during the past 20 years is Job Characteristics Theory (JCT; Hackman & Oldham, 1976, 1980). The basic job characteristics model, which has its roots in early work by Turner and Lawrence (1965) and Hackman and Lawler (1971), is shown in Figure 2.1. At its most general level, five core job characteristics (i.e. skill variety, task identity, task significance, autonomy, and task feedback) are seen as prompting three psychological states which, in turn, affect a number of beneficial personal and work outcomes: work effectiveness, general job satisfaction, growth satisfaction (i.e. satisfaction with opportunities for personal learning and growth at work) and internal motivation (i.e. the extent to which individuals experience personal satisfaction when they perform well at work). The links between the job characteristics, the psychological states, and the outcomes are shown as moderated by three individual characteristics: the employee’s knowledge and skill, growth need strength, and satisfaction with the work context.
inconsistent factor solutions. While a few studies have confirmed the presence of the five hypothesized job dimensions (e.g., Brass, 1979; Lee & Klein, 1982), the greater proportion of studies have reported factor solutions inconsistent with the a priori five-factor structure (e.g., Birnbaum, Farh & Wong, 1986; Dunham, Aldag & Brief, 1977).

Recent research has attempted to explain these inconsistent factor solutions. For example, Fried and Ferris (1986) argued that employees with different backgrounds and in different positions in the organization might differ in their ability to differentiate among job characteristics. Their results provided some support for these arguments, demonstrating that a factor structure consistent with the a priori model emerges more readily when respondents are younger, more highly educated, or in higher positions in the organization.

Other research suggests that the nature of the JDS itself might influence the factor structure obtained. Harvey, Billings and Nilan (1985), using confirmatory actor analysis, uncovered method factors as a reason for the conflicting findings regarding the dimensionality of the JDS. Specifically, their results suggested that the best fitting solution was one with the five a priori dimensions plus one or two method factors (one for the negatively worded items and one for the 3-anchor items). Similar results were obtained by Idaszak and Drasgow (1987). Their factor analyses revealed a six-factor solution—five factors corresponding to the hypothesized five-factor structure and the sixth representing the negatively worded JDS items.

In an effort to remedy these measurement problems, Idaszak and Drasgow (1987) revised the JDS by rewriting the negative items into a positive form. Results of several studies suggest that the factor structure of this revised JDS better fits the a priori structure than the original JDS (Cordery & Sevastos, 1993; Idaszak & Drasgow, 1987; Idaszak, Bottom & Drasgow, 1988; Kulik, Oldham & Langner, 1988). However, when both the original and revised JDS items were completed by the same respondents, the revised JDS did not improve upon the original to predict the outcomes in JCT (Cordery & Sevastos, 1993; Kulik, Oldham & Langner, 1988).

Research has not yet provided an explanation for the differences in factor structures between the original and revised JDS. One possibility is that employees have difficulty mentally reversing the negatively worded JDS items, but have little difficulty with the revised, positively worded items. If this is the case, we would expect individuals who are skilled at reversing negatively worded items (e.g., individuals with strong reading comprehension skills) to have little difficulty with the original JDS items and that factor analyses would reveal solutions for the original JDS that were consistent with the a priori structure. Although this possibility has never been tested directly, it is consistent with results obtained by Fried and Ferris (1986) which showed that education moderated the factor structure of the JDS.

Alternatively, it may be that the way the JDS is administered has an impact on the factor structure obtained. For example, if individuals are not informed...
that negatively worded items are included in the JDS, they may not carefully attend to them when completing the instrument, and a method factor might emerge. By informing respondents early on about the properties of the JDS, a factor solution consistent with the hypothesized solution might be obtained.

The motivating potential score

In addition to suggesting five separate job characteristics, JCT proposes a single index, the Motivating Potential Score (MPS), that reflects the overall potential of the job to foster positive work outcomes (Hackman & Oldham, 1976). This index, which follows directly from JCT (see Figure 2.1), is constructed using the following formula: MPS = (Skill variety + Task significance + Task identity) / 3 × Autonomy × Task feedback.

To examine the validity of this strategy of combining job characteristics, research has contrasted associations obtained between outcomes and MPS with those obtained using a simpler additive measure (i.e., variety + significance + identity + autonomy + feedback) (cf. Arnold & House, 1980; Evans & Ondrack, 1991; Ferris & Gilmore, 1985; Hackman & Oldham, 1976). In total, results of these studies indicate that the simple, additive index is a better predictor of personal and work outcomes than the MPS index. For example, in their meta-analytic review of the job design literature, Fried and Ferris (1987) found corrected mean correlations between the MPS index and satisfaction and performance of 0.63 and 0.22, respectively. However, the corrected correlations for the additive index were 0.74 (satisfaction) and 0.27 (performance).

One explanation for these results concerns the two multiplicative terms included in the MPS formula. Given that multiplicative operations can compound the effects of measure unreliability, it may be that MPS performs poorly relative to the additive index because the job characteristics measures are not perfectly reliable (Aldag, Barr & Brief, 1981; Taber & Taylor, 1990). Alternatively, it may be that the theoretical model on which the MPS score is based is largely invalid. That is, since the multiplicative MPS formula is based on the proposition that specific job characteristics affect particular psychological states and that these three states combine to determine the personal and work outcomes, failure to find support for the MPS measure calls into question the ‘causal core’ of JCT. This will be discussed later in this chapter.

Objectivity of job characteristics ratings

As noted earlier, most of the research on JCT has used the JDS alone to obtain measures of the job characteristics. But a controversy has emerged in recent years concerning whether job incumbents’ JDS ratings are based on ‘objective job properties’ or on some extraneous social and situational influences (Algera, 1990; Roberts & Glick, 1981).

Three streams of research have addressed the issue of the objectivity of employee job ratings. The first of these focuses on the associations between incumbents’ ratings of a job’s characteristics and ratings of those characteristics made by external observers such as peers, supervisors, or researchers (e.g. Algera, 1983; Birnbaum, Farh & Wong, 1986; Glick, Jenkins & Gupta, 1986; Spector, Dwyer & Jex, 1988). Job ratings provided by external observers are assumed to be more accurate judgments than incumbents’ ratings because observers are assumed to be less personally involved in the job itself. Thus, if incumbents’ ratings converge with ratings provided by observers, it is argued that incumbents’ ratings are accurate descriptions of their objective jobs.

Recent meta-analyses of this literature show moderate convergence between ratings of job characteristics made by incumbents and those made by non-incumbents (Fried & Ferris, 1987; Spector, 1992). For example, Fried and Ferris (1987) report a median corrected correlation of 0.63 between incumbent and observer ratings of the job characteristics, suggesting that incumbents often provide generally accurate descriptions of the objective characteristics of their jobs. However, this research does show considerable variability in the convergences of ratings across studies, ranging from a low of 0.16 to a high of 0.91.

One explanation for this variability involves the incumbents’ and observers’ level of experience with and knowledge of the target job. Specifically, greater convergence among ratings might be expected when both incumbents and observers fully understood all of the job’s properties. Unfortunately, few of the studies examining incumbent–observer job rating convergence provide much in the way of information about the raters’ knowledge of the target job, and systematic research on the impact of job knowledge on job rating convergence has not yet been conducted.

A second stream of research has addressed the objectivity of employee job ratings by examining the effects of changes in objective job properties on incumbents’ JDS scores (e.g. Griffin, Bateman, Wayne & Head, 1987; Kilduff & Regan, 1988; Luthans, Kemmerer, Paul & Taylor, 1987). For example, a field experiment by Luthans et al. (1987) examined whether the JDS scores of salespeople were significantly affected by encouraging employees to engage in such activities as (a) using different selling approaches, (b) designing new merchandise displays, (c) keeping records of sales activities, and (d) selecting their own break and lunch periods.

In general, meta-analyses of this literature suggest that such manipulations of the objective job environment have a substantial impact on employees’ JDS scores (Spector, 1992; Taber & Taylor, 1990). For example, Taber and Taylor (1990) report weighted average correlations between incumbents’ MPS scores and objective job conditions of 0.62 and 0.40 for laboratory and field studies, respectively. All in all, this evidence is consistent with results of studies focusing on incumbent–observer job rating convergence and suggests that individuals generally provide descriptions of their jobs that reflect objective conditions.
The final set of studies to address the objectivity of incumbents' job ratings examined the effects of information from social sources on employee JDS scores (e.g. Griffin, 1983; Griffin et al., 1987; Jex & Spector, 1989; Kilduff & Regan, 1988; Schnake & Dumler, 1987; Vance & Biddle, 1985). Most of this research is based on Social Information Processing Theory (Salancik & Pfeffer, 1977) which argues that if social information has an impact on job perceptions, than employees are basing their job ratings on factors other than the objective job environment. 

Research on the effects of social information has been conducted in both the laboratory and the field and has typically involved the manipulation of both informational cues and objective job properties (e.g. Griffin, 1983; O'Reilly & Caldwell, 1979). For example, in the study by O'Reilly and Caldwell (1979), subjects in an objectively complex task condition were asked to read and evaluate MBA application files as well as to make judgments about the applicant. In an objectively simple task condition, individuals were allowed only to code the application information. To manipulate informational cues about the tasks, subjects were shown evaluation forms ostensibly completed by other subjects and concerning the experimental tasks. For example, one "complex informational cue" stated: 'The job is complex enough to maintain your interest. I think you would have plenty of freedom at work.'

Recent meta-analyses of these studies (i.e. Spector, 1992; Taber & Taylor, 1990) suggest that social information often has effects on employee job ratings, but that these effects are considerably weaker than those of objective job properties. For example, Taber and Taylor (1990) conclude that manipulations of objective job properties control from two to six times more variance in JDS scores than do manipulations of informational cues provided by social sources.

One explanation for these results is that the magnitude of the effects for the objective job versus informational cues is simply a function of the relative strength of the manipulations used in the studies. Another possibility is that the effects vary as a function of individuals' experience with and understanding of the objective properties of the target job. That is, individuals may be more responsive to information from social sources when they have so little experience with the job that they are unable to confidently make their own judgments. Some support for this possibility is found in a study by Vance and Biddle (1985) which demonstrated that the effects of informational cues on job descriptions were lower after individuals gained experience on the job.

In summary, three research streams have assessed the objectivity of employee ratings of job characteristics. Studies have examined job incumbent-observer rating convergence, effects of objective manipulations on employee ratings, and the relative effects of social versus objective job manipulations on employee reports. Across all three research streams, results provide moderate support for the argument that employee job ratings represent generally accurate descriptions of the objective job environment.

Mediating effects of the psychological states

JCT posits that three psychological states intervene between the five job characteristics and the personal and work outcomes (see Figure 2.1). Specifically, the model argues that variety, significance, and identity contribute to meaningfulness, that autonomy contributes to responsibility, and that feedback contributes to knowledge of results. These states are then expected to contribute to the outcomes.

Results of numerous studies provide only mixed support for the predicted role of the psychological states (cf. Arnold & House, 1980; Champoux, 1991; Hogan & Martell, 1987; Johns, Xie & Pang, 1992). In particular, results show that job characteristics often contribute to psychological states other than those specified in the model (Fried & Ferris, 1987). For example, the study by Johns and his associates (1992) suggests that identity, significance, and autonomy contribute significantly to both meaningfulness and responsibility. Second, evidence suggests that the psychological states do not always mediate as predicted by JCT. For example, Fried and Ferris' (1987) meta-analysis of this literature suggests that the psychological states explain more variance in the outcomes of satisfaction and internal motivation than do the job characteristics, but that the job characteristics explain more variance in the performance outcome than do the psychological states.

The most likely reason for the results described above is that JCT is simply too simple and tightly linked to capture a rather complex phenomenon. Thus, rather than a few predetermined characteristics affecting certain psychological states, it is probably more reasonable to expect all of the job characteristics to affect these states to some extent. That is, it is probable that individuals who work on jobs with high autonomy not only experience responsibility at work, but are also likely to find the jobs meaningful and to obtain information about their performance effectiveness as a consequence of this autonomy.

Variance in outcomes explained by job characteristics

JCT posits that high levels of core job characteristics enhance employees' motivation, satisfaction, and performance. The theory does not suggest which outcome variables should be most substantially affected by the job characteristics.

In general, previous research suggests that the job characteristics explain more variance in the outcomes of satisfaction and motivation than in the performance outcome. For example, in an analysis of 32 field experiments that manipulated core job characteristics, Kopelman (1985) showed that job satisfaction increased in 80% of the studies and that performance increased in 63%. The median increase in productivity across all studies was 6.4%. These results are generally consistent with those obtained in the Fried and Ferris (1987) meta-analytic review of the correlational studies involving the JDS.
Their results demonstrated that the additive job characteristics index accounted for 44%, 55%, and 77% of the variance in measures of internal motivation, general satisfaction, and growth satisfaction, respectively. However, the same index explained only about 7% of the variance in performance.

One explanation for the finding that job characteristics explain more variance in motivation and satisfaction outcomes than in work performance involves the issue of common method variance. This argument posits that there is a greater likelihood of high correlations among independent and dependent variables when all variables are measured in a single questionnaire using similar item formats than when variables are measured using multiple methods. Since job characteristics, motivation, and satisfaction are typically measured in the JDS and performance data are obtained from a source other than an incumbent (e.g. a supervisor), the pattern of results obtained in the previous studies is consistent with the common method argument.

Two approaches have been used to assess the validity of this argument. First, correlations between incumbents’ ratings of job characteristics and their satisfaction and motivation are contrasted with correlations between these outcomes and measures of job characteristics obtained from external observers (cf. Algina, 1983; Birnbaum, Farh & Wong, 1986; Gerhart, 1988; Glick, Jenkins & Gupta, 1986). If the common method variance argument is to receive support, correlations between incumbents’ ratings of satisfaction and job characteristics should be of greater magnitude than correlations between incumbents’ satisfaction and observers’ ratings of a job’s characteristics.

Results provide little support for the common method variance argument showing that observers’ ratings of job characteristics explain about as much variance in employee satisfaction as do incumbents’ ratings (Fried & Ferris, 1987). For example, in the Birnbaum, Farh & Wong (1986) study, the median correlations between incumbents’ job satisfaction and incumbents’ and observers’ ratings of job characteristics were 0.40 and 0.37, respectively.

In a second assessment of the common method variance position, Stone (1986) contrasted the job characteristics–satisfaction effect sizes for both field and laboratory research. If the common method variance argument is valid, the effect sizes obtained in correlational field studies should be of a higher magnitude than those found in laboratory studies in which the job characteristics have been experimentally manipulated. Once again, the results provide little support for the common method variance critique. Effect sizes found in field studies for the criteria of general satisfaction and satisfaction with the work itself were 0.63 and 0.88, respectively. For the laboratory studies, the effect sizes were very similar—0.53 (general) and 0.93 (work itself).

In total, research suggests that job characteristics account for more variance in job satisfaction and internal motivation measures than in measures of performance. However, there is little support for the notion that common method variance explains these results. One alternative explanation is that behavioral responses such as performance are affected by a wide range of factors other than job characteristics (e.g. equipment, pay systems, employee health), whereas satisfaction and motivation are primarily affected by characteristics of the work. Another possibility is that performance measures are likely to suffer a severely restricted range of possible values, since the organization may have terminated the poorest performers at regular evaluation periods (Kulik & Oldham, 1987). This reduction of range in performance scores can lead to an attenuated estimate of the true correlation between job characteristics and employee performance. A restriction of range is less likely to be found in the satisfaction measures, since dissatisfied employees may remain on the job for a variety of other reasons, while the organization is likely to tolerate job dissatisfaction to the extent that it does not have any visible effect on performance.

**Moderating effects of GNS, context satisfactions, and knowledge and skill**

JCT posits that these three variables jointly moderate relations between the job characteristics, the psychological states, and the outcomes. Hackman and Oldham (1976, 1980) originally suggested that there were two sites for the effects of these moderators: between the job characteristics and the psychological states and between the states and the outcomes. However, very little research has tested the effects of the moderators on these relations; instead most research has simply examined the effects of moderators on the relations between the job characteristics and outcomes. Moreover, the joint moderation of these three variables has never been fully tested. In fact, no previous study has examined individual or joint moderating effects involving knowledge and skill. Thus, reviewed below are studies that have focused on the individual moderating effects of GNS and context satisfactions.

**Growth need strength**

JCT argues that high GNS employees will respond more positively to complex, high MPS jobs than low GNS employees. Although the results of numerous studies provide some support for this argument (e.g. Champoux, 1991, 1992; Hackman, Pearce & Wolfe, 1978; Johns, Xie & Fang, 1992; Tietgs, Tetrick & Fried, 1992), recent meta-analytic reviews of this literature differ in their conclusions regarding which outcomes are moderated by GNS. Loher, Noe, Moeller and Fitzgerald (1985) concluded that GNS moderated the job characteristics–satisfaction relation. They found average correlations between job characteristics and satisfaction of 0.68 and 0.38 for high and low GNS employees, respectively. On the other hand, Fried and Ferris (1987) concluded that GNS moderated the job characteristics–performance relation, and Spector (1985) demonstrated that GNS moderated relations involving both satisfaction and performance.
Although these results suggest that GNS plays a significant role in JCT, it is not clear why inconsistent results were obtained in the meta-analyses described above. One possibility is that different studies were included in the various reviews. For example, Spector (1985) included studies that measured need for autonomy and need for achievement as proxies for GNS, whereas Loher et al. (1985) and Fried and Ferris (1987) included only those studies that measured GNS directly. Another possibility is that the outcomes were treated differently in the analyses. For example, Loher treated general and growth satisfaction as one construct, while Fried and Ferris treated these measures as separate outcomes.

Context satisfactions

JCT argues that employees who are satisfied with several aspects of the work context (e.g., pay, job security, co-workers and managers) respond more positively to jobs high on the core characteristics than those who are dissatisfied with the context. The argument is that active dissatisfaction with such contextual factors may distract employees' attention from the work itself and orient their energy instead toward coping with the experienced problems.

Numerous studies have tested these arguments (cf. Champoux, 1992; Brocker, Wiesenfeld, Reed, Grover & Martin, 1993; Tiesg, Tetrick & Fried, 1992). However, results provide little support for the predicted role of context satisfactions. Although a few studies provide results in the direction predicted by the theory (Oldham, Hackman & Pearce, 1976; Orpen, 1979), few statistically significant findings have been obtained. Moreover, results of several other studies (e.g., Borger & Chew, 1986; Champoux, 1981; Johns, Xie & Fang, 1992) suggest a moderating effect exactly the opposite of that proposed by JCT. That is, in these studies individuals often respond most positively to jobs high on the characteristics when they are dissatisfied with the context.

These inconsistent results call into question the role of context satisfactions in JCT. It may be that in some circumstances a dissatisfying context distracts employees' attention from the work itself, while in other circumstances such a context actually causes employees to focus their attention on the work (Dunham, Pierce & Newstrom, 1983). The latter may be a possibility since focusing attention on the work itself could insulate employees from the stressful effects of a dissatisfying context (Dunham, Pierce & Newstrom, 1983).

Areas of future research

In summary, numerous studies have tested various aspects of JCT and provided it with mixed results. On the one hand, it does appear that individuals are able to provide reasonably accurate descriptions of their jobs using the JDS and that individuals with high growth need strength respond more positively to the core job characteristics than individuals with relatively weak GNS. On the other hand, the psychological states do not mediate the job characteristics—outcome relations as specified in the model, the MPS measure does not predict outcomes as effectively as a simpler additive version, and context satisfactions have little consistent impact on the relation between characteristics of jobs and outcomes.

There are a number of potentially important areas of future research concerning JCT. One of these involves the ongoing effects of job characteristics on individuals' characteristics (i.e., their needs and talents). In its current form, JCT views job and individual characteristics as two sets of independent constructs that do not necessarily influence one another. However, recent work suggests that characteristics of the environment do exert long-term influence on the characteristics of people operating in that environment. Specifically, Kolb and Schooher (1982) have shown that over the long term, self-directed work leads both to increased intellectual flexibility (i.e., the individual's ability to deal with complex cognitive problems that require weighing alternative sides of an issue) and to a stronger preference for self-directed activities. And Brousseau (1978) has demonstrated that the motivating potential of jobs is associated with changes in two personality characteristics: active orientation and freedom from depression.

Given the research described above, there is reason to believe that, over time, the characteristics of jobs might have a substantial impact on employees' characteristics that are central to JCT (i.e., GNS and knowledge and skill). For example, individuals who work on complex, challenging jobs might discover that they need new knowledge and skills to accomplish the work—and gradually acquire what they need in the course of doing the work. It is also possible that the design of jobs might affect employees' GNS scores. For example, high GNS employees who work on simple jobs might experience chronic frustration, resulting in lowered GNS (Kulik, Oldham & Hackman, 1987).

Unfortunately, few studies have tested these possibilities empirically. Longitudinal studies are now needed that carefully address (a) the specific characteristics of jobs that influence employee characteristics and (b) the time interval required for jobs to exert this influence.

Another area requiring attention involves the actual job characteristics that are the focus of future empirical research. Nearly all research on JCT has focused on five job characteristics (i.e., autonomy, feedback, etc.). The difficulty with the emphasis on these five characteristics is that researchers have for the most part neglected other potentially important characteristics of jobs—characteristics that might combine and interact with those characteristics originally proposed by JCT to influence employees' personal and work outcomes.

Included in this set of neglected characteristics are two suggested by Hackman and Oldham (1980) that deal with the social context of the work: agent feedback (the degree to which the employee receives performance feedback from supervisors and co-workers) and dealing with others (the degree to which the job requires employees to work closely with other people). In
addition, a number of commentators have identified other job characteristics that may warrant research attention, such as time pressure, intellectual demands, and required physical movement (Taber & Taylor, 1990; Zaccaro & Stone, 1988). Research is now needed that examines the contribution of such job characteristics to our understanding of employees’ work responses.

**An Interdisciplinary Perspective**

One of the more recent developments in the field of job design is the interdisciplinary viewpoint espoused by Campion and his associates (Campion, 1988; Campion & McClelland, 1991, 1993; Campion & Thayer, 1985). This perspective attempts to integrate various job design approaches into a single framework. Specifically, the interdisciplinary framework classifies previous job design approaches into four types and argues that features associated with each will lead to different beneficial outcomes. In addition, the framework suggests that each of the job design approaches is associated with a series of potentially negative outcomes. The four approaches and the outcomes associated with them are shown in Table 2.1 and described briefly below.

**Table 2.1 Summary of expected costs and benefits from the four job design approaches**

<table>
<thead>
<tr>
<th>Job design approach</th>
<th>Benefits</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanistic</td>
<td>Decreased training time</td>
<td>Lower job satisfaction</td>
</tr>
<tr>
<td></td>
<td>Higher utilization levels</td>
<td>Lower motivation</td>
</tr>
<tr>
<td></td>
<td>Lower likelihood of error</td>
<td>Higher absenteeism</td>
</tr>
<tr>
<td></td>
<td>Less chance of mental overload and stress</td>
<td></td>
</tr>
<tr>
<td>Motivational</td>
<td>Higher job satisfaction</td>
<td>Increased training time</td>
</tr>
<tr>
<td></td>
<td>Higher motivation</td>
<td>Lower utilization levels</td>
</tr>
<tr>
<td></td>
<td>Greater job involvement</td>
<td>Greater likelihood of error</td>
</tr>
<tr>
<td></td>
<td>Higher job performance</td>
<td>Greater likelihood of mental</td>
</tr>
<tr>
<td></td>
<td>Lower absenteeism</td>
<td>overload and stress</td>
</tr>
<tr>
<td>Biological</td>
<td>Less physical effort</td>
<td>Higher financial costs</td>
</tr>
<tr>
<td></td>
<td>Less physical fatigue</td>
<td>because of changes in</td>
</tr>
<tr>
<td></td>
<td>Fewer health complaints</td>
<td>equipment or job</td>
</tr>
<tr>
<td></td>
<td>Fewer medical incidents</td>
<td>environment</td>
</tr>
<tr>
<td></td>
<td>Lower absenteeism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher job satisfaction</td>
<td></td>
</tr>
<tr>
<td>Perceptual/motor</td>
<td>Lower likelihood of error</td>
<td>Lower job satisfaction</td>
</tr>
<tr>
<td></td>
<td>Lower likelihood of accidents</td>
<td>Lower motivation</td>
</tr>
<tr>
<td></td>
<td>Lower likelihood of mental overload and stress</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower training time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher utilization levels</td>
<td></td>
</tr>
</tbody>
</table>

The **motivational** approach has its origins in work on job enrichment (e.g., Motivation-Hygiene Theory and JCT) and focuses on characteristics that make jobs meaningful and responsible. Thus, jobs high on motivational design have high levels of autonomy, feedback, skill variety, and recognition from others. It is expected that jobs with these features will enhance employees’ satisfaction, motivation, and effectiveness. On the negative side, jobs that match the motivational approach are expected to have longer training times and to be more difficult to staff due to their greater mental demands.

The **mechanistic** approach (e.g., job simplification) emphasizes human resource efficiency. Jobs high on mechanistic design are simple, repetitive and frequently assisted by automation. These jobs are expected to be associated with efficiency and flexibility outcomes such as few errors, ease of staffing and low training costs. Costs of the mechanistic approach include low job satisfaction, low motivation, and high absenteeism.

The **biological** approach focuses on issues related to strength and endurance requirements as well as noise and climate limits. The objective of this approach is to ensure that employees’ physical capabilities and limitations are not exceeded by the design of their jobs. Thus, jobs high on biological design result in less physical fatigue, create fewer health complaints, and cause fewer injuries than other jobs. The costs of jobs designed from a biological approach include the expenses associated with equipment necessary to reduce the physical demands of the work and the possibility that employees might become drowsy or lethargic on jobs with few physical demands.

Finally, the **perceptual/motor** approach attempts to ensure that employees’ cognitive capabilities are not exceeded by the nature of the job or the physical characteristics of the workplace or equipment. Jobs high on perceptual/motor design have limited information processing and memory requirements and are expected to be associated with positive reliability outcomes such as reduced error-rates and accidents. In addition, this approach is expected to result in lower mental overload and stress. On the negative side, it is argued that jobs designed to match the perceptual/motor approach can lower employee satisfaction and motivation because they are less mentally stimulating.

Like JCT, the interdisciplinary framework is accompanied by a survey, the Multi-method Job Design Questionnaire (MJDQ; Campion & Thayer, 1985), which assesses the elements associated with each of the four job design approaches. Versions of the MJFQ have been designed for use both by job incumbents (Campion, 1988) and by observers (Campion & Thayer, 1985) and have been shown to have acceptable psychometric qualities (Campion, 1988) and convergent and discriminant validity (Campion, Koslak & Langford, 1988) with the JDS.

Much of the research concerning the interdisciplinary perspective has focused on associations between MJFQ measures of the four job design approaches and the outcomes expected to be influenced by each approach. The outcomes predicted to be associated with each of the approaches follow the descriptions
The advantage of the interdisciplinary framework is that it is more comprehensive than previous models and recognizes both the possible benefits and the costs of various approaches to job design. Yet the framework itself has as yet received little empirical attention—and the attention it has received has been from Campion and his associates. Thus, more empirical studies testing the various propositions of the framework are clearly needed before its contribution to the literature can be assessed. Future work is also needed to better integrate the various approaches to job design into a single, clear theoretical framework that describes the specific conditions under which each of the approaches contributes to desirable outcomes. Finally, the framework needs to be expanded to account for the possibility that individual difference characteristics, other than those previously investigated by Campion, may influence the way employees respond to the various approaches to job design.

The Design of Jobs for Teams

Each of the approaches discussed thus far has focused on the design of jobs for employees who work relatively independently of one another. In this section the focus is on research that has examined the effects of work designed to be performed by a team of employees rather than by individuals. The objectives of team work design are often similar to those sought when individual jobs are redesigned—to enhance the motivation, satisfaction, and work effectiveness of employees (Hackman & Oldham, 1980; Wall & Martin, 1987). The basic difference is that responsibility for managing the work activities and processes lies with the group as a whole rather than with the individual employee. Hence, such teams are often labeled ‘autonomous’, ‘self-directing’, or ‘self-managing’ (Cotton, 1993).

For some time, autonomous or self-directed work teams have been a major component of socio-technical systems theory, an approach that attempts to optimize the relation between the social and technical aspects of the organization (Trist, Susman & Brown, 1977). However, this theory provides little guidance concerning the specific criteria that should be used in determining just what is (and what is not) a ‘well-designed’ autonomous work group (Hackman & Oldham, 1980).

Such criteria are set forth in a more recent comprehensive model of team work design developed by Hackman and his colleagues (Hackman, 1987; Hackman & Oldham, 1980). This model is shown in Figure 2.2 and proposes that the overall effectiveness of work groups in organizations is a joint function of three ‘process criteria’: (a) having a sufficient level of effort applied to the group task, (b) assuring that sufficient knowledge and skill of group members is applied to the task, and (c) having members devise and use performance strategies (i.e., ways of working together on the task) that are appropriate for the group task.
Three primary design features of groups are proposed as critical in achieving these process results. First, group members' efforts are expected to be a function of the group task structure. Building on the previously discussed JCT, Hackman proposes that the group task should be high in motivating potential. Thus, the task should require team members to use a variety of skills; it should be a whole and identifiable piece of work; it should provide team members with regular and trustworthy feedback about how the team is performing; it should provide autonomy for members to decide together how they will carry out the work; and the outcomes of the task should have significant consequences for others.

Second, group composition is expected to directly affect the amount of knowledge and skill that is applied to the task. Hackman proposes four aspects of composition that are particularly relevant: (a) members should have high task-relevant expertise, (b) the group should be just large enough to do the work, (c) members should have a moderate level of interpersonal skill, and (d) members should be moderately diverse in terms of their backgrounds and talents.

Finally, Hackman argues that group norms affect the performance strategies members use in carrying out the task. Choices about performance strategy can be important in determining how well a group performs. For example, if a group task required close coordination among members, then a group that developed an explicit strategy for coordinating member inputs should perform better than a group that proceeds with ad hoc procedures. Performance strategies are usually under control of group norms. Thus, according to Hackman, the challenge in designing a work group is to help members develop norms that reinforce the use of strategies appropriate to the group task.

Although no previous study has systematically tested this entire framework, a number of studies have examined the effects of work teams designed in line with some of Hackman's criteria (Cordery, Mueller & Smith, 1991; Ondrack & Evans, 1987; Wall, Kemp, Jackson & Clegg, 1986). In most of these studies, the team is assigned to complete a large product or work process and makes all relevant decisions related to the completion of this product. For example, the team schedules its own work, makes decisions about which employees will complete particular tasks, decides when rests breaks will be taken, decides on an equipment maintenance schedule, and decides how often product quality will be checked. Teams are also provided with regular feedback about their performance effectiveness and are given responsibility for evaluating the effectiveness of each team member. Finally, in many studies of autonomous teams, members are given substantial input into hiring and firing decisions involving group members (Cordery, Mueller & Smith, 1991; Wall et al., 1986).

A number of case studies and quasi-experimental investigations provide substantial support for the argument that autonomous teams have positive effects on employees' attitudes and behaviors (cf. Cordery, Mueller & Smith, 1991;
Trist, Susman & Brown, 1977; Wall et al., 1986; Walton, 1977). Among the case studies focusing on autonomous groups, the best known application occurred in the General Foods plant in Topeka (Walton, 1977, 1982). Autonomous teams were the foundation of the production process in this plant with teams designed to perform most production and support tasks. In general, Walton (1977) reports that the teams were responsible for positive outcomes (e.g. high employee satisfaction and substantial production savings). In addition, Walton (1982) reports that, through 1981, productivity in the plant improved every year except one, and that product quality was consistently high.

A quasi-experimental investigation by Cordery and his associates (1991) examined the effectiveness of autonomous, self-directed teams by comparing the responses of three groups of employees: those in self-directed work teams in a new plant, those in self-directed teams in an established plant, and those operating under traditional work design in an established plant. Results demonstrated that employees in self-directed teams (in both plants) reported higher job satisfaction and organizational commitment than those working under traditional work design. However, employees in self-directed teams in the new plant demonstrated higher absenteeism and turnover than both self-directed team members and traditional workers at the established plant. Exit interviews suggested that these latter results could be attributed to external factors such as availability of work elsewhere and the distance to travel to the new plant.

Comprehensive reviews of both case and quasi-experimental studies suggest that self-directed groups have generally positive effects on employees' attitudes and behaviors (Beekun, 1989; Pearce & Ravlin, 1987). The most recent of these reviews (i.e. Cotton, 1993) concluded that introducing self-directed work teams resulted in increased productivity in 83% of the studies conducted, in decreased absenteeism in 79% of the investigations, and in increased job satisfaction in 93% of the studies. Moreover, only a trivial percentage of the studies showed that these work outcomes actually decreased after the introduction of teams.

Despite these very promising results research on self-directed teams, like research on other approaches to job design, is not without its limitations. One of these is the failure of previous studies to examine the possibility that there might be individual differences in how members respond to the dynamics of teams. As noted previously, research on JCT has demonstrated that there are important individual differences in how people respond to jobs designed for individual employees (see Fried & Ferris, 1987, for a review). Yet little research has examined the possibility that individuals' needs or preferences (e.g. those for social interaction and growth) interact with various team arrangements to influence employee outcomes. Secondly, the Hackman model of team effectiveness has not yet been tested in its entirety, and it is not clear if the components suggested by Hackman (i.e. effort, knowledge and skill, and performance strategies) combine in the fashion suggested. Moreover, it is not clear which components of self-directed teams have the strongest impact on their effectiveness. That is, is the effectiveness of self-directed teams primarily a function of their composition, the group task, the performance strategies used by the team, or some other element of the team design? Finally, most of the results concerning the effects of self-directed teams are based on case studies (cf. Cotton, 1993). More longitudinal studies using experimental and quasi-experimental designs are needed before we can make firm conclusions about the long-term effects of such teams.

New Topics for Future Research

Job comparisons

Nearly all the previous work concerned with the design of jobs for individuals has focused only on employees' responses to the characteristics of their own jobs. However, it is obvious that individual jobs do not exist in isolation of one another but instead are located in a network of other jobs in the work unit and organization.

Recent research has established that individuals are aware of, and often respond to, the other jobs that surround them. Specifically, this research suggests that individuals often (a) contrast the characteristics (e.g. autonomy and variety) of their own jobs to the job characteristics of other employees and (b) respond to their own jobs partly as a result of this job comparison process (Montagno, 1985; Oldham, Kulik, Ambrose, Stepina & Brand, 1986; Oldham, Nottenberg, Kassner et al., 1982). Consistent with principles of equity theory (Adams, 1963; Goodman, 1974), results show that employees who perform jobs comparable in design and complexity to those of referent jobs exhibit higher levels of internal motivation than employees who work on jobs that are either more or less complex than their comparative jobs (Oldham et al., 1982).

More work is now needed to better understand the job comparison process. For example, work is needed that examines which jobs are frequently used as comparative standards. Do employees contrast their jobs to those of co-workers or to those of managers? And under what circumstances are job comparisons most likely to occur? That is, are individuals most likely to attend to the job characteristics of others early or late in their tenure on particular jobs? And how much interpersonal contact between the target employee and co-workers is necessary before co-worker jobs are selected as comparative standards? Finally, research is needed on the stability of comparative jobs. Do employees contrast their jobs to the same comparative jobs over time, or are different jobs used for comparison purposes?

The role of the physical context

In addition to neglecting the job characteristics of employees other than the target employee, much of the previous research on job design has overlooked
the physical context in which the work is performed. That is, few previous
studies have examined the impact the spatial configuration of the organization
(e.g. the distance between employee workstations, the number of physical
boundaries surrounding the employee's work area, and the average space
available to an employee in the work unit) on employees' reactions to their
work.

Yet research in the tradition of environmental psychology and behavior (cf.
Oldham, Kulič & Stepan, 1991; Sundstom, Burt & Kamp, 1980; Sutton &
Rafaeli, 1987) suggests that such configuration dimensions may have a sub-
stantial impact on individuals' work responses. The reason for the possible
significance of the spatial configuration is twofold: (a) configuration dimen-
sions (e.g. enclosures) may provide individuals with protection from un-
wanted or unexpected intrusions and (b) the absence of such intrusions may
especially benefit employees on complex jobs by allowing them to focus and
concentrate on their work.

Only a few studies have tested these possibilities, and the results thus far
have been equivocal (cf. Block & Stokes, 1989; Oldham, Kulič & Stepan, 1991).
For example, Block and Stokes demonstrated that employees working
on a complex task performed best when working in low density conditions.
On the other hand, Oldham and his colleagues demonstrated that employees on
complex jobs responded similarly to protected (i.e. many physical boundaries,
high distance to others, dense areas) and unprotected configurations.
However, employees working on simple jobs exhibited the lowest performance
and job satisfaction when working in unprotected environments.

Additional studies are now needed to further investigate the role of the
physical environment on employee reactions to the design of jobs. For ex-
ample, work is needed to examine the impact of dimensions of the environ-
ment that have received little attention—such as, the distance between
employees and supervisors and the nature of physical enclosures (e.g. solid vs
clear). In addition, research is needed on the combined effects of configura-
tion dimensions and employee characteristics (e.g. GNS) on employee re-
sponses to work. Finally, future studies are needed that examine the impact of
various configurations on employee responses to working in autonomous
teams. To this writer’s knowledge, research examining the possible intersec-
tion between teams and configurations has never been conducted systemati-
cally.

The process of changing jobs

Most of the approaches to job design discussed thus far have focused on the
nature and characteristics of jobs that prompt employees' responses. Unfor-
fortunately, few of these approaches deal specifically with strategies for intro-
ducing changes in these job dimensions. Systematic research is now needed that
investigates the risks and benefits of alternative job design change strategies.

For example, research is needed that examines the effects of different levels of
employee participation in the process of changing jobs. Should employees be
allowed to generate ideas for specific job changes or should these ideas be
generated and implemented by managers alone? If employees are involved in
the change process, at what stage should they provide input (i.e. before a final
decision has been made to implement a change program or after such a
decision)? And what are the long-term effects of employee involvement in the
change process? Previous research suggests that participative approaches to
job design may be effective in improving employee satisfaction with the newly
designed job (Griffith, 1985). Yet we know little about the potential costs of
such employee involvement (e.g. enhanced expectations and decreased
efficiencies).

In addition to examining the effects of employee involvement in the design
process, research is needed on the impact of the magnitude of job changes.
Most job design change projects involve changing simultaneously multiple
characteristics of the job (Campion & McClelland, 1991; Hackman, Oldham,
Janson & Purdy, 1975; Herzberg, 1976). We know little about the relative
effectiveness of such 'broadsiding' change programs versus those that change
the work gradually over time (e.g. changing one or two job characteristics at a
time). Moreover, little is currently known about the appropriateness of these
change strategies for individuals with different needs and talents and skills.

Alternative outcomes of job design

Much of the research on the design of work has focused on outcomes of direct
relevance to the employing organization (e.g. work performance) or to the
employee's working life (e.g. job satisfaction). Yet previous studies suggest
that the individuals' experiences in an organization might have a substantial
impact on aspects of an individual's life outside the work setting, such as
family relations, drug and alcohol abuse, and heart disease (Hughes &

Research is now needed that directly addresses the impact of the nature of
jobs on non-work outcomes. There are a number of possible ways that jobs
might influence experiences in non-work domains. For example, if jobs are
well designed from a motivational perspective, individuals might become
increasingly absorbed in and committed to their work activities. To the
extent that this work involvement compromises the time and energy individ-
uals have for other pursuits (e.g. family activities), a deterioration of rela-
tionships with family and friends might be expected. Alternatively, if jobs are
simplified, routinized and otherwise designed according to mechanistic prin-
ciples, the job dissatisfaction that is likely to result may 'spillover' to satisfac-
tion with non-work areas. Research on topics such as these that focus on the
long-term non-work consequences of the nature of the jobs would seem well
worthwhile.
ACKNOWLEDGEMENTS

The author thanks Anne Cummings and Carol Kulik for helpful comments on an earlier draft of this chapter.

REFERENCES


Chapter 3

FAIRNESS IN THE ASSESSMENT CENTRE

Helen Baron and Karen Janman
Saville and Holdsworth Ltd

INTRODUCTION

The Assessment Centre (AC) is widely used as a means of managerial selection and development. Its espousal by AT&T in the United States for identifying managerial potential (Bray & Grant, 1966) with very positive results encouraged other companies to use it. AC use is also growing in Europe where the method originally evolved (it was first used for officer selection in pre-Second World War Germany). Surveys (Boyle, Fullerton & Yapp, 1993; Shackleton & Newell, 1991, 1993; Smith & Abrahamsen, 1992; Preito & Munduate, 1994) show between 45 and 60% of large UK companies report using the AC at least sometimes and there is a similar high usage reported in Germany. The AC is also fairly popular in Belgium, at least among Flemish businesses, and it is sometimes used in France, although individual management selection procedures are more common there. AC technology has made little inroad into practices in southern Europe, with very low usage rates reported in Spain and Italy. Outside Europe, Di Milia, Smith and Brown (1994) report that some 22% of large Australian companies use the AC and other individual reports show that the AC technique is used at least occasionally in many other countries.

The aim of this review is to examine the widely held view that AC technology is a very fair as well as potent way of identifying management potential. We have examined the impact of the AC both on groups typically covered by equal opportunities legislation as well as on other potential sources of bias which could unfairly lower or raise the assessment of particular groups of candidates. However, where there is little research on an aspect of the AC itself, we have looked at related pure research, or research from other areas where similar issues arise. We have concentrated on the use of AC technology with management groups and for the identification of management potential with...