THE CHANGING NATURE OF JOBS:

A META-ANALYSIS EXAMINING CHANGES IN JOB CHARACTERISITCS OVER TIME

by

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(Under the Direction of Brian J. Hoffman)

ABSTRACT

In recent years, the "changing nature of work" has become a growing topic of interest, but little empirical research has actually investigated proposed changes in the way modern organizations do business. This study uses cross-temporal meta-analysis of means to examine changes in five core job characteristics over the past 35 years. Results revealed that jobs are increasingly characterized by task identity, task significance, skill variety, and autonomy since 1975. However, feedback failed to show significant gains. Moderator analyses did not support sample gender as a moderator of changes in core job characteristics, indicating that jobs have not become more enriched for women in recent years. These findings are discussed in light of theoretical and practical implications for organizations navigating the changing nature of work.

INDEX WORDS: Job Characteristics, Task Identity, Task Significance, Skill Variety, Autonomy, Feedback, Work Design, Changing Nature of Work

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DEDICATION

To Jon, my fiancé, without whose encouragement and support this would not have been possible. And, to my family who instilled in me the value of education and never allowed me to settle for less than my true potential.

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CHAPTER 1

INTRODUCTION

Over the past 20 years, "the changing nature of work" has received considerable attention among management scholars (Howard, 1995), business leaders (Maney, 2009), and the popular press (Godin, 2009). Some suggest that this is the dawn of a new industrial revolution—the age of *digitalization* (National Academy of Sciences, 1999) as evidenced by the incredible growth of and dependence on technology. Others have noted that traditional jobs and work schedules are becoming archaic, replaced by fluid work roles (Davis, 1995; Motowidlo & Schmit, 1999) and flextime (Patterson, 2001) which contribute to the hazy line between work and non-work (Allan, Loudoun, & Peetz, 2007; Patterson, 2001). To compete in the global economy, hierarchically structured work units have been replaced with teams (Kozlowski, Gully, Nason, & Smith, 1999; Salas, Cooke, & Rosen, 2008), core work tasks are outsourced for faster, cheaper production (Cant & Jeynes, 1998), and the reporting structures of organizational hierarchies are flattening (National Research Council, 1999). Indeed, changes in the nature of work are often explicitly referenced as rationale for the importance of studying a variety of organizational phenomenon, including person-organization fit (Caldwell, Herold, & Fedor, 2004), organizational commitment (Solinger, van Olffen, & Roe, 2008), changes in selection systems (Murphy, 1999), alternations in performance assessment (Motowidlo & Schmit, 1999), and organizational citizenship behaviors (Randall, Cropanzano, Borman, & Birjulin, 1999).

Despite frequent reference to the changing nature of work in the management literature, there is a surprising dearth of empirical research substantiating these changes (National Academy of Sciences, 1999). Much of the literature is anecdotal (e.g., Canton, 2006; Godin, 2009) or

reflects sociological / macro-economical interpretations of the underlying causes of presumed changes (e.g., globalization, diversity). Given that supposed changes in the workplace are frequently referenced as evidence for the importance of a cross-section of topics in the management literature, systematic investigations of the changing nature of work have the potential to inform multiple literatures.

This study investigates the most popular conceptualization of work characteristics (Grant, Fried, & Juillerant, 2010), Hackman and Oldhman's (1975) job characteristics model (JCM), to provide one of the first empirical descriptions of the ways in which work has changed. Given the popularity, empirical evidence, and use of a standardized instrument over the years, the job characteristics model is ideally suited for an analysis of the changes in work. This study uses a cross-temporal meta-analysis of mean levels of job characteristics over the past 35 years to investigate the degree to which: (a) the five core job characteristics have changed over time, (b) observed changes remain after objective organizational characteristics are removed, and (c) the pattern of changes in job characteristics differs for jobs characterized by having more female employees.

CHAPTER 2

LITERATURE REVIEW AND HYPOTHESES

The Changing Nature of Work

At the end of the last century, the Army Research Institute charged the National Academy of Science to investigate "the changing nature of work and the implications for occupational analysis," (National Academy of Sciences, 1999; p. *vii*). The National Academy of Science Task Force identified four key themes concerning the American workforce, including: changes in worker demographics, blurring of boundaries between jobs, increasing variation in work structure, as well as a lack of knowledge of the implications and interdependent nature of the first three themes (National Academy of Sciences, 1999). In other words, the first three themes identified changes occurring within the American workforce, and the final trend noted the need of more research in order to better understand these changes and their effects in the workplace. According to the National Academy of Sciences (1999), "these changes may lead to new conditions and to possibilities that some might characterize as a transformation" (p. 5). However, in the decade since this review, limited empirical work has investigated changes in working conditions.

Job Characteristics

Since its development in 1975, the job characteristics model (JCM) along with the associated measure, the Job Diagnostic Survey (JDS), has become the predominant model used to describe the motivating potential of jobs (Humphrey, Nahrgang, & Morgeson, 2007). Indeed, Fried and Ferris (1987) note "the JDS is the most frequently used instrument for the measurement of job characteristics," (p. 288). The JCM proposes that high levels of the five

core characteristics (task identity, task significance, skill variety, feedback, and autonomy) contribute to three critical psychological states (experienced meaningfulness of the work, experienced responsibility for the work outcomes, and knowledge of the results of the work activities), which in turn lead to positive personal and work outcomes (high motivation, high quality performance, high job satisfaction, as well as decreased absenteeism and voluntary turnover). In other words, the job characteristics act as a gauge for the enrichment of jobs (Hackman & Oldham, 1975). Substantial research has supported the influence of these characteristics on a variety of attitudinal and behavioral outcomes (Fried & Ferris, 1987; Loher, Noe, Moeller, & Fitzgerald, 1985; Taber & Taylor, 1990). The remainder of this section outlines the ways in which proposed work-related changes may manifest in potential changes in overall levels of the five core job characteristics.

Task identity. Task identity concerns the degree to which an employee completes a task "from start to finish," experiences identification with the final product, and ultimately, takes pride in producing a discernible product (Hackman & Oldham, 1975). For instance, task identity is high when an employee manages an entire project or provides a complete service and, as a consequence, the employee has the opportunity to see the finished outcome of the work (Hackman, 1977; Nadler, Hackman, & Lawler, 1979). On the other hand, a job on an assembly line or in an organization with a functional structure would be characterized by lower levels of task identity (Hackman, 1977; Nadler, Hackman, & Lawler, 1979).

With the continued transition from manufacturing to a service-based economy, tasks and roles have become more loosely defined, and many workers are no longer responsible for delivering a tangible product (Howard, 1995; National Academy of Sciences, 1999). At first blush, the shift away from manufacturing tangible products may seem to yield a decrease in task

identity; however, the blurring of organizational roles as well as the shift to a service economy may actually contribute to increases in task identity. Specifically, as organizational roles have become less defined, employees have become involved in many aspects of service delivery, as evidenced by the emergence and popularity of cross-training (Marks, Sabella, Burke, & Zaccaro, 2002) and customer-focused principles of six-sigma (Pande, 2007).

Similarly, technological advancements are dissolving barriers that previously divided projects into separate tasks (National Academy of Sciences, 1999; Van der Spiegel, 1995), allowing workers to complete large-scale projects with less help and in less time than in years past. As noted by Nadler, Hackman, and Lawler (1979), combining multiple tasks together to produce one "whole" task should yield increased perceptions of task identity and ownership.

Finally, competency models are becoming increasingly prevalent in organizations. Compared to traditional, task-based approaches, competency models are more general in nature and more closely related to organizational goal attainment rather than individual task completion (Ployhart, Schneider, & Schmitt, 2006). Thus, employees may be identifying with organizational goals and values beyond their job-centered tasks (Fried, Levi, & Laurence, 2008). In other words, by linking individual employee tasks or competencies to greater organizational goals, employees are able to see how they contribute to these goals—making the employee an active part of goal attainment and providing a broader base of identification as well as increasing experienced meaningfulness of the job. The rise of the service industry, technological advancements, and competency based approaches may contribute to increases in task identity over the years. Based on these factors, it is hypothesized that:

Hypothesis 1: Task identity has increased since 1975.

Task Significance. Task significance involves a job's effect on other employees, the organization, or the greater community (Hackman & Oldham, 1975). Jobs high on task significance have important consequences for employees, customers, and the organization if the tasks are not completed appropriately (Nadler, Hackman, & Lawler, 1979). When employees realize that their work importantly affects others, the work itself becomes more meaningful (Hackman, 1977).

The past few decades have seen growing adoption of alternative organizational structures (i.e., leaner, flatter hierarchies) in which a relativity small number of core employees are given increased responsibility for multiple phases of service delivery (Bettis, Bradley, & Hamel, 1992; Rousseau & Wade-Benzoni, 1995). Because organizations have steadily decreased management positions since the 1980's, managers are responsible for a greater number of subordinates compared to years past (Cappelli, et al., 1997; Rajan & Wulf, 2006). In order to successfully manage so many employees, managers have spread out their decision making power, resulting in an empowered work force (Cappelli, 1999). At the same time, organizations hope that decentralized structures will enhance organizational flexibility and creativity (Andersen, 2004). With the associated increases in responsibility, modern employees have become central to organizational success, adding to the degree of felt accountability for the job. Furthermore, flattened hierarchies have pushed decision making power to lower rungs of the organizational ladder, enabling lower level employees to have greater influence on organizational outcomes and increased responsibility (Howard, 1995).

The popularity of teams and, in particular, the emergence of self-managed or self-directed work teams may also contribute to increased task significance. By establishing self-directed work teams, employees experience high levels of interdependence and high demand for joint

effort among team members (Cappelli et al., 1997) both of which are proposed to result in enhanced task significance and perceived meaningfulness (Nadler, Hackman, & Lawler, 1979). Although, team members may be working independently on specific pieces of a project, together, their efforts combine into a larger project that could not have been completed without the team. During this process, team members are expected to perceive increased feelings of accountability to fellow team members. Given shifts in organizational structure, the upsurge of decentralized decision making, and the rise in teams, we hypothesize that:

Hypothesis 2: Task significance has increased since 1975.

Skill variety. Skill variety concerns the extent that a job requires the use of a variety of different skills for effective performance (Hackman & Oldham, 1975). Skill variety is associated with higher levels of felt meaningfulness and personal value. Because the job demands the utilization of a wide range of employees' talents and skills while limiting repetition in the workload, the work is stimulating for employees (Hackman & Oldham, 1975; Nadler, Hackman, & Lawler, 1979).

Increased downsizing in recent years has greatly reduced the number of employees in any given company; however, it has not reduced the workload (Knudsen, Johnson, Martin, & Roman, 2003). Consequently, fewer employees are managing heavier workloads compared to years past, resulting in a demand for flexible, boundary-spanning employees (Davis, 1995). Additionally, the flattened organizational structure dramatically reduces opportunities for upward movement; furthermore, greater competition results among co-workers, peers, and external candidates when a promotion opportunity does become available (Cappelli, 1999). In order to enhance their skill sets, employees may shift positions laterally within and between organizations, making them more marketable for future positions (Fitzpatrick, 2009). Some organizations, realizing the value

of well-rounded employees, have put in place developmental programs designed to provide high potential employees with diverse experience through developmental initiatives such as job rotation, developmental assessment centers, job relocation, tuition reimbursement programs, and formal mentoring programs (Cappelli, et al., 1997; Konczak & Foster, 2009).

Technological advancements are also aiding in the increase of skill variety. The rapid upgrade and creation of new technology forces workers to learn new systems and programs in order to stay competitive in their jobs (Hesketh & Neal, 1999). Moreover, in effort to operate competitively in the world market, organizations are increasingly tasking employees with learning the latest technology (Howard, 1995).

As evidenced by the trend toward competency modeling as opposed to traditional forms of job analysis, managers and human resource professionals emphasize the need for employees with a broader skill set tied to organizational goals (Shippman, et al., 2000). Instead of being bound to a narrow, specific list of KSAs, individuals in many organizations are selected based on a broader list of competencies (e.g., creativity, flexibility) which are valued by the organization and deemed critical for its success. Competencies, although unique to each company, tend to capture more interpersonal skills relative to the more traditional job analysis (Shippman, et al., 2000). The trend in downsizing, technological advances, and the competency framework led us to hypothesize:

Hypothesis 3: Skill variety has increased since 1975.

Feedback. Feedback is high when work activities provide individuals clear information about their performance effectiveness (Hackman & Oldham, 1975). The JCM conceptualizes the feedback dimension as feedback that results directly from the job itself, but many organizations have adopted a broader perspective of the feedback characteristic to include employees'

perceptions of total feedback received on the job (i.e., feedback from assessment centers, performance appraisals, training programs; Cappelli, et al., 1997). This includes formal and informal feedback provided by supervisors, peers, team members, and customers alone or in conjunction with various technological products and systems.

With the popularity of organization-wide initiatives such as 360-Feedback, total quality management, and six-sigma, feedback has become a staple of modern organizations. For instance, one third of all American companies report using some form of multi-source feedback (Bracken, Timmereck, & Church, 2001), and as many as 90% of Fortune 500 companies report using 360-Feedback (Edwards & Ewen, 1996). In conjunction with the annual performance evaluation and informal feedback, employees in modern organizations receive frequent feedback about their performance.

Technology has increased the speed at which feedback can be given. For instance, software programs can identify human errors and prompt the employee to fix mistakes even before the task is completed (Hesketh & Neal, 1999). Additionally, technological advances such as quality assessments (e.g., online customer surveys) and employee monitoring / tracking systems (e.g., advanced management information systems, company Intranet) increase the amount of performance data available on each employee and thus, increase the potential supply of feedback.

Finally, past work design research has linked increased feedback to increases in direct communication between an employee and client (Nadler, Hackman, & Lawler, 1979). With the shift from an industry based in manufacturing to one more service oriented, feedback often comes directly from interactions with internal and external customers (Applebaum & Bratt,

1994). The popularity of feedback programs, technological advances in performance tracking, and the increasing use of customer feedback led us to hypothesize:

Hypothesis 4: Feedback has increased since 1975.

Autonomy. Autonomy refers to the discretion employees are afforded in determining how and when their job is completed (Hackman & Oldham, 1975). Employees in positions of high autonomy have greater control over their work and feel responsible for the outcomes (Devine, Reay, Stainton & Collins-Nakai, 2003; Nadler, Hackman, & Lawler, 1979).

Technological advances, structural shifts in the workplace, flattened hierarchies (Howard, 1995), downsizing of middle management (National Academy of Sciences, 1999), and the emergence of autonomous work teams (Applebaum & Batt, 1994) have decentralized decision-making power allowing lower level employees more autonomy than in previous decades (National Academy of Sciences, 1999). For instance, engineers working for Google can spend 20% of their billable time working on projects of their choosing (Moskowitz, Levering, & Tkaczyk, 2010).

In addition to increased autonomy in the nature of the work being done, modern workers are also seeing increased control over when and where work is completed. Facilitated in part by advancements in communication technology, organizations increasingly allow employees the flexibility to decide where and when work will be completed. Caudron (1992) reported that between 1988 and 1992 the number of telecommuters in the U.S. more than doubled from three million to over six million employees, and this number continues to increase. The number of employees telecommuting at least one day a week in 2008 was 24.3 million (WorldatWork, 2009). These unprecedented levels of control in the time and place in which work is completed are proposed to enhance employees' perceptions of autonomy.

Based in part on negative experiences with downsizing in the 1980's and 1990's, U.S. workers' perceptions of job stability and security have decreased (Cappelli, et al., 1997; Leana, 2002) so too has faith in the once strong psychological contract (Ricart & Portales 2001; Patterson, 2001). The traditional career ladder in many organizations has been "broken" in the sense that there is no longer one designated career path to follow in order to move up into higher positions in the organizational hierarchy (Leana, 2002; Osterman, 1994). As a consequence, more responsibility is placed on the employee to seek training opportunities, attain performance goals, and essentially, manage their own careers (Leana, 2002). The rise in flexible work styles, shifting organizational structures, and "broken" career ladders lead us to hypothesize:

Hypothesis 5: Autonomy has increased since 1975.

Objective Job Characteristics

Throughout this manuscript, it has been hypothesized that changes in the job characteristics over time are predicated, at least in part, on changes in type of work people do (e.g., the shift from manufacturing to service economy). Accordingly, it is important to consider whether observed changes are actually a function of differences in sample characteristics over time. In other words, if earlier studies sampled a higher proportion of lower level jobs from manufacturing organizations while recent studies sampled upper level professional jobs from service organizations, observed changes could be due to sample bias. Of course, to the degree that sample characteristics reflect changes in the broader economy, observed effects would not necessarily be indicative of sample bias; instead, observed changes will reflect true differences in the nature of work over the past 35 years. Accordingly, we also compare the sample characteristics in this study to trends in the broader labor market.

Three variables that may affect the interpretation of changes in job characteristics over time are the complexity of the job, the industry in which the job belongs, and the organization type. Job complexity refers to the mental demands associated with a given job (London & Klimoski, 1975) or the level of expertise needed to successfully complete the job. Given the emergence of the knowledge economy (Felin, Zenger, & Tomsik, 2009), jobs may have become more complex in recent years; thus, we collect and report results controlling for job complexity. As emphasized above, the industry reflected in the U.S. economy has shifted from manufacturing to service over the past 30 years (Mishel, Bernstein, & Allegretto, 2007). Accordingly, it is probable that studies from earlier years will contain more manufacturing samples, whereas, studies from later years are more likely to sample from service orientated jobs; thus, results are reported controlling for industry as well. Finally, to ensure any findings are not attributable to disproportionally sampling certain types of organizations over the years, organization type (e.g., business, government, medical, or education) was also examined as a possible covariate. In order to better understand the source of any observed changes, we present results controlling for objective organizational job characteristics and with organizational characteristics free to covary.

Sample Gender

The percentage of women participating in the U.S. workforce has increased steadily since the 1970's (Mishel, Bernstein, & Alleretto, 2007). In 1975, women made up 39.6 % of the working population (U.S. Department of Labor, 2009) while currently, the percentage of working women is slightly higher than that of men (50.3%; Rampell, 2010). The number of women earning four year college degrees is also steadily increasing. In 1975, 18.7% of women age 25 to 29 had obtained a bachelors degree. In 2008, the percentage of women with college

degrees rose to 34%. Meanwhile men's college graduation rates have remained relatively steady over the years (25.1% in 1975 and 26% in 2008; U.S. Census Bureau).

By gaining work experience and advanced degrees, women are creating cracks in the glass ceiling—the invisible barrier blocking women from reaching managerial positions (U.S. Bureau of National Affairs, 1995). In 1972, only 17% of working women held management positions, but by 2000, this number had risen to 49.5% (Stroh, Langlands, & Simpson, 2006). According to the U.S. Department of Labor, in 2009, 51% of top-paid employees in management, professional fields, and related occupations were women. Given the increasing number of women obtaining degrees, entering the workplace, and taking leadership roles, it is predicted that women are experiencing more enriched jobs in recent years.

Hypothesis 6: Sample gender will moderate the relationship between year and job characteristics, such that samples with a higher proportion of women will report higher levels of the five characteristics in more recent years.

CHAPTER 3

METHOD

Literature Search

Studies were located using an electronic search of Web of Science and PsycInfo. In order to ensure that articles relevant to the job characteristics model were identified, a citation search of Hackman and Oldham (1975) was used, which produced 1,453 citations dated between 1975 and May 2010.

Criteria for Inclusion

Studies were included if they: (a) measured one or more job characteristic with the JDS (Hackman & Oldham, 1975) or the Revised Job Diagnostic Survey (JDS-R; Idaszak & Drasgow, 1987; see Appendix for comparison) using the original 7-point scale, (b) reported the mean and associated sample size for at least one of the job characteristics, and (c) were conducted using U.S. based samples.

Originally created in 1975, the JDS remains the leading measure of job characteristics (Grant, Fried, & Juillerant, 2010; Humphrey et al., 2007). Given the popularity and longevity of the measure, the JDS is ideally suited to gauge changes in job characteristics over the past 35 years (1975-2010). Consistent with past cross-temporal meta-analyses (Twenge & Campbell, 2001; Twenge, Zhang, & Im 2004) we chose to focus on working samples from the U.S. As noted by Fried and colleagues (2008), the importance and motivating potential of job characteristics varies considerably across culture due to differing norms, economic policies, and industry trends. Thus, we focused on U.S. based samples to avoid confounding our results with cultural differences and to ensure as much homogeneity as possible in the studies included.

Based on these criteria, 84 published studies and nine dissertations where included yielding 477 data-points across the five of job characteristics.

Coding of Studies

Main effects. The mean, standard deviation, and sample size associated with each of the five job characteristics (task identity, task significance, skill variety, autonomy, and feedback) were coded in order to examine the study hypotheses. As suggested by Oliver and Hyde (1993) and based on common practice in prior cross temporal meta-analyses (Twenge, 2000; Twenge, 2001; Twenge & Campbell, 2001), to accommodate for time spent in the publication process, the year of data collection was coded two years before the study's publication unless the collection year was explicitly stated. To maintain independence of the data, if the same job characteristic appeared twice in the same study (e.g., longitudinal studies), the data points were averaged; however, when the second data collection was longer than 10 years after the first, the study was excluded (only one study was excluded due to this).

Moderators and control variables. In order to investigate the degree to which observed changes in job characteristics remain after controlling for objective job characteristics, job complexity, industry, and organization type were effects coded for use as control variables. Job complexity was measured using Job Zone SVP ratings on O*Net—Job Zone 1 and 2 (low complexity) includes jobs that require at most a high school diploma; Job Zone 3 and 4 (medium complexity) describes jobs at require at most a college degree; Job Zone 5 (high complexity) includes jobs that require education beyond a college degree. Additionally, a final other / mixed / unable to code category was added. Job industry was coded as service, manufacturing, or undefined / mixed. Finally, organization type was coded as business, government, medical, education, or other / mixed. Effects coding of the control variables resulted in nine vectors (g-1

for each variable) with four vectors capturing the effects of organizational type, two capturing industry, and three for complexity. Consistent with past meta-analyses investigating gender differences (e.g., Eagly, Karau, & Makhijani, 1995; Ng, Eby, Sorensen, & Feldman, 2005), sample percent male was also coded. All studies were coded by two of three trained coders and agreement among raters was found to be high (93%). Disagreements were settled by discussion.

Cross-Temporal Meta-Analysis

Cross-temporal meta-analysis differs from typical psychometric meta-analysis in one primary respect: instead of summarizing effect sizes, mean levels of a scale are the focus of analyses (Twenge & Campbell, 2001). Specifically, the relationship between construct means and the year the data were collected is investigated to determine changes in the means over time. Because effect sizes are not the focus, it is unnecessary to undertake corrections typical to psychometric meta-analysis (e.g., attenuation, range restriction, etc.). The magnitude of the change in job characteristic means over time is calculated by use of the averaged, within sample standard deviations (*SD*) and the associated regression equation for each variable. The average *SD* is calculated by averaging the within-sample *SD*s which yields the average variation of the JDS in a sample of individuals. By using the average *SD*, this method avoids the ecological fallacy (or altering correlations; Rosenthal, Rosnow, & Rubin, 2000) which results when the magnitude of change is estimated using mean scores variation instead of assessing variation in individual scores within a population. Without using the average *SD*, the magnitude of the resulting effect size is inflated due to the fact that individual scores vary more than mean scores (Twenge, Konrath, Foster, Campbell, & Bushman, 2008).

Each mean was weighted by the inverse variance calculated from the given study, giving more weight to studies with larger *n*'s but also taking into account sample variance. To weight

by the inverse variance, the within sample *SD* of each of the job characteristics from each study was squared to obtain the variance. The variance was then multiplied by 1/*n* (one over the sample size of the study). This product is inverted to obtain the weighting variable (1/*v*). In total 83% of data-points included in this meta-analysis reported an associated *SD*; however, for the small percentage of samples that did not report *SD*, the average *SD* per job characteristic (calculated by averaging all provided sample *SD*s for a given job characteristic) was used to obtain the weighting variable.

Although weighting samples by inverse variance gives samples with greater *n*'s more weight given that these samples should better approximate the population, this should be cautioned when examining changes over time due to the fact that very large samples that are not representative examples of the years in which the data were collected can bias the results. Because of this, an outlier analysis using Cook's d was conducted. Of the 477 data-points, nine were found to be outliers and thus were removed from the meta-analysis, leaving 468 data-points across the five job characteristics and a total sample size of 92,956 employees. The nine data-points identified as outliers came from three studies (5 data-points from Rosenbach and Gregory, 1982; and 2 data-points from Tyler et al., 2006; and, Katz 1978a, 1978b). Each of these three studies had large sample sizes and the jobs sampled in these studies were not representative of the type of job typically held by employees from the given year. For example, Rosenbach and Gregory (1982) reported the job characteristics of airline pilots (*n*=2,256) and U.S. air force pilots (*n*=3,297) with both groups reporting high enrichments levels compared to their 1980 counterparts when weighting by inverse variance. Because the inverse variance weights samples with larger sample sizes more heavily, it appears that the sample weighting was largely responsible for these nine outliers.[1]

Analyses

To examine Hypotheses 1 through 5, concerning changes in job characteristics (skill variety, task identity, task significance, skill variety, feedback, and autonomy) over time, five regression analyses were conducted. In each analysis, the inverse variance weighted mean of each job characteristic was regressed on the year of data collection. Significant *r* values indicate a significant change in mean levels of a given job characteristics over time.

Next, a set of regression analyses controlling for job complexity, industry, and organizational level was conducted. To do this, the nine vectors representing the three control variables were entered in step one of the regression analysis followed by the year of data collection in step two. The change in *R* was examined to determine if job characteristics have changed over time, controlling for objective work characteristics.

Finally, Hypothesis 6 concerns the moderating effect of gender on the relationship between year and job characteristic. Moderated multiple regression was used to test this hypothesis. Consistent with the recommendation of Aiken and West (1991), year and sample percent male were centered by subtracting each variable's mean from all observations. In step one, the centered year of data collection and the centered sample percent male was entered, and in step two, a percent male X year interaction term was entered.

CHAPTER 4

RESULTS

Preliminary Analyses

To determine whether the study characteristics in this meta-analysis were representative of the broader labor market, percent male and industry across year periods were checked against data from the Department of Labor (2009) and the Economic Report of the President (2010). The national average of the percentage of men in the workforce generally matched that found in the studies included in this meta-analysis. Overall, the U.S. workforce has witnessed a slight decrease in the percentage of males in the workforce since the 1970's. Between 1976 and 1979, men made up 59.1% of the workforce on average. Between 2000 and 2005, the percentage of working men dropped to 53.5%. This general trend is echoed in the literature with the samples containing the most males found in the earlier time periods and the samples containing the smallest percentage of males found in the later years (see Table 4.1).

The shift in the U.S. economy from manufacturing to service can be illustrated by examining the percentage of gross domestic product (GDP) from each industry. In 1979, the manufacturing industry produced 31.2% of the U.S. GDP; this shrunk to 18.9% in 2008. Additionally, the service industry produced 55.3% of the GDP in 1979 which rose to 68.2% in 2008. Taken together, this shows a general decrease in manufacturing and an increase in service from the 1970's to the 2000's. This general trend was reflected in the literature as well with the majority of manufacturing samples collected in the 1970's (54.1%), 32.4% collected in the

1990's, and no manufacturing samples collected after 2000. Conversely, the 1970's had the smallest percentage of service samples (22.2%), and this percentage increased to 34.5% in the 1990's and 2000's. Together, these findings suggest that the literature included in this meta-analysis is generally reflective of trends in the broader economy.

When conducting a cross-temporal meta-analysis, it is important that the same scale be used across years to ensure that any observed changes over time are due to cohort effects, rather than changes in scaling (Twenge, et al., 2008). Although the JCM was chosen for this review because this literature has used a standard scale over the years (the JDS), a small amount of JCM research has reported using the revised version of the JDS (i.e., JDS-R; Idaszak & Drasgow, 1987; see Appendix). In total, 393 data points reported using the JDS and only 75, the JDS-R. Although the means and standard deviations were relatively similar for each of the measures (JDS *M*=5.06, *SD*=.67; JDS-R *M*=5.32, *SD*=.56), independent sample t-tests were conducted to examine the potential differences in JDS and JDS-R responses. For all variables except autonomy, the t-tests revealed non-significant results indicating that regardless of the measure used, the scale means remain consistent. Given that the scale characteristics are similar between the JDS and JDS-R, any observed effects are due to cohort effects rather than scaling differences. Because autonomy scores were found to vary by measure, two separate regressions were conducted, one assessing only the relationship between year of data collection and JDS autonomy, and the other, year and JDS-R autonomy. The relationship between autonomy and year was consistent across the JDS and JDS-R in terms of magnitude, direction, and significance level.

Primary Analyses

Descriptive statistics and regression results are presented in Table 4.2. Of the five perceived job characteristics, four were found to be significantly related to year. Specifically, task identify, task significance, skill variety, and autonomy have significantly increased since 1975 (r_w=.32, .26, .34 and .33 respectively) providing support for Hypotheses 1, 2, 3, and 5. However, the relationship between year and feedback was non-significant, indicating no support for Hypothesis 4.

To investigate the magnitude change over time, Cohen's *d*'s were calculated for each job characteristic (Table 4.3). In general, the effects were moderate (.40 to .45) with the majority of job characteristics (task identity, task significance, and autonomy) falling in this range. Skill variety produced the largest effect (*d*=.74), and feedback displayed the smallest (*d*=.12).

To investigate interactions with gender, the percent of males in each sample and the year of data collection were centered to create an interaction term (Table 4.4). None of the five job characteristics displayed a significant interaction with percent male; thus, Hypothesis 6 was not supported[2].

To investigate the degree to which observed changes in job characteristics are attributable to objective characteristics of the samples, the relationship between year and job characteristics controlling for industry, organization type, and job complexity was examined (Table 4.5). The results revealed that task identity, skill variety, and autonomy remained significantly related to year when objective sample characteristics were controlled (R=.568, ΔR=.049; p<.05; R=.628, ΔR=.058; p<.01; and R=.503, ΔR=.106; p<.001, respectively), but task significance no longer showed a significant increase. Consistent with the main effects analysis, feedback failed to show significant increases.

Importantly, the effects coding for the control variables produced nine vectors, each taking away one degree of freedom, resulting in a loss of nine degrees of freedom for only three variables. This, coupled with a relatively small sample size may be the reason for the non-significant findings for task significance and feedback. However, by using effects coding we are able to interpret the β's associated with the control variables. Interestingly, complexity emerged as a significant predictor for task identity, skill variety, and autonomy. Specifically, medium complex jobs were negatively related to task identity. Furthermore, high complexity jobs were positively related to skill variety and autonomy while low complexity jobs contributed negatively to both variables.

Table 4.1
National Average Percent Male in the Workforce and Percent Male Represented in the Samples

Time Period	National Average % Male	Sample Average % Male
1975-1984	58.0	58.2
1985-1994	54.9	50.1
1995-2005	53.4	41.4

Note. National Average % Male taken from U.S. Department of Labor (2009).

Table 4.2
Linear Changes in Job Characteristics over Time

Variable	*N*	*k*	*M*	*SD*	r_w
Job Characteristic					
- Task Identity	16,158	89	4.77	.58	.321**
- Task Significance	16,687	92	5.52	.55	.264*
- Skill Variety	21,872	92	5.10	.79	.388**
- Feedback	18,652	90	4.95	.46	.119
- Autonomy	19,587	105	5.13	.63	.325**
Year of Data Collection	--	468	1987	7.97	--

Note. N = total sample size; k = number of independent samples; M = overall mean; SD = standard deviation; r_w = inverse variance weighted correlation with year; * $p < .05$, ** $p < .01$.

Table 4.3
Magnitude of Changes in Job Characteristics

Variable	1975 *M*	2010 *M*	*SD*	*d*
Job Characteristic				
- Task Identity	5.12	5.68	1.29	.43
- Task Significance	6.00	6.48	1.08	.45
- Skill Variety	4.44	5.31	1.18	.74
- Feedback	4.19	4.33	1.19	.12
- Autonomy	4.08	4.57	1.22	.40

Note. 1975 M = job characteristic mean from 1975; 2010 M = job characteristic mean from 2010; SD = average standard deviation; d = Cohen's d.

Table 4.4
Effect of Job Characteristics on Year and Moderating Effect of Gender

Variable	*k*	*R*	ΔR^2	*B*	*SE B*	β	*t*
• Task Identity							
Step 1	48	.384	.148*				
Percent Male				.000	.002	-.005	-.031
Year				.019	.008	.389	2.524*
Step 2	48	.385	.000				
Percent Male X Year				.000	.000	.023	.878
• Task Significance							
Step 1	49	.336	.113				
Percent Male				.001	.002	.101	.679
Year				.016	.007	.356	2.371*
Step 2	49	.336	.000				
Percent Male X Year				.000	.000	.017	.118
• Skill Variety							
Step 1	48	.661	.436***				
Percent Male				.011	.003	.422	3.551**
Year				.047	.009	.658	5.352**
Step 2	48	.661	.001				
Percent Male X Year				.000	.000	-.024	.839
• Feedback							
Step 1	50	.173	.030				
Percent Male				.000	.002	-.012	-.079
Year				.008	.005	.228	1.487
Step 2	50	.320	.072				
Percent Male X Year				.000	.000	-.289	-1.926
• Autonomy							
Step 1	61	.517	.242***				
Percent Male				.006	.002	.380	3.046*
Year				.020	.005	.537	4.308***
Step 2	61	.555	.041				
Percent Male X Year				.000	.000	.209	1.833

Note. K = number of independent samples; B = unstandardized coefficient; SE B = standard error of B; β = standardized coefficient; *t* = computed value of t-test; * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4.5
Effect of Job Characteristics on Year with Objective Job Characteristics Controlled

Variable	*k*	*R*	ΔR^2	*B*	*SE B*	β	*t*
• Task Identity							
Step 1 (Controls)	89	.523	.274**				
Business				-.095	.075	-.135	-1.262
Government				-.014	.080	-.020	-.170
Medical				-.067	.115	-.069	-.582
Education				.102	.101	.136	1.013
Service Industry				-.042	.088	-.077	-.480
Manufacturing Industry				.042	.133	.045	.317
High Complexity				-.035	.078	-.071	-.448
Medium Complexity				-.271	.086	-.486	3.158**
Low Complexity				.042	.078	.077	.536
Step 2	89	.568	.049*				
Year				.013	.006	.270	2.381*
• Task Significance							
Step 1 (Controls)	92	.543	.294**				
Business				-.170	.081	-.228	-2.104*
Government				-.195	.090	-.262	-2.180*
Medical				.218	.127	.216	1.716
Education				.317	.119	.389	2.668**
Service Industry				-.066	.092	-.119	-.719
Manufacturing Industry				.033	.134	.036	.250
High Complexity				.119	.088	.215	1.355
Medium Complexity				.106	.090	.185	1.171
Low Complexity				-.177	.092	-.280	-1.915
Step 2	92	.543	.001				
Year				.002	.006	.035	.768
• Skill Variety							
Step 1 (Controls)	92	.580	.337***				
Business				-.158	.095	-.169	-1.661
Government				-.021	.106	-.022	-.197
Medical				.182	.182	.126	.999
Education				-.076	.186	-.057	-.408

Note. *K* = number of independent samples; B = unstandardized coefficient; SE B = standard error of B; β = standardized coefficient; *t* = computed value of t-test; * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4.5 (continued)
Effect of Year on Job Characteristics with Objective Job Characteristics Controlled

Variable		*k*	*R*	ΔR^2	*B*	*SE B*	β	*t*
	Service Industry				.073	.118	.092	.618
	Manufacturing Industry				-.052	.186	-.039	-.278
	High Complexity				.418	.101	.653	4.153***
	Medium Complexity				.067	.154	.084	.434
	Low Complexity				-.657	.144	-.709	-4.553***
Step 2		92	.628	.058**				
	Year				.025	.009	.328	2.780**
• Feedback								
Step 1 (Controls)		90	.363	.132				
	Business				-.065	.066	-.122	-.977
	Government				.026	.069	.055	.374
	Medical				.048	.112	.063	.429
	Education				.057	.099	.092	.574
	Service Industry				-.036	.073	-.087	-.496
	Manufacturing Industry				.135	.109	.196	1.247
	High Complexity				.007	.069	.020	.104
	Medium Complexity				.016	.083	.040	.189
	Low Complexity				-.153	.079	-.353	-1.941
Step 2		90	.376	.010				
	Year				.005	.005	.132	.946
• Autonomy								
Step 1 (Controls)		105	.382	.146				
	Business				-.088	.066	-.138	-1.336
	Government				.001	.081	.002	.018
	Medical				-.011	.107	-.013	-.101
	Education				-.177	.105	-.240	1.680
	Service Industry				.016	.077	.032	.208
	Manufacturing Industry				.164	.114	.201	1.443
	High Complexity				.276	.128	.420	2.168*
	Medium Complexity				-.080	.092	-.153	-.868
	Low Complexity				-.190	.086	-.354	-2.213*
Step 2		105	.503	.106***				
	Year				.018	.005	.408	3.660***

Note. *k* = number of independent samples; B = unstandardized coefficient; SE B = standard error of B; β = standardized coefficient; *t* = computed value of t-test; * $p < .05$; ** $p < .01$; *** $p < .001$.

CHAPTER 5

DISCUSSION

Despite frequent references to the changing nature of work in the academic and popular press, little empirical research has documented the aspects of jobs that have changed over the last 30 years. Over a decade ago, the National Academy of Sciences (1999) acknowledged "the need for a systematic approach to understanding how work is changing" and at least two reviews have speculated about changes in job characteristics (Fried et al., 2008; Grant, et al., 2010). This study used cross-temporal meta-analysis of Hackman and Oldham's (1975) job characteristic model to provide the first empirical examination of suggested changes in the characteristics of work. The results revealed that work in the U.S. is characterized by increasing levels of task identity, task significance, skill variety, and autonomy. In addition, the findings for task identity, skill variety, and autonomy held even after controlling for objective characteristics. Together, this study contributes to the literature by providing among the first empirical evidence of changes in job characteristics and by demonstrating the usefulness of cross-temporal meta-analysis for understanding organizational phenomenon. Given the frequently referenced centrality of the changing nature of work to a variety of organizational phenomena, this study has the potential to contribute to multiple areas of research and practice.

Main Findings & Implications

Of the five job characteristics, task identity, task significance, skill variety, and autonomy were found to be increasing since 1975. The effect size for task identity was moderate indicating that later employees are identifying more with their work compared to their earlier counterparts. Based on this finding, it seems that modern employees are completing entire projects and taking

pride in task completion. However, this definition might "fall short in explaining the experience of identity and meaningfulness" in the modern workplace (Fried, et al., 2008; p. 591). In knowledge-based workplaces, the outcome of work efforts may not be completely discernable, and the success of work activities might not be known or acknowledged by the employee or management. Nevertheless, knowledge-based companies that encourage employees to take risks and support an innovative organizational culture may instill employees with a sense of identity that expands beyond task completion (Fried, et al., 2008). Similarly, in service oriented jobs where employees are not responsible for producing a tangible product, employees may be replacing task identification with more of a service identity composed of a broader, more strategic customer service goal (Schneider, 1980). Additionally, the National Research Council (1999) suggests that team members may identify more with being part of the team itself rather than with their individual functions or tasks within the group thus, replacing task identity with team identity. Finally, taking this logic a step further, it may be that employees are more likely to identify with their profession as opposed to the tasks of their jobs. So, in this case, organizations might benefit from emphasizing broader competences compared to job tasks in order to increase organizational identity and commitment. Taken together, although the results suggest task identity has increased since 1975, future research should determine if this increase in task identity is really due to identification with the job tasks or if it stems from some broader affiliation with an employee's profession, organization, or workplace goals.

With a moderate effect size, perceived task significance was also found to be significantly increasing over time. Given the customer focus of the service industry (e.g., Schneider, 1980), this finding is not surprising. When an employee provides a service to a customer, the employee immediately witnesses the customer's response and then is able to track

the chain of this reaction (Fried, et al., 2008). For example, a customer may spread the word about the employee's excellent service to other potential customers, gaining the company new business, or a client may relay a particularly bad service experience to their manager, causing the end of a business partnership. By observing that their behavior and decisions have consequences for the organization, employees may feel they have increased responsibility over not only their work, but ultimately the outcomes of the company; therefore, a certain amount of risk results with every decision they make (Cappelli, et al., 1997).

Although increases in task identity and task significance should be related to increases in the experienced meaningfulness of the work, increases in both of these variables may also lead to increases in workplace stress and job demands. For example, increased exposure to customers and pressure from management to provide excellent customer service may prove taxing on employees' emotional labor resources (Fried, et al., 2008). Additionally, although many organizational change initiatives (i.e., flattening, restructuring, decentralization) are designed to produce more effective and efficient organizations, in order to succeed, they require considerably more from employees in terms of additional skills, competencies, and high organizational commitment—many of which current employees may lack (Cappelli, et al., 1997). Increasing task demands and job stressors associated with change initiatives could be a reason for the relatively high rate of voluntary turnover of surviving employees following an organizational downsizing initiative (Trevor & Nyberg, 2008). Furthermore, high work demands have been consistently shown to spill-over into family life (Frone, Russell, & Cooper, 1992; Greenhaus & Beutell, 1985) which, in turn have been linked with negative job attitudes, low job satisfaction, as well as turnover intentions (Allen, Herst, Bruck, & Sutton, 2000; Mesmer-Magnus & Viswesvaran, 2005). Organizations could work to alleviate some these work stressors by

implementing flexible work policies such as telecommuting options, flextime, and on-site day care which can help to decrease work related stress as well as reduce work-family conflict (Fried, et al., 2008; Gajendran & Harrison, 2003).

Of the five job characteristics, perceived skill variety has increased the most since 1975, suggesting that skill variety is a particularly important variable in the modern workplace. Increases in skill variety may be due to the growing need for organizations to adapt and compete in unstable, dynamic environments. These findings provide the first empirical substantiation for claims that it is critical that organizations recruit and select flexible employees who have mastered a general, broad skill set so that they can effectively fill multiple roles (Davis, 1995; Howard, 1995). These employees will be better able to complete tasks not included on their job description and adapt to unforeseen challenges. In addition, these findings underscore the importance of training programs designed to broaden employee skills, such as cross-training and Executive MBA programs. Further, because of the ever-changing organizational needs and goals, compensation systems should be designed to reflect the use of broad competencies and employee flexibility, rather than tasks associated with a particular job.

Like task identity and task significance, increases in skill variety may not necessarily yield uniformly positive outcomes. In the "traditional" organizational system of the past, employees were selected for entry-level positions, received the majority of training on the job, and were expected to move-up a designated path on the organizational ladder primarily by seniority (Cappelli, et al., 1997). In modern organizations, unskilled entry-level positions are disappearing, employees are more responsible for seeking KSA's before being selected for a position, and because organizational ladders appear "broken" (Leana, 2002), many employees must move laterally in or across organizations in order to obtain the necessary skills and

experience to be considered for a promotion (Cappelli, et al., 1997; Fitzpatrick, 2009). Due to these factors, employees may feel increasing pressure to master new skills potentially leading to emotional exhaustion, increased work-related stress, and eventually burnout. On-the-job training or allocating funds for individual employee development (i.e., conference / workshop attendance, leader development) may help to alleviate some of the pressures on the employee. Organizations characterized by a fast-paced work environment and ever-changing work demands should select candidates who are flexible, intelligent, conscientious, and who demonstrate higher levels of stress tolerance.

Autonomy exhibited a moderate increase suggesting that employees have experienced an increase in perceived autonomy over time. The observed increase in autonomy may have both positive and negative consequences. The increased freedom to work on their own schedules and decide how to complete the work increases employees' perceptions of control as well as decreases intent to quit (Baltes, Briggs, Huff, Wright, & Neuman, 1999). Given that modern workers increasingly value autonomy from work (Twenge, Campbell, Hoffman, & Lance, 2010), it is important that employers provide this valued work characteristic to employees. However, the flexibility provided by increases in autonomy is a double edged sword. Organizations must consider how to monitor performance, perform administrative functions, and schedule meetings when employees are not physically in the workplace. In addition, as the line between "work-time" and "family-time" blurs, employees may feel that they are always at work (Igbaria & Guimaracs, 1999; Standen, Daniels, & Lamond, 1999). Owing in part to this blurring line, American workers currently work more hours a week than workers in any other industrialized nation (International Labor Organization, 2007), a trend with potential negative consequences for workers' health, personal life, and likely, productivity.

Perceived feedback was the only job characteristic which was found to not be significantly increasing over time. One reason for the null results of the feedback-year relationship may be due to the wording of the items on the JDS. Specifically, the feedback scale was designed to measure *feedback from the job itself* (Hackman & Oldham, 1975) but with the use of annual performance reviews typical in most organizations and the popularity of multi-source feedback for employee development, this is not necessarily how feedback is conceptualized in modern workplaces. For example, none of the feedback items even mention the manager's role in the feedback process (e.g., "Just doing the work required by the job provides many chances for me to figure out how well I am doing"). It seems the JDS's supplemental, yet rarely used, feedback from agents scale would be more appropriate at capturing contemporary ideas of feedback. Researchers as well as organizational representatives wishing to use the JDS to measure feedback should consider using both feedback subsections to adequately assess the modern conceptualization of the construct. However, even these items may be too simplistic in that they may miss valuable parts of the feedback construct for particular jobs. For example, in service orientated jobs it would be particularly important to assess the extent to which employees receive feedback from the customer. Additionally, with an increasing number of employees spending less physical time in the office, the problem arises of how to provide these employees with timely and accurate feedback when face-to-face employee-supervisor and employee-coworker interactions are more rare (Fried, et al., 2008).

The lack of an increase in feedback may have both positive and negative consequences for organizations. The obvious disadvantage of a not finding an increase in feedback over the years is that by supplying employees with high levels of performance feedback, they gain a more accurate perspective of their performance level and are able to learn from previous mistakes.

However, with the increasing ease of collecting performance data, organizations may run the risk of supplying too much feedback to employees (Fried et al., 2008), in turn, lending to "technostress" (Van der Spiegel, 1995) in which employees may become anxious from constant performance monitoring. Indeed, management by exception, a style of leadership linked to frequent performance monitoring and performance feedback has been shown to have inconsistent (Judge & Piccolo, 2004) and sometimes have negative (Lowe, Kroeck, & Sivasubramaniam, 1996) relationships with employee attitudes and performance. Similarly, employees may become overwhelmed with the amount of feedback, not attend to positive feedback, or suffer from burnout if they receive excessive negative feedback (Fried, et al., 2008). Taken together, these suggest that the lack of an increase in feedback perceptions may not necessarily have negative consequences for the organization. A meta-analysis examining feedback interventions revealed that although providing feedback to employees resulted in a positive relationship with performance, over one third of feedback interventions from the included studies displayed negative effects with employee performance (Kluger & DeNisi, 1996). Organizations should strive for feedback systems that lessen the level of detailed feedback to ensure that employees only attend to the most pertinent feedback (Fried, et al., 2008).

The results reveal that task identity, skill variety, and autonomy continue to show increases, even when controlling for objective sample characteristics. Regardless of the job complexity, organization type, and industry, it appears that jobs are becoming more enriched Thus, our findings are not solely due to differences in jobs / occupations sampled in the extant literature. Additionally, there appears to be considerable variability in job characteristics of jobs with similar levels of complexity and in similar industries. As a result, it does not appear that changes in perceived job characteristics can solely be attributed to changes in the nature of the

national economy. Our findings are also bolstered by the correspondence in the current sample and trends in national labor market (i.e., gender break-down of the workforce and the shift from manufacturing to service orientated jobs).

After controlling for differences associated with the nature of the jobs sampled, perceived task significance became non-significant suggesting that the changes in task significance over time may be largely attributable in to changes in objective job characteristics over time. As mentioned above, future research is needed to determine what employees may be identifying with if identification does not stem from job tasks.

Based on changes in the labor market over the last few decades, we expected that women's jobs would have increasing levels of enrichment relative to 30 years ago. In contrast to our hypothesis and despite increases in education and job opportunities for women, women did not report more enriched jobs relative to men in more recent years. There are a few possible reasons. First, to investigate the moderating role of gender, we used the percentage of males in the samples. This approach, however, is a bit of a blunt instrument, necessitated by the extant literature. Although it would have been ideal to investigate gender and job characteristics at the individual level, this is not possible in meta-analysis. Next, the number of studies that reported sample gender was small, possibly precluding the detection of significant results. Toward this end, the interaction term explained arguably practical significant portions of variance in job characteristics. Specifically, both feedback and autonomy approached significance. Feedback was in the expected direction suggesting that women are receiving more feedback in later years compared to their male counterparts. However, autonomy displayed a different trend. Specifically, although samples with more women are reporting increases autonomy in since 1975, samples with more men have reported increases in autonomy at a faster rate. One possible

explanation for this finding is differences in work styles. Women are more likely to be characterized by a collaborative style in which they seek participation and buy-in from others (Eagly, Karu, & Makhijani, 1995; Shipman & Kay, 1999) leading to lower perceived autonomy. Furthermore, women engage in higher levels of organizational citizenship behaviors than men (Allen & Rush, 2001), implying possible differences in performance goals. Women may identify less with tasks, per se, and focus more on working with others. In any case, it is critical that organizations take measures to ensure that women's jobs are as enriched as are their male counterparts.

Limitations

Despite the contributions of the current study, it is not without limitations. First, because the JDS was first developed in 1975, only 35 years could be used for analysis. It is expected that if earlier data were available, we would find stronger effects than those revealed here. Nevertheless, our findings have the most relevance for modern organizations since many of the contemporary organizational initiatives (i.e., organizational restructuring, downsizing, flattening) did not beginning until the 1980's and 1990's (Cappelli, et al., 1997).

Next, the job characteristics model focuses on task characteristics. Recent years have seen the emergence of a more nuanced view of work characteristics (e.g., knowledge characteristics, social characteristics, physical characteristics; Grant et al., 2010); however, this research is in its infancy, and therefore, it was not possible to investigate these expanded conceptualizations.

Finally, the JDS assesses respondents' *perceptions* of job characteristics, not objective job characteristics. Thus, our study is ill-equipped to draw inferences regarding changes in objective job characteristics. Still, given that perceptions are proposed to be the key mediator

between the environment and subsequent attitudes and behavior, the investigation of perceptions is arguably equally important to the investigation of objective environmental characteristics (James & James, 1989). In addition, given the correspondence between our results and labor trends suggesting increases in job characteristics, these perceptions, to some degree, reflect an objective reality. For instance, our results revealed that job complexity would be expected to be related to the job characteristics, such that more complex jobs are likely more enriched. Thus, our finding that job complexity covaried with the job characteristics provides preliminary evidence that these perceptual measures of job characteristics are capturing objective characteristics of the work and not just perceptions. Additionally, despite the fact that the overwhelming majority of research concerning job characteristics measures incumbents' perceptions, early lab work assessed respondents' ratings of manipulated jobs (Farr, 1976; O'Reilly & Caldwell, 1979; Terborg & Davis, 1982) and found that the JDS was sensitive to changes in objective job characteristics. Overall, past research has provided evidence of objective and perceptive convergence for job characteristics (see Fried & Ferris, 1987 for a discussion of this issue).

Conclusion

Despite frequent reference to the changing nature of work, research has rarely investigated the ways that work has changed through the lens of organizational constructs. This study reflects the first application of cross-temporal meta-analysis in the organizational literature in order to understand how work has changed over the last 35 years. Our results have practical implications for organizations facing continuous changes in the way work is done and point to critical areas for research that must be addressed so that organizations can thrive in the modern, global economy.

1 When analyses were conducted with these studies included but without weighting by sample size, our results did not change from those reported below. Thus, had these studies been included in the sample weighted analyses, any differences in effects would be due to the large sample sizes associated with these studies, rather than the mean level of job characteristics.

2 When the objective job characteristics were added as control variables in step 1 of the regression analysis, the results did not change.

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APPENDIX

Job Diagnostic Survey (JDS; Hackman & Oldham, 1975) compared to the Job Diagnostic Survey, with Revisions (JDS-R; Idaszak & Drasgo, 1987)

Task Identity

- To what extent does your job involve doing a "whole" and identifiable piece of work? That is, is the job a complete piece of work that has an obvious beginning and end?
- The job provides me the chance to completely finish the pieces of work I begin.
- The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end. (Reverse coded).

  Revised item: The job is arranged so I can do an entire piece of work from beginning to end.

Task Significance

- In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?
- This job is one where a lot of other people can be affected by how well the work is done.
- The job itself is not very significant or important in the broader scheme of things. (Reverse coded).

  Revised item: The job itself is very significant and important in the broader scheme of things.

Skill Variety

- How much variety is there in your job? That is, to what extent does your job require you to do many different things at work, using a variety of skills and talents?
- The job requires me to use a number of complex of high-level skills.

- The job is quite simple and repetitive. (Reverse code).

Feedback

- To what extent does doing the job itself provide you with information about your work performance? That is, does the actual work itself provide clues about how well you are doing—aside from any "feedback" co-workers or supervisors provide?

- Just doing the work required by the job provides many chances for me to figure out how well I am doing.

- The job itself provides very few clues about whether or not I am performing well. (Reverse code).

  Revised item: After I finish a job, I know whether I performed well.

Autonomy

- How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

- The job gives me considerable opportunity for independence and freedom in how I do the work.

- The job denies me any chance to use my personal initiative or judgment in carrying out the work. (Reverse coded).

  Revised item: The job gives me the chance to use my personal initiative and judgment in carrying out the work.