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CHARACTERISTICS FOR SUCCESS:
PREDICTING INTERVENTION EFFECTIVENESS WITH THE JOB CHARACTERISTICS
MODEL

by

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B.S. The Florida State University, 2006

A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Science
in the Department of Industrial Organizational Psychology
in the College of Sciences
at the University of Central Florida
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ABSTRACT

The current study examines the effects of the five core job characteristics (skill variety, task significance, task identity, autonomy, and feedback) proposed by Hackman-Oldham (1974) at the team level by investigating whether the model variables are related to the effectiveness of a motivationally-based team-level productivity enhancement intervention. Previous literature has almost exclusively focused on the effects of these job characteristics at the individual level and their direct relationships with employee attitudes and subjective measures of performance. This thesis aims to further the job characteristics literature by exploring the effects of the characteristics at the team level, as well as the moderating effect of the team construct of value congruence, while simultaneously exploring boundary conditions of the Productivity Measurement and Enhancement System (ProMES) developed by Pritchard. Hypotheses postulated a negative relationship between the characteristics and intervention effectiveness; such that effectiveness is negatively impacted when the characteristics already exist at high levels. Results, though non-significant, are suggestive of this counter-intuitive negative relationship between four of the characteristics and intervention effectiveness. Value congruence between team leaders and members was not a significant moderator of the relationship between the characteristics and effectiveness. Results suggest that a more powerful study to further parse out these relationships would be valuable.

To my parents with love & thanks.

ACKNOWLEDGMENTS

To Bob, Huy, and Dave—I am forever grateful for your willingness to guide me along this process. Your wisdom, advice, and feedback are irreplaceable—through you all I have learned so much. A huge thank you to all my family and friends who have supported me—you have kept me sane 😊.

TABLE OF CONTENTS

LIST OF FIGURES.....	viii
LIST OF TABLES	ix
CHAPTER ONE: INTRODUCTION.....	1
Interventions to Maximize Productivity	1
Productivity in Teams.....	2
Purpose	3
Contributions	5
CHAPTER TWO: LITERATURE REVIEW.....	7
Characteristics of the Job	7
The Characteristics and Productivity.....	9
The Motivating Potential Score (MPS)	10
The Characteristics in Teams:.....	11
Organizational Value Congruence as Potential Moderator.....	11
ProMES and the Characteristics	12
Hypotheses	15
CHAPTER THREE: METHODOLOGY	20
Sample.....	20
Measures	20
Analyses	23
CHAPTER FOUR: RESULTS	24
CHAPTER FIVE: DISCUSSION.....	28
Practical Implications.....	28

Strengths	29
Limitations.....	30
APPENDIX A: COPYRIGHT PERMISSION LETTER.....	33
APPENDIX B: EXCERPTS FROM THE PROMES META-ANALYSIS INSTRUMENT.....	34
REFERENCES	41

LIST OF FIGURES

Figure 1 The Pritchard-Ashwood Model of Motivation.....	10
Figure 2 The Hackman-Oldham (1974) formula for calculating the Motivation Potential Score used to test hypothesis 3.....	12
Figure 3 Model of the relationships explored in the current thesis.....	16

LIST OF TABLES

Table 1 Descriptive statistics for all study variables.....	25
Table 2 Zero order correlations between job characteristics and intervention effectiveness.....	26

CHAPTER ONE: INTRODUCTION

Productivity forms the backbone of all organizations, being able to do more with less is a competitive advantage. Productivity growth is also linked to organizational longevity and survival (Harris; 1994; Druckman, Singer, & Van Cott, 1997). The term productivity is used in a number of ways, however, the current study uses the definition by Pritchard (1992); how well a system uses its resources to achieve its goals. With this definition, productivity is a combination of both efficiency and effectiveness. Organizational attempts to improve productivity constitute significant human resource and capital investments; therefore, determining the organizational conditions which maximize the effectiveness of such interventions and their boundary conditions is important.

Interventions to Maximize Productivity

Job enrichment interventions are designed to enhance employee motivation and thus other outcomes such as performance and productivity. One approach to job enrichment is Hackman and Oldham's (1974, 1975, 1976) Job Characteristics Model (JCM), a motivational based model describing those job characteristics thought to motivate work behaviors and performance. The model specifically identifies five core characteristics thought to underlie work motivation: autonomy (i.e., the freedom an individual has in carrying out work), skill variety (i.e., the extent to which an individual must use different skills to perform his or her job), task identity (i.e., the extent to which an individual can complete a whole piece of work), task significance (i.e., the extent to which a job impacts the lives of others), and feedback from the job (i.e., the extent to which a job imparts information about an individual's performance). The model was intended to drive work design, within the framework of job enrichment (Hackman & Oldham, 1974). The subsequent development of the Job Diagnostic Survey provided a theoretically derived method to measure these characteristics in order to relate them to various work outcomes. The survey was originally

presented as useful in both diagnosing and evaluating job re-design efforts (Hackman & Oldham, 1974, 1975). Job enrichment interventions which address these five job characteristics have shown positive impacts on productivity, decreases in employee stress, and increases in job satisfaction (Karaseck & Theorell, 1990; Loher, Noe, Moeller, & Fitzgerald, 1985).

Motivationally based productivity interventions, such as the Productivity Measurement and Enhancement System (ProMES) developed by Pritchard (1990), are designed to improve productivity by enhancing employee motivation. For example, ProMES develops performance measures using principles of employee participation (Bobko & Colella, 1994; Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1988), controllability of the performance measures (Pritchard et al., 2007), and feedback (Nadler, 1979).

Productivity in Teams

Productivity in teams is fundamentally different than individual productivity. Effective team performance requires a focus on both task work, any task related functions, and teamwork, the ability to work cohesively to attain common goals (McIntyre & Salas, 1995). The tasks completed by teams are also different, in that they require a degree of interdependence in order to be completed. The unique nature of team-based work complicates the design of productivity interventions designed to maximize team performance. ProMES, however, has shown significant positive effects on productivity in both individual and team level applications (Pritchard, Harrell, DiazGranados, & Guzman, 2007; Pritchard, 1995). Alternatively, classic jobs models, such as Hackman and Oldham's Job Characteristics Model, have been heavily studied at the individual level. There has been little investigation of how the five job characteristics outlined in the model are manifested and their effects at the team level. Humphrey, Nahrgang, and Morgeson (2007) explicitly left out team level studies from their recent meta-analysis of the job characteristics literature and called for

comprehensive future research into the effects of Hackman and Oldham's five core job characteristics at this level. Furthermore, there is little understanding of how team level constructs such as trust, interdependence, and leadership moderate the effects of the characteristics in teams.

Purpose

The current thesis aims to answer this call by testing the relationship between the characteristics and productivity posited by the model in a sample of team-based jobs and also looking at a potential team level moderator of this relationship, value congruence. Value congruence concerns the degree to which team members and their leaders hold the same organizational values (Maierhofer, Griffen, & Sheehan, 2000). A more detailed discussion of value congruence within teams follows in chapter two.

The secondary goal of this thesis is to determine the conditions under which productivity interventions such as ProMES are the 'appropriate' answer to the organizational problem. Many organizations implement interventions, reap no benefit, and then wonder why. I argue that perhaps they are applying the wrong band-aid to the problem. For example, ProMES is designed to be the 'answer' to productivity problems which are the result of low motivation. However, there is currently no valid and reliable method to assess work motivation directly. The variables of the JCM framework have been presented as underlying mechanisms of work motivation and empirically related to motivation in meta-analyses (e.g. Humphrey, Nahrgang, & Morgeson, 2007; Fried & Ferris, 1987), therefore they are utilized as a proxy measure of the motivational potential already present in the team for the current thesis. Meta-analytic work by Pritchard et al. (2007) demonstrates a robust relationship between ProMES and gains in productivity. However, in this thesis I look to explore boundary conditions which restrict the level of intervention effectiveness. Given that interventions like ProMES are designed to operate by enhancing the motivational characteristics of the job it is

reasonable to hypothesize that such interventions would be less effective for teams whose jobs are already high on the characteristics. The opportunity for improvement in motivation is simply smaller in these teams compared to teams which are low on the five characteristics. In some instances, implementing such interventions may even have a negative effect on productivity if employees felt that the intervention detracted from their already high levels of the characteristics. Support for this notion would indicate that high levels of the characteristics prior to intervention implementation would place boundary conditions on intervention effectiveness.

To summarize, the purpose of the current study is to test the Hackman-Oldham job characteristics model at the team level and simultaneously determine boundary conditions of motivationally based productivity interventions by investigating whether the model variables are related to the effectiveness of team-level productivity enhancement interventions. It is hypothesized that interventions, such as ProMES, will have a smaller effect for jobs which are high on the characteristics when compared to jobs low in the characteristics because these jobs are already high in motivation potential according to the Hackman-Oldham model.

Specifically, three major research questions will be addressed: (1) what is the combined effect of the five characteristics outlined by the Hackman-Oldham model on intervention effectiveness, (2) do team level constructs, such as value congruence, moderate the relationship between the characteristics and intervention effectiveness, and (3) what is the impact of each individual characteristic on intervention effectiveness? Answers to these questions will address several of the calls for future research put forth in the most recent and comprehensive meta-analysis of the job characteristics literature by Humphrey, Nahrgang, and Morgeson (2007).

Contributions

First, the current study contributes to the JCM literature by furthering our understanding the impact of job characteristics on team-based work. Prior investigations of the job characteristic literature have explicitly removed team-based jobs from their analyses (e.g. Humphrey, Nahrgang, & Morgeson, 2007; Fried & Ferris, 1987; Hackman & Oldham, 1976). The ProMES intervention is most often used with units such as departments and smaller teams who work together intimately to produce specific outputs. This study will help answer the call by Humphrey, Nahrgang, and Morgeson (2007) for investigation regarding the manifestation of job characteristics in team-based work. Accordingly, I will follow the definition of a team set forth by Salas, Dickinson, Converse, and Tannenbaum (1992): a distinguishable set of two or more people interacting towards a common goal in specific roles, for a discrete period of time. Specifically, the sample includes data from teams working in the service and manufacturing, military, police, and healthcare sectors.

Secondly, by studying the moderating effects of value congruence this study will contribute to the growing body of literature recognizing the importance of organizational culture. Culture can influence how the job characteristics are manifested, how they are perceived, as well as organizational performance (Johns, Xie, Fang, 1992; Marcouldies & Heck, 1993). Therefore, this study will provide an important look at the impact of one aspect of organizational culture (value congruence) on the relationship between the core job characteristics and productivity.

Finally, by investigating the effects of the characteristics on intervention effectiveness, this study explores boundary conditions of motivation-based productivity interventions. There is a meta-analytic evidence regarding organizational variables which moderate intervention effectiveness (e.g. Pritchard, Harrell, DiazGranados, & Sargent, 2007), however there has yet to date been any attempt to examine the impact of the JCM characteristics. Discerning the impact of these variables

on intervention effectiveness can help guide theorists in their understanding of the mechanisms underlying such interventions and help practitioners apply them more effectively. Furthermore, these analyses will provide the first empirical test of the underlying motivational aspects of the ProMES intervention. Though the intervention was designed on the basis of Pritchard-Ashwood (2007) model of motivation, to be discussed in detail, the lack of a valid and reliable method to measure work motivation has precluded an empirical test of the theoretical premise of ProMES. By using the characteristics of the JCM model as proxy measures of motivation, this thesis will provide the first investigation of the motivational mechanisms underlying ProMES.

CHAPTER TWO: LITERATURE REVIEW

Characteristics of the Job

The following section is dedicated to defining the core job characteristics identified by Hackman and Oldman (1974) and providing evidence from the existing literature regarding the characteristics.

Task significance is generally defined as the degree to which the tasks inherent in the job are significant to the organization and have an important impact on the work or lives of co-workers and those outside the organization (Hackman & Oldham, 1976; Hirschfeld, Schmitt, & Bedeian, 2002). It reflects the degree to which a person has a clear idea on where the job ‘fits’ within the organization and how important it is to the completion of the final organizational product (Orpen, 1979). The Hackman-Oldham (1974) theory of inherent work task characteristics identifies task significance as a core job characteristic that contributes to motivation and performance. The desire for high levels of productivity becomes greater when the outcomes of a particular effort are deemed highly important and even more important if the outcomes also significantly impact others. When a task is significant its outcomes affect not only the individual, but also others within their department or even outside of the organization. High levels of task significance have been related to lower levels of employee absenteeism (e.g. Fried & Ferris, 1987; Rentsch & Steel, 1998) and to higher levels of self-reported work satisfaction (Orpen, 1979). Meta-analysis results indicate that task significance impacts motivation, as well as attitudinal outcomes such as job satisfaction (Behson, Eddy, & Lorenzet, 2000).

Task Identity is defined as the extent to which an individual can complete a whole and identifiable piece of work. Hackman and Oldham (1975) postulate that this characteristic creates a

sense of responsibility for completion that acts as a motivational driver. Task identity has shown positive relationships with job satisfaction and a curvilinear relationship with organizational commitment (Lin & Hsieh, 2002). In combination with the other four components, task identity has also shown positive impacts on productivity (Humphrey, Nahrgang & Morgeson, 2007).

Skill Variety is defined as the degree that the job requires the performance of different activities to complete the work. A job high in skill variety requires a range of skills and talents (Hackman & Oldham, 1975). The ubiquitous integration of technology into the workplace over the past decade has led to jobs which are more cognitively demanding of a wider range of skills and abilities (Parker & Wall, 2001). Complex jobs have shown significant, positive relationships with job satisfaction, intrinsic motivation, and productivity (Spector, 1992; Jassen, 2001)

The term *Autonomy* lacks a clearly agreed upon definition in the literature, however, most scholars consider it to reflect the degree of control people have over making decisions about their work (Breugh, 1985). The positive relationship between autonomy and productivity is well documented in the literature (e.g. Bazerman, 1982; Spector, 1986; Greenberger, Strasser, & Lee, 1988; Baltes & Baltes, 1992; Orpen, 2001). However, none of this literature has considered the effects of autonomy on productivity intervention effectiveness. Productivity interventions often focus the efforts of employees or work groups on behaviors or outcomes which will bring the highest value to the organization. However, if employees do not have the autonomy to control how their work is accomplished, they will have less freedom to make the changes in behavior necessary to achieve these higher levels of productivity.

Feedback from the job itself is defined as the degree to which carrying out the activities inherent in the job provides clear information to the employee about the effectiveness of their performance (Hackman & Oldham, 1974). For example, calling new potential clients is part of the job of an

insurance salesperson. During these calls the salesperson gets a great deal of feedback from the potential client they are calling based on the client's reactions to their selling technique. This immediate feedback lets the salesperson know how effective their pitch is going throughout the sales call. Feedback from the job allows employees to self-monitor their progress towards goals and feeds back knowledge of their results. The literature has demonstrated that this type of feedback has small, but positive relationships with both objective ($\rho = .09$) and subjective measures ($\rho = .20$) of job performance (Humphrey, Nahrgang, & Morgeson, 2007).

The Characteristics and Productivity

Humphrey, Nahrgang, and Morgeson (2007) completed a comprehensive meta-analysis of the job characteristics literature, building upon and extending the original meta-analysis conducted by Fried and Ferris (1987). Their results indicated that though the corrected correlations were small ($\rho = -.03$ to $.17$) four of the five job characteristics were significantly related to objective measures of performance (i.e. output based measures); task significance, task identity, skill variety, and feedback. Autonomy was the only characteristics which did not indicate a statistically significant relationship with objective measures of performance. However, autonomy, task identity, task significance, and feedback did show non-zero corrected correlations with subjective performance (e.g. performance appraisals) (average $\rho = .18$). All five characteristics demonstrated positive relationships with internal work motivation (mean $\rho = .39$), job satisfaction (mean $\rho = .41$), and growth satisfaction (mean $\rho = .55$). Similar, results showing small positive correlations between the individual characteristics and objective, output based measures of performance have also been found in previous studies (Kulik, Oldham, Langer, 1988).

The Motivating Potential Score (MPS)

Hackman and Oldham (1974, 1975) prescribe a method for computing an overall summary score based on the individual job characteristics measured with the Job Diagnostic Survey, termed the Motivating Potential Score (MPS), reflecting the motivational potential of a job. The five major model variables can be viewed as either task-related (skill variety, task identity, and task significance) or job management related (autonomy and feedback). The model posits a multiplicative relationship between the major components. For the purposes of computing an overall motivation score the task-related components are averaged and then multiplied by autonomy and then by feedback scores (See Figure 1). This type of relationship means that when any of the components are low, there is a significant impact on the MPS score. Hence, maximal outcomes can only be achieved when *all* characteristics are maximized.

$$\text{MPS} = \left(\frac{\text{Task Significance} + \text{Task Identity} + \text{Skill Variety}}{3} \right) \times \text{Autonomy} \times \text{Feedback}$$

Figure 1: The Hackman-Oldham (1974) formula for calculating the Motivation Potential Score used to test hypothesis 3.

The Characteristics in Teams: Organizational Value Congruence as Potential Moderator

The most recent comprehensive survey of US organizations indicated that 48% of organizations utilized team-based work (Devine et al., 1999). Interestingly though, examinations of the JCM model have remained constrained to the individual level of analysis, with both major meta-analyses of the JCM literature leaving out team-based primary studies of JCM characteristics all together (Humphrey, Nahrgang, & Morgeson, 2007; Fried & Ferris, 1987). There has been limited investigation of the characteristics as the team in primary studies—with most attention being limited to the effects of team characteristics such as interdependence on autonomy (Bailey, 1998; Janz, Colquitt, & Noe, 1997). Humphrey and colleagues (2007) did take a step in this direction, however, by looking at the effects of the social characteristics of the job, such as feedback from others, social support, interaction outside of the organization, and interdependence. They found that no primary studies had attempted to examine the relationship between such social characteristics and objective measures of performance; however, there was a weak positive relationship with subjective measures of performance and positively related to employee attitudes, such as job satisfaction. Furthermore, they call for further study of the effects the traditional JCM characteristics at the team level, in addition to examination of potential moderating effects of team characteristics such as trust and cooperative norms on the relationships between the JCM characteristics and outcomes. This thesis begins to redress this gap by investigating value congruence as a potential moderator.

When managers and employees feel the same things are important and worth working towards in the organization, their organizational values are in congruence. At the basic level, managerial values have been found to impact employee behavior (e.g. Adkins & Russell, 1997; Wiener, 1988; Chatman, 1989). Evidence has further suggested that manager-employee value

congruence can influence supervisor ratings of work performance (e.g. Becker, Billings, Eveleth, & Gilbert, 1996), ethical behavior (Posner, Kouzes, & Schmidt, 1985), prosocial behavior and self reported levels of teamwork (O'Reilly & Chatman, 1986; Posner, 1992). Value congruence is an element of organizational culture thought to underlie organizational effectiveness and sustainability (Maierhofer, Griffen, & Sheehan, 2000).

ProMES and the Characteristics

ProMES is based on the theoretical model of motivation developed by Naylor, Pritchard, and Ilgen (1980), which was later refined by Pritchard and Ashwood (2007). Founded upon the notions of expectancy theory (Vroom, 1964; Campbell & Pritchard, 1976; Mitchell & Daniels, 2003) the model states that motivation is captured by the following process: (1) efforts are applied to actions, (2) these actions achieve certain results, (3) these results are then evaluated, (4) certain outcomes result from these evaluations, and (5) finally the outcomes satisfy certain needs. This process is depicted in Figure 2.



Figure 2: The Pritchard-Ashwood Model of Motivation.

The Pritchard-Ashwood theory is most concerned with the connections between the variables, stating that motivation is only high when all of these connections are strong. For example, if an employee does not receive feedback regarding their performance, it may not be clear to them how their results are being evaluated. Therefore the results to evaluation connection would be low. According to the Pritchard-Ashwood model, even one low connection can cause motivation to

suffer. ProMES was explicitly developed to address all of the connections in this model in order to maximize motivation and productivity.

ProMES utilizes a process of collaboration, in which incumbents of the work unit, supervisors, and upper level management explicitly define the objectives of the targeted work unit and develop measures that reflect how well those objectives are being met (Pritchard, 1990). A trained facilitator directs the efforts of the design team, often comprised of a subset of target unit members and supervisors. Employees then receive regularly scheduled feedback regarding their performance over time and meet to discuss ways to improve performance. A single index of unit effectiveness can be calculated based on an aggregate of the individual measures, and this overall score can be tracked over time. The participatory development, focus on feedback, and single index of productivity differentiate ProMES from other productivity enhancement programs. Meta-analysis results indicated that the average effect size of ProMES on productivity, calculated in terms of a Cohen's d-statistic, is 1.16 (Pritchard, Harrell, DiazGranados, & Guzman, 2007). Practically, this effect size indicates that productivity during the ProMES intervention is an average of 1.16 standard deviations higher than productivity during baseline.

Motivational interventions like ProMES are based upon several methods which have the potential to influence the five core job characteristics. For example, ProMES is an intervention based on feedback; therefore, employees receive a greater amount of quality feedback from the job regarding their performance once the intervention is implemented. Applications such as *ProMES Navigator*, an online application which allows for real-time performance measurement, make it easy for employees to track their individual or team performance against performance benchmarks as they are actually performing tasks. ProMES could also foster autonomy since it relies on performance measures which are under employee control. Control over performance measures

refers to the degree to which variation in the amount of effort employees allocate to those tasks underlying the performance measures results in actual variation in the performance measures themselves (Pritchard, van Tuijl, Bedwell, Weaver, Fullick, & Wright, under review). Utilizing measures whose variance is primarily determined directly by employee effort increases the amount of autonomy available at both the individual and team level. ProMES also fosters autonomy through the use of feedback meetings, during which teams work together to develop improvement strategies and evaluate their effectiveness.

In terms of the three characteristics considered ‘task-related’, the ProMES process may influence their relation with performance in several ways. Task significance, for example, could be enhanced due to the development of contingencies for each performance indicator. The contingencies in ProMES are a graphical representation of the relationship between different levels of the performance measure and the actual contribution of that level to overall effectiveness of the targeted unit. See Pritchard (1990) for a more in depth description of the contingency development process. During the contingency development process the intervention design team organizes performance measures in terms of both positive and negative contribution (i.e. productivity would be affected most positively if performance measure A reached its highest possible level and productivity would be affected most negatively if performance measure B was at its lowest possible level). This is a clear delineation of what tasks contribute the most to productivity and the impact of each task on overall effectiveness. The ProMES process also involves discussion of the unit’s contributions to the organization at a more general level during the development of team objectives. This process would help target unit members become more aware of their impact on others both within and outside of the organization. This explicit demarcation could enhance task significance. Skill variety could also be affected by ProMES. For example, the process involves delineating the

tasks which contribute to overall team effectiveness and determining what measures capture the most effective ways to complete these tasks. By simply outlining what the most effective process is and explicit task strategies, employees become aware that they may need to use a new or broader range of skills than they had been previously relying on. This would inherently increase the degree of skill variety necessary for the job. Lastly, ProMES could potentially influence task identity, though somewhat indirectly. ProMES is not meant to result in job re-design; therefore, a job would not suddenly result in more finished products after an intervention. However, the contributions of the job to the overall product would be more salient. The intervention could help frame the portions of the product which are produced and could be seen as end products of the team itself.

Hypotheses

Figure 3 represents the relationships investigated in this study. Hackman and Oldham's model indicates that higher levels of the job characteristics are desirable and the previous literature noted above indicates that they are positively related to work motivation. However, motivationally based productivity interventions, such as ProMES, function on the assumption that motivation is the central mechanism causing low productivity. These interventions achieve success by increasing the motivational properties of the job and work environment. Therefore, I argue that interventions instituted within teams which already have high levels of the job characteristics will be less effective and actually negatively impact productivity.

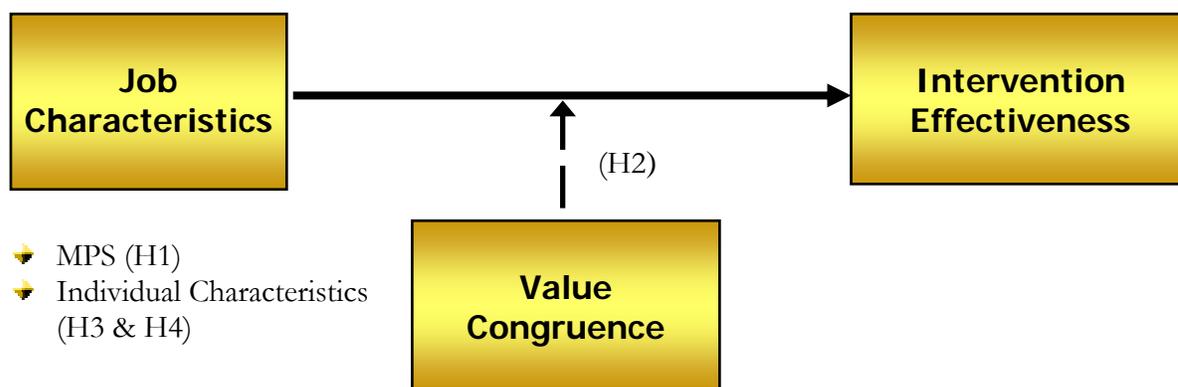


Figure 3: Model of the relationships explored in the current thesis.

Murphy (1990) reminds us that productivity interventions can have unintended negative side effects. In one example, he notes that job re-design interventions can make it more difficult to forecast, schedule, and coordinate work as workers retain more responsibility and autonomy. Building upon these ideas, I argue that the higher the job is on Hackman and Oldham’s five core characteristics prior to the intervention, the less effective a motivationally-based intervention designed to improve productivity will be. This notion may at first seem counter-intuitive considering that the five core characteristics have shown positive relationships with productivity and considering that job enrichment interventions which address the five job characteristics have shown positive impacts on productivity using MPS as a predictor (Karaseck & Theorell, 1990; Loher, Noe, Moeller, & Fitzgerald, 1985). If MPS is high for a particular team prior to implementation of the intervention, then motivation may not really be the mechanism underlying their low productivity. Based on the Hackman-Oldham model, jobs already high on these characteristics would already be maximizing motivation, therefore an intervention designed to correct motivationally-based productivity problems would not be as effective—there would simply be less room to improve motivation. Furthermore, such interventions could be potentially detrimental to productivity in

these cases. For example, employees already enjoying high levels of autonomy may react negatively to such an intervention because it tracks their daily work outputs more closely and regularly than had been done previously. When the motivating properties of the job are low there is much greater degree of improvement possible. Since intervention effectiveness in this study is measured as a change in productivity from baseline to intervention, I argue that as the motivating potential score increases there be less change (improvement) from baseline to intervention. Therefore, it is postulated the MPS will show a significant negative relationship with intervention effectiveness.

Hypothesis 1: The Motivating Potential Score (MPS) will be negatively related to the degree of productivity gain achieved after a productivity enhancement intervention.

Conceptually, hypothesis 1 is testing the moderating effect of MPS on the intervention-productivity relationship. There is no need to test the moderating effect as such directly, however, since the criterion is productivity gain. In this study productivity gain is manifested as an effect size (d) which inherently reflects the intervention-productivity relationship. Specifically, d represents the number of standard deviations of change from baseline to feedback conditions (See Pritchard, Harrell, DiazGranados, & Guzman, 2007).

The effects of the characteristics at the team level are not well understood as noted previously. In an attempt to begin dressing this gap, value congruence was examined as a potential moderator of the relationship between MPS and intervention effectiveness. Value congruence means that leaders (e.g. supervisors) and their team members agree that the same things are important for the organization's success and are willing to work according to these values. If the motivating potential of the job is low, but the leaders and team members agree on what is important for success than there would be the greatest potential for improvement if a productivity enhancement intervention were instituted. In this case, both leaders and members would agree that

the intervention is important for organizational success. Therefore, in instances where MPS is low and value congruence is high, intervention effectiveness should be maximized. When value congruence is high, work group members have more similar conceptualizations and agreement about the tasks at hand (Jehn, Chadwick, & Thatcher, 1991). This clarity and agreement regarding important tasks and task strategies should positively the impact of the productivity. This leads to the second hypothesis:

Hypothesis 2: The relationship between MPS and productivity gain will be moderated by the degree of value congruence such that units high in value congruence, but low on MPS will achieve the most effective interventions.

The literature has questioned whether the multiplicative relationship formulated by MPS trades minimal gains in prediction for large increases in complexity. Due to the intercorrelations between the characteristics it has been suggested that a simple additive sum of the characteristics is equally predictive of outcomes such as productivity (e.g. Dunham, 1976; Roberts & Glick, 1981). Therefore, the third hypothesis concerns the individual effects of each characteristic on intervention effectiveness. Analyzing the individual effects of each characteristic will allow for their individual impact on intervention effectiveness will be quantified. My goal is to parse out the predictive contribution of each characteristic to determine which have the most powerful impact on intervention effectiveness. Determining the strength of their individual contributions will shed additional light on the issue of the original multiplicative relationship. Therefore, hypotheses 3a-3e postulate that each characteristic will be negatively related to intervention effectiveness.

Hypotheses 3a-3e: Levels of (a) Task significance, (b) task identify, (c) skill variety, (d) autonomy, and (e) feedback from the job will be negatively related to the productivity gain achieved after the implementation of a productivity intervention program.

Recent literature indicates mixed results regarding which characteristics are most strongly related to performance outcomes. Humphrey, Nahrgang, and Morgeson (2007) found the strongest correlations between autonomy ($\rho = .23$) and task variety ($\rho = .23$) with subjective performance outcomes, whereas Fried and Ferris found task identity ($\rho = .26$) and job feedback ($\rho = .48$) to be the strongest predictors. There is a great deal of literature regarding the effects of feedback both from the job itself and from others on performance indicating that feedback is a strong driver of performance, therefore it is hypothesized that feedback from the job will have the strongest impact on intervention effectiveness when compared to the impact of the other four characteristics.

Hypothesis 4: Of the five core characteristics, feedback from the job will be the strongest predictor of intervention effectiveness.

CHAPTER THREE: METHODOLOGY

The hypotheses were tested using a database of ProMES projects. There are currently data for 88 ProMES projects in the database. The majority of the projects were completed within the United States and Europe, though the database contains data for projects from eight different countries. Additionally, project data are available for jobs in the manufacturing, military, healthcare, education, sales, and service industries. Specifically, the database is comprised of responses to a meta-analysis instrument developed by Paquin (1997), which attempted to identify all the variables that might influence the effectiveness of the intervention.

Sample

Projects were utilized in current analyses if they included data for the relevant variables for this study. Inclusion criteria also necessitated that the project have productivity information for at least one baseline period and at least two intervention periods. Sixty-four projects met this criteria ($N = 64$) and were included in analyses. Specifically, these projects targeted teams which included military airline pilots, police, veterinary doctors at a teaching hospital, and manufacturing teams. They included projects completed in the US, Sweden, Germany, Switzerland, the Netherlands, and France. Teams in this sample had an average of 5 members ($M = 5.1$)

Measures

Measures of all independent variables were obtained from ratings of each ProMES project completed by the respective project facilitator upon project completion. Each facilitator was asked to complete a comprehensive questionnaire regarding various variables hypothesized to affect intervention effectiveness. Current analyses utilized a subset of these variables described below.

The questions regarding the job characteristics were adapted from section 1 of Hackman and Oldham's (1975) Job Diagnostic Survey and included in the ProMES meta-analysis instrument

(Paquin, 1997). Specifically, the original JDS survey utilized a 7-point anchored Likert scale, while the current study utilized a 5-point anchored Likert scale in order to fit within the scheme of the meta-analysis instrument.

Task Identity was operationalized by the question was “To what extent did the job involve the group as a unit doing a "whole" and identifiable piece of work? That is, was the work performed by the group as a unit a complete piece of work that had an obvious beginning and end? Or was it only a part of the overall piece of work, which was finished by individuals or machines outside of the group?” Ratings were provided on a 5-point Likert scale with anchors from “The group’s job involved doing a whole piece of work from start to finish, the results of their activities were easily seen in the final product or service” to “The group’s job was only a tiny part of the overall piece of work performed by the group, the results of their labor could not be seen in the final product or service.”

Skill Variety was operationalized by the question, “How much variety did the job contain? That is, to what extent did the job require group members to do many different things at work, using a variety of skills and talents?” Raters again used a 5-point Likert scale with anchors from “Very much, the job required group members to do many different things, using a number of different skills and talents” to “Very little, the job required group members to do the same routine things over and over again.”

Task Significance was operationalized by the question, “In general, how significant or important was the job? That is, were the results of the group's work likely to significantly affect the lives or well-being of other people?” Raters indicated the level of significance on a 5-point anchored Likert scale with anchors from “Highly significant” to “Not very significant.”

Autonomy was operationalized by the question: “How much group autonomy was there in the job? That is, to what extent did the job allow the group as a unit to decide on their own how to do the job?” Ratings were again provided using a 5-point Likert scale; anchors were from “Very much” to “Very little.”

Feedback from the job itself was operationalized by the question “To what extent did the job itself provide group members with information about their performance? That is, did the actual work itself provide clues about how well the group was doing - aside from any feedback provided by supervisors or co-workers?” Raters responded using a 5-point Likert scale which was anchored from “Very much, the job was set up so that group members received almost constant feedback” to “Very little, the job itself provided almost no feedback, so the group could work forever without finding out how well they were doing.”

Value Congruence was operationalized as the “degree of agreement in organizational values between target unit personnel and management” on a 5-point anchored Likert scale. A response of 5 was anchored with: “Clear agreement and a willingness to work together to achieve those values.” A rating of three was anchored with: “Some disagreement in what was important, but willingness existed to work together.” A rating of one was anchored with: “Significant disagreement in values and a lack of willingness to work together.” Thus the value congruence item assessed both agreement and willingness to work together based on these values.

Intervention Effectiveness was the dependent variable in all analyses. This value was calculated for each project using the Hunter, Schmidt, and Jackson (1992) method for calculating effect size (the *d*-statistic) and based on the overall effectiveness scores obtained for each unit. The overall effectiveness scores during baseline were compared to the overall effectiveness scores during the period after ProMES feedback was started. This application of *d* gives the number of standard

deviations of change from baseline to feedback conditions. See Pritchard, Harrell, DiazGranados, and Guzman (2007) for an in-depth discussion of the method of *d*-statistic calculation.

Analyses

All analyses were conducted using multiple regression and the hypothesized moderation effect of value congruence was tested using Barron and Kenny's (1985) method for moderated multiple regression. All analyses controlled for potential confounds directly related to ProMES itself (i.e. components of this specific methodology). Specifically, a recent meta-analysis by Pritchard, Harrell, DiazGranados, and Guzman (2007) investigated the effects of various elements of the ProMES system itself on productivity gain. The degree that the project followed the prescriptive steps outlined by Pritchard (1990) for conducting ProMES (degree of match), was the strongest predictor of productivity gain ($\beta = .34$), therefore it will be included in the multiple regression analysis as a control variable. The aim of the current study was to generalize to motivationally based productivity interventions, using ProMES as an example. To do this, it was important to parse out those effects specific to ProMES, which is the purpose of including the control variable. Main effects and interaction (moderating) effects were also tested utilizing multiple regression. Interaction terms were calculated by centering and then multiplying the moderator with the independent variable to form an interaction term. Analyses were conducted using the software program SPSS 14.0. An alpha level of .05 was utilized for all statistical tests unless otherwise indicated.

CHAPTER FOUR: RESULTS

Means, standard deviations, and zero order correlations are presented in tables 1 and 2. The mean intervention effectiveness (d) achieved in the projects included in these analyses was 1.21 (SD = 1.50). This can be interpreted as indicating that on average productivity increased by an entire standard deviation and a fifth from baseline to feedback. Overall, MPS showed a non-significant, negative zero order correlation with productivity gain ($r = -.05, p = .72$). Task identity ($r = -.12, p = .33$), skill variety ($r = -.08, p = .55$), task significance ($r = -.15, p = .23$), and autonomy ($r = -.21, p = .10$) all showed similar negative, non-significant relationships with intervention effectiveness. Feedback from the job ($r = .07, p = .59$) and value congruence showed positive correlations with productivity gain, however only the relationship between productivity and value congruence was significant ($r = .29, p = .02$). Though few of the zero order correlations were statistically significant, it is interesting to note that four of the five characteristics (all except feedback from the job) demonstrated a negative relationship with intervention effectiveness as predicted.

Table 1
Descriptive statistics for all study variables.

	<i>Sample Size</i>	<i>Mean</i>	<i>Standard Deviation</i>
1. Intervention Effectiveness	64	1.21	1.50
2. Task Identity	64	3.86	.94
3. Skill Variety	64	3.16	1.09
4. Task Significance	64	3.55	1.32
5. Autonomy	64	3.23	1.23
6. Feedback from job	64	3.13	1.05
7. MPS	64	39.05	26.02
8. Value Congruence	63	3.54	.98

Table 2

Zero order correlations between job characteristics and intervention effectiveness.

	1.	2.	3.	4.	5.	6.	7.	8.
1. Intervention Effectiveness	--							
2. Task Identity	-.12	--						
3. Skill Variety	-.08	.13	--					
4. Task Significance	-.15	.20	.49**	--				
5. Autonomy	-.21	.28*	.52**	.42**	--			
6. Feedback from job	.07	.12	.16	.12	.29*	--		
7. MPS	-.05	.34**	.56**	.54**	.82**	.65**	--	
8. Value Congruence	.29*	.20	.12	.17	.16	.34**	.29*	--

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

To test hypothesis 1, productivity gain was regressed on to MPS. The resulting overall model was significant ($F(2, 61) = 6.81, p < .01, r^2 = .18$). After controlling for degree of match, however, there was no significant main effect for MPS ($\beta = -.03, t(63) = -.27, p = .79$). Thus, no statistically significant support was provided for hypotheses 1, though the relationship was in the hypothesized negative direction.

Hypothesis 2, regarding the moderating effect of value congruence on the relationship between MPS and intervention effectiveness, was tested by regressing effectiveness onto MPS and their interaction term. The overall model was significant ($F(4, 58) = 4.10, p < .01, r^2 = .22$). No significant main effects were found for MPS ($\beta = -.03, t(68) = -.24, p = .82$), nor for value congruence ($\beta = .13, t(68) = .96, p = .34$). Additionally, their interaction term was not significant (β

= -.13, $t(68) = -1.04$, $p = .30$) indicating that value congruence was not a significant moderator of the MPS-intervention effectiveness relationship.

To test hypotheses 3a-3e, productivity gain was regressed on to all five job characteristics. The resulting overall model was significant ($F(6, 57) = 2.67$, $p < .05$, $r^2 = .47$). After controlling for degree of match, however, there again were no significant main effects for any of the five characteristics. However, autonomy ($\beta = -.21$, $t(63) = -1.48$, $p = .14$) and task identity ($\beta = -.04$, $t(63) = -.34$, $p = .74$) did produce negative beta-weights. Conversely though, skill variety ($\beta = .07$, $t(63) = .48$, $p = .63$), feedback from the job ($\beta = .06$, $t(63) = .45$, $p = .65$), and task significance ($\beta = .03$, $t(63) = .18$, $p = .86$) displayed positive, though also non-significant beta weights. Overall, no statistically significant support was provided for hypotheses 3a-3e, though two of the relationships (3b & 3d) were in the hypothesized negative direction. This lack of significance circumvented the ability to test hypothesis 4, which postulated that feedback from the job would be the strongest predictor of the five characteristics of intervention effectiveness.

CHAPTER FIVE: DISCUSSION

The results of this thesis provide an initial exploration of the effects of the characteristics of the JCM model at the team level and of potentials boundary conditions of motivationally based productivity interventions. All interpretations should be considered as tentative and with caution due to a lack of statistical significance and low power; however results are noteworthy as they were generally in the hypothesized negative direction and suggest that future, more powerful investigations of these research questions would be valuable. At a team level, MPS was negatively related to intervention effectiveness, though this relation was weak and non-significant. It is important to keep in mind that in this case a negative relationship would indicate that as MPS increases the *improvement* in productivity decreases, not that actual productivity levels are lower during the intervention compared to baseline. This suggests, however, the potential for further investigation of MPS as a boundary condition for the effectiveness of such motivationally based productivity interventions. Additionally, autonomy and task identity showed negative, though non-significant, predictive relationships with effectiveness and four of the five characteristics were negatively correlated with effectiveness. This suggests that it would be meaningful to further parse out the individual contributions of each characteristic in addition to their effects when combined into the global MPS measure.

Practical Implications

Tentatively, these results could also have implications for practitioners. Organizational interventions are a cost and time investment. Results of this thesis suggest that measuring the levels of the characteristics may be a worthwhile first step in determining the appropriateness of motivationally based productivity interventions. Teams which are already high on the characteristics may not reap the large gains in productivity which have been associated with these types of

interventions, like ProMES. Additionally, the ubiquitous nature of team based work in the new global economy has made understanding how to make teams effective vital. Though low statistical power contributed to a lack of statistically significant findings, there were several methodological strengths worthy of note.

Strengths

First, objective, output based measures of productivity were used to gauge intervention effectiveness in terms of productivity gain. The use of output-based measures also protects this study from the common method bias which is prevalent in prior literature due to the use of self-report measures of attitudes and performance (Glick, Jenkins, & Gupta, 1986; Humphrey, Nahrgang, & Morgeson, 2007). Previous research has focused on attitudinal outcomes such as satisfaction and has relied on limited behavioral performance outcomes such as turnover intentions, therefore the relationship between the model factors and productivity remains unclear and weakly developed in the literature. This study will help to parse out the relationship based on measures which are valid and under the employee's control (Pritchard, van Tuijl, Bedwell, Weaver, Fullick, & Wright, Under Review).

Third, outside raters, who were not organizational incumbents, but who are intimately familiar with the tasks and goals of the job due to facilitation of the productivity intervention, provided ratings of the job characteristics. Glick, Jenkins, and Gupta (1986) reported evidence of method effects when comparing job characteristic models based on self-reported outcomes to models based on outside observer ratings. Theoretically speaking, this could be due to redefinition of the job by the employee which creates discrepancies between the actuality of the characteristics of the job and the employee's perceptions of the characteristics based on their re-definition (Hackman & Oldham, 1980; Griffin, Welsh, & Moorehead, 1981). The median correlation between incumbent

and observers ratings of the characteristics has been reported at .65 in validation studies of the Job Diagnostic Survey (Hackman & Oldham, 1975). Though external ratings are open to their own set of limitations, their validity is not threatened by problems of re-definition and in this case, common method bias.

Fourth, this thesis included a wide range of jobs, from an international sample. Single job samples collected from only one region within the US permeate the job characteristics literature, limiting the generalizability of previous findings due to restriction of range (Humphrey, Nahrgang, & Morgeson, 2007). To further counter range restriction, the current thesis is based on a subset of the ProMES database which will include data from over eight countries and a multitude of jobs. This investigation used a subset of the studies which included data from six different countries that includes 24 different jobs in widely different industries, including manufacturing, education, sales, service, and healthcare.

Limitations

As noted earlier, however, there were several potential barriers and limitations of the current proposal. First, in their original model Hackman-Oldman (1974) postulate that the relationship between the five job characteristics and outcomes are mediated by constructs known as the Critical Psychological States (CPS). The original model posits that the relationship between the core characteristics and outcomes is fully mediated by three critical psychological states; experienced meaningfulness, experienced responsibility for outcomes, and knowledge of actual results of the work activities. However, empirical tests have only provided support for partial mediation by the CPS in terms of relationships between the characteristics and outcomes such as attitudinal outcomes; self rated motivation, general job satisfaction (Hackman & Oldham, 1976; Fried & Ferris, 1987; Johns, Xie, & Fange, 1992; Renn & Vandenberg, 1995). Benson, Eddy, and Lorenzet's (2000)

combined meta-analysis and structural equation modeling (SEM) techniques to test the mediation hypothesis and their results indicated that though the three part model including full mediation by CPS accounted for slightly more variance in the outcome measures, the two part model, which did not include the mediation by CPS, actually provided a superior fit for the data. Similar tests further indicate that including the hypothesized mediation effect is not necessary to maximize the amount of outcome variance explained by the core characteristics (Renn & Vandenberg, 1995). This thesis was precluded from analyzing the mediating hypothesis due to the use of archival data which did not include CPS measures. However, the literature supports the use of the two part model of job characteristics which does not include the mediation effects of the three CPS.

Second, the original Hackman-Oldham (1974) model posits that GNS moderates the relationships between the characteristics and work outcomes. Limited empirical support for the moderating effects of GNS has been provided in the literature; however the manifestation of this effect in outcome variables and even which characteristics are affected is relatively unclear (Roberts & Glick, 1981; Loher, Noe, Moeller, & Fitzgerald, 1985; Fried & Ferris, 1987). More powerful statistical analysis, however, have not supported the utility of GNS as a moderator (Hogan & Martell, 1987; Tiegs, Tetrick, & Fried, 1987). Therefore, GNS was not included in the current analyses.

Third, the non-significant results of this study may be due to low power—a product of small sample size and the use of several single-item measures. The use of the full job diagnostic survey was not possible due to the length, complexity, and aims of the overall ProMES meta-analysis instrument (Paquin, 1997). Single-item measures are often criticized for possible unreliability and the potential for measurement error (e.g. Wanous, Reichers, & Hudy, 1997). However, these measures exert negative effects only in that they increase the item error variance—thus making it *more*

difficult to achieve significance and therefore a more conservative test. Therefore, if anything, the analyses may have underestimated the true relationships between the variables.

Fourth, the generalizability of the study may also be limited by the use of data from a single intervention type. Replication of these results with different interventions would be valuable. Additionally, though there were advantages to having the intervention facilitator fill out the response instrument (e.g. of all intervention participants they observed all of the phases and meetings) this also could have a negative impact on our results. Differences in question interpretation, for example, could have added random error. Additionally, there were no means to assess inter-rater reliability.

Finally, the directionality of the characteristics-performance relationship has been questioned and an alternative model proposed in which performance acts as the exogenous variable causing variation in the characteristics (Griffen, Welsh, & Moorehead, 1981). Confirmatory structural equation modeling demonstrated that this reverse causality model actually had better fit than traditional directional models in an upper-level military sample (Hogan & Martell, 1987). In the current study the characteristics were rated at the end of the intervention process; therefore the directionality of the relationship can not be clearly deduced. However, the analyses are somewhat safeguarded from this threat considering the longitudinal design in which data was collected over the course of several time intervals for each intervention project.

Overall, this thesis furthers both the JCM and productivity intervention literatures by providing an exploratory investigation of the five core characteristics at the team level and the boundary conditions of motivationally based productivity interventions, such as PromES. Results were suggestive of a negative relationship between some of the characteristics and intervention effectiveness indicating that future, more powerful research designed to further parse out these relationships would be valuable.

APPENDIX A: COPYRIGHT PERMISSION LETTER



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February 17, 2008

Robert Pritchard, PhD
Full Professor
Department of Psychology
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Dear Bob,

This letter will confirm our recent conversation. I am completing a master's degree at the University of Central Florida entitled " Characteristics for Success: Predicting Intervention Effectiveness with the Job Characteristics Model." I would like your permission to reprint in my thesis relevant excerpts from the following:

Pritchard, R. D. (1995). ProMES Meta-Analysis Instrument. Retrieved January 10, 2007 from:
<http://promes.cos.ucf.edu/meta-structural.php>

The excerpts to be reproduced are: pages 10-13 of the instrument. These pages will be included in order to provide a copy of the questions utilized for my data analyses. The requested permission extends to any future revisions and editions of my dissertation, including non-exclusive world rights in all languages, and to the publication of my dissertation on demand by UMI. These rights will in no way restrict republication of the material in any other form by you or by others authorized by you. Your signing of this letter will also confirm that you own or your company owns the copyright to the above-described material. If these arrangements meet with your approval, please sign this letter where indicated below and return it to me in the enclosed return envelope. Thank you for your attention in this matter.

Sincerely,

Sallie Weaver

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

By: Robert Pritchard, PhD

Signature: _____

Date: 3/2/08

APPENDIX B: EXCERPTS FROM THE PROMES META-ANALYSIS INSTRUMENT

EXCERPT FROM THE PROMES META-ANALYSIS INSTRUMENT

June 12, 1995

The purpose of this instrument is to collect data on ProMES projects that will allow us to aggregate the results of our studies using meta-analysis. I will put the database together, agree to keep it current, and distribute it to the contributors. Those who have contributed ProMES studies with productivity data will have access to these data. Those who have not will not have access.

Fill out the instrument as completely as possible, realizing that there will be some missing data on most projects. When you aren't sure how to complete a scale, make notes by that item. That way we can clarify the scales in future versions of the instrument.

The intention is that we fill out the instrument on all past and current projects at this time. Then, once every six months to a year, we update the projects that are still ongoing. This update will be much less involved than the work to do the original questionnaire since the majority of the information will not have changed. If a project has not yet started feedback, it is not necessary to complete the instrument. We will catch that project on the next cycle. Thus, there is no optimal time in the life of a project to complete the instrument. We will continually update the data base.

Fill out one copy of the questionnaire for each ProMES unit.

A lot of work by many of the research teams doing ProMES has gone into making the meta-analysis instrument as complete and as clear as possible. This has resulted in a lengthy questionnaire. Thus, it will take some time to complete the instrument. In addition, it is important that we do the ratings on all the projects we have conducted (including those that were unsuccessful or were not completed) so that we can get as complete a data set as possible.

We have a chance here to create something unique in our field. It is a lot of work, but the payoffs are very large. I appreciate your contributions.

Bob Pritchard

2.1.3 Job Characteristic Variables (JDS) for the Target Unit

Describe the target unit's work with these scales. (The following items are adapted from the items in section 1 of Hackman & Oldham's 1975 Job Diagnostic Survey, Development of the Job Diagnostic Survey, Journal of Applied Psychology, 60, 159-170, quoted from Cook, J. D., Hepworth, S. J., Wall, T. D., & Warr, P.B. 1981. The experience of work: A compendium and review of 249 measures and their use. London: Academic Press).

Skill variety: the degree to which the job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the employee.

1. How much variety did the job contain? That is, to what extent did the job require group members to do many different things at work, using a variety of skills and talents?

- ___ 5. Very much, the job required group members to do many different things, using a number of different skills and talents.
- ___ 4.
- ___ 3. Moderate variety.
- ___ 2.
- ___ 1. Very little, the job required group members to do the same routine things over and over again.

Task identity: the degree to which the job requires completion of a "whole" and identifiable piece of work, i.e., doing a job from beginning to end with a visible outcome.

2. To what extent did the job involve individuals within the group doing a "whole" and identifiable piece of work? That is, was the work performed by individuals within the group a complete piece of work that had an obvious beginning and end? Or did it only comprise a small part of the overall piece of work, which was finished by other members of the group or automatic machines?

___ 5. The individual's job involved doing a whole piece of work from start to finish, the results of their activities were easily seen in the final product or service.

___ 4.

___ 3. The individual's job was a moderate size "chunk" of the overall piece of work performed by the group, their contribution could be seen in the final outcome.

___ 2.

___ 1. The individual's job was only a tiny part of the overall piece of work performed by the group, the results of their labor could not be seen in the final product or service.

3. To what extent did the job involve the group as a unit doing a "whole" and identifiable piece of work? That is, was the work performed by the group as a unit a complete piece of work that had an obvious beginning and end? Or was it only a part of the overall piece of work, which was finished by individuals or machines outside of the group?

___ 5. The job of the group involved doing the whole piece of work from start to finish.

___ 4.

___ 3. The job of the group was a moderate size part of the overall piece of work.

___ 2.

___ 1. The job of the group was only a tiny part of the overall piece of work performed.

Task significance: the degree to which the job of the group has a substantial impact on the lives or work of other people, whether in the immediate organization or in the external environment.

4. In general, how significant or important was the job? That is were the results of the group's work likely to significantly affect the lives or well-being of other people?

___ 5. Highly significant, the outcomes of the group's work could affect other people in very important ways.

___ 4.

___ 3. Moderately significant.

___ 2.

___ 1. Not very significant, the outcomes of the group's work were not likely to have important effects on other people.

Autonomy: the degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out.

5. How much individual autonomy was there in the job? That is, to what extent did the job allow individual group members to decide on their own how to do the job?

- 5. Very much, the job allowed individual group members almost complete responsibility for deciding how and when the work was done.
- 4.
- 3. Moderate autonomy, many things were standardized and not under the individual group member's control, but individual group members could make some decisions about their work.
- 2.
- 1. Very little, the job allowed individual group members almost no personal "say" about how and when the work was done.

6. How much group autonomy was there in the job? That is, to what extent did the job allow the group as a unit to decide on their own how to do the job?

- 5. Very much, the job allowed the group almost complete responsibility for deciding how and when the work was done.
- 4.
- 3. Moderate autonomy, many things were standardized and not under the group's control, but the group could make some decisions about their work.
- 2.
- 1. Very little, the job allowed the group almost no personal "say" about how and when the work was done.

Feedback from the job itself: the degree to which carrying out the work activities required by the job results in the employee obtaining direct and clear information about the effectiveness of his or her performance.

7. To what extent did the job itself provide group members with information about their performance? That is, did the actual work itself provide clues about how well the group was doing - aside from any feedback provided by supervisors or co-workers?
- 5. Very much, the job was set up so that group members received almost constant feedback.
 - 4.
 - 3. Sometimes doing the job provided feedback to the group, sometimes it did not.
 - 2.
 - 1. Very little, the job itself provided almost no feedback, so the group could work forever without finding out how well they were doing.

Feedback from agents: the degree to which the employee receives clear information about his or her performance from supervisors or co-workers.

8. To what extent did managers or co-workers let group members know how well they were doing on the job?
- 5. Very much, managers or co-workers provided group members with almost constant feedback about how well they were doing.
 - 4.
 - 3. Moderately, sometimes people gave feedback, other times they did not.
 - 2.
 - 1. Very little, people almost never let group members know how well they were doing.

Dealing with others: the degree to which the job requires the employee to work closely with other people in carrying out the work activities (including dealings with other organization members and with external organizational "clients").

9. To what extent did the job require individuals within the group to work with each other.
- 5. Very much, dealing with other group members was an absolutely essential and crucial part of doing the job.
 - 4.
 - 3. Moderately, some dealing with other group members was necessary.
 - 2.
 - 1. Very little, dealing with other group members was not at all necessary in doing the job.
10. To what extent did the job require individuals within the group to work with individuals outside of the group (either within or outside the organization).
- 5. Very much, dealing with individuals outside of the group was an absolutely essential and crucial part of doing the job.
 - 4.
 - 3. Moderately, some dealing with individuals outside of the group was necessary.
 - 2.
 - 1. Very little, dealing with individuals outside of the group was not at all necessary in doing the job.

2.1.4. Psychological Characteristics

Degree of trust between target unit members and management.

1. Degree of trust the target unit has in management

___ 5. Very much. Members of the target unit felt that management would never take advantage of them.

___ 4.

___ 3. Moderate. Members of the target unit trusted management would be supportive in most situations but felt they would take advantage of them occasionally.

___ 2.

___ 1. Very little. Target unit members felt that management would take advantage of them at every opportunity.

2. Degree of trust management had in the members of the target unit.

___ 5. Very much. Management felt that the target unit would never take advantage of them.

___ 4.

___ 3. Moderate. Management felt that the target unit would be supportive in most situations but felt that they would take advantage of them occasionally.

___ 2.

___ 1. Very little. Management felt that the target unit would take advantage of them at every opportunity.

3. Degree of agreement in organizational values between target unit personnel and management.

This item gets at something different from trust. It is the degree to which target unit personnel and management feel the same things are important and worth working towards in the organization.

___ 5. High agreement. Clear agreement and a willingness to work together to achieve those values.

___ 4.

___ 3. Moderate agreement. Some disagreement in what was important, but a willingness existed to work together.

___ 2.

___ 1. Low agreement. Significant disagreement in values and a lack of willingness to work together.

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