1992

Job characteristics of construction craftsmen and their relationships to affective work outcomes

Musibau Adeola Shofoluwe

University of Northern Iowa

Copyright ©1992 Musibau Adeola Shofoluwe

Follow this and additional works at: https://scholarworks.uni.edu/etd

Part of the Construction Engineering and Management Commons

Let us know how access to this document benefits you

Recommended Citation

Shofoluwe, Musibau Adeola, "Job characteristics of construction craftsmen and their relationships to affective work outcomes" (1992). Dissertations and Theses @ UNI. 824. https://scholarworks.uni.edu/etd/824

This Open Access Dissertation is brought to you for free and open access by the Student Work at UNI ScholarWorks. It has been accepted for inclusion in Dissertations and Theses @ UNI by an authorized administrator of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.
INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
Job characteristics of construction craftsmen and their relationships to affective work outcomes

Shofoluwe, Musibau Adeola, D.I.T.
University of Northern Iowa, 1992
JOB CHARACTERISTICS OF CONSTRUCTION CRAFTSMEN
AND THEIR RELATIONSHIPS TO AFFECTIVE WORK OUTCOMES

A Dissertation
Submitted
In Partial Fulfillment
of the Requirements for the Degree
Doctor of Industrial Technology

Approved:
Dr. Mohammed F. Fahmy, Advisor
Dr. H. Stephan Egger, Co-Advisor
Dr. Rex W. Pershing
Dr. Bruce G. Rogers
Dr. Dhirendra K. Vajpeyi

Musibau Adeola Shofoluwe
University of Northern Iowa
July 1992
JOB CHARACTERISTICS OF CONSTRUCTION CRAFTSMEN
AND THEIR RELATIONSHIPS TO AFFECTIVE WORK OUTCOMES

An Abstract of a Dissertation
Submitted
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Industrial Technology

Approved:

Faculty Advisor

Dean of the Graduate College

Musibau Adeola Shofoluwe
University of Northern Iowa
July 1992
ABSTRACT

This research was undertaken to investigate the extent to which employee-perceived job characteristics were related to internal work motivation and general satisfaction. Research shows that the structure of work has a significant influence on the motivation and general satisfaction of workers.

A job characteristic model developed by Hackman and Oldham (1980) was used as a basis for conducting this study. The study population consisted of construction craft workers who were registered members of the bricklayers, carpenters, and electrical unions located in a mid-western state. Job diagnostic survey questionnaires were mailed to 650 craftsmen. A total of 236 (36.3%) instruments were returned. Data analysis was performed using the Statistical Package for Social Sciences (SPSS). Analysis involved cross-tabulations, mean ratings, correlation matrix, and analysis of variance.

Results of the study revealed that positive correlations exist among employee-perceived job characteristics, critical psychological states, and work outcomes as predicted by the model. The motivating potential score (MPS), which represents the summary of all job core characteristics, was also significantly correlated.
with the employee-perceived job characteristics and critical psychological states. No statistically significant differences were observed in the perceptions of the craftsmen regarding the job core characteristics.

Carpenters had higher growth need strength (GNS) than the electricians. Overall, construction craftsmen have GNS that are similar to those of professional-technical workers. The craftsmen did not differ in their perceptions regarding the MPS of their job. However, considering the overall means reported for all the groups, it appears that construction work is very high in motivating potential.

While no statistically significant differences were observed in the general satisfaction level of the craftsmen, the results showed that carpenters had higher internal work motivation than the electricians. Therefore, considering their higher GNS, carpenters should respond more positively to a job that is high in MPS than would the electricians.

The samples in this study seemed to have positive attitudes toward their jobs. Several recommendations were made, among which contractors were urged to structure their jobs to include all the job core characteristics. Recommendations were also made with respect to areas that deserve further study.
ACKNOWLEDGEMENTS

The successful completion of this dissertation was made possible through the support of several people within and outside the academic settings. Within the university, I would like to extend my special gratitude to my committee chairman and program advisor, Dr. Mohammed F. Fahmy. He gave me the best cooperation and support any graduate student could possibly hope for, not only during the conduct of this study, but throughout my entire doctoral study. His professional advice and guidance contributed significantly to the success of this study.

A special recognition is extended to Dr. Bruce G. Rogers, a member of my doctoral committee, who helped me with the statistical analysis of my data. His relentless effort toward the successful completion of this research is greatly appreciated.

Also, special commendations go to other members of my committee. Dr. Stephan Egger, my co-advisor, always maintained an open-door policy for consultation and advice regarding this research and other academic matters. Dr. Rex W. Pershing was very helpful to me from the first day I started working on my candidacy papers, and was always there to listen to me. I wish him a very happy retirement. Last, but not the least, special thanks also go to Dr. Dhirendra
Vajpeyi for his support. His editorial comments and suggestions indeed contributed to the quality of this dissertation.

Outside the academic setting, I would like to extend my sincere appreciation to all the union managers and/or agents who willingly cooperated with me in urging their members to participate in this study. Also, special thanks are extended to those groups of craftsmen who participated in this study. They indeed made this study a reality.

Many people have inspired me to reach this far. The number one person is my wife, Idowu M. Shofoluwe. Her understanding, encouragement and endurance contributed, in part, to the success of this dissertation. I thank you for your loyalty, and I love you. A special recognition is also extended to my two sons, Olanrewaju and Ademola for their patience. These two boys also felt the heat of my doctoral work. They frequently asked, "Dad when are you going to be done"? Well, sons, it's over!

Finally, I would like to extend my sincere appreciation to my parents in Nigeria for their encouragement. This dissertation is dedicated to them.
TABLE OF CONTENTS

| ACKNOWLEDGEMENTS                                      | ii  |
| LIST OF TABLES                                         | vii |
| LIST OF FIGURES                                         | ix  |

<table>
<thead>
<tr>
<th>CHAPTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>I  INTRODUCTION</td>
</tr>
<tr>
<td>Significance of the Study</td>
</tr>
<tr>
<td>Purpose of the Study</td>
</tr>
<tr>
<td>Statement of the Problem</td>
</tr>
<tr>
<td>Research Questions</td>
</tr>
<tr>
<td>Assumptions</td>
</tr>
<tr>
<td>Delimitations</td>
</tr>
<tr>
<td>Definition of Terms</td>
</tr>
<tr>
<td>II  REVIEW OF RELATED LITERATURE</td>
</tr>
<tr>
<td>Job Characteristics Model</td>
</tr>
<tr>
<td>Related Research on Job and Individual Characteristics</td>
</tr>
<tr>
<td>Influence of Individual Differences</td>
</tr>
<tr>
<td>Effects of Cues</td>
</tr>
<tr>
<td>Construction-Related Motivational Studies</td>
</tr>
<tr>
<td>Conclusions</td>
</tr>
<tr>
<td>III  METHODS AND PROCEDURES</td>
</tr>
<tr>
<td>Research Design</td>
</tr>
<tr>
<td>Population and Sample Selection</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Questionnaire Response Rate Among the Groups</td>
<td>52</td>
</tr>
<tr>
<td>2. Distribution of Responses by Sex</td>
<td>52</td>
</tr>
<tr>
<td>3. Distribution of Responses by Age</td>
<td>53</td>
</tr>
<tr>
<td>4. Distribution of Grade School Completed</td>
<td>54</td>
</tr>
<tr>
<td>5. Responses by Other Types of Schooling or Training</td>
<td>55</td>
</tr>
<tr>
<td>6. Distribution of Responses by Number of Years with the Union</td>
<td>56</td>
</tr>
<tr>
<td>7. Responses by Number of Years in Current Trade</td>
<td>56</td>
</tr>
<tr>
<td>8. Responses by Union Classification</td>
<td>57</td>
</tr>
<tr>
<td>9. Job Titles of Respondents</td>
<td>57</td>
</tr>
<tr>
<td>11. Intercorrelations Among Employee-Perceived Job Characteristics, MPS, Work Outcomes, and Critical Psychological States for all Groups of Craftsmen</td>
<td>62</td>
</tr>
<tr>
<td>12. One-Way Analysis of Variance on Skill Variety</td>
<td>63</td>
</tr>
<tr>
<td>13. One-Way Analysis of Variance on Task Identity</td>
<td>64</td>
</tr>
<tr>
<td>14. One-Way Analysis of Variance on Task Significance</td>
<td>65</td>
</tr>
<tr>
<td>15. One-Way Analysis of Variance on Autonomy</td>
<td>65</td>
</tr>
<tr>
<td>16. One-Way Analysis of Variance on Job Feedback</td>
<td>66</td>
</tr>
<tr>
<td>17. One-Way Analysis of Variance on Growth Need Strength and Tukey Comparisons</td>
<td>66</td>
</tr>
<tr>
<td>18. One-Way Analysis of Variance on Motivating Potential Scores</td>
<td>68</td>
</tr>
</tbody>
</table>
19. One-Way Analysis of Variance on General Satisfaction ........................................ 68
20. One-Way Analysis of Variance on Internal Work Motivation ............................... 69
21. One-Way Analysis of Variance on Experienced Meaningfulness .......................... 70
22. One-Way Analysis of Variance on Experienced Responsibility ............................. 71
23. One-Way Analysis of Variance on Knowledge of Results ..................................... 71
LIST OF FIGURES

FIGURE                                      PAGE


Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
CHAPTER 1
INTRODUCTION

One of the most pressing issues in the construction industry today is its declining productivity. Studies show that the construction industry contributes, in large measure, to the declining rate of productivity in the United States (Arditi, 1985; Cremeans, 1981). A study conducted by the Business Roundtable (1983), a construction industry organization, found that "a drop in construction productivity in the U.S. is about 20% at the aggregate industry level" (p. 11). The construction industry is the nation's largest industry in terms of dollar volume, labor force employed, and its contribution to the Gross National Product (GNP) (Arditi, 1985; Choromkos & McKee, 1981). With its role in the national economy, the industry's productivity has not improved for the past decade. Its labor performance has been cited as poor (Laufer & Jenkins, 1982). Additionally, worker absenteeism and voluntary turnover are very high.

Considering all these factors, one could suggest significant problems in worker motivation and overall job satisfaction. Contractors, however, have not been very responsive to the psychological needs of construction craftsmen. Their major concern has been on how to increase
productivity. This lack of sensitivity to the needs of construction craft workers has been criticized by many construction experts. The number of empirical studies conducted in the motivational area has been scarce. Laufer and Jenkins (1982) wrote that:

The quality of human performance depends, in large part on human motivation. . . . So far, little has been done to raise construction motivation. This is reflected in the negligible number of studies focussing on this subject. (p. 531)

The overwhelming concern of construction educators and industry leaders led to a call for innovative ways to examine the nature of construction work and how construction workers can be motivated for improved productivity. In response to such a call, Maloney and McFillen (1985) conducted a study of construction worker motivation and job satisfaction. They concluded that construction workers' satisfaction with their work would depend on the nature of incentives attached to the job as well as their expectations of reward from such job. They also found that "low satisfaction is more likely to lead directly to tardiness, absenteeism, turnover and indirectly to decreased productivity" (p. 72).

Significance of the Study

For decades, productivity in construction had been falling at a rate many industry leaders found disturbing. With the public outcry over escalated cost of new
construction projects, leaders in construction education and in construction industry called for ways by which construction projects could be developed effectively without undue cost (Griffis & Butler, 1988).

Labor motivation and job satisfaction were among potential areas considered for improving the situation (Laufer & Jenkins, 1982; Maloney, 1983; Maloney & McFillen, 1985, 1986). In a study conducted by the Business Roundtable (1982), it was found that construction managers often fail to motivate workers for improved productivity. Bresnen et al. (1984) also stated in their report that management must devise ways to increase the "satisfaction, morale, and motivation" of the construction workers (p. 421). They argued that it would be wrong to apply findings of other behavioral research on motivation to construction without examining how the construction industry differs from other firms. They called for distinct motivational studies that incorporate all the job characteristics of the industry. Two factors are associated with worker motivation to work: work content and work context (Maloney & McFillen, 1986). Work content deals with such elements as types of activities involved, skills required, and challenges provided by the job. Work context includes such elements as supervision, pay, company practices, co-workers, and work environment. Work content and work context provide means
for investigating construction work for possible causes of employee behavior such as absenteeism, and turnover problems (Maloney & McFillen, 1986).

Maloney and McFillen (1986) found in their study of union workers that "construction workers have growth needs that are similar in strength to other blue collar workers" (p. 137). However, because the authors were the first to examine the motivational attributes of construction workers with respect to construction job characteristics using Hackman and Oldham’s (1980) model, they were unable to compare their results with others. They recommended further studies. Their findings also indicated that "construction jobs are low in motivating potential" (p. 137). These findings contradict an earlier non-empirical report by Borcherding and Oglesby (1974) that construction work provided enrichment needed to arouse motivation in workers. This kind of contradiction also necessitates a need for further inquiry.

Other studies have also confirmed the potential influence of job structuring on motivation and job satisfaction of workers. For example, in a study involving the relationships of job characteristics to job satisfaction, Loher and Noe (1985) found that the way jobs are structured is more likely to lead to job satisfaction of workers. Laufer and Jenkins (1982) also stated in their
report that the significance of different construction job dimensions (such as job feedback and autonomy) and their relationships to job outcomes (such as internal work motivation) had not been studied in depth. Specifically, they concluded with the following statement: "To say that research and practice in this area are at a satisfactory level would be a mistake. There is still a great deal to learn about motivation, especially in construction" (p. 544).

Laufer and Jenkins (1982) then developed a model based on an expectancy theory of motivation with the hope that the model could be applied to help find solutions to construction motivational problems. Unfortunately, this model has not been applied in construction; thus, its applicability in solving construction worker motivation was considered questionable (Maloney & McFillen, 1984). Moreover, there has been a lack of empirical evidence to support many of the findings of motivation research in construction. For example, Borcherding's research findings on factors affecting construction worker motivation and job satisfaction have been criticized for lacking conceptual and methodological procedures (Bresnen et al., 1984; Maloney & McFillen, 1984). The construction industry cannot, and should not, rely on research findings that are not supported
by empirical data in making significant decisions regarding job design and job restructuring.

**Purpose of the Study**

The purpose of this study was to investigate the characteristics of construction work, as perceived by construction craftsmen, and the relationships of these perceptions to affective work outcomes (general satisfaction, and internal work motivation). It is anticipated that the findings of this study will contribute to the body of knowledge in construction. Also, it is expected that the findings will shed light on the ways construction work is structured and how this work affects worker motivation and job satisfaction. The results can then aid construction industry managers in their efforts toward job restructuring with the intent of making the job more challenging, motivating, and satisfying to the construction workers.

**Statement of the Problem**

Studies indicate that the nature of work itself has a significant impact on the motivation and job satisfaction of workers. Thus, the problem of this study was to investigate the degree to which employee-perceived job characteristics were related to internal work motivation and general satisfaction. The job characteristics model developed by Hackman and Oldham (1980) was used as the basis for
conducting this study. This model and its principal components are fully discussed in chapter two.

Research Questions

The following research questions were used to guide this study:

1. What relationships exist among employee-perceived job characteristics, critical psychological states, and affective work outcomes as specified in Hackman and Oldham's model?

2. What differences exist among craftsmen of different construction trades on employee-perceived job characteristics?

3. What differences exist among craftsmen of different construction trades on growth need strength (GNS)?

4. What differences exist among craftsmen of different construction trades on motivating potential scores (MPS) of employee-perceived job characteristics?

5. What differences exist among craftsmen of different construction trades on affective work outcomes and critical psychological states?

Assumptions

The following underlying assumptions were made with respect to this study:
1. Union workers would be able to provide accurate perceptions of construction job characteristics because of their experience with the job.

2. Construction craftsmen involved in this study would have adequate educational background to read and interpret the information contained in the research instrument.

3. There would be no collaboration between two or more respondents in answering the questionnaires as this practice may affect the true perceptions of the respondent to whom the instrument is sent.

4. The respondent to whom the instrument was mailed would actually respond to the questionnaire instead of having someone else answer it.

5. The construction union organization from which the sample was drawn maintained accurate and current listing of union members of all trades it claims to represent.

**Delimitations**

1. Only union workers were included in this study.

2. The population for this study consisted of bricklayers, carpenters, and electricians who were currently registered with their respective local or national construction trade organizations.

3. The following personnel were not included in the study: construction laborers, superintendents, and project managers.
Definition of Terms

The following terms are defined for clarification purposes. For each defined variable that was measured by the Revised Job Diagnostic Survey (RJDS), the specific items that were used to measure such variables are listed in parenthesis. The RJDS can be found in Appendix A.

Affective Work Outcomes: These are the benefits or reactions an employee obtains from performing a job. The following affective work outcomes were measured: general satisfaction, and internal work motivation. Oldham, Hackman, and Stepina (1978) defined them as follows:

General Satisfaction: "An overall measure of the degree to which the employee is satisfied and happy with the job" (p. 7) (sect. 2: items 3, 13, 9).

Internal Work Motivation: "The degree to which the employee is self-motivated to perform effectively on the job, i.e., the employee experiences positive internal feelings when working effectively on the job, and negative internal feelings when doing poorly" (p. 7) (sect. 2: items 2, 6, 10, 14).

Critical Psychological States: The components of the job characteristics model which describe the conditions under which workers will develop internal work motivation from their work. They include experienced meaningfulness,
experienced responsibility, and knowledge of results. Oldham, Hackman, and Stepina (1978) defined them as follows:

**Experienced Meaningfulness**: "The degree to which the employee experiences the job as one which is generally meaningful, valuable, and worthwhile" (p. 6) (sect. 2: items 7, 4).

**Experienced Responsibility**: "The degree to which the employee feels personally accountable and responsible for the results of the work he or she does" (p. 6) (sect. 2: items 8, 12, 15, 1).

**Knowledge of Results**: "The degree to which the employee knows and understands, on a continuous basis, how effectively he or she is performing the job" (p. 6) (sect. 2: items 5, 11).

**Craftsmen**: In construction industry, craftsmen are the skilled workers employed to work at the construction site. In this study, the following craftsmen were included: bricklayers, carpenters, and electricians.

**Employee-Perceived Job Characteristics**: Hackman and Oldham (1980) defined employee-perceived job characteristics as consisting of five components: Skill Variety, Task Identity, Task Significance, Autonomy, and Job Feedback. Each of these is defined as follows:

**Skill Variety**: "The degree to which a job requires a variety of different activities in carrying out the"
work, involving the use of a number of different skills and talents of the person" (p. 78) (sect. 1: items 4, 8, 12).

**Task Identity**: "The degree to which a job requires completion of a 'whole' and identifiable piece of work, that is, doing a job from beginning to end with a visible outcome" (p. 78) (sect. 1: items 3, 18, 10).

**Task Significance**: "The degree to which the job has a substantial impact on the lives of other people, whether those people are in the immediate organization or in the world at large" (p. 79) (sect. 1: items 5, 15, 21).

**Autonomy**: "The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures for carrying it out" (p. 79) (sect. 1: items 2, 20, 16).

**Job Feedback**: "The degree to which carrying out the work activities required by the job provides the individual with direct and clear information about the effectiveness of his or her performance" (p. 80) (sect. 1: items 7, 11, 19).

**Enriched Jobs**: These are jobs that are structured in a very complex way, but at the same time, are very challenging to workers. An enriched job is expected to provide motivating and challenging experience to workers.

**Growth Need Strength (GNS)**: An indication of an individual's need for personal accomplishment, learning,
and the further development of one's skills and abilities" (Maloney & McFillen, 1986, p. 141). The higher the need for personal growth, the more a worker is expected to respond favorably to jobs that are high in motivating potential. The "would-like" format (Hackman & Oldham, 1980, p. 305) was used in this study (sect. 3: items 2, 3, 6, 8, 10, 11).

**Job Characteristics Model:** A Model developed by Hackman and Oldham (1980) to study and measure how workers react to job characteristics.

**Motivating Potential Score:** This refers to a "measure of the degree to which a job might be expected to have the capacity to create internal work motivation" (Maloney & McFillen, 1986, p. 140). A high MPS indicates that a job has the potential to create a motivating work situation.

**MPS:** Acronym for "Motivating Potential Score." Hackman and Oldham (1980, p. 81) computed MPS as follows:

\[
\text{MPS} = \left[ \frac{\text{Skill} + \text{Task} + \text{Task}}{3} \right] \times \text{Autonomy} \times \text{Job Feedback} \\
\]

**Revised Job Diagnostic Survey (RJDS):** A slightly modified version of Hackman and Oldham's (1980) Job Diagnostic Survey.

**RJDS:** Acronym for "Revised Job Diagnostic Survey."
"Would-like" growth need strength: A would-like format of the "growth need strength" indicates a measure of the degree to which an employee would personally like certain job characteristics to be present in his or her job.
CHAPTER II
REVIEW OF RELATED LITERATURE

The review of literature consists of three major components: (a) brief theoretical background of Hackman and Oldham's (1980) job core characteristics model, (b) related research on job and individual characteristics, and (c) construction-related motivational and productivity studies.

**Job Characteristics Model**

Job enrichment has been a subject of discussion in many organizational textbooks for decades. It has also been recognized as a good method of making employees develop feelings of satisfaction in their jobs. Specifically, research has found that employees are more likely to improve their performance if their jobs are challenging and motivating to them. Loher and Noe (1985) reported that "job enrichment seeks to improve both employee performance and satisfaction by building greater scope for personal achievement and recognition and greater opportunity for individual achievement and growth into employees' jobs" (p. 280). Loher and Noe also recognized job enrichment as organizational intervention designed to improve the quality of the work life of workers by making their jobs more interesting to them.
Once job enrichment has been accepted as one way of motivating employees at the work place, several researchers (Dunham, 1977; Kemp & Cook, 1983; O’Reilly, Parlette, & Bloom, 1980) have used its theory to investigate the relationships between job and individual characteristics and certain organizational outcomes, such as motivation and job satisfaction. The theoretical basis for many current enrichment efforts is the Hackman and Oldham’s job core characteristics model (Figure 1). The model proposes that three conditions (critical psychological states) are necessary in a job before high internal motivation can occur. First, the worker must experience the work as personally meaningful (experienced meaningfulness); secondly, the worker must feel responsible for the outcome of his or her work (experienced responsibility); and finally, the worker must have knowledge of the results of his or her work (knowledge of results).

The model also predicts that the five job core characteristics (skill variety, task identity, task significance, autonomy, and job feedback) of a job influence the three critical psychological states. Specifically, "experienced meaningfulness" is influenced by three job core characteristics. They include (a) skill variety, (b) task identity, and (c) task significance. For a worker to experience his or her job as meaningful, a job must involve
a variety of different activities (skill variety), requires completion of entire and identifiable pieces of work (task identity), and have a considerable impact on other people (task significance). In order for a worker to have a feeling of personal responsibility, his or her job must provide great latitude for individual discretion in carrying out the assigned responsibilities (autonomy). According to Hackman and Oldham (1980):

When the job provides substantial autonomy to the persons performing it, work outcomes will be viewed by those individuals as depending substantially on their own efforts, initiatives, and decisions. . . . As autonomy increases, individuals tend to feel more personal responsibility for successes and failures that occur on the job and are more willing to accept personal accountability for the outcomes of their work. (p. 79)

Finally, it is essential that the job itself provide some kind of feedback in order for the worker to have knowledge of his or her work outcomes.

According to the model, three factors moderate the relationships between the job characteristics and internal work motivation. They include (a) knowledge and skill, (b) growth need strength, and (c) "context" satisfaction. If a job is high in "motivating potential" (i.e., high in all job core characteristics), it is more likely that those workers who have sufficient knowledge and skill to perform well will experience significantly positive feelings as an outcome of their work. The opposite would be true for those workers.
who are not competent enough to perform well on the job. The second moderator (growth need strength) relates to the psychological needs of people. According to Hackman and Oldham (1980), the psychological needs of people are very essential in finding out how an individual worker will respond to a job that is high in motivating potential. They explained:

Some people have strong needs for personal accomplishment, for learning, and for developing themselves beyond where they are now. Those people are said to have strong "growth needs" and are predicted to develop high internal motivation when working on a complex, challenging job. Others have less strong needs for growth and will be less eager to exploit the opportunities for personal accomplishment provided by a job high in motivating potential. (p. 85)

They concluded that "individuals with strong needs for growth should respond eagerly and positively to the opportunities provided by enriched work" (p. 85).

The third moderator deals with the "contextual" satisfaction with the work itself. Specifically, the model predicts that an individual who is relatively satisfied with certain aspects of work context (such as pay, job security, co-workers, and supervisors) will likely "respond more positively to enriched and challenging jobs than individuals who are not satisfied with those aspects of work context" (p. 86). It was concluded that if such individual also possesses strong growth need strength, it is likely that a very high level of internal motivation will occur.
Related Research on Job and Individual Characteristics

Several studies have been conducted on the relation of job and individual characteristics to certain job outcomes (such as motivation and job satisfaction). A review of literature shows that many of these studies used the Hackman and Oldham model. However, only one study has been done in the construction area using the Hackman and Oldham model. Specifically, Maloney and McFillen (1986) conducted a study...
among unionized construction workers in a Midwest city to assess their perceptions of their job and work environment. A total of 650 workers from 10 construction unions were included in the study. The subjects were asked to complete a series of questions related to their work. The authors used a job characteristics index (JCI) to measure their variables. While the results of their study have been helpful in understanding how the construction union workers reacted to different job conditions, their findings could not be compared with others because that was the first time JCI was used in construction.

In a study designed to examine the conditions under which jobs would instigate the development of internal work motivation, Hackman and Lawler (1971) found that any jobs that are high on job core dimensions would likely lead to worker motivation, provided such worker has a desire for higher order need satisfaction. They also found that such a job would likely lead to employee job satisfaction and lower absenteeism.

In a study conducted to investigate the "moderating effects of employee growth need strength (GNS) and the level of job satisfaction with the work context on employee responses to enriched work," Oldham, Hackman, and Pearce (1976, p. 395) used the job diagnostic survey (JDS) to collect data from 201 employees who worked at 25 jobs in a
bank. Their purpose was to examine the conditions which could influence employees to respond in a positive manner to an enriched job. The results revealed that "employees who have strong growth needs and also are satisfied with the work context (i.e. with their pay, job security, co-workers, and supervisors) respond more positively to an enriched job than do employees who have weak needs for growth and/or dissatisfied with the work context" (p. 395). An experimental study also showed that job enrichment has a certain impact on job satisfaction, but a non-significant effect on productivity (Umstot, Bell, & Mitchell, 1976).

Sims, Szilagyi, and Keller (1976) conducted a study on the construct validity of perceptual methods of measuring job characteristics dimensions. They found "powerful evidence of the reliability and the discriminant validity of perceptual methods of measuring job characteristics over a wide spectrum of jobs in many organizations" (p. 210). They concluded that the results of their study "provide much promise for the potential use of job characteristics measurements, both for diagnostic uses, and for research purpose" (p. 210). Fried and Ferris (1987) examined the validity of Hackman and Oldham's job characteristics model by reviewing some of the past studies on the model. Their results support the multidimensionality of job characteristics; however, no complete agreement could be
reached on the exact number of dimensions. Roberts and Glick (1981) also conducted a review study of the Hackman and Oldham task design model and issued a comprehensive report contrary to the findings of the previous authors. Nevertheless, various studies have confirmed the applicability of the job characteristics model.

Orpen (1979) conducted a field experiment to assess the effect of job enrichment on employee responses. His samples consisted of some federal agency clerical workers who were randomly assigned to either "enriched" or "unenriched" job conditions. In the enriched job condition, changes were deliberately made to increase each of the five job core dimensions. For the unenriched conditions, no changes were made in their original duties and tasks. The pretest-posttest results showed that employees in the enriched group perceived their jobs to be more enriched than before. The enrichment also caused significant increases in employee job satisfaction, job involvement, and internal motivation. Orpen (1979) concluded that "enrichment can cause substantial improvements in employee attitudes, but that those benefits may not lead to greater productivity" (p. 189).

In an effort to determine the degree to which perceptions of task characteristics reflect variations in job satisfaction, Caldwell and O'Reilly (1982) conducted a
laboratory experiment as well as a field study. For the laboratory study, the representative samples consisted of 77 Master of Business Administration (MBA) students who were randomly assigned to role play a satisfied or dissatisfied job incumbent. It was found that subjects in the "satisfied" group described the same stimulus job as more enriched than did those in the "dissatisfied-role" group. For the field study, Caldwell and O'Reilly (1982) surveyed 88 retail representatives holding the same job. The results indicated that certain "aspects of job satisfaction were found to be strongly related to perceived task characteristics" (p. 361). The authors also argued that "satisfied job incumbents may describe their jobs more favorably in terms of job characteristics, rather than in terms of variations in job dimension" (p. 361).

Griffin (1982) conducted a study to investigate the relationships among employee perceptions of task attributes and long-term productivity and overall job satisfaction. His study involved 100 randomly selected manufacturing employees of a plant located in the Southwest. Using the job characteristics inventory scale, Griffin (1982) found strong positive correlations between certain task attributes and productivity and job satisfaction. Overall satisfaction was, however, unrelated to task attributes. Griffin (1982) also measured the employee growth need strength (GNS) using
Hackman and Oldham's higher-order need strength measure. Growth need strength was found to moderate the task attribute-job satisfaction relationship. In terms of managerial practice, Griffin concluded that "improvements in the design of work may enhance such organizationally relevant outcome variables as job satisfaction and employee productivity" (p. 936).

Loher and Noe (1985) applied a meta-analytical technique to investigate the precise relationship between job characteristics and job satisfaction. They extended their research as far as examining the role of GNS as a possible moderator of this relation. Their results showed "moderate relation between job characteristics and job satisfaction" (p. 280). This relation was also found to be stronger for employees that were high in GNS. However, the relation was found to be weak for employees with low GNS. The authors recommended that it might be necessary to combine task dimensions if the relationship between job complexity and job satisfaction was to be established.

Katz (1978) used survey data from 3,085 public sector employees from four different governmental organizations to investigate the degree to which job longevity influenced employee reactions to task characteristics. His findings showed that "the strength of the task dimension-job satisfaction relationships are significantly affected by job
longevity regardless of age and growth-need strength" (p. 703). Specifically, Katz (1978) found satisfaction scores of those employees who had been employed for a short period of time (4-12 months and 1-3 years) to be related to the various task dimensions. Kemp and Cook (1983) also examined the issue of job longevity as a possible moderator of a task design-job satisfaction relationship. They studied the influence of job longevity (length of time a person is employed in his or her current job) along with the growth need strength as moderator of the task design-job satisfaction relationship. They collected data from two studies of 390 and 406 blue-collar employees. Using moderated regression analysis and subgroup correlation analytic technique, they found that job longevity was not a significant moderator of the job complexity-job satisfaction relationship. However, growth need strength was found to be a moderator of the job complexity-job satisfaction relationship only for employees with short job tenure.

In a "longitudinal investigation of task characteristics relationships," Griffin (1981, p. 99) investigated the degree to which employees' perceptions of task characteristics and reactions to those perceptions were stable over time. It was found that employees' perceptions of their tasks were fairly stable over a 3-month time interval. Also, individual reactions to perceived task
characteristics were found to be less stable and "somewhat more complex" (p. 99). These findings, according to the author, "indicate the need for an expanded view of individual-task interactions" (p. 111).

An organizational factor has also been identified as a possible moderator of worker reactions to job characteristics. Dunham (1977) conducted a study to examine worker responses to a task from various widely different functional specialty groups within an organization. It was found that "non-task environmental factors block the worker from obtaining the outcomes" (p. 44). Specifically, Dunham (1977) contended that workers often fail to show positive responses to an expanded task simply because of a blocking of the valued outcomes. It was also argued that "those blockages were present in varying degrees and could be indexed by functional specialty" (p. 63).

In another study involving task characteristics-job satisfaction relationship, King (1974) reported that expectations concerning a job, and not objective job characteristics, were the primary determinants of job satisfaction as well as job performance. Conley (1983) also found expectations of task significance and feedback to be related to job attitudes.
Influence of Individual Differences

With respect to individual differences and reactions to job characteristics, Wanous (1974) argued that individual differences are more likely to influence ways by which employees react to job characteristics. In order to empirically support this argument, Wanous (1974) conducted a study among 80 newly hired female telephone operators using three different methods of measuring individual differences as moderators of employee reactions to job characteristics. Based on the job satisfaction results, Wanous found "higher order need strength" to be the most useful way to measure these types of individual differences. In a similar study conducted to investigate the effect of individual differences on perceptions of job characteristics and job satisfaction, Schmitt, Coyle, White, and Rauschenberger (1978) found the "growth need strength" to be related to job dimensions. Relatedness needs were also found to have played a "significant role in determining perceptions of jobs and job satisfaction" (p. 889). Females were also found to be higher on relatedness needs, which "has a very strong effect on their perception of the extent to which their job involves dealing with other people" (p. 898). In other words, the authors argued that those individuals with high relatedness needs were more likely to view their jobs
as more significant and skill demanding when they involved people.

O'Reilly, Parlette, and Bloom (1980), in their study of the sources of systematic variations in perceptions of task characteristics among employees holding identical jobs, found that "perceptual assessment of task characteristics vary with the individual's frame of reference and job attitudes" (p. 118). They identified these individual's frame of reference as tenure, education, background, income, race, and socialized expectations. Given that the frame of reference and other associated variables that could account for objective or perceptual redefinitions of the job have been controlled, the authors argued that "one's general satisfaction is more likely to result in differential assessments of job characteristics than the opposite" (p. 128).

Effects of Cues

White and Mitchell (1979) investigated the effects of social cues on employee perceptions of job enrichment. They found that cues given off by co-workers as well as the physical properties of the task had an effect on employee perceptions of job enrichment and job ambiguity. They argued that "social cues of co-workers may be an important determinant of whether a job is perceived as enriched or unenriched" (p. 8). The authors, however, admitted that
actual job factors also had a "somewhat more substantial effect on enrichment perceptions" (p. 8).

O'Reilly and Caldwell (1979) also argued in support of the influence of certain cues as determinants of worker's perceptions of task characteristics and job satisfaction. They conducted a laboratory study utilizing enriched and unenriched tasks. They found that perceptions of task characteristics, such as variety, autonomy, and feedback, were basically a function of informational cues, and not objective aspects of the job. Walsh, Taber, and Beehr (1980) presented other view on perceived job characteristics. They argued that the effects of job characteristics on individual outcomes may be contingent upon the organizational setting.

Spector and Jex (1991) conducted the most recent research on perceived job characteristics. These authors argued that most of the past research involving the job characteristics theory have been limited to incumbent reports of job characteristics. Then, they designed a study using job characteristics data from three independent sources (incumbents, ratings from job descriptions, and the dictionary of occupational titles). Their results showed that incumbent reports of job characteristics correlated significantly with several employee outcomes such as job satisfaction, work frustration, and turnover intentions.
Construction-Related Motivational Studies

Declining productivity has been a major problem confronting the construction industry for decades. Several construction leaders have called for ways construction productivity could be improved without undue cost overrun. Labor motivation and job satisfaction have been identified as areas that deserve much attention.

While several studies have been conducted to establish a relationship between job and individual characteristics, and certain affective work outcomes, very little has been done in the areas of construction. Borcherding and Oglesby (1974) conducted an exploratory study of productivity and job satisfaction in the construction industry. They found the construction job to be associated with worker job satisfaction. Their reports showed that "satisfaction and productivity (in construction) lie in making the work flow smoothly rather than in job enrichment" (p. 413). They argued that construction workers were satisfied with their work only when such jobs were structured in a way that no delay was foreseen in the schedule. Their findings also revealed that construction workers were satisfied with their job when they saw the results of their work. These particular findings parallel one of the characteristics of the critical psychological states discussed under the Hackman and Oldham's (1980) job characteristics model, which
indicates that workers are more likely to develop internal motivation if their work is perceived to be meaningful to them. Additionally, the authors also found that job satisfaction for craftsmen include: (a) having complete tasks, (b) good workmanship, (c) having a productive day, (d) physical exhaustion signifying a hard day of work, (e) working on a tangible physical structure, and (f) a social work conditions.

In a separate study of productivity in industrial construction, Borcherding (1976) found a lack of motivation by construction workers on large projects due to the fact that they had very little or no satisfaction from their work. Their findings also indicated that these individual workers would like to accept responsibility for their job's success, and that they would like control over their work. While these reports by Borcherding (1976) and Borcherding and Oglesby (1974) have helped construction researchers in understanding the factors affecting construction worker motivation and other work outcomes, these same reports have been criticized as suffering from a "series of conceptual and methodological weaknesses" (Maloney & McFillen, 1984, p. 15). Maloney and McFillen (1984) also pointed out that these authors have failed to define major variables (such as motivation and job satisfaction) or indicate how they were measured. Because of these weaknesses, replication of the
studies was difficult. Moreover, the sampling procedure employed in these studies made it erroneous to draw generalizations from the research results. Also, no information was given regarding the manner in which the samples were selected such as whether they were randomly selected and/or representative of the population for which they were drawn. These studies were also criticized because of the method used by the researchers in collecting their data. Specifically, Borcherding (1976) and Borcherding and Oglesby (1974) collected their data through group interviewing. This technique of data gathering was also criticized by Bresnen, et al. (1984) as "generating a significant non-random bias in the sample" (p. 423).

Maloney and McFillen (1985, 1986) conducted motivational studies on the importance unionized construction workers attached to various job-related factors, and their satisfaction with each factor. They concluded that the degree to which construction workers would be satisfied with their work would depend, in large measure, on the nature of incentive their job and firm offer as well as their expectation of the reward they might receive. They also argued that workers are more likely to be satisfied with their work if they receive the results they desire or expect from the work. These findings paralleled that of Borcherding (1976) and also conformed to
the expectancy theory of motivation. The theory relates behavior to an individual's expectations that "certain behavior will have predictable outcomes which satisfy organizational or individual goals" (cited in Oglesby, Parker, & Howell, 1989). Maloney and McFillen (1986) recommended that contractors should devote greater effort toward identifying the high growth-need strength of workers, and, workers should be provided with more enriched work, although the idea of providing workers with enriched work just to motivate them was refuted by Borcherding and Oglesby.

Laufer and Jenkins (1982) indicated in their report that the significance of different construction job dimensions (e.g. feedback and autonomy) and their relationship to job outcomes (e.g. worker motivation and job satisfaction) had not been studied in depth. This and other findings attest to the needs for further study in this area. Knowing how construction workers attribute their internal work motivation and job satisfaction to job characteristics could aid project managers in planning and scheduling construction projects for optimum improved productivity and work outcomes.

Conclusions

The review of literature germane to the research problem was discussed in this chapter. It is evident that
the construction industry is facing a productivity dilemma, and that the relations of job characteristics to motivation and job satisfaction of construction workers have not been adequately researched. Many of the past findings on construction worker motivation have been based on non-empirical studies. Empirical studies, however, have shown that the way jobs are structured have a profound influence on the work outcomes.

A common notion among construction experts is that construction work is enriched; that is, a construction job is high on motivating potential. If this is so, one may hypothesize that the construction trade will score high in the job core dimensions. A review of literature on job design in construction showed that little work has been accomplished in this area. To examine the potential significance of job design in construction toward improving worker motivation and job satisfaction, a study was needed to collect data relating the construction job to the individual characteristics.

Thus, the problem of this research was to investigate the nature of construction jobs as perceived by construction craftsmen and the relationships of these perceptions to affective work outcomes. It is more likely that certain aspects of a construction job may in fact influence worker internal motivation and general satisfaction.
CHAPTER III
METHODS AND PROCEDURES

The problem of this study was to examine the characteristics of construction work as perceived by construction craftsmen and the relationships of these perceptions to affective work outcomes. An extensive review of literature indicated a need for this study. Data collection instruments as well as procedures used to accomplish the objectives of this study are discussed in this section.

Research Design

An exploratory research method was used in this study. According to Behling (1984), "the exploratory design is used to accumulate data in order to formulate more precise hypothesis or research questions" (p. 47). Determining the relationships between one or more variables is believed to be an example of exploratory research.

Population and Sample Selection

The population for this study consisted of construction craftsmen who were registered members of three established construction union organizations located in a midwestern state. These union organizations were bricklayers, carpenters, and electricians. The names and addresses of these union organizations were listed in construction
related publications. Prior to administering the questionnaires, the researcher contacted the business agents of these union organizations to seek their cooperation to allow their members to participate in the study. They all agreed to cooperate with the researcher. Upon their request, a copy of the questionnaire was mailed to each agent for examination.

Historically, the construction industry has not been overwhelmingly responsive to survey questionnaires. A survey response rate of about 25 to 30% percent is very common. For example, when Maloney and McFillen (1985) surveyed 2,800 unionized construction workers in a major midwestern city, only 703 responses (25%) were received. Also in a survey of 400 Engineering News Record contractors, a response rate of 25% was obtained (Choromokos & McKee, 1981). Udo-Inyang (1989) conducted a doctoral dissertation research dealing with "interpersonal communications on construction sites," and of the 335 questionnaires he sent out to various construction craftsmen, only 105 (31%) were received. Based on the researcher’s discussion with each of the union business agents, a response rate of approximately 30% was expected for this study.

The three union organizations had approximately 800 members. Of these 800 members, 400 members belonged to the carpenters' union, 230 to the electrical union, and 170 to
the bricklayers' union. The total population for both electrical and bricklayers' unions were surveyed, while a systematic random sampling technique was used to select 300 samples from the carpenters' union. Borg and Gall (1983) wrote on the subject of systematic sampling as follows:

As with simple random sampling, the technique of systematic sampling is used to obtain a sample from the defined population. This technique can be used if all members in the defined population have already been placed on a list in random order. (p. 248)

Research Instrument

Hackman and Oldham's (1980) job characteristics model served as the conceptual basis for this study. The model has been previously discussed (see Figure 1). The major focus of this study was on the relationships among employee-perceived job characteristics, the resulting affective work outcomes, and the constructs in the model.

Following the development of the job characteristics model, Hackman and Oldham (1975) developed the job diagnostic survey (JDS), an instrument specifically designed to measure the principal components of the job characteristics model. Several improvements have been made on the instrument since 1975. The JDS "measures several job characteristics, employees' experienced psychological states, employees' satisfaction with their jobs and work
context, and the growth need strength of respondents" (Hackman & Oldham, 1980, p. 275). Hackman and Oldham (1975) also wrote the following in support of the JDS:

Through out the development of the JDS, analyses were conducted to assess the validity of the theory on which the instrument is based—and the findings were used to revise and refine the theory simultaneously with the improvement of the instrument itself. (p. 161)

Hackman and Oldham (1975) argued that these instruments were to be completed by the incumbents of the job in question and not by someone external to the job. In addition, the authors indicated that the JDS was "not copyrighted and therefore may be used without the authors' permission" (p. 275). The authors also did not object to the use of the instrument in a revised or modified form (Gobesky, 1991).

The JDS consists of eight sections; however, not all these sections are applicable to all research situations. For example, in this research and with the type of research questions that were to be answered, only a few sections were applicable. The researcher also modified some of the questionnaire items in the instrument in order that they be suitable for describing construction work. These modifications, however, did not alter the true meaning of the original wordings and still measured the intended constructs. Therefore, no new validation of the instrument was deemed necessary. A likert-type scale was used in
answering all the questions. The respondents were asked to respond to a series of statements related to their job.

The following key variables were measured on a seven-point scale:

1. Employee-perceived job characteristics.
2. Critical psychological states.
3. Affective work outcomes.
4. Individual growth need strength.

The questionnaire items measuring the employee-perceived job characteristics were distributed throughout the first section of the questionnaire, while those items that measured the three critical psychological states were distributed in the second section. Items that measured the two affective work outcomes were also distributed throughout section two, and those items that measured the employee GNS were located in section three of the instrument. Finally, section four included questions that pertain to the demographic information of the respondents.

Instrument Validity

Following the development of the job characteristics model, and its subsequent job diagnostic survey (JDS), a significant number of studies have been conducted to assess the instrument's validity. Specifically, Hackman and Oldham (1976) and Oldham, Hackman, and Stepina (1978) have presented evidence which indicated that the constructs
measured by the JDS, in general, related to one another as predicted by the job characteristics model on which the instrument is based.

In a study conducted to assess the theory, Hackman and Oldham (1976) found that the job core dimensions and outcome measures (as measured by the JDS) related well to each other as predicted. Katz (1978) also found support for the mediating effect of GNS. In another study designed to examine the validity of the theoretical model, Fried and Ferris (1987) concluded that their results supported the multidimensionality of job characteristics, although there was less agreement on the exact number of dimensions. Sims et al. (1976) also found "powerful evidence of the reliability and the discriminant validity of perceptual methods of measuring job characteristics over a wide spectrum of jobs in many organizations" (p. 210).

**Instrument Reliability**

Hackman and Oldham (1975) used Spearman Brown's procedures to calculate the internal consistency reliability coefficients for the JDS based on data from a large number of employees working on over 60 different jobs. The results showed that the internal consistency of reliability ranged from 0.88 (GNS) to a low of 0.71 (skill variety and feedback) for the scales used in their study. Oldham et al. (1978) presented internal consistency reliabilities for the
JDS based on data obtained from approximately 6,930 employees working on 876 different jobs in 56 organizations. The internal consistency reliabilities for the JDS scales used ranged from a high of 0.88 (total GNS) to a low of 0.58 (task significance). The authors claimed that these figures were similar to those reported in previous studies.

Katz (1978) reported internal consistency reliabilities of 0.82, 0.72, 0.72, 0.74, and 0.71 for skill variety, task identity, task significance, autonomy, and job feedback, respectively. These were also confirmed to be similar to those reported by Hackman and Oldham (1975). Finally, Conley (1983) used Cronbach's coefficient alpha as an indicator of internal consistency. With the exception of the experienced responsibility for work outcome (alpha = 0.46), internal consistency reliabilities for Conley's data ranged from a high of 0.88 (task identity) to a low of 0.64 (experienced meaningfulness). The author concluded that "the results generally suggest that internal consistency of the scales is satisfactory" (p. 63).

Pilot Testing

The instrument was submitted to the doctoral committee for their necessary critique. After the committees' suggestions were incorporated, the instrument was pilot-tested with six local construction craft workers to
ascertain that it was free of ambiguity in content, wording, and format. No faults were detected.

**Data Collection**

The researcher formally planned to mail 700 survey questionnaires to the three groups of construction craftsmen. However, it was later discovered that 40 of the 300 selected carpenters and 10 of the 170 selected bricklayers were retired. Since the model used for this study calls for active workers, these 50 individuals were removed from the study; thus, the total sample size was reduced to 650. A cover letter accompanied each questionnaire explaining the purpose of the study and insuring the individual's right to privacy and confidentiality. Each of the unions' business agents also wrote additional cover letters to their members in support of the research. To facilitate early return, a self-addressed, stamped envelope was enclosed with each questionnaire. A follow-up letter was sent to each survey participant after 2 weeks. A total of 236 (36.3%) questionnaires were returned by the close of the survey. However, only 230 (35.4%) questionnaires were usable.

**Data Analysis Procedure**

Construction craftsmen were asked to describe the amount of skill variety, task identity, task significance, autonomy, and job feedback in their jobs on the RJDS
instrument. The items measuring each of these dimensions were averaged to arrive at a set of five summary scores. A motivating potential score was computed for each worker by combining measures of five job core characteristics using the following formula developed by Hackman and Oldham (1980, p. 81):

\[
MPS = \frac{\text{Skill variety} + \text{Task identity} + \text{Task significance}}{\text{Autonomy} \times \text{Job feedback}}
\]

This computation yielded a single index that was used to assess how enriching or motivating the construction jobs were.

Based on this formula (Hackman & Oldham, 1976, p. 258), in order for any job to be high on the Motivating Potential Score (MPS), it must be high on at least one of the three job core characteristics of skill variety, task identity, and task significance. This is because these job core characteristics have a combined effect that could prompt experienced meaningfulness. In addition, a low score on one of the three job characteristics would not affect the overall motivating potential of a job because it can easily be compensated for by high scores on the two remaining job characteristics (Hackman & Oldham, 1980). Conversely, a low score on either autonomy or job feedback would reduce the
overall motivating potential of a job because, according to the job characteristics model, "both experienced responsibility and knowledge of results must be present if internal motivation is to be high" (Hackman & Oldham, 1980, p. 81). Autonomy and job feedback are the two job characteristics that can lead to those two psychological states. Following the MPS formula, the possible range of MPS score for a job is 1 to 343 (7 cubed).

Rationale for MPS Formula

Following the development of MPS formula, Hackman and Oldham (1976) discussed the rationale behind the two "multiplicative" terms used in the formula in order to dispel any suspicion about the validity of the two multiplicative terms. They developed 5 different models for combining the job dimensions and correlated them with "three questionnaire-based dependent measure" (p. 273). They described their findings as follows:

The results do not meaningfully differentiate among the models. While the full multiplicative model proves to be slightly the worst, and the regression models are slightly the best, the obtained differences are so small as to be of negligible practical significance. Thus, while the model-specified MPS formula is not disconfirmed by the data, neither has it been shown to represent a more adequate means of combining the job dimensions than other, simpler alternatives. (pp. 273-274)

The research questions were analyzed as follows, using a level of significance of 0.05:
Research Question One

What relationships exist among employee-perceived job characteristics, critical psychological states, and work outcomes as specified in Hackman-Oldham's model? As specified in Hackman and Oldham's model, the job core dimensions of skill variety, task identity, task significance, feedback, and autonomy are associated with the corresponding critical psychological states. To assess this proposition, a correlation analysis was performed to determine the degree of relationships between employee-perceived job characteristics and critical psychological states. A correlation analysis was also performed to assess the degree of relationships between employee-perceived job characteristics and work outcomes. There were specific questionnaire items in the revised job diagnostic survey that measured each of the identified variables above. These variables and their corresponding questionnaire items are discussed in the following paragraphs. All the variables have been defined elsewhere in chapter one.

Employee-perceived job characteristics. Five job core characteristics were measured by RJDS.

1. Skill Variety--Skill variety was measured by a scale consisting of these three items:

(a) My job provides much variety; that is, the job requires me to do many different things using a variety of my skills and talents.
(b) The job requires me to use a number of complex or high-level skills.

(c) The job is quite simple and repetitive (reversed score).

2. Task Identity—Task identity was measured by the following three items:

(a) My job involves doing a "whole" and identifiable piece of work. That is, my job is a complete piece of work that has an obvious beginning and end.

(b) The job provides me the chance to completely finish the pieces of work I begin.

(c) The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end (reversed score).

3. Task Significance—The following items were used to measure the variable:

(a) My job is very significant or important; that is, the result of my work is most likely to significantly affect the lives or well-being of other people.

(b) This job is one where a lot of other people can be affected by how well the work gets done.

(c) The job itself is not very significant or important in the broader scheme of things (reversed score).

4. Autonomy—The following three items were used to measure the variable:

(a) I have autonomy; this means I am able to decide on my own how to go about doing the work.

(b) The job denies me any chance to use my personal initiative or judgement in carrying out the work (reversed score).
(c) The job gives me considerable opportunity for independence and freedom in how I do the work.

5. Job Feedback—Job Feedback was measured by the following three items:

(a) The job I do provides me with information about my work performance; that is, the actual work itself provides feedback about how well I am doing aside from any feedback provided by my co-workers or supervisors.

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

(c) The job itself provides very few clues about whether or not I am performing well (reversed score).

Critical psychological states. The following three psychological states were measured:

1. Experienced Meaningfulness—This variable was measured by the following two items:

(a) Most of the things I have to do on this job seem useless or trivia (reversed score).

(b) The work I do on this job is very meaningful to me.

2. Experienced Responsibility—The following four items were used to measure the variable:

(a) It’s hard, on this job, for me to care very much about whether or not the work gets done right (reversed score).

(b) I feel a very high degree of personal responsibility for the work I do on this job.

(c) I feel I should personally take the credit or blame for the results of my work on this job.
(d) Whether or not this job gets done right is clearly my responsibility.

3. Knowledge of Results--This variable was assessed by the following two items:

(a) I usually know whether or not my work is satisfactory on this job.

(b) I often have trouble figuring out whether I'm doing well or poorly on this job (reversed score).

Affective work outcomes. The following two affective work outcomes were measured:

1. General Satisfaction--General satisfaction was measured by the following three items:

(a) Generally speaking, I am very satisfied with this job.

(b) I frequently think of quitting this job (reversed score).

(c) I am generally satisfied with the kind of work I do in this job.

2. Internal Work Motivation--The four items that measured this variable include the following:

(a) My opinion of myself goes up when I do this job well.

(b) I feel a great sense of personal satisfaction when I do this job well.

(c) I feel bad and unhappy when I discover that I have performed poorly on this job.

(d) My own feelings generally are not affected much one way or the other by how well I do on this job (reversed score).
Research Question Two

What differences exist among craftsmen of different construction trades on employee-perceived job characteristics? Different employees respond differently to an enriched jobs. To assess the differences in perceptions among craftsmen of different trades on employee-perceived job characteristics, a total mean response score was computed on each of the job core characteristics for each group of craftsmen. A one-way analysis of variance (One-Way ANOVA) was then performed to assess the differences in the group mean responses.

Research Question Three

What differences exist among craftsmen of different construction trades on growth-need strength (GNS)? In order to examine any significant differences, an 11-item subscale of the RJDS was used. These items consisted of characteristics that could be present in a job. Respondents were asked to indicate the degree to which they would like each characteristic to be present in their job. The response scale ranged from 4 to 10, which was later converted to a scale of 1 to 7 for data analysis. The following six items were used to measure growth need strength:
1. Stimulating and challenging work.

2. Chances to exercise independent thought and action in my job.

3. Opportunities to learn new things from my work.

4. Opportunities to be creative and imaginative in my work.

5. Opportunities for personal growth and development in my job.

6. A sense of worthwhile accomplishment in my work.

A total mean response score was computed on the GNS measures for each group of craftsmen. A one-way analysis of variance was then performed to assess the differences in the group mean responses.

Research Question Four

What differences exist among craftsmen of different construction trades on motivating potential scores (MPS) of employee-perceived job characteristics? To assess any possible differences, the MPS was first computed for each of the craftsmen using the formula established by Hackman and Oldham (1980). This formula was previously discussed elsewhere in this paper. Then, a total mean score was determined for each of the three groups of craftsmen. Finally, a one-way analysis of variance was performed to assess the differences in the group mean responses.
Research Question Five

What differences exist among craftsmen of different construction trades on affective work outcomes and critical psychological states? In order to determine if any significant differences exist among the groups, a grand mean scores were first computed for each group of craftsmen. Then, a one-way analysis of variance was performed on each variable to assess the differences in the group mean responses.
CHAPTER IV
PRESENTATION AND ANALYSIS OF DATA

This study was conducted to investigate the characteristics of construction work, as perceived by the construction craftsmen (bricklayers, carpenters, electricians), and the relationships of these perceptions to affective work outcomes (general satisfaction and internal work motivation). This chapter consists of two sections. The first section presents the demographic information pertaining to the subjects. The second section deals with the analysis of the study findings.

Demographic Information

Table 1 presents the distribution of questionnaire response rates among the groups. Of the 650 questionnaires, 160 were mailed to bricklayers, 260 to carpenters, and 230 to electricians. The total response rate was 36.3%. Of the total number returned, only 35.4% was usable for the purpose of data analysis. Of the 6 questionnaires that were not usable, 3 were returned undelivered for expired forwarding address; 2 belonged to retired people; and 1 was filled out incompletely. As shown in Table 1, 29.4% of the bricklayers surveyed returned their instruments; 42.7% of the carpenters returned theirs; and 33.9% of the electricians returned theirs as well.
Table 1

<table>
<thead>
<tr>
<th>Union</th>
<th>Mailed</th>
<th>Returned</th>
<th>Usable</th>
<th>% Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bricklayers</td>
<td>160</td>
<td>47</td>
<td>42</td>
<td>29.4</td>
</tr>
<tr>
<td>Carpenters</td>
<td>260</td>
<td>111</td>
<td>110</td>
<td>42.7</td>
</tr>
<tr>
<td>Electricians</td>
<td>230</td>
<td>78</td>
<td>78</td>
<td>33.9</td>
</tr>
<tr>
<td>Total</td>
<td>650</td>
<td>236</td>
<td>230</td>
<td>36.3</td>
</tr>
</tbody>
</table>

Table 2 presents the distribution of responses by sex.
The respondents consisted of 227 males and 3 females.

Table 2

<table>
<thead>
<tr>
<th>Sex</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>227</td>
<td>98.7</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 3 shows the age distribution of the respondents. Approximately 21% of the respondents belonged to an age group of between 35 and 39 years, while 16.5% were in the age group range of 40 and 44 years. Those who were 55 years or older accounted for 15.5%. The remaining responses were fairly distributed.

Table 4 shows the distribution of grade school completed. An overwhelming majority (91.7%) of the survey respondents had completed a 12th grade education.

Table 3

Distribution of Responses by Age

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 or under</td>
<td>11</td>
<td>4.8</td>
</tr>
<tr>
<td>25 - 29</td>
<td>17</td>
<td>7.4</td>
</tr>
<tr>
<td>30 - 34</td>
<td>25</td>
<td>10.9</td>
</tr>
<tr>
<td>35 - 39</td>
<td>49</td>
<td>21.3</td>
</tr>
<tr>
<td>40 - 44</td>
<td>38</td>
<td>16.5</td>
</tr>
<tr>
<td>45 - 49</td>
<td>27</td>
<td>11.7</td>
</tr>
<tr>
<td>50 - 54</td>
<td>28</td>
<td>12.2</td>
</tr>
<tr>
<td>55 or older</td>
<td>35</td>
<td>15.5</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 4

Distribution of Grade School Completed

<table>
<thead>
<tr>
<th>Grade</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>7</td>
<td>3.0</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>2.6</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>2.2</td>
</tr>
<tr>
<td>12</td>
<td>211</td>
<td>91.7</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>100.0</td>
</tr>
</tbody>
</table>

In addition to formal high school education, respondents were also asked to indicate any other type or types of schooling or training they might have had. Table 5 presents this information. It appears that a large number of craftsmen had completed an apprenticeship training. Eight of the respondents possessed college degrees. As can be seen in Table 5, the total number of frequencies did not add up to 230, the total number of respondents, because of the multiple response checks made by the respondents.

Table 6 presents data on the number of years workers have been with their union. About 38% of the respondents have been with their union for over a period of 20 years.
Approximately 24% have spent less than 5 years with their union. The remaining responses were evenly distributed.

Table 5
Responses by Other Types of Schooling or Training

<table>
<thead>
<tr>
<th>Types of Schooling or Training</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apprenticeship</td>
<td>153</td>
<td>56.5</td>
</tr>
<tr>
<td>Technical/Vocational</td>
<td>60</td>
<td>22.1</td>
</tr>
<tr>
<td>Some College</td>
<td>50</td>
<td>18.5</td>
</tr>
<tr>
<td>College Degree</td>
<td>8</td>
<td>2.9</td>
</tr>
<tr>
<td>Total</td>
<td>271</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 7 shows the distribution of responses regarding the number of years craftsmen have spent in their current trade. About 44% have been in their current trade for over a period of 20 years. Also, about 35% have been in their current trade for a period of between 10 and 19 years, and 21% have spent less than 10 years.

The distribution of responses by union classification are presented in Table 8. Of the 230 craftsmen who responded to the survey, 42 were bricklayers, 110 were carpenters, and 78 were electricians.
Table 6

**Distribution of Responses by Number of Years with the Union**

<table>
<thead>
<tr>
<th>Range</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5</td>
<td>55</td>
<td>23.9</td>
</tr>
<tr>
<td>5 - 9</td>
<td>25</td>
<td>10.9</td>
</tr>
<tr>
<td>10 - 14</td>
<td>30</td>
<td>13.0</td>
</tr>
<tr>
<td>15 - 19</td>
<td>33</td>
<td>14.3</td>
</tr>
<tr>
<td>20 or over</td>
<td>87</td>
<td>37.8</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 7

**Responses by Number of Years in Current Trade**

<table>
<thead>
<tr>
<th>Range</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5</td>
<td>24</td>
<td>10.4</td>
</tr>
<tr>
<td>5 - 9</td>
<td>25</td>
<td>10.9</td>
</tr>
<tr>
<td>10 - 14</td>
<td>37</td>
<td>16.1</td>
</tr>
<tr>
<td>15 - 19</td>
<td>43</td>
<td>18.7</td>
</tr>
<tr>
<td>20 or over</td>
<td>101</td>
<td>43.9</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Table 8  
Responses by Union Classification

<table>
<thead>
<tr>
<th>Union</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bricklayers</td>
<td>42</td>
<td>18.3</td>
</tr>
<tr>
<td>Carpenters</td>
<td>110</td>
<td>47.8</td>
</tr>
<tr>
<td>Electricians</td>
<td>78</td>
<td>33.9</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 9 presents data relative to the job titles of the respondents. The majority (67%) of the craftsmen bore the title of journeyman, about 10% were apprentice, and 22.6% bore titles other than apprentice or journeyman.

Table 9  
Job Titles of Respondents

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apprentice</td>
<td>24</td>
<td>10.4</td>
</tr>
<tr>
<td>Journeyman</td>
<td>154</td>
<td>67.0</td>
</tr>
<tr>
<td>Other</td>
<td>52</td>
<td>22.6</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Analysis of Study Findings

This section deals with the analysis of the research findings. The problems of this study were addressed through the research questions. In addition to the demographic information requested, survey respondents were also asked to indicate, on the RJDS, the amount of skill variety, task identity, task significance, autonomy, and job feedback present in their jobs. The response scales for sections 1 and 2 on the RJDS ranged from 1 to 7. The response scale for section 3 on RJDS ranged from 4 to 10. For statistical analysis purposes, and uniformity with the rest of the instrument, this scale was later converted to a range of 1 to 7 as suggested by Hackman and Oldham (1980).

Summary Statistics

Table 10 presents the means and standard deviations for the bricklayers, carpenters, and electricians on the job core characteristics (including MPS), critical psychological states, and the affective work outcomes.

Research Question One

What relationships exist among employee-perceived job characteristics, critical psychological states, and affective work outcomes as specified in Hackman and Oldham's model?

Hackman and Oldham's model specifies that correlations will exist between the following variables:
Table 10

Means and Standard Deviations on Employee-Perceived Job Characteristics, MPS, Critical Psychological States, and Affective Work Outcomes for the Groups of Craftsmen

<table>
<thead>
<tr>
<th>Factors</th>
<th>Bricklayers (N = 42)</th>
<th>Carpenters (N = 110)</th>
<th>Electricians (N = 78)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>Skill Variety</td>
<td>5.23</td>
<td>1.33</td>
<td>5.56</td>
</tr>
<tr>
<td>Task Identity</td>
<td>5.06</td>
<td>1.52</td>
<td>5.18</td>
</tr>
<tr>
<td>Task Significance</td>
<td>5.22</td>
<td>1.38</td>
<td>5.45</td>
</tr>
<tr>
<td>Autonomy</td>
<td>4.83</td>
<td>1.35</td>
<td>5.11</td>
</tr>
<tr>
<td>Job Feedback</td>
<td>5.18</td>
<td>1.22</td>
<td>4.94</td>
</tr>
<tr>
<td>MPS</td>
<td>138.22</td>
<td>75.0</td>
<td>146.27</td>
</tr>
<tr>
<td>Gen. Satisfaction</td>
<td>5.63</td>
<td>1.09</td>
<td>5.73</td>
</tr>
<tr>
<td>Internal Work</td>
<td>6.10</td>
<td>0.72</td>
<td>6.05</td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experienced</td>
<td>6.12</td>
<td>0.81</td>
<td>5.98</td>
</tr>
<tr>
<td>Meaningfulness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experienced</td>
<td>5.93</td>
<td>0.10</td>
<td>5.97</td>
</tr>
<tr>
<td>Responsibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge of Results</td>
<td>5.67</td>
<td>1.07</td>
<td>5.65</td>
</tr>
<tr>
<td>Growth Need</td>
<td>5.75</td>
<td>1.17</td>
<td>5.95</td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
(a) experienced meaningfulness with skill variety, task identity, and task significance, (b) experienced responsibility with autonomy, and (c) knowledge of results with feedback. The model also postulates that the three critical psychological states are positively associated with internal work motivation and general satisfaction. Also, it was further predicted that correlations will exist between the job core characteristics and the internal work motivation and general satisfaction. The model also predicts that MPS will correlate significantly with the critical psychological states.

In order to determine the extent to which the above variables relate to each other as specified in the model, a correlation analysis was performed among all the variables for all three groups (Table 11). As shown in that table, experienced meaningfulness correlated with skill variety ($r = .46$), task identity ($r = .33$), and task significance ($r = .43$) all beyond the .01 level of significance. The correlations between experienced responsibility and autonomy ($r = .46$), and between knowledge of results and feedback ($r = .36$) were also significant at the .01 level of significance. Therefore, the five model-specified correlates were supported by this study. These $r$ values were in the medium effect size range, using Cohen's (1977) convention.
The conventional definitions of effect size were offered by Cohen (1977) as follows:

- small: $r = .10; d = .2$
- medium: $r = .30; d = .5$
- large: $r = .50; d = .8$ (pp. 25-26; p. 83)

where $d$ = standardized difference between the means, and $r$ represents the Pearson product-moment correlation coefficient.

Also, the critical psychological states were significantly correlated with the internal work motivation and general satisfaction, as predicted. The $r$ values were in the small to large effect size range. The MPS, which represents a summary of the job core dimensions, was also significantly associated with the critical psychological states, in a small to medium effect size range.

There were also positive correlations between general satisfaction and skill variety ($r = .40$), task identity ($r = .31$), task significance ($r = .35$), autonomy ($r = .35$), and job feedback ($r = .36$) beyond the .01 level of significance.

The correlations between internal work motivation and skill variety ($r = .37$), task identity ($r = .23$), task significance ($r = .31$), autonomy ($r = .22$), and job feedback ($r = .31$) were also significant beyond the .01 level of significance. All the $r$ values were in the small to medium effect size range.
Table 11

**Intercorrelations Among Employee-Perceived Job Characteristics, MPS, Work Outcomes, and Critical Psychological States for all Groups of Craftsmen**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Skill variety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Task identity</td>
<td>.38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Task significance</td>
<td>.43</td>
<td>.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Autonomy</td>
<td>.48</td>
<td>.54</td>
<td>.26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Job Feedback</td>
<td>.35</td>
<td>.39</td>
<td>.33</td>
<td>.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. MPS</td>
<td>.59</td>
<td>.63</td>
<td>.48</td>
<td>.79</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. General satisfaction</td>
<td>.40</td>
<td>.31</td>
<td>.35</td>
<td>.35</td>
<td>.36</td>
<td>.48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Int. work motivation</td>
<td>.37</td>
<td>.23</td>
<td>.31</td>
<td>.22</td>
<td>.31</td>
<td>.40</td>
<td>.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Experienced meaningfulness</td>
<td>.46</td>
<td>.33</td>
<td>.43</td>
<td>.31</td>
<td>.36</td>
<td>.48</td>
<td>.55</td>
<td>.52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Experienced responsibility</td>
<td>.42</td>
<td>.39</td>
<td>.29</td>
<td>.46</td>
<td>.21</td>
<td>.48</td>
<td>.41</td>
<td>.48</td>
<td>.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Knowledge of Results</td>
<td>.29</td>
<td>.30</td>
<td>.16</td>
<td>.37</td>
<td>.36</td>
<td>.44</td>
<td>.39</td>
<td>.28</td>
<td>.33</td>
<td>.41</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** N = 230

^All correlations are significant at .0005 level except the correlations between the knowledge of results and task significance (p = .014).
Research Question Two

What differences exist among craftsmen of different construction trades on employee-perceived job characteristics? The mean responses on employee-perceived job characteristics for bricklayers, carpenters, and electricians are reported in Table 10. In order to examine if any significant differences exist in the perceptions of the three groups on employee-perceived job characteristics, a one-way analysis of variance was performed on all job core dimensions. Tables 12 through 16 present the results of these tests.

Regarding the perceptions of the groups on skill variety, the F value of 1.69 was found to be non-significant (p = 0.19), meaning that non-significant differences existed among the groups in their perceptions (Table 12).

| Table 12 |
| One-Way Analysis of Variance on Skill Variety |
| Source | df | Sum of Squares | Mean Squares | F Ratio | p  |
| Between Groups | 2 | 4.91 | 2.45 | 1.69 | .19 |
| Within Groups | 227 | 331.06 | 1.46 |
| Total | 229 | 335.97 |
Test results (Table 13) also showed no significant differences in the perceptions of the craftsmen regarding task identity ($F = 0.12; df = 2/227; p = 0.89$).

Table 13

**One-Way Analysis of Variance on Task Identity**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.46</td>
<td>.23</td>
<td>.12</td>
<td>.89</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>433.58</td>
<td>1.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>434.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Likewise, no significant differences were found in the perceptions of the craftsmen regarding task significance ($F = 2.35; df = 2/227; p = 0.10$) (Table 14). There were no significant differences in the perceptions of the craftsmen as well regarding autonomy and job feedback ($F = 2.49; df = 2/227; p = 0.08$; and $F = .71; df = 2/227; p = 0.49$, respectively). The results of these tests are presented in Tables 15 and 16.

**Research Question Three**

What differences exist among craftsmen of different construction trades on growth need strength? The mean responses on growth need strength for the three groups
are presented in Table 10. The differences were examined by analysis of variance (Table 17). The $F$ value of 3.55 was found to be significant ($p = .03$), suggesting significant differences among the craftsmen regarding their growth need strength.

Table 14

One-Way Analysis of Variance on Task Significance

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>$F$ Ratio</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>6.84</td>
<td>3.42</td>
<td>2.35</td>
<td>.10</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>330.65</td>
<td>1.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>337.49</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 15

One-Way Analysis of Variance on Autonomy

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>$F$ Ratio</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>7.30</td>
<td>3.65</td>
<td>2.49</td>
<td>.08</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>332.19</td>
<td>1.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>339.49</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 16

One-Way Analysis of Variance on Job Feedback

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>1.94</td>
<td>.97</td>
<td>.71</td>
<td>.49</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>310.15</td>
<td>1.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>312.09</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 17

One-Way Analysis of Variance on Growth Need Strength and Tukey Paired Comparisons

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>8.60</td>
<td>4.30</td>
<td>3.55</td>
<td>.03</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>274.85</td>
<td>1.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>283.45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

G G G G
r r r r
p p p p

Mean Group 3 1 2

5.52 Grp 3
5.75 Grp 1
5.94 Grp 2 *

Note: (*) denotes pairs of groups significantly different at the .05 level.
A post hoc analysis, using the Tukey procedure, revealed that carpenters had higher GNS than the electricians, a small effect size (d = .37). There were no significant differences in the mean responses of the bricklayers and those of the carpenters and electricians.

Research Question Four

What differences exist among craftsmen of different construction trades on motivating potential score (MPS) of employee-perceived job characteristics? A motivating potential score was computed for each worker, and the mean score recorded for each group of craftsmen (Table 10). In order to examine if any significant differences exist in the group means, a one-way analysis of variance was performed. The results of this analysis are presented in Table 18. The F value of 0.47 was found to be non-significant (p = .63); this indicates that no significant differences exist among the groups in their perceptions regarding the MPS.

Research Question Five

What differences exist among craftsmen of different construction trades on affective work outcomes and critical psychological states? The means and standard deviations for the affective work outcomes and the critical psychological states are presented in Table 10. In order to determine if any significant differences exist in the general satisfaction level of the craftsmen, a one-way analysis of
variance was performed. The test results (Table 19) showed no significant differences in the satisfaction level of the craftsmen ($F = 0.37; df = 2/227; p = 0.69$).

### Table 18

One-Way Analysis of Variance on Motivating Potential Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>4628.88</td>
<td>2314.44</td>
<td>.47</td>
<td>.63</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>1125078.64</td>
<td>4956.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>1129707.52</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 19

One-Way Analysis of Variance on General Satisfaction

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.76</td>
<td>.38</td>
<td>.37</td>
<td>.69</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>233.56</td>
<td>1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>234.32</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regarding the internal work motivation of the craftsmen, a test involving a one-way analysis of variance (Table 20) showed that significant differences exist in the
internal work motivation level of the craftsmen ($F = 3.53; \ df = 2/227; \ p = 0.03$). The Tukey test showed that the carpenters had higher internal work motivation than the electricians, a small effect size ($d = .33$). No significant differences were found in the internal work motivation level of the bricklayers and those of the carpenters and electricians.

Table 20

One-Way Analysis of Variance on Internal Work Motivation

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>$F$ Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>4.40</td>
<td>2.20</td>
<td>3.53</td>
<td>.03</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>141.49</td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>145.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Group</td>
<td>3</td>
<td>2 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.77</td>
<td>Grp 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.05</td>
<td>Grp 2</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>6.10</td>
<td>Grp 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: (*) denotes pairs of groups significantly different at the .05 level.

An analysis was also conducted to examine the degree to which the craftsmen experienced their jobs as that which
were generally meaningful and worthwhile (experienced meaningfulness). A statistical analysis (One-Way ANOVA) showed no significant differences in the mean responses of the three groups ($F = 1.64; \text{df} = 2/227; p = 0.20$). Table 21 presents the results of this test.

Table 21

**One-Way Analysis of Variance on Experienced Meaningfulness**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>$F$ Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>2.79</td>
<td>1.39</td>
<td>1.64</td>
<td>.20</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>192.19</td>
<td>.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>194.98</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On experienced responsibility, the differences among the groups were also examined by a One-Way ANOVA (Table 22). The $F$ value of 0.13 was found to be non-significant ($p = 0.87$). In regard to the knowledge of results (Table 23), the $F$ value of 0.01 was found to be non-significant ($p = 0.99$), suggesting non-significant differences in the mean responses of the groups.
Table 22
One-Way Analysis of Variance on Experienced Responsibility

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.21</td>
<td>.10</td>
<td>.13</td>
<td>.87</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>175.22</td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>175.43</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 23
One-Way Analysis of Variance on Knowledge of Results

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.02</td>
<td>.01</td>
<td>.01</td>
<td>.99</td>
</tr>
<tr>
<td>Within Groups</td>
<td>227</td>
<td>265.12</td>
<td>1.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>229</td>
<td>265.14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents a general summary of the significance, purpose, problem, and methodology of the study as well as a brief review of the literature. In addition, a summary of the study findings (including discussions), conclusions, and recommendations for further study are presented.

Summary

This study was conducted to investigate the characteristics of construction work, as perceived by construction craftsmen, and the relationships of these perceptions to affective work outcomes (general satisfaction and internal work motivation). Considering the low productivity, high worker absenteeism, and voluntary turnover in the construction industry, one could suggest problems in worker motivation and overall general satisfaction. Studies indicate that the nature of work itself has a profound impact on the motivation and general satisfaction of workers. Unfortunately, the relations of construction job characteristics to internal work motivation and general satisfaction have not been adequately researched.
Thus, it became necessary in this study to collect data from three groups of construction craftsmen regarding their work and individual demographic characteristics. It is anticipated that the results of this study would help construction managers in their efforts toward job redesign, with the intent of making the job more challenging, motivating, and satisfying to construction workers.

The literature review for this study was centered on three major components: (a) theoretical background of Hackman and Oldham's (1980) job characteristics model, (b) related research on job and individual characteristics, and (c) construction-related motivation and job satisfaction studies. The job characteristics model developed by Hackman and Oldham (1980) was used as the basis for conducting this study. Detailed discussions of this model, its principal components, and other related literature are fully addressed in chapter two.

An exploratory research method was employed in conducting this study. The population consisted of construction craftsmen who were registered members of three established construction union organizations located in a mid-western state. These union organizations include bricklayers, carpenters, and electricians. As readers may recall, Hackman and Oldham's job characteristics model served as the conceptual basis for this study. The Revised
Job Diagnostic Survey (RJDS) was used to measure the employee-perceived job characteristics, critical psychological states, internal work motivation, and general satisfaction. The RJDS was examined by the doctoral committee for proper wording and the general layout. After incorporating the committee's suggestions, the instrument was pilot-tested with six local construction craftsmen. Analysis of the subjects' responses indicated that the instrument was free of ambiguity in content, wording, and format.

The questionnaires were mailed to 650 construction craftsmen. Prior to this, a cooperative agreement was reached between the researcher and the union managers regarding the administration of the questionnaires. A cover letter accompanied each survey explaining the purpose of the study and insuring the subjects' right to privacy and confidentiality. Additional cover letters were provided by the union managers. To facilitate early return, a self-addressed, stamped envelope was enclosed with each questionnaire. A follow-up letter was sent to each survey participant after two weeks. A total of 236 (36.3%) questionnaires were returned by the close of the survey. Of those returned, only 230 (35.4%) were usable.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS), version 4.1.
Analysis involved cross-tabulation, mean ratings, correlation analysis, and analysis of variance. Research question one was analyzed by computing intercorrelations among the variables. Research questions two through five were analyzed by performing One-Way ANOVA.

Findings of the Study

This study was conducted to investigate the extent to which employee-perceived job characteristics were related to certain affective work outcomes. The results are presented herein in two sections. The personal demographic characteristics of the craftsmen are examined in the first section. The second section addresses the findings relative to the research questions.

Demographic Characteristics

1. The majority (98.7%) of the craftsmen who responded to the survey were men.

2. Approximately 12% of the craftsmen were 29 years old or under. About 32% were in the age bracket of 30 and 39 years, and 28% were in the age bracket of 40 and 49 years. Those in the age bracket of 50 years and over accounted for about 28%.

3. An overwhelming majority (92%) of the craftsmen had completed a 12th grade education.

4. A large number (57%) of craftsmen had completed an apprenticeship training, and 19% had a college degree.
5. About 38% of the craftsmen have been with their respective union for over a period of 20 years. Approximately 24% have spent less than 5 years with their union.

6. About 44% of the craftsmen have been in their current trade for over a period of 20 years. About 35% have spent between 10 and 19 years in their current trade, and 21% have spent less than 10 years.

7. About 48% were carpenters, and about 34% were electricians. Bricklayers accounted for about 18%.

8. A majority of the craftsmen (67%) bore the occupational title of journeyman, and about 10% were apprentice. Those who bore titles other than apprentice or journeyman accounted for about 23%.

Findings Related to the Research Questions

Research Question One: What relationships exist among employee-perceived job characteristics, critical psychological states, and affective work outcomes as specified in Hackman and Oldham’s model?

1. The employee-perceived job characteristics were significantly correlated with the model-specified critical psychological states.

2. The three critical psychological states were also found to relate significantly to general satisfaction and internal work motivation.
3. The MPS was significantly correlated with the five employee-perceived job characteristics. Also, the MPS was found to be significantly associated with the three critical psychological states.

4. The employee-perceived job characteristics were found to be significantly associated with the affective work outcomes (general satisfaction and internal work motivation).

Research Question Two: What differences exist among craftsmen of different construction trades on employee-perceived job characteristics?

No statistically significant difference was found among the groups of craftsmen regarding their perceptions on skill variety, task identity, task significance, autonomy, and job Feedback.

Research Question Three: What differences exist among craftsmen of different construction trades on growth need strength?

A statistically significant difference was found among the craftsmen regarding their perceptions on growth need strength. Carpenters had higher GNS than the electricians (small effect size). An analysis of GNS scores obtained in the past studies (Appendix F) showed that construction craftsmen have GNS that are similar to those of professional-technical workers.
Research Question Four: What differences exist among craftsmen of different construction trades on motivating potential score (MPS) of employee-perceived job characteristics?

No statistically significant difference was found among the craftsmen regarding their perceptions on the motivating potential score of their job.

Research Question Five: What differences exist among craftsmen of different construction trades on affective work outcomes and critical psychological states?

1. There were no statistically significant differences in the general satisfaction levels of the craftsmen.

2. A statistically significant difference was observed in the internal work motivation level of the craftsmen. Carpenters had higher internal work motivation than the electricians, a small effect size. No statistically significant differences were found in the internal work motivation level of the bricklayers and those of the carpenters and electricians.

3. No statistically significant differences were observed in the mean responses of the craftsmen regarding the experienced meaningfulness, experienced responsibility, and knowledge of results.
Conclusions

The problem of this study was to investigate the degree to which employee perceptions of construction job characteristics were related to certain affective work outcomes. Based on the findings obtained in this study, the following conclusions were made:

Conclusions Related to Research Question One

1. Positive correlations (in the small and medium effect size range) exist between employee-perceived job characteristics and general satisfaction, as predicted in Hackman and Oldham's model.

2. Positive correlations exist between employee-perceived job characteristics and internal work motivation, as predicted in Hackman and Oldham's model (small and medium effect size range).

3. Positive correlations exist between employee-perceived job characteristics and critical psychological states, as predicted in Hackman and Oldham's model. These correlations were in the small and medium effect size range.

4. All critical psychological states and work outcomes were significantly correlated with the job core characteristics in the small and medium effect size range. Table 11 presents the intercorrelations among all the variables.
Conclusions Related to Research Question Two

No statistically significant differences were observed in the perceptions of craftsmen regarding the job core characteristics. Therefore, none of the three craft areas (bricklaying, carpentry, and electrical) can be considered to be higher than the others on the job core dimensions (Tables 12 through 16).

Conclusions Related to Research Question Three

Carpenters had higher GNS (small effect size) than the electricians (Table 17). Based on the job characteristics model, the GNS relates to the psychological needs of employees. These psychological needs are very crucial in examining how an individual employee would react to a job that is high in motivating potential. Thus, it can be concluded that carpenters would respond more positively to enriching and challenging job than would the electricians. In general, construction craftsmen have GNS that are similar to those of professional-technical workers.

Conclusions Related to Research Question Four

The craftsmen did not differ in their perceptions regarding the MPS of their jobs (Table 18). However, considering the overall means reported for all the groups, it appeared, generally, that construction work is very high in motivating potential. Thus, construction work has the capacity to arouse worker interest and create internal work
motivation. These findings contradicted an earlier report by Maloney and McFillen (1986) that "construction work appears to have little potential to motivate the workers performing the work" (p. 145). The differences in the findings of these two studies may be due to the types of survey instruments used in collecting the data. For this study, a Revised Job Diagnostic Survey (RJDS) instrument was used; whereas in Maloney and McFillen's study, a Job Characteristic Index (JCI) questionnaire was used. It is noteworthy, however, to note that the RJDS was specifically constructed to be used along with the Hackman and Oldham's model.

Conclusions Related to Research Question Five

1. Positive correlations exist between the critical psychological states and internal work motivation and general satisfaction. Thus, it can be concluded that an employee will achieve high internal work motivation and general satisfaction if his or her job provides those three psychological states.

2. Bricklayers, carpenters, and electricians did not differ from each other in their general satisfaction level.

3. Carpenters had higher internal work motivation than the electricians (small effect size). Therefore, they would respond more positively to a job that is high on MPS than would the electricians.
4. The craftsmen did not differ in their perceptions in regard to the critical psychological states. Thus, none of the three craft areas can be considered to be higher than the others on these dimensions. The complete findings are presented in Tables 19 through 23.

Overall, higher correlations were observed among all the variables. No large differences were detected. In general, all the craftsmen had very positive attitudes toward their jobs as evidenced by their mean scores on the RJDS (Table 10).

**Recommendations Based on the Study**

Construction work is a complex task which requires the dedication and motivation of skilled craftsmen. The findings obtained in this study have significant implications for the construction industry. Therefore, based on these findings, the following recommendations are made:

1. The contractors or managers should make an effort to structure their jobs to include the five job core dimensions (skill variety, task identity, task significance, autonomy, and job feedback). It is expected that the higher the jobs are on these job core dimensions, the more workers will develop strong interest in developing personal responsibility for their work.
2. Contractors should consider improving worker motivation and general job satisfaction with job context factors such as pay, compensation, job security, etc.

3. Contractors should consider redesigning their jobs to improve their motivating potential. Employees with high growth need strength would likely be discouraged by a job that is low in motivating potential.

4. Construction workers have different needs and desires. Therefore, contractors must make an effort to identify those workers with a high growth need strength, and then design jobs to meet their challenge. This could be done at any appropriate time by administering the GNS section of Hackman and Oldham's (1980) JDS instrument.

5. Not all workers will respond positively to enriched jobs. Therefore, it is recommended that contractors match jobs with the skills, experience, and growth needs of workers.

6. Contractors could also combine certain tasks in order to increase their skill variety and task identity. This approach will permit an individual worker to perform an entire piece of work rather than allowing several workers to do it. The ultimate goal of combining tasks is to maximize worker motivation and general job satisfaction.

7. A large majority of construction craftsmen have 12th grade education. It is recommended that further and
continuous training be provided for their professional development.

Recommendations for Further Research

The following recommendations are made for further research:

1. Several studies have concluded that the nature of the relationships between job characteristics and worker reactions to their work would depend upon the need states of the employees. Therefore, future research should include a test of the moderating effect of employee growth need strength on task perception-work outcomes relationships.

2. A field experimental study should be conducted to assess the effects of job enrichment on construction worker satisfaction, motivation, and productivity.

3. Future research should be conducted to examine the relationships between employee-perceived job characteristics and long-term productivity.

4. In addition to job contents, construction workers expect other factors such as job context (pay, job security, compensation, friendly workers, etc.) to improve in their jobs. Therefore, it is recommended that future research include an investigation of worker satisfaction with certain contextual factors and the extent to which these factors relate to worker motivation and general satisfaction.
5. A study of this nature should be conducted to include both union and open shop workers to examine the similarities and differences in their levels of motivation and general satisfaction.

6. This study should be replicated in the near future using a broader geographical setting and including more groups of construction craftsmen. About two-third of the study population did not respond to the survey. This could be due to their level of education. Therefore, it is recommended that future researcher devise ways to identify and collect data from various groups of construction craftsmen with different levels of education.
References


APPENDIX A

Questionnaires.
Section 1

Listed below are a number of statements which could be used to describe a job. You are to indicate whether each statement is an accurate or an inaccurate description of your job.

Please try to be as objective as you can in deciding how accurately each statement describe your job regardless of whether you like or dislike your job.

Write a number in the blank beside each statement, based on the following scale:

How accurate is the statement in describing your job?

<table>
<thead>
<tr>
<th>Very Inaccurate</th>
<th>Very Accurate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

1. ____ My job requires me to work closely with other people.

2. ____ I have autonomy; this means I am able to decide on my own how to go about doing the work.

3. ____ My job involves doing a "whole" and identifiable piece of work. That is, my job is a complete piece of work that has an obvious beginning and end.

4. ____ My job provides much variety; that is, the job requires me to do many different things using a variety of my skills and talents.

5. ____ My job is very significant or important; that is, the result of my work is most likely to significantly affect the lives or well-being of other people.

6. ____ Managers and/or co-workers let me know how well I am doing on my job.
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very</td>
<td>Moderately</td>
<td>Very</td>
<td>Inaccurate</td>
<td>Accurate</td>
<td>Accurate</td>
<td></td>
</tr>
</tbody>
</table>

7. ____ The job I do provides me with information about my work performance; that is, the actual work itself provide feedback about how well I am doing aside from any feedback provided by my co-workers or supervisors.

8. ____ The job requires me to use a number of complex or high-level skills.

9. ____ The job requires a lot of cooperative work with other people.

10. ____ The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.

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

12. ____ The job is quite simple and repetitive.

13. ____ The job can be done adequately by a person working alone - without talking or checking with other people.

14. ____ The supervisors and co-workers on this job almost never give me any "feedback" about how well I am doing in my work.

15. ____ This job is one where a lot of other people can be affected by how well the work gets done.

16. ____ The job denies me any chance to use my personal initiative or judgement in carrying out the work.

17. ____ Supervisors often let me know how well they think I am performing the job.

18. ____ The job provides me the chance to completely finish the pieces of work I begin.

19. ____ The job itself provides very few clues about whether or not I am performing well.

(Continue on next page)
20. ____ The job gives me considerable opportunity for independence and freedom in how I do the work.

21. ____ The job itself is not very significant or important in the broader scheme of things.

Section 2

Please indicate how you personally feel about your job. Each of the statements below is something that a person might say about his or her job. You are to indicate your own personal feelings about your job by marking how much you agree with each of the statements.

Write a number in the blank for each statement, based on this scale:

How much do you agree with the statement?

1 2 3 4 5 6 7
Disagree Disagree Disagree Neutral Agree Agree Agree
Strongly Slightly Slightly Strongly

____ 1. It's hard, on this job, for me to care very much about whether or not the work gets done right.

____ 2. My opinion of myself goes up when I do this job well.

____ 3. Generally speaking, I am very satisfied with this job.

____ 4. Most of the things I have to do on this job seem useless or trivia.

____ 5. I usually know whether or not my work is satisfactory on this job.

____ 6. I feel a great sense of personal satisfaction when I do this job well.

____ 7. The work I do on this job is very meaningful to me.

____ 8. I feel a very high degree of personal responsibility for the work I do on this job.
9. I frequently think of quitting this job.

10. I feel bad and unhappy when I discover that I have performed poorly on this job.

11. I often have trouble figuring out whether I'm doing well or poorly on this job.

12. I feel I should personally take the credit or blame for the results of my work on this job.

13. I am generally satisfied with the kind of work I do in this job.

14. My own feelings generally are not affected much one way or the other by how well I do on this job.

15. Whether or not this job gets done right is clearly my responsibility.

Section 3

Listed below are a number of characteristics which could be present on any job. People differ about how much they would like to have each one present in their own jobs. We are interested in learning how much you personally would like to have each one present in your job.

Using the scale below, please indicate the degree to which you would like to have each characteristic present in your job.

NOTE: The numbers on this scale are different from those used in previous scale
Would like having this only a moderate amount (or less)

Would like having this very much

Would like having this extremely much

1. High respect and fair treatment from my supervisor.

2. Stimulating and challenging work.

3. Chances to exercise independent thought and action in my job.

4. Great job security.

5. Very friendly workers.

6. Opportunities to learn new things from my work.

7. High salary and good fringe benefits.

8. Opportunities to be creative and imaginative in my work.

9. Quick promotions.

10. Opportunities for personal growth and development in my job.

11. A sense of worthwhile accomplishment in my work.
Section 4 - Biographical Background

So far you have helped us answer several questions pertaining to your work. In this section, we would need the following information to enable us make comparisons among different groups of construction craftsmen. It is not necessary to sign or place your name on the questionnaire. All your responses would be strictly kept confidential; only statistical summaries of the responses of groups of craftsmen will be cited.

We really appreciate your help in providing this important information. Please try to make every answer a sincere one.

Please check the appropriate box:

1. What is your sex?  [ ] Male  [ ] Female

2. What is your age?
   [ ] 24 or under  [ ] 40 - 44
   [ ] 25 - 29  [ ] 45 - 49
   [ ] 30 - 34  [ ] 50 - 54
   [ ] 35 - 39  [ ] 55 or older

3. Please indicate the number of years of public or parochial school you have completed (Circle the number corresponding to the years you have completed).

   1  2  3  4  5  6  7  8  9  10  11  12
   Elementary  Junior High  High School

4. Indicate any other type(s) of schooling or training you may have completed.

   [ ] Apprenticeship
   [ ] Technical/Vocational School: How many years ____
   [ ] Some college: How many years ____ (write in number)
   [ ] College degree
5. How long (in years) have you been with your union?

- [ ] less than 5
- [ ] 5 - 9
- [ ] 10 - 14
- [ ] 15 - 19
- [ ] 20 or over

6. How long (in years) have you been in your current trade?

- [ ] less than 5
- [ ] 5 - 9
- [ ] 10 - 14
- [ ] 15 - 19
- [ ] 20 or over

7. To which union do you belong? (check only one)

- [ ] Bricklayers
- [ ] Carpenters
- [ ] Electrical Workers
- [ ] Others (please specify) ___________________

8. What is your job title?

- [ ] Apprentice
- [ ] Journeyman
- [ ] Other (Please specify) ___________________

PLEASE GO TO NEXT PAGE
THE END !! - THANK YOU FOR YOUR TIME.
WE WISH YOU LUCK IN YOUR JOB !!

Additional Information: In the space provided below, please provide any additional comment and/or information you feel we need to know about your job.

Research Findings:
* Would you like to receive a copy of the abstract of the research findings ?. If so, please send a post card to us at the address below:

Attn: M.A. Shofoluwe
Department of Industrial Technology
University of Northern Iowa
Cedar Falls, IA 50614-0178

* You may also contact your local union to find out about the research findings. The study is scheduled to be completed by July, 1992.
APPENDIX B

Typical Letter to the Union Agents.
December 26, 1991

Mr. Roger Boyles, Business Agent
Carpenters' Union, Local #308
350 Waconia Court S.W.
Cedar Rapids, IA 52404

Dear Mr. Boyles:

It was a pleasure talking to you over the telephone last week. As I explained to you, I am conducting a research dealing with the "Job characteristics of construction craftsmen and their relationships to work outcomes". The purpose of the research is to investigate the structure of construction work as perceived by construction craftsmen, and their relationships to internal work motivation and job satisfaction.

It is hoped that the findings of this study would shed light on the way construction work is structured and how this work affects worker motivation and job satisfaction. The results could then aid construction industry managers in their job restructuring efforts with the intent of making construction job more challenging, motivating and satisfying to the workers.

As requested, a rough draft of the research questionnaire is hereby enclosed for your necessary reading. I will greatly appreciate any effort you can provide to facilitate the participation of your members. I shall be contacting you again very soon to finalize the arrangement concerning the administration of the questionnaire.

If you need to contact me regarding this matter, my home phone number is (319) 266-5249 and the office number is (319) 273-6825 or 273-2561. Thank you for your cooperation in this matter.

Sincerely,

Musibau A. Shofoluwe
Graduate Assistant

Dr. Mohammed F. Fahmy
Professor and Advisor

Enclosure:
APPENDIX C

Cover and Follow-up Letters.
March 9, 1992

Dear Construction Worker:

The attached questionnaire is part of our research efforts at the University of Northern Iowa (UNI). It is designed to find out how construction workers (like yourself) feel about their jobs and their work environment as a whole. It is hoped that the findings of the study would help construction industry devise better ways of making construction work more motivating and challenging to the construction workers.

Please help us answer the questionnaire as frankly and honestly as you can. It will only take about 12 minutes to answer all the questions. Your reply within 5 days will be highly appreciated, as we intend to complete the study within a possible short period of time. Be assured that your responses will be kept confidential. No one will know how you responded; therefore do not put your name on the questionnaire.

The code number at the end of the questionnaire is for control purposes only; and there is no way you can be identified by the number. Your union organization decided to whom to send the questionnaires. Neither your union nor any contractor will ever get access to the information you provided in the questionnaire. Only the research team at UNI will see your completed questionnaire.

After you complete the questionnaire, please fold and put it in the enclosed self-addressed postage-free envelope, seal properly, and mail it. All returned questionnaires will be destroyed as soon as our analysis is completed. Only statistical summary of the findings will be published.

We thank you very much for your assistance and cooperation in this study. Remember, by completing this questionnaire, you can make significant contribution to the construction industry as it tries to make your job more motivating and rewarding to you.

Sincerely,

Musibau A. Shofoluwe
Graduate Assistant

Dr. M. F. Fahmy
Professor and Advisor

Enclosure:
March 26, 1992

Dear Construction Worker:

About two weeks ago, you received a survey concerning a research on the job characteristics of construction craftsmen and their work environments as a whole. Along with our survey was a cover letter written, and signed by your business agent encouraging you to respond to the survey. If you have responded to the survey, please disregard this letter, and we thank you for your help.

If you have not returned the survey, we just want you to know how important your response is to the success of our research. We encourage you to take some few minutes of your time to complete and return the survey as soon as possible. We must receive your completed survey by April 8, 1992 in order to include it in our analysis.

Once again, we thank you for your help. We wish you the best of luck on your job.

Sincerely,

Musibau A. Shofoluwe
Graduate Assistant

Dr. Mohammed F. Fahmy
Professor and Advisor
APPENDIX D

Support Letters From Union Agents.
March, 1992

RE: Research Study Survey

Dear Member:

The Executive Board of I.B.E.W. Local Union # 288 is cooperating with Dr. Mohammed F. Fahmy (Advisor), and Musibau A. Shofoluwe (Graduate Assistant) of the University of Northern Iowa in a research study. The study deals with the job aspects of construction workers. Specifically, the research team would like to find out about the motivation and job satisfaction of construction workers. We have been asked to participate in this study.

The results of the study would be shared with our organization, and it would let us know how satisfied construction workers are with certain aspects of their job. This could help our union in its long-range planning efforts with the intent of making construction work more challenging and motivating to our members.

Would you please read the enclosed information and respond to the survey questionnaire. A self-addressed stamped envelope is provided for your convenience and immediate reply. Your responses would be strictly kept confidential.

Thank you for your time. Should you have an interest in the results, please contact our office, and I shall be happy to share the summary with you when it is available.

This mailing prepared and sent by I.B.E.W. Local Union # 288 with reimbursement for all expenses.

Fraternally,

Donald J. Frost
Business Manager
March 1992

Dear Member:

RE: Research Study Survey

Our Union is cooperating with Dr. Mohammed F. Fahmy (Advisor), and Musibau A. Shoofouwe (Graduate Assistant) of the University of Northern Iowa in a research study. The study deals with the job aspects of construction workers. Specifically, the research team would like to find out about the motivation and job satisfaction of construction workers. We have been asked to participate in this study. The results of the study would be shared with our organization, and it would let us know how satisfied construction workers are with certain aspects of their job. This could help our union in its long-range planning efforts with the intent of making construction work more challenging and motivating to our members.

Would you please read the enclosed information and respond to the survey questionnaire. A self-addressed stamped envelope is provided for your convenience and immediate reply. Your responses would be strictly kept confidential.

Thank you for your time. Should you have an interest in the results, please contact our office, and I shall be happy to share the summary with you when it is available.

Sincerely,

Roger A. Boyles, Business Agent
Carpenters Local #308
March 1, 1992

Dear Brother:

Re: Research Study Survey

Our Union is cooperating with Dr. Mohammed F Fahmy (Advisor), and Musibau A Shofoluwe (Graduate Assistant) of the University of Northern Iowa in a research study. The study deals with the job aspects of construction workers. Specifically, the research team would like to find out about the motivation and job satisfaction of construction workers. We have been asked to participate in this study.

The results of the study would be shared with our organization, and it would let us know how satisfied construction workers are with certain aspects of their job. This could help our union in its long-range planning efforts with the intent of making construction work more challenging and motivating to our members.

If you care about the conditions and future of our industry and trade, please read the enclosed information and respond to the survey questionnaire.

A self-addressed, stamped envelope is provided for your convenience in promptly replying to this request. Your response to this survey will be kept strictly confidential.

Thank you for your time. Should you have an interest in the results of the study, please contact me. I will be happy to share the summary with you when it is available.

Fraternally,

Tom Ludolph
President, Local 28
(319) 236-0673
APPENDIX E

Comments Made by Survey Respondents.
Respondents' Comments

1. Seldom are you praised for doing a good job, but supervisors always show out your mistakes. Likewise you can never do too much, but most of the time you can't do enough. When you have a good day and do well, they just want more.

2. Seniority has little to do with job security. Nepotism runs high.

3. There doesn't seem to be a quick way to get through the red tape to get a journeyman's card. I have over 10 years experience, a 4-year degree in my field. Plus I look at this journeyman card as accreditation.

4. I would like to see the contractors, foremen, and superintendents to treat us journeymen like people instead of complaining all the time and yelling. If it wasn't for people like myself, they wouldn't have the job or position.

5. Some contractors require you to do substandard work that you know is not right. You either do it or quit.

6. As a union member/craftsperson I like to think we strive for better job conditions and a high level of education and living standard for our members. With this in mind, my job presents a constant challenge. It would be interesting to see how non-union would respond to the same questionnaire and compare the results.

7. Your job depends on the way your employer tells you how he wants the work done right or wrong; you do it or you get fired. The boss is always right.

8. I like what I do and enjoy it.

9. Just hope everyone in the trade gets as much joy and satisfaction in their job as I do in mine.

10. I love my job -- being repetitive is a drawback but its not mechanical. I take great pride in whatever I do.

11. To be in this type of work you should like construction, or else it is going to be awful hard work.
12. I take a lot of pride in the finished product of my work, and getting it done on time. But certain bosses and supervisors make me not care at all about it.

13. Being a union electrician carries a wide field of knowledge, and you must keep up with this field due to the changes of technology. The more you know, the more you grow. . . .

14. I am good at bricklaying, stone, and caulking, and other things that go with my job. I try to pass it on to others.

15. I like this trade. Outside work is enjoyable, unemployed during winter is a downfall. Summer pay is good. . . .

16. I feel it is necessary to emphasize trades more on the high school level. Not every one is a college student and these occupations are very rewarding.

17. It’s very hard work -- very physical. As foreman, my job becomes difficult when the Architects don’t provide enough information simply. So I have a hard time telling my men what to do when the blueprints or specs aren’t specific. We are the most physically demanding trade there is!

18. You must know how to work as an individual, as well as rely on your co-workers. . . The best part of any job is the bond you make with your piers.

19. Since a job must be done to specifications and plans, creativity and independent thought is sometimes not possible. However, good crews can still find time or labor-saving ways to do a job. Many times, due to the size of a job, beginning a job and seeing it through to completion is impossible. Emphasis seems to have shifted to "do it fast", i.e. ‘plumb and level we don’t need, all we need from you is speed.’ This demoralizes a crew quickly. Job security is a nice concept, but, in construction, you are a temporary employee. . . .

20. I get a great amount of satisfaction and sense of accomplishment from my work. It makes me proud to drive around and see things I have built and aided in building. At times I am discouraged with the trades and myself. Although these times are short-lived, I am generally happy and content.
21. I see it that my job creates a work place that others may use to better their jobs and that makes me feel good.

22. Provide some manner to pressure shop foremen to accept responsibility for improper or even illegal orders given to workers to carry out. Some are contrary to city code and national electrical code.

23. There is absolutely no recognition. We do not get to think for ourselves. Everything is thought out by the superintendent. It's real degrading. There is no challenge.

24. I feel the building trades have fallen far behind in the area of paid holiday and vacations. I have not received either one in my 30 years in the trade.

25. Many supervisors push too much for quantity rather than quality. They look out for themselves only.

26. Being in the union is like exposing yourself to a disease of attitude. Eighty percent (80%) of the people I've worked with are proud of how little work they can get away with in a day. . . . Working with people like this is difficult.

27. My job could be very fulfilling.

28. Most of my negative answers come from the fact that construction has no security or benefits. . . . But one positive note -- in construction you have more freedom -- no pressure of a time clock.

29. It is a good trade if the persons you work for let you do the job the way it should be done.

30. Costs or profits are killing the quality of work in construction today. This starts with inadequate engineering -- poor prints -- and supervisors that are only interested in getting the job done quickly. Quality is no longer wanted, only a quick finish. For this reason, more unqualified help is hired and the attitude of the qualified person is diminished. You get what you pay for (pay now or later).

31. I feel it should be number one responsibility to train apprentices in the union very well and instill some pride and experience on organized labor and how to get
along among ourselves to build the unions into one family.

32. I think the union's pay scale "sucks". A union person may make more money than non-union, but a non-union contractor will pay a person with more experience better than others with less experience. In the union, we are all paid the same. And I feel this is wrong.

33. Cooperation and coordination between superintendents, management, and foremen, to workers are very poor. It's very hard to be as productive as possible when kept in the dark. Ninety five percent (95%) of jobs that I've been on, I've never been given even a general look or explanation of blueprints or layout. It seems that management is afraid to show me building plan for fear I might know more than them on building trades and practices. It's very frustrating not knowing what is expected next. And also hard to plan ahead and be efficient and kept busy.
APPENDIX F

JDS Means and Standard Deviations
By DOT Category.
Norms for the job diagnostic survey (Technical Report #16).
School of Organization and Management, Yale University.