UNIVERSITY OF CINCINNATI

Date: 10/25/2005

I, Shilpa Shrikrishna Dabke,

hereby submit this work as part of the requirements for the degree of:

Master of Science

in:

Civil Engineering

It is entitled:

Job Satisfaction of Women in Construction Trades

This work and its defense approved by:

Chair: Dr. Sam Salem

Dr. Ash Genaidy

Dr. Issam Minkarah

JOB SATISFACTION OF WOMEN IN CONSTRUCTION TRADES

A Thesis submitted to the
Division of Research and Advance Studies
of The University Of Cincinnati

in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE

in the Department of Civil and Environmental Engineering
of the College of Engineering
2005

by

Shilpa Shrikrishna Dabke
B.E. (Civil), University of Mumbai, Mumbai, India, 2001

Committee Chair: Dr. Ossama Salem, P.E., CPC

Abstract

Women face unique challenges to work and establish themselves in non traditional occupations such as construction trades. Existing research on women in construction focuses on engineers and entrepreneurs, yet little to no attention has been given to women in trades. Thus, the aim of this research is to review literature on tradeswomen, and to conduct a localized study to determine if demographic variables affect satisfaction with work, pay, opportunities, supervision, and people on the job for tradeswomen. These variables include age, education, number of dependents, number of trade years, duration of work, and frequency of work outside of the local area. Thirty-nine tradeswomen from the Cincinnati area were surveyed to assess their satisfaction or dissatisfaction with construction work.

Currently, literature review indicates that research on tradeswomen is limited and largely restricted to identifying measures that can attract and retain women in construction trades. Studies on motivation and job satisfaction of construction workers neither identify nor compare perceptions of tradeswomen about their work. Results of this exploratory study showed that pay, benefits, and job security are most important to women in their occupation. Although tradeswomen appear to be satisfied with the nature of work in construction trades, this is not the case in terms of pay, benefits, and job security. Demographic variables did not affect the level of job satisfaction for women in construction trades. Research on tradeswomen is essential and important as the industry tries to change its image, encourage diversity in order to mitigate labor shortage.

Keywords

Tradeswomen, job satisfaction, women in trades, work satisfaction

Acknowledgements

I would like to express my gratitude to my graduate advisor, Dr. Sam Salem, for his guidance, support, and encouragement during my study at the University of Cincinnati. This experience will definitely help shape up my professional career.

I am grateful to Dr. Ash Genaidy for devoting time to help me at various stages of my graduate study, especially during the analysis phase of this research. Dr. Issam Minkarah has provided valuable insights and encouragement throughout my research and I greatly appreciate his support. I am grateful to the faculty and staff at the University of Cincinnati for their help during my coursework and thesis.

I am thankful to local unions and construction firms from the Cincinnati area for distributing the questionnaire and to all the tradeswomen for participating in this study. Last but not the least, I thank my parents, sisters, family, and friends for their unconditional support and much needed encouragement

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 Introduction

1.1 Introduction

In 2002, the construction industry offered 6.7 million wage and salary jobs and is expected to add 1 million new jobs by 2012 (U.S. Bureau of Labor Statistics, 2002). Women's participation in construction from 1980 to 2000 has rapidly increased by 76% (The Center to Protect Workers' Rights, 2002). This includes women employed in clerical and support divisions, management, professional, and production occupations. Women in trades increased by 13.8% from 1995 to 2001 (NAWIC Statistics, 2001). In 2004, women comprised 6.4% of construction managers, 11.7% of civil engineers, and an overall 2.5% of total employment across various trades (Bureau of Labor Statistics: Household Data Annual Averages, 2004). Thus, construction remains a Non Traditional Occupation (NTO) for women, as women comprise of less than 25% of those employed in this industry. The participation of women distributed by trade is shown in Table 1.1.

Today women comprise of a large part of paid labor force. By 2010, women are projected to account for 48% of total labor force (Facts about working women, 2005). One in two working women provides half or more of their household income. Women comprise of 50% of the population who work more than one job. Although more and more women are entering the workforce to support the family, their participation in construction trades has been stagnant since 1990.

High wages, autonomy in work, and unique products are notable highlights of construction work. According to BLS (2003), average hourly earnings in construction

trades ($18.95) are higher than other private industries ($15.35). Construction is the only goods producing sector in which employment is projected to grow. In spite of high pay, the majority of women refrain from construction jobs.

In 1978, Department of Labor set goals to hire women on federally funded construction projects and increase their participation to 6.9% over three year period. Clearly, after 26 years these goals haven't reached. Labor statistics suggest that employment of women in trades is still insignificant. Key reasons for less participation of women have been identified as negative image of the construction industry, i.e., dirty and dangerous, sexual harassment on job sites, and health and safety issues.

1.2 Problem statement

Construction workers take pride in their craftsmanship and derive great satisfaction by being a part of the project they build. Hence, construction work is a self rewarding and motivating job. The study of job satisfaction of construction workers to improve productivity has been an important topic of research since 1970's. Borcherding (1974) focused on satisfaction and dissatisfaction with the job in construction craft. In the mid 1980's, Maloney and McFillen (1986) studied the importance and satisfaction workers' attach to job related factors. Recently, changes in worker satisfaction among U.S. construction workers from the 1970s, 1980s, to the 1990s are studied by Goodrum (2003). No attempt has been made to study specifically women in construction. In order to understand the low participation of women in construction trades, it is necessary to understand their satisfaction related to construction work. Satisfaction of women working in trades can be different from majority of the construction workers and this issue is not

addressed in the industry. As a result, we are interested in studying the level of job satisfaction of female construction workers and identifying the needs unique to them.

As stated previously, research on women in construction is mainly restricted to engineers and entrepreneurs (Yates 2001; Hopkins and Maskell-Pretz 1997; Boles and Scott 1996). Other studies have focused on health and safety issues for women in construction trades (NIOSH, 1999). So far, the perceptions of tradeswomen about their job and work environment have not been a major research subject, as this is a complex and subjective matter. Strategies or measures implemented by employers to improve worker satisfaction are based on research conducted primarily on male dominant workforce.

National Association of Women In Construction (NAWIC, 2004) conducted a survey of non members to identify and compare the type and profile of females employed in construction. The data was collected regarding the perceptions, attitudes and feelings of women about construction. Ninety-three percent reported overall higher satisfaction with their job. Thus women are motivated to work in construction industry. It has been predicted that future workforce will comprise of large number of women and minority (Garrity 2004). Factors motivating and satisfying women can be different and therefore, it is now imperative to study the job satisfaction of women in construction trades.

Skilled labor shortage is a major issue the industry is facing today. Many national and statewide organizations such as NAWIC, Chicago Trades Women, Associated General Contractors of America (AGC), and Associated Builders and Contractors (ABC) have been implementing programs to attract and retain women in construction trades. To enhance the participation of women in construction trades, it is necessary to understand

their perceptions about the nature of work and level of satisfaction or dissatisfaction with the job.

1.3 Objectives

The objectives of this study are:

- To summarize existing research and literature on women in construction trades and evaluate studies performed on job satisfaction of construction workers in the US.
- To determine the level of satisfaction or dissatisfaction related to work factors, i.e. "Work", "Pay", "Supervision", "Opportunities for Promotion", "People on the job", and "Job in general" and to analyze the relationships that exist between these satisfaction measures and demographic variables

The first objective was met by conducting a comprehensive online literature review of 12 databases followed by bibliographical search. To meet the second objective, a questionnaire was developed to collect information about demographics, importance and corresponding satisfaction related to work elements from women working in construction trades in and around the metropolitan areas of Cincinnati, Ohio. The Job Descriptive Index (JDI) and the Job In General (JIG) scale are evaluative tools developed and modified by researchers at Bowling Green State University (Balzer et al. 1997). They were used as a part of the questionnaire to assess the level of satisfaction or dissatisfaction with "Work", "Pay", "Supervision", "Opportunities for Promotion", "People on the job", and "Job in general".

1.4 Significance of the research

One of the objectives of this study is to review literature on women in construction trades. This research will summarize studies performed on women in trades and job satisfaction of construction workers and will identify research needs in this area.

Results of the exploratory study performed on tradeswomen in and around Cincinnati area will shade light on perceptions of tradeswomen about their work, what elements in work are important to tradeswomen, and their satisfaction or dissatisfaction with different work elements. The findings from this study can be used to modify and expand this research to determine status of tradeswomen in the US and assess their job satisfaction level.

1.5 Thesis organization

The thesis report is organized into five chapters. The first chapter provides a brief introduction to the research conducted. The problem statement, research objectives, and significance of this study are discussed.

Chapter 2 discusses in detail the research conducted on satisfaction with job related to construction industry. It summarizes the work done on motivation, performance, and labor productivity improvement in construction. Status of women in construction trades, research conducted on women in non traditional occupations with emphasis on construction, and studies performed on health and safety issues related to women in construction are also discussed in Chapter 2. It presents the efforts undertaken by various local and national organizations to foster participation of women in construction trades.

Chapter 3 describes the research methodology. Mode of data collection, type of data required to achieve the objectives is discussed in detail. The development of the questionnaire, target respondents, identifying and contacting the respondents, pilot testing the questionnaire, and formation of the database is summarized in Chapter 3. Statistical techniques used to analyze the data are described.

Classification of data according to age, ethnicity, primary trade of the respondent, and educational background is presented in Chapter 4. Descriptive analysis is performed on the data colleted. From the descriptive analysis work elements important to women and their satisfaction or dissatisfaction with those elements is analyzed. Scores on satisfaction scales are calculated and its significance is noted. Analysis of means is performed to identify significant differences between satisfaction variables. Correctional analysis is performed to identify relationship between satisfaction and demographic variables.

Findings from the data analysis are discussed in detail under "Discussion" section in chapter 5. This thesis concludes with conclusions, and recommendations for future work in suggested areas.

Table 1.1: Percentage of women in construction trades in 2004

Primary Trade	Total employed (In thousands)	Women (% of total)
Brickmasons, Blockmasons, Stonemasons	239	0.9
Carpenters	1764	1.8
Cement masons, Concrete finishers and Terrazzo workers	115	0.2
Construction laborers	1234	3.2
Operating engineers and Equipment Operators	367	1.0
Drywall installers, Ceiling tile installers and Tapers	213	1.1
Electricians	781	2.1
Painters, Construction and Maintenance	719	5.8
Pipelayers, Plumbers, Pipefitters	635	0.9
Roofers	269	1.3
Sheet Metal workers	152	4.0
Helpers, Construction Trades	121	5.3

2 Literature Review

2.1 Introduction

Women form a significant portion of today's workforce and their participation in construction is significantly higher than it was twenty years ago. This chapter describes research done on women in Non Traditional Occupations (NTO) and construction in particular. Advantages and disadvantages of employment in traditional and non traditional occupations for women are researched. The nature of construction industry and employment of women in trades is also discussed. Efforts undertaken by various organizations to employ and train women in construction trades, other initiatives taken to foster their employment, barriers for women entering and establishing in trades, and factors affecting retention of women in trades are highlighted. Research performed on health and safety of tradeswomen in reviewed. Studies performed on motivation and job satisfaction of construction workers in the U. S. are referred. Research performed on women in construction in other countries is also reviewed.

2.2 Literature review strategy

Participation of women in construction trades has been insignificant and stagnant over last two decades. Publications strictly related to women in construction trades are limited and relevant studies were conducted during late 80's and early 90's. Thus studies performed on women in other non traditional occupations were searched to gain broader perspective on status and job satisfaction of women in non traditional occupations. Books published on women in non traditional occupations, and tradeswomen were reviewed.

A literature review was conducted using 12 databases: Expanded Academic Search Premier, Civil Engineering Abstracts, Compendex, Contemporary Women's Issues, CSA Engineering Research Database, Dissertation Abstracts, Gender Watch, Medline, Psychology and Behavioral Sciences Collection, Social Sciences Citation Index, Social Sciences Index, and Women's Resources International. Databases were searched using different keyword such as "women in construction trades", "women in construction", "female workers", "gender", "diversity", and "tradeswomen". Databases were also searched with author names who have performed extensive work in this area, i.e. Susan Eisenberg on women in construction trades, and Maloney and McFillen on motivation and job satisfaction of construction workers. Flowchart depicting the literature review process is shown in Figure 2.1.

After the initial search through databases, bibliographic search was conducted to identify articles and publications relevant to this study. Websites of various organizations i.e. National Association of Women in Construction (NAWIC), Chicago Women in Trades, and Hard Hatted Women were visited. Statistics were obtained from Bureau of Labor Statistics (BLS) and Centre to Protect Workers' Rights (CPWR) websites. Local unions were contacted to collect information brochures they use to recruit and educate women.

A systematic review is presented in the form of a table at the end of this chapter summarizing literature on women in Non Traditional Occupations, women in construction trades and job satisfaction of construction workers in the U.S. Each table consists of six columns: name of the author/s, objective of the study, exposure, outcome measure (variables formed to achieve the objective), study population, and important

findings. Study objective and exposure were specifically included in the table as each study assessed different characteristics of the population.

2.3 Women in Non Traditional Occupations (NTO)

During the twentieth century participation of women in labor force increased dramatically. But women are concentrated in a narrow range of occupations. In the U.S., secretarial, nursing, school teaching, and administrative jobs are tagged as women's work whereas jobs in construction trades, engineering, vehicle operations, and protective services are called men's work. Eighty percent of all administrative support workers and sixty six percent of all retail and personal services sales workers are women (Molly Martin, 1997). Occupations with high concentration of women are largely lower paid and of lower status. In the past two decades, number of families headed by women has increased (Molly Martin, 1997). As more women become the head of the household, better paying jobs in NTO become important.

The U.S. Department of labor defines a NTO for women as one in which less than 25% of those employed in the field are women. Architects, mathematicians, dentists, police officers, fire fighters, and construction occupations are some of the NTO for women. Affirmative action agreements between government and employers opened doors to these occupations for women. Job training, higher pay, and other benefits associated with unions attracted women to NTO which in return could improve their living standard. Employment of women in NTO increased following the Executive Orders of 1978 but it is still not significant in occupations such as construction trades.

Studies performed on women in NTO are summarized in Table 2.1. Women who had worked in NTO including construction trades had positive work experiences and found the job interesting, challenging and satisfying. Economic need was the important factor driving women to work in NTO including construction trades. Women have described benefits of working in NTO as opportunity to master technical skills, seeing a real product at the end of their labor, and same pay and benefits as men set by union contracts. Many women have mentioned their struggle in overcoming childhood beliefs of pursuing anything but a "man's" job, working and establishing themselves in hostile world, and gaining respect and self esteem with their work. Women associated lack of support during pregnancy and childcare with a career in NTO. Sexual and racial harassment on job sites is discouraging women from having a successful career in NTO.

2.4 Women in construction trades

Women are employed in construction trades for long, but they still face unique challenges to work and establish in these fields. Women face difficulties in recruitment, training, and promotion. Today organizations such as National Institute for Women in Trade Technology & Science, Chicago Trades Women, Hard Hatted Women (Cleveland, Ohio), Oregon Tradeswomen, Inc., Washington Women in Trades (Seattle), Nontraditional Employment for Women (NEW, NY) are developing and implementing programs and workshops to increase awareness about employment opportunities and benefits of work in non traditional occupations for women. In Ohio, Orientation to Non traditional Occupations for Women (O.N.O.W.) offers 180 hours of introductory training in carpentry, machine trades, electricity and welding. It provides basic training in sexual

harassment issues, work ethics, and self esteem. It also provides monetary assistance for those who qualify. In spite of these efforts, women's participation in trades has been stagnant for the last two decades. Researchers believe that male dominated construction industry, social and cultural beliefs associated with image of the construction industry, sexual harassment on job sites, and constant need to prove one's abilities and qualifications are some of the reasons distracting women from construction trades.

Women's economic empowerment efforts have concentrated on promoting women into white collar and management jobs and far too little attention has been given to efforts promoting women in blue collar occupations. Table 2.2 summarizes studies performed on women in construction trades. In a Construction Industry Institute (CII) study, tradeswomen were surveyed to understand their personal experiences of working in construction. The study identified what women liked and disliked about their job and what changes they would like to see. Martin (1997) and Eisenberg (1998) summarized the personal experiences of women from different trades identifying the difficulties they faced and possible reasons for small proportion of women that work in trades. Although these studies identify the measures to attract and retain women in trades, the results are not by supported by empirical evidence.

2.5 Research in other countries

In the U.K. and Australia, research is performed on attracting and retaining women in engineering and managerial positions of construction sector. Fielden at al. (2000) reviewed the literature on status of women in British construction industry. Barriers faced by women to enter, work and establish in construction industry were

outlined in this article. They noted that lack of knowledge and poor image of the industry, male dominated training courses, recruitment procedures, sexist attitudes, male dominated culture, and lack of flexibility to fulfill family commitments were some of the barriers faced by women to work in construction.

Dainty et al. (2000) compared men's and women's careers in U.K. construction industry and concluded that discrimination in promotion and advancement against women is prevalent in construction leading to exclusion of women. Researchers suggested six steps to promote diversity in the industry such as creating more awareness among industry leaders and employers regarding importance and need of diversity; educating unions, employers and clients to manage diverse workforce; improving the negative industry image; encouraging culture change; providing better access by introducing formal and fair recruitment procedures and improving retention rate; and monitoring the progress.

Agapiou (2002) studied perceptions of gender role and attitudes toward work among male and female operatives in the Scottish construction industry. He interviewed 3 employers, 4 supervisors, 10 male and 11 female operatives and apprentices from Scottish construction industry to understand their perception of women in trades, benefits of having women in the workforce and characteristics of women who complete apprenticeship program. He concluded that initiatives to recruit women in trades were a result of skilled labor shortages rather than a commitment to equal opportunity. He noted improved confidence of female apprentices to work in trades and growing acceptance of women by men marking a beginning of cultural shift. Agapiou suggested that creating

more awareness about the advantages of diversity, i.e., different perspectives, within the industry professionals would benefit the industry and women alike.

2.6 Studies on job satisfaction in construction

Job satisfaction has been defined as feelings a worker has about his or her job in relation to previous experiences, current expectations, or available alternatives (Balzer et al., 1997). Studies on consequences of job satisfaction have documented moderate negative relation between job satisfaction and absenteeism (Locke, 1976) and weak-to-moderate relationship between job satisfaction and turnover (Mobley, 1982). Employees who are satisfied are less likely to be absent than employees who are dissatisfied. Dissatisfied workers are more likely to quit than those who are satisfied. Research on job satisfaction and job performance found little evidence to support such relationship (Vroom, 1964). Clearly, level of worker job satisfaction can have an impact on the organization. Table 2.3 summarizes studies performed on job satisfaction of construction workers in the US

In construction, the majority of the research on motivation and worker job satisfaction was performed in the 1980's. However, these studies performed by Schrader (1972) and Borcherding & Oglesby (1974), were not based on empirical evidence and thus the validity of some of their findings was questioned. Maloney and McFillen (1985) conducted a comprehensive study on motivation of construction workers using expectancy theory as theoretical framework. Although this study included responses from 19 tradeswomen, no comparisons were made to identify the needs and satisfaction level of tradeswomen.

Birkland et al. identified construction workers' job and financial satisfaction, yet failed to identify satisfaction with other work elements such as the quality or nature of work, opportunities, and coworkers. From the literature review, it was observed that no empirical study has been conducted to understand the perceptions of tradeswomen about different elements in their work and that there is a need to assess the status of women in construction trades. Thus, this study focuses on job satisfaction of women in construction trades in and around metropolitan areas of Cincinnati, Ohio.

Figure 2.1: Literature review methodology flowchart

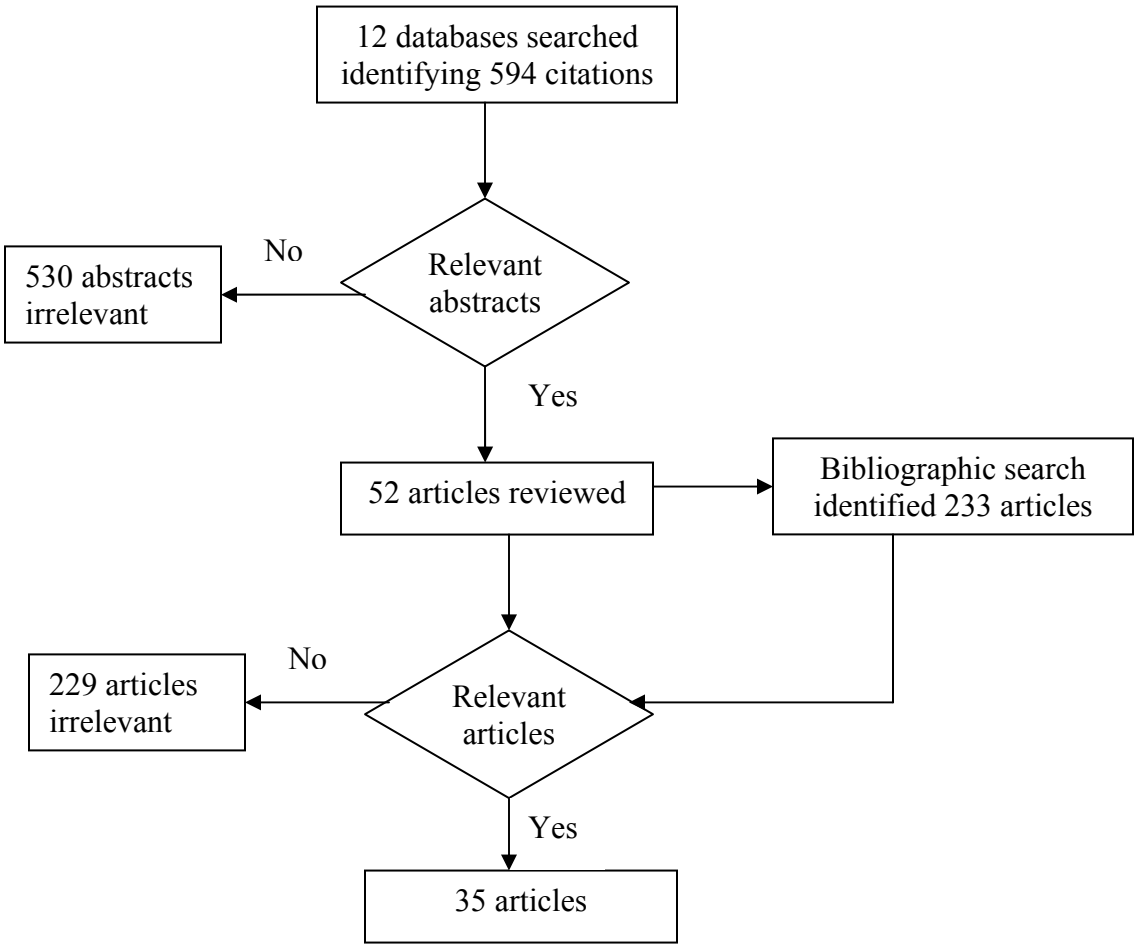


Table 2.1: Studies performed on women in Non Traditional Occupations (NTO)

Author/s	Objective	Exposure	Outcome measure	Study population	Main findings
Molly Martin (1997)	▪ Narration of work experiences of women in Non Traditional Occupations (NTO)		▪ Not applicable	▪ Not applicable	▪ Women enter NTO out of economic necessity ▪ Women face difficulties during pregnancy and childcare because of irregular and moving nature of work and lack of support from employers ▪ Sexual and racial harassment on job sites discourage women from working in trades.
Padavic Irene (1991)	▪ To identify the causes for women's lack of interest in blue collar jobs	▪ Two populations of white collar women employed at Urban Utility: one, temporarily employed in blue-collar jobs during strike and second women hired after the strike	▪ Interest in blue-collar jobs ▪ Economic need ▪ Exposure to the tools and tasks of the job ▪ Attitude and preferences that might affect women's interest in working in blue-collar jobs	▪ Population one: 225 women ▪ Population two: 100 women	▪ Economic need was chief motivating factor to consider blue-collar jobs ▪ Preference for day work and aversion for manual labor discouraged women to choose blue collar occupation ▪ African American women were more likely to accept obstacles in exchange for high wage jobs than Caucasian women

Author/s	Objective	Exposure	Outcome measure	Study population	Main findings
McIlwee Judith (1982)	▪ To identify work related expectations ▪ To assess feelings about current work & social and physical work environment ▪ To determine changes in work experiences and attitudes between first & second year interviews and to analyze reasons given by those who did not remain in the job after first year	▪ Respondents were selected from public, private, & vocational training programs from 3 cities in California: San Diego, Los Angeles, San Francisco	▪ Work intrinsic ▪ Social relationships ▪ Pay/benefits ▪ Autonomy ▪ Future advancement ▪ Working conditions ▪ Performance ▪ Hours/ ▪ Scheduling ▪ Job satisfaction	▪ Interviews with 86 women working in non traditional occupations	▪ Intrinsic rewards were more important to women than Pay/Benefits or autonomy ▪ Majority of the respondents (62%) reported more satisfaction with job during second year ▪ During the first year, mastering skills, getting along with coworkers & supervisors was main concern and primary source of satisfaction & dissatisfaction respectively. ▪ During the second year women were more concerned about nature of work, working conditions and relationship with management.
Lillydahl Jane (1986)	▪ To determine interest of women in training and/ or employment in blue-collar jobs ▪ To understand experiences of women who had worked or were working in blue-collar jobs	▪ Men & women were surveyed from two small towns in Colorado, Meeker &Walden ▪ Random sampling of two out of three households	▪ Interest in employment in blue-collar jobs ▪ Interest in training for blue-collar jobs ▪ Work experiences of women in blue collar jobs	▪ 695 Responses	▪ 50% of younger women and 30% of older women showed some interest in blue-collar jobs ▪ Women hade positive comments about their work but often cited harassment on job sites ▪ Male coworker support was often cited as important by women who held blue-collar jobs

Author/s	Objective	Exposure	Outcome measure	Study population	Main findings
Moccio Francine & Finklestein Marni (2000)	▪ To review literature on women in non traditional occupations with a focus on construction industry	▪ Not available	▪ Overview of construction industry ▪ Review of working conditions, employment, training, & earnings	▪ Not available	▪ Emerging trends in non traditional employment for women ▪ External barriers such as discrimination in hiring and harassment can be addressed by regulations ▪ Outreach programs specifically targeting women are required to address internal barriers such as, beliefs and attitudes

Table 2.2: Studies performed on women in construction trades

Author/s	Objective	Exposure	Outcome measure	Study population	Main findings
Anderson et al. (CII study, 1991)	▪ To determine existing condition of women in construction ▪ To explore opportunities for expanding construction workforce	▪ Women in management, technical support, supervision, & trades were surveyed across the US	▪ Professional" & "Hard hat" woman profile indicating what they appreciate in their work; like and dislike with the job & changes they would like to see ▪ Management perceptions	▪ Not available	▪ Management commitment to attract and retain women in construction ▪ Sponsorship and financial assistance to women to study construction, & engineering ▪ Fair policy to retain women in management and technical support ▪ Need to provide clear career path and effective training to women in trades ▪ Need to train all workers in human relations ▪ Need to improve job safety and hygiene
Susan Eisenberg (1998)	▪ To analyze experiences of women working in trades ▪ To identify reasons behind less participation of women in trades	▪ Interviews with tradeswomen across US	▪ Not available	▪ 30 tradeswomen	▪ Women should be provided opportunities to establish themselves as journeywomen ▪ Access to training in apprenticeship that leads to employment in the industry would make apprenticeship investment worthwhile ▪ Need to escalate hiring goals periodically ▪ Programmatic funding associated with changes in organizational culture are necessary to incorporate women in trades

Author/s	Objective	Exposure	Outcome measure	Study population	Main findings
Goldenhar Linda (NIOSH study, 1999)	▪ To identify health and safety issues for tradeswomen ▪ To suggest measures revising traditional practices in order to provide safe, healthy and fair conditions on job sites	▪ Interviews and Surveys of tradeswomen across the United State	▪ Training ▪ PPE/PPC ▪ Sanitary facilities ▪ Workplace Culture ▪ Injury and Illness data and research ▪ Reproductive hazards	▪ 475 women working in trades	▪ Lack of on-the-job training ▪ Ill fitting PPE/PPC ▪ Unhygienic sanitary facilities ▪ Hostile workplace and sexual harassment ▪ Need to collect accurate injury & illness data by gender
Goldenhar et al. (2000)	▪ To review literature on health and safety of women working in construction	▪ Search of Medline and Silver Platter databases for research on women, construction, & injury published from 1960 to 1999	▪ Fatal/non fatal injuries among male and female construction workers ▪ Working condition/quality of work life	▪ Not applicable	▪ Average fatality rate for women construction workers was twice more than industry average of women workers ▪ High proportion of women laborers and women construction workers die as a result of motor vehicle accident ▪ Leading causes of death were quite different for men and women ▪ There are some differences in risk of injury between tradesmen and tradeswomen

Table 2.3: Studies performed on job satisfaction of construction workers in the U.S.

Author/s	Objective	Exposure	Outcome measure	Study population	Main findings
Schrader (1972)	▪ To identify motivational factors relevant to construction workers applying Maslow's Hierarchy of Needs	▪ Applied to construction craftsmen	▪ Formation of motivational program to motivate craftsmen ▪ Cost of such program	▪ Not available	▪ Increased motivation among construction craftsmen reduces growing construction production cost ▪ Potential exists for approximately 10:1 return on investment in properly administered programs to motivate craftsmen
Borcherding & Oglesby (1974)	▪ To explore relationship between productivity and job satisfaction or dissatisfaction among home office management, field supervisors and workmen	▪ Management and labor from companies employing carpenters, electricians, plumbers, pipe fitters & sheet metal workers from St. Louis	▪ Job satisfiers ▪ Factors that affect job satisfaction ▪ Tentative recommendations for improving job satisfaction	▪ 65 interviews 1 to 5 hr each with management & labor	▪ Efforts involved in producing highly visible physical structure provided immense job satisfaction to all employees, regardless of an individual's level in job hierarchy ▪ Measures of improving work satisfaction are disregarded by contractors resulting in inefficient use of human resources
Maloney and McFillen (1985)	▪ To determine variables that influence worker motivation, performance, & satisfaction using expectancy theory of motivation ▪ To suggest measures to improve performance & satisfaction	▪ Questionnaires sent to Unionized construction workers from a Midwestern area in US	▪ Performance ▪ Importance ▪ Satisfaction ▪ Expectancy ▪ Instrumentality ▪ Valence ▪ Motivation ▪ Growth Need Strength (GNS)	▪ 703 construction workers including ▪ 19 women workers	▪ Overall motivational score was low ▪ Intrinsic rewards were most important ▪ Performance level is most satisfying when followed by extrinsic rewards ▪ *Construction work not intrinsically satisfying

Author/s	Objective	Exposure	Outcome measure	Study population	Main findings
Birkland et al. (1996)	▪ To understand characteristics of the workforce ▪ To survey a broad cross-section of the craft workforce to gain a better understanding of worker perception of job, career & employment conditions	▪ Questionnaires sent to Craft personnel from seven companies across the US ▪ Both union and non-union participation ▪ More than 30 trades	▪ Job satisfaction ▪ Satisfaction with financial aspect of work	▪ 4,600 construction craft workers	▪ Women were more likely to report higher averages of satisfaction than men ▪ Foremen were twice likely to report higher job satisfaction than journeymen and apprentices ▪ No of employers or no. of years in trades had no effect on likelihood of reporting higher job satisfaction ▪ Less educated respondents were more likely to report higher job satisfaction ▪ Satisfaction with financial aspect of work was somewhat higher than overall job satisfaction ▪ Higher level of pride in the job than financial satisfaction or work satisfaction
Paul Goodrum (2003)	▪ To examine changes in worker satisfaction among union & non-union construction workers in the US from 1970s, 1980s, to 1990s	▪ Data from General Social Survey (GSS) from 1972 to 1998. ▪ Full-time or part-time construction workers	▪ Work satisfaction	▪ 1970s: 526 cases ▪ 1980s: 745 cases ▪ 1990s: 719 cases	▪ Change in worker satisfaction over three decades is statistically insignificant. ▪ No observed differences in job satisfaction among union and non-union members. ▪ Intrinsic job characteristics are most important to workers

3 Design & Methodology

3.1 Study design

The main objective of this study is to identify the level of job satisfaction or dissatisfaction with job for women in construction trades. This objective was met by surveying women working in construction trades in and around metropolitan areas of Cincinnati, Ohio. Data was collected with the help of a questionnaire adopted from previous research. The questionnaire was drafted in a preliminary form and was sent for review to industry experts. Comments and suggestions received were incorporated at this stage and the questionnaire was modified. Cover letter addressing the respondents and the questionnaire were approved by University of Cincinnati Institutional Review Board. Respondents were asked not to write name, address, and/or contact information to maintain confidentiality. Respondents were informed that questionnaires will be destroyed after recording the data. A copy of the cover letter and the questionnaire can be found in Appendix I.

The questionnaire consists of three sections. In section one, respondents are asked to indicate demographics information such as age, ethnicity, no. of dependents, educational background, primary trade, number of hours and weeks worked last year, and nature of work outside local area. The second consists of 34 items to assess the importance and perceived satisfaction of various work elements. This section was adopted and modified from previous studies (Maloney and McFillen 1985) by including items related to hygiene and sanitary conditions on job sites, adequacy of personal protective equipment and clothing, understanding of family responsibilities by union

and/or management, and support from management during maternity. Cronbach's reliability coefficient, α, was 0.9278 indicating high internal consistency of the modified section. Responses were measured on a Likert scale from 1 to 5 with 1 indicating "Not at all", 3 indicating "Moderate" and 5 indicating "Extreme". An example of this is provided below.

	Importance					**Satisfaction**				
	Not at all	Slight	Moderate	Very	Extreme	Not at all	Slight	Moderate	Very	Extreme
Task variety	1	2	3	4	5	1	2	3	4	5

The Job Descriptive Index (JDI) was used as a third section of the questionnaire to assess satisfaction level with "Work", "Pay", "Supervision", "Opportunities for promotion", and "Co-workers" and a sixth scale "Job In General (JIG)" was used to assess overall job satisfaction. These six categories are pertinent and important in construction industry. JDI asked respondents to describe his or her job rather than asking to indicate job satisfaction directly. Other aspects of JDI that were critical in choosing to use it as a part of the questionnaire were that it was short and easy to administer and score.

JDI measures satisfaction with five facets i.e. work, pay, opportunities, supervision, and people on the job as Smith et al. (1969) observed that these five facets emerged consistently across a number of studies on job satisfaction. It was assumed that measures of these sub areas were relatively independent. JIG scale was constructed to reflect global, long- term evaluation of the job. Researchers used adjective format for JDI & JIG items to avoid use of complex statements and to lower the reading level making it possible to administer it to a wide range of employees. JDI & JIG were validated using

evidence for both discriminant and convergent validity in a series of four studies using four unique samples. Discriminant validity evidence requires that JDI facet should distinguish from satisfaction with other aspects of the job i.e. distinguish satisfaction with pay from satisfaction with work. Convergent validity evidence requires that JDI facet measures and other measures purported to measure the same constructs provide similar evaluations. A detailed discussion on development and validation of JDI can be found in "The measurement of satisfaction in work and retirement" by Smith et al. (1969). JDI was revised subsequently to take into account changes in jobs and use of language. A study by Paul et al. (1990) supported the equivalence of the original and the revised JDI versions. Internal reliability estimates calculated in a 1997 study for JDI and JIG scale are presented below.

Scale	**α**	**n**
Work	0.90	1623
Pay	0.86	1603
Opportunities for promotion	0.87	1611
Supervision	0.91	1613
Co-workers	0.91	1615
Job in general	0.92	1629

Carson et al. (2002) used meta-analysis technique to assess the construct validity of JDI summarizing previous empirical studies that examined antecedents, correlates and consequences of job satisfaction. The construct validity of JDI was supported by acceptable estimates of internal consistency and test-retest reliability and demonstrated convergent and discriminant validity.

The standard format suggested by the developers of JDI and JIG is used to score the responses colleted by questionnaires. About half the items are worded favorably, the "yes" response indicating satisfaction. A "yes" response is scored as 3; a "no" response is

scored as 0; a “maybe” response is scored as 1, as it indicates a somewhat favorable response. Remaining items are worded unfavorably so that a “yes” response indicates dissatisfaction. For unfavorably worded items a “yes” response is scored as 0, a “no” response is scored as 3, and a “maybe” response is scored as 1.

An example of this is provided below:

In scale Pay:

	Yes	**No**	**?**
Income adequate for normal expenses	3	0	1
Underpaid	0	3	1

3.2 Data collection

Local unions, i.e., carpenters and millwrights, electric workers, plumbers or pipe fitters, roofers, sheet metal workers, bricklayers, laborers, and painters and local companies with non-union female members were contacted to distribute the questionnaire. Stamped envelopes each containing a copy of the cover letter, questionnaire, and prepaid return envelope were given to business managers of unions and company representatives of non-union firms to be sent to tradeswomen. With the carpenters and millwrights union, we had the opportunity to personally interview the tradeswomen who wished to participate in this study. Eight women from Carpenters and Millwrights union were interviewed after they completed the questionnaire. Of the 105 questionnaires sent out, 39 questionnaires were completed and returned by the respondents, indicating a response rate of 37.14%. We received a letter from one of the

respondents describing her personal experiences. It is scanned and presented in Appendix II.

3.3 Data analysis

Statistical Package for Social Sciences (SPSS) is used to create database of responses and conduct statistical analysis.

Section I: Demographics

Demographic variables for construction workers such as age, ethnic background, primary trade, educational background, and employment characteristics are formed using the data collected by survey questionnaires. Responses from the questionnaire were analyzed to form a profile of the study's sample.

Section II: Importance and Satisfaction

A descriptive analysis is performed on importance and satisfaction items identifying mean, standard deviation and median values for the same. Responses obtained in this study are not enough to perform factor analysis to combine related items into factors. Paired t-test comparisons are made between importance and satisfaction items, and those significant at the 0.05 level are considered in this study. Importance and satisfaction items are ranked by means to make comparisons.

Section III: JDI and JIG

JDI "Work", "Supervision", "Co-workers", and JIG scales are computed by adding points associated with an individual's responses to items in respective scales. JDI "Pay" and "Promotion" includes half the number of items as other scales. In order to create a common scale, scores on JDI "Pay" and "Promotion" are doubled. Thus scores

on these scales can range from 0 to 54 as there are 18 items in “Work”, “Supervision”, “Co-workers”, and JIG scale and 9 items in “Pay” and “Promotion” scales. Scores well above 27 indicate satisfaction and well below 27 indicate dissatisfaction.

A descriptive analysis is performed identifying mean, standard deviation and median for JDI and JIG scales. Mean values indicate satisfaction or dissatisfaction with the job for JDI and JIG scales. Mean values are compared by demographic variables by conducting t-test for independent samples. Differences in means significant at the 0.05 level are noted. The Bonferroni correction is applied whenever more than two mean comparisons are made to reduce significance level for a Type I error. Bivariate correlation analysis is performed to identify effect of demographic variables on job satisfaction in female construction workers. Pearson correlation coefficients significant at the 0.05 level are noted. Multivariate linear regression is attempted to identify relationship if any between satisfaction and demographic variables.

4 Results

4.1 Demographics

Thirty nine questionnaires are received back out of 105 indicating a response rate of 37.14%. One incomplete survey is discarded leaving 38 valid responses for the analysis. Table 4.1 shows the demographic distribution of the respondents by age, ethnic background, marital status, number of dependents, entry in construction trades, union membership, if income was primary source of support, current work status, number of years in current trade, and journeywomen/ apprentice status and tendency to quit.

Classification by ethnicity showed that 68% of the women are Caucasian, 26% are African American and the remaining 6% identified themselves as "other". 42% of the women are married whereas 32% are single and 18% are divorced. When asked about number of dependents, 34% indicated 0 dependents, 29% indicated 1 dependent and 37% indicated two or more dependents. Income is primary source of support for 82% of the respondents. Twenty-six out of thirty-eight women (68%) heard about construction trades from a family member or friend. Union members form 89.5% of the sample while 10.5% are non-union. 32 women in this study are journeywomen and 4 are apprentices.

In order to understand the educational background, women were asked to indicate their number of years of schooling, if they had General Equivalency Diploma (GED), if they had attended technical school or college, number of years for which they attended technical school and college, and if they got technical school or college degree. The majority of women completed high school (90%) and those who did not obtained a GED. The distribution by education background is shown in Table 4.2.

Distribution by primary trade of the respondents is shown in Figure 4.1. Number of women listed with each union was enquired and is shown in Table 4.3. Of the study population, twelve women are electric workers, 8 are carpenters, 5 are plumbers or pipe fitters, and 4 are roofers. Majority of the women (89%) worked 40 hours or more per week. But most of them are not employed for better part of the year. 37% are employed for less than 40 weeks. 58% were employed at the time of survey while 42% unemployed. Figure 4.2 and 4.3 show distribution by number of hours worked per week and number of weeks worked last year. Table 4.4 enlists distribution for responses regarding work outside local area.

When asked whether or not they would accept a job in another line of work with same pay and benefits, 50% of the women from both age groups expressed a desire to quit construction trades. Of twenty-three women who were working for forty weeks or more, fifteen (65%) reported that they would accept another job. Twenty-two out of thirty-four (59%) women who worked for forty hours or more would quit construction trades if they could find another job with same pay and benefits. Irrespective of their current work status, 50% of the women would work in another line of work. Twenty-two of thirty-one (71%) women who were the primary support for their family would accept a job in other areas.

Table 4.1: Demographic distribution

Demographic variable		Frequency	Percent
Age	21-40	16	42.1
	41-60	22	57.9
Ethnic background	African American	10	26.3
	Caucasian	26	68.4
	Other (Includes Pacific Islander or Native Hawaiian)	2	5.3
Marital status	Married	16	42.1
	Single	12	31.6
	Divorced	7	18.4
	Widowed	1	2.6
	No Response	2	5.3
Dependents	0	13	34.2
	1	11	28.9
	2 or more	14	36.8
Construction trade entry	Family member or friend	26	68.4
	News paper or other advertisement	4	10.5
	Other*	8	21.1
Union membership	Yes	34	89.5
	No	4	10.5
If income primary source of support	Yes	31	81.6
	No	7	18.4
Current work status	Yes	22	57.9
	No	16	42.1
Journeywoman/ apprentice	Journeywoman	32	84.2
	Apprentice	4	10.5
No. of years in current trade	0-10	16	42.1
	11-20	16	42.1
	21-30	6	15.8
Will you accept job in another line work with same pay and benefits	Yes	23	60.5
	No	14	36.8
	May be	1	2.6

* Other includes Orientation to Non Traditional Occupations for Women (O.N.O.W), and Ohio Job Net

Table 4.2: Distribution by educational background

Demographic variable		Frequency	Percent
No. of years of school	10	2	5.3
	11	2	5.3
	12	34	89.5
General Educational Development (GED)	Yes	5	13.2
	No Response	33	86.8
Attended technical school?	Yes	7	18.4
	No	7	18.4
	No Response	24	63.2
No. of years of technical school	0	7	18.4
	1	5	13.2
	2	2	5.3
	No Response	24	63.2
Technical school degree	Yes	3	7.9
	No	16	42.1
	No Response	19	50.0
Attended college?	Yes	12	31.6
	No	4	10.5
	No Response	22	57.9
No of years of college	0	4	10.5
	1	2	5.3
	2	6	15.8
	3	3	7.9
	4	1	2.6
	No Response	22	57.9
College degree	Yes	3	7.9
	No	20	52.6
	No Response	15	39.5
Apprenticeship	Yes	33	86.8
	No	1	2.6
	No Response	4	10.5

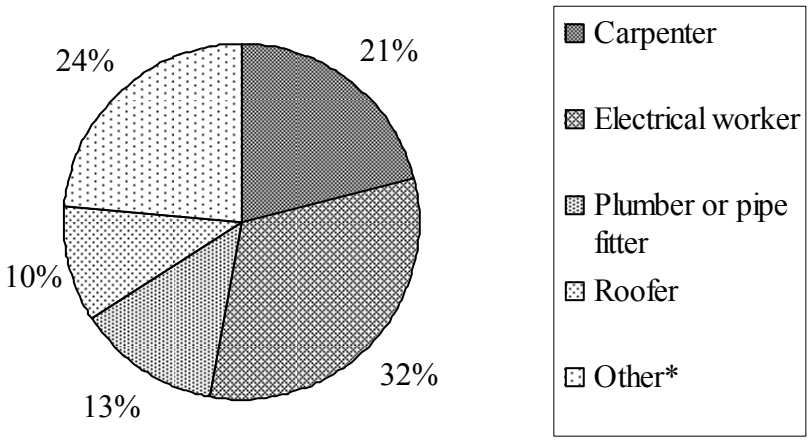
Table 4.3 No. of women listed with unions at the time of survey (Feb. 05)

Trade	No. of women listed	No. of women participated in this survey
Plumbers / Pipe fitters	32	5
Roofers	8	4
Sheet Metal workers	8	3
Cement Masons	6	0
Painters	10	1
Carpenters & Millwright	20	8+1
Electricians	40	12
Bricklayers	3	1

Table 4.4: Distribution by working outside region

Demographic variable		Frequency	Percent
Do you work outside local area	Yes	22	57.9
	No	16	42.1
No. of times worked outside local area in past 5 years	0	14	36.8
	1-2	7	18.4
	3	6	15.8
	More than 3	7	18.4
	No response	4	10.5
No. of weeks worked outside local area	0	15	39.5
	1-9	7	18.4
	10	5	13.2
	More than 10	5	13.2
	No Response	6	15.8

Figure 4.1: Distribution by primary trade of the respondent



*Other includes Asbestos worker (1), Bricklayer (1), Laborer (2), Millwright (1), Painter (1), and Sheet metal worker (3)

Figure 4.2: Distribution by hours worked per week

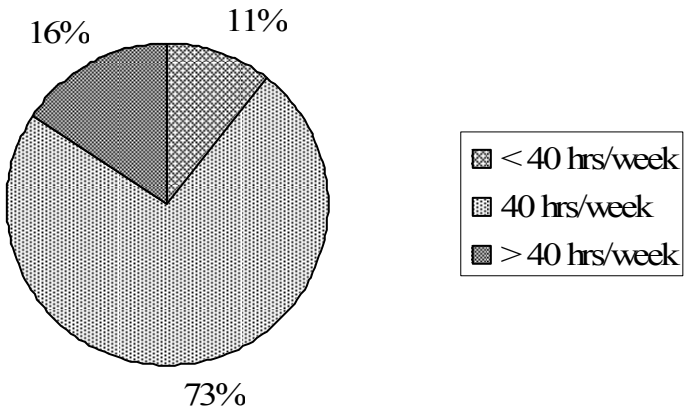
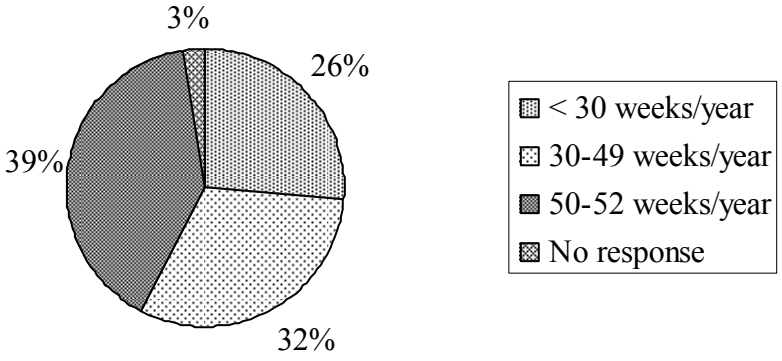


Figure 4.3: Distribution by number of weeks worked per year



4.2 Discussion with Carpenters & Millwrights

We had the opportunity to talk to carpenters and millwrights after they completed the questionnaire. It was an informal discussion where respondents were asked to narrate their personal experiences of working in construction trades, the nature of the industry, and what can be done to attract and retain women in construction trades.

Profile of carpenters and millwrights

Six carpenters were Caucasian whereas two were African American. The only millwright in this study was Caucasian. All of them had completed high school or had acquired General Equivalency Diploma (GED). Carpenters and millwright were journey level workers. Five carpenters had heard about construction trades from family member or friend while two had got information about a career in trades from Orientation to Non-traditional Occupations for Women (O.N.O.W.). Two women had their husbands working with the same union while two had seen their father/uncle work in construction trades. Income was primary source of support for six of them. Four of them were working at the time of the survey. All carpenters worked for 40 hrs/ week when work was available. Four of them worked for forty weeks or more during last year. When asked if they would accept another job for same pay and benefits, five replied “yes” and three replied ‘no”.

Personal experiences of carpenters and millwrights

Women liked the nature of work in carpentry and were proud of building a structure as a result of their efforts. They took great pride on projects they worked and talked highly about those projects. Many of them mentioned helping or seeing their fathers and uncles do carpentry as a child and chose carpentry as a career. They were

attracted to trades primarily because of higher wages. Some of them had worked administrative jobs but joined trades because of pay and union benefits.

Four women are working in construction for more than fifteen years, two for more than ten years, and three for 6-10 years. Experiences of Caucasian and African American women were very different. African American women faced both sexual and racial harassment and wanted to quit trades if they could find another job with equal pay & benefits. Women who had a family member working in trades naturally received better treatment. Women with more than 15 years of experience mentioned of the abuse and harassment they faced on job sites during initial years but also mentioned of the changing conditioned. They added that situation was improving on job sites for women as supervisors and coworkers started accepting women as a part of workforce. Some supervisors and coworkers accepted women on job sites but some opposed the idea. Women mentioned that they did not expect different treatment from supervisors or coworkers and just wanted to do their job.

These stories coincide with the stories of women in NTO compiled by Martin (1997) and Eisenberg (1998). Many of them did not find employment year long and this added to their job insecurity. Because they worked in Midwest region, they might have faced more difficulties finding yearlong employment especially during winter months. Moving nature of work also affected them because of childcare and family responsibilities. Overall they wanted to work in trades and establish themselves so that next generation of women would be better off. They appeared strong willed and determined to make a change. But they also realized that there is long way before construction trades can become a traditional occupation for women.

4.3 Importance and satisfaction with job

The mean, standard deviation, and median values for importance and satisfaction items are shown in Table 4.5. Paired t-test comparisons are made between importance and satisfaction items and 2-tailed significance values (p-value) are shown in Table 4.6. Items with differences significant at the 0.05 level are ranked and the rankings are shown in Table 4.7.

Pay, benefits, job security, personal protective equipment for job performance, opportunities to learn new things, opportunities to develop skills and abilities, separate and hygienic sanitary facilities on job sites are deemed important by tradeswomen. On the other hand, the least important work factors are monetary incentives, bonuses, opportunities for promotion, effective workplace layout, and feedback about job performance.

Women in construction trades are most satisfied with personal protective equipment, the ability to execute work, completion of a whole and identifiable piece of work, job training, opportunities to develop skills and abilities, and opportunities for challenging work. They are least satisfied with separate and hygienic sanitary facilities, understanding of family responsibilities by management, support from management during maternity or other medical situations, job security and work benefits.

A comparative analysis ranking the importance and satisfaction items reveal that pay, benefits, and job security are the most the important things to women in their work, yet their satisfaction level in these areas is low. Trade jobs pay higher than administrative jobs, but if women are not employed year long in trades, they might suffer from financial

difficulties and perceive lesser job security. Women also reported a need for separate and hygienic sanitary facilities on job sites.

The opportunity to learn new things, adequacy of tools, quality equipment and machinery for job performance, and supervisor support were found to be important, yet their satisfaction is relatively lower in these aspects of work. These things can be provided to women in their job by owner, management or union to improve job satisfaction.

Satisfaction with support from management and/or union in understanding family responsibilities and childcare also receives a lower ranking. Many women manage household responsibilities in addition to work and thus management and union support is essential to help them create a balance between the workplace and home.

Table 4.5: Mean, standard deviation and median for importance and satisfaction items

Item	Importance			Satisfaction		
	Mean	Std. dev	Median	Mean	Std. dev	Median
Task variety	3.84	0.64	4.00	3.54	0.69	4.00
The particular task assignment you receive	3.59	0.72	4.00	3.44	0.77	3.00
Work activities providing direct and clear feedback about job performance	3.78	0.80	4.00	3.00	1.06	3.00
Completion of whole and identifiable piece of work	4.19	0.75	4.00	3.83	0.94	4.00
Amount of freedom in your work	3.89	0.73	4.00	3.71	0.87	4.00
Ability to plan your work	4.06	0.81	4.00	3.68	0.98	4.00
Ability to execute your work	4.25	0.69	4.00	4.00	0.83	4.00
Participation in decision making	3.89	0.95	4.00	3.34	1.02	3.00
Adequacy of tools, equipment, machinery for job performance	4.24	0.85	4.00	3.37	0.97	3.00
Adequacy of technical supervision	3.58	0.87	4.00	3.28	0.66	3.00
Adequacy of job training	4.28	0.78	4.00	3.75	0.94	4.00
Special clothing for job performance	3.71	1.02	4.00	3.34	1.00	3.00
Personal protective equipment for job performance	4.42	0.76	5.00	4.08	0.85	4.00
Separate and hygienic sanitary facilitates on job sites	4.29	0.93	4.50	2.95	1.27	3.00
Effective workspace layout	3.76	0.89	4.00	3.22	0.79	3.00
Work pay	4.51	0.51	5.00	3.64	0.90	4.00
Work benefits	4.50	0.60	5.00	3.24	1.00	3.00
Job security	4.50	0.69	5.00	3.21	1.23	3.00
Bonuses	3.50	1.34	4.00	2.56	1.40	2.00
Monetary incentives	3.50	1.18	4.00	2.33	1.29	2.00
Opportunity for promotion	3.61	1.36	4.00	2.42	1.36	2.00
opportunity to learn new things	4.38	0.59	4.00	3.59	0.98	4.00
opportunity to do something that gives a sense of self esteem	4.27	0.69	4.00	3.66	0.99	4.00
Opportunity for challenging work	4.19	0.62	4.00	3.68	0.88	4.00
Opportunities to develop skills and abilities	4.37	0.63	4.00	3.68	0.93	4.00
Utilizing skills and knowledge	4.32	0.66	4.00	3.66	0.88	4.00
Friendliness of coworkers	3.89	0.86	4.00	3.55	0.89	3.00
Coworker support	4.08	0.78	4.00	3.42	0.92	3.00

Item	Importance			Satisfaction		
	Mean	Std. dev	Median	Mean	Std. dev	Median
Supervisor support	4.19	0.78	4.00	3.32	1.13	3.00
Feedback from coworker	3.81	0.91	4.00	3.37	0.79	3.00
Feedback from supervisor	3.92	0.86	4.00	3.19	1.08	3.00
Flexible work hours	3.38	1.01	3.00	3.08	1.19	3.00
Understanding of family responsibilities by supervisor and/or management	3.95	1.16	4.00	3.03	1.30	3.00
Support from management and/or union during maternity or other medical situations	3.94	1.07	4.00	3.14	1.13	3.00

Table 4.6: Paired t-test on importance and satisfaction items

Item	p-value
Task variety	0.006
The particular task assignment you receive	0.324*
Work activities providing direct and clear feedback about job performance	0.001
Completion of whole and identifiable piece of work	0.021
Amount of freedom in your work	0.181*
Ability to plan your work	0.010
Ability to execute your work	0.018
Participation in decision making	0.005
Adequacy of tools, equipment, machinery for job performance	0.000
Adequacy of technical supervision	0.078*
Adequacy of job training	0.006
Special clothing for job performance	0.017
Personal protective equipment for job performance	0.026
Separate and hygienic sanitary facilitates on job sites	0.000
Effective workspace layout	0.000
Work pay	0.000
Work benefits	0.000
Job security	0.000
Bonuses	0.006
Monetary incentives	0.000
Opportunity for promotion	0.000
Opportunity to learn new things	0.000
Opportunity to do something that gives a sense of self esteem	0.000
Opportunity for challenging work	0.001
Opportunities to develop skills and abilities	0.000
Utilizing skills and knowledge	0.000
Friendliness of coworkers	0.036
Coworker support	0.001
Supervisor support	0.000
Feedback from coworker	0.004
Feedback from supervisor	0.000
Flexible work hours	0.243*
Understanding of family responsibilities by supervisor and/or management	0.002
Support from management and/or union during maternity or other medical situations	0.002

* items with p-value less than 0.05 are not ranked

Table 4.7: Importance-satisfaction ranking

Item	Importance rank	Satisfaction rank
Work pay	1	10
Work benefits	2.5	20
Job security	2.5	22
Personal protective equipment for job performance	4	1
Opportunity to learn new things	5	11
Opportunities to develop skills and abilities	6	6
Utilizing skills and knowledge	7	8.5
Separate and hygienic sanitary facilitates on job sites	8	27
Adequacy of job training	9	4
Opportunity to do something that gives a sense of self esteem	10	8.5
Ability to execute your work	11	2
Adequacy of tools, equipment, machinery for job performance	12	15.5
Completion of whole and identifiable piece of work	14	3
Opportunity for challenging work	14	6
Supervisor support	14	19
Coworker support	16	14
Ability to plan your work	17	6
Understanding of family responsibilities by supervisor and/or management	18	25
Support from management and/or union during maternity or other medical situations	19	24
Feedback from supervisor	20	23
Participation in decision making	21.5	17.5
Friendliness of coworkers	21.5	12
Task variety	23	13
Feedback from coworker	24	15.5
Work activities providing direct and clear feedback about job performance	25	26
Effective workspace layout	26	21
Special clothing for job performance	27	17.5
Opportunity for promotion	28	29
Bonuses	29.5	28
Monetary incentives	29.5	30

4.4 Job Descriptive Index (JDI) and Job In General (JIG) scales

4.4.1 Descriptive analysis

The minimum, maximum, mean, standard deviation, and median values for JDI and JIG scales are shown in Figure 4.4.

Work: An average score of 42.81 for "Work" indicates tradeswomen's satisfaction with the nature of work in construction trades. The minimum and maximum score for "Work" are 22 and 54 respectively. The median for work is 44. Overall women are satisfied with the nature of the work in construction trades.

Pay: A mean of 33.58 for "Pay" also indicates satisfaction. The scores for "Pay" range from 0 to 54 with a median score of 34. Standard deviation for "Pay" is high, 14.56. These low and high scores may be due to the fact that, although high paying, construction work is seasonal and may not necessarily provide year long employment. Thus, some women reported higher satisfaction with "Pay" while some women are less satisfied with "Pay". Current work status of women did not affect mean value of "Pay". Women who were working at the time of study reported a mean of 33.63 while women who were not working reported a mean value of 33.5. Apprentices reported an average of 22.5 for "Pay" whereas journeywomen reported an average of 35.94 (p value = 0.08). Apprentices are paid lesser than journey level workers as they are learning the skills and these values indicate that apprentices might perceive these wages to be less than what they deserve.

Opportunities: Women reported dissatisfaction with "Opportunities" with a mean score of 19.68 and a standard deviation of 15.96. The range for "Opportunity" score is 0 to 54.

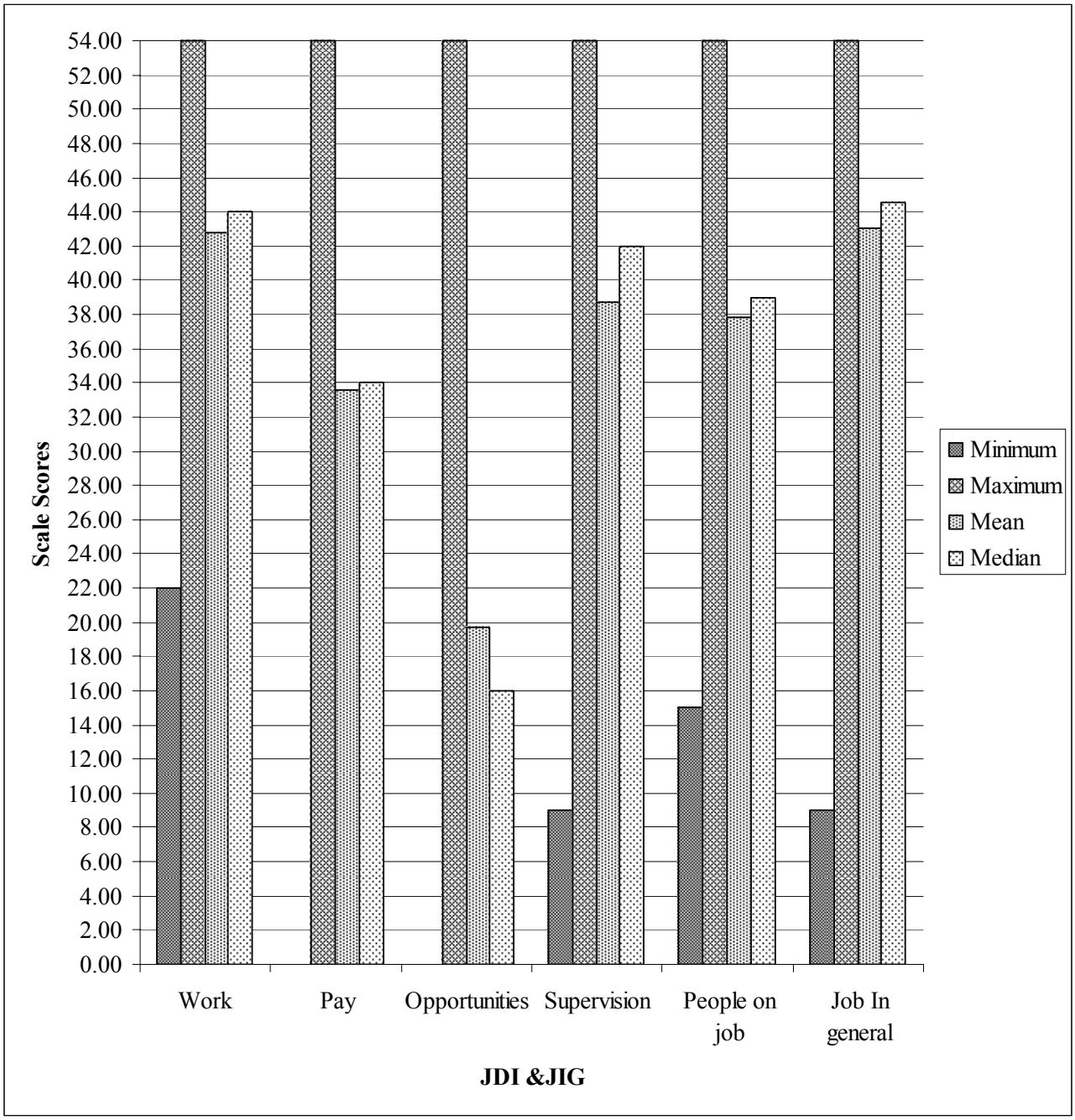
Median score for “Opportunity” is 16. Beyond the journeywomen status, the career path for tradeswomen is not well defined–a possible reason for the reported dissatisfaction in this area. Difference in the mean values for “Opportunity” reported by apprentices and journeywomen is not significant. Women who worked outside local area reported 23.45 as mean for “Opportunity” whereas women who didn’t work outside local area reported 14.5 as mean for “Opportunity” (p-value = 0.067).

Supervision: The fourth scale, “Supervision”, has a mean of 38.71 and indicates satisfaction with supervision. Minimum and maximum score for “Supervision” are 9 and 54 respectively. Median score for “Supervision” is 42.

People on the job: Women reported a mean score of 37.86 for “People on the job”, indicating satisfaction. The standard deviation is 10.05 with minimum and maximum scores of 15 and 54 respectively. Median score for “People on job” was 39. These minimum and maximum scores indicate that the women’s decision to work in construction trades is not affected by the treatment of coworkers or supervisors and is in accordance with previous studies performed on job satisfaction of women in non-traditional occupations.

Job In General (JIG):“Job In General (JIG)” scored 43.02, which is the highest mean value among all scales and represents satisfaction with work in construction trades. The range for “Job In General” is 9 to 54 and median score is 44.5.

Figure 4.4: Minimum, maximum, & mean scores for JDI and JIG scales



4.4.2 Analysis of means by demographic variables

The mean values of JDI and JIG Scales are further analyzed by age group, ethnicity, marital status, number of dependents, union/non-union membership, whether or not the income is a primary source of support, current work status, work background, and intention to quit. They are shown in Table 4.8. The mean values by educational background are shown in Table 4.9. JDI and JIG mean values by primary trade of the respondent are listed in Table 4.10. The average values by working weeks and hours are shown in Table 4.11. The mean values for JDI and JIG for work duration out of the region are shown in Table 4.12. P-values for mean comparisons are shown in Table 4.13.

There were no significant differences observed when mean values for JDI and JIG scales were analyzed by age group. When analyzed by ethnicity, mean values differed for pay. In the "Pay" category, African American women and Caucasian women reported a mean value of 25.2 and 36.3 respectively (p-value = 0.043). 50% of African American Women worked 40 weeks or more last year and 65% of Caucasian women worked 40 weeks or more last year. The reasons for less duration of employment of African American women need to be investigated.

JDI and JIG scale means did not differ significantly by educational background. Almost all the women had completed high school and those who did not had acquired GED. Also, few women had attended technical school or college and therefore no significant difference was observed in JDI and JIG scales.

Significant differences are observed in the mean values of "Supervision" when analyzed by union/non-union membership. Women with union membership reported a

mean score of 37.5 for “Supervision” whereas women working for open shop contractors reported a mean score of 49 (p- value = 0.079).

Mean values for “Pay” varied by number of years in trades. Mean values for “Pay” increased as number of years in trades increased. Most of the women in this study are union workers. Their average “Pay” score is least for first five years of employment as during apprenticeship program they are paid lower than journeywomen. Average “Pay” score increases as they work in trades and acquire journeywomen status.

Average scores for “Supervision” varied by the number of weeks worked last year. Women who worked for 30-49 weeks reported a mean value of 32.5 whereas women who worked 50 weeks or more reported a mean of 43.67 (p-value = 0.023). The average score for “Opportunities for promotion” for women who worked 40-49 weeks in a year was 12.5, significantly lower score than the mean reported by all respondents (t value = 0.0704). These women were not employed for the entire year and thus may have perceived lesser opportunities in work.

Significant differences were observed in JDI and JIG average scores when analyzed by primary trade of the respondent. Carpenters showed a higher satisfaction score with all JDI and JIG scales. Electrical workers were satisfied with “Work”, “Pay”, “Supervision”, “People on the job” and “Job in general” but were dissatisfied with “Opportunity”. Plumber or pipe fitters were also dissatisfied with “Opportunity” with a mean score of 9.6.

Satisfaction levels for “Work”, “Opportunity” and “Job in general” were higher for women who worked outside of the local area. Women working outside the local area reported a mean of 45.59 for “Work” and those working inside the local area reported

mean of 39 for “Work” (p-value = 0.028). Average “Opportunity” scores reported by women who worked outside local area and who did not were 23.45 and 14.5 respectively (p-value = 0.067). Satisfaction with “Job in general” averaged higher with a mean score of 45.54 for women working outside the local area was and averaged 39.56 for women who did not work (p-value = 0.04). Differences were significant for “Supervision” and “Job in general” for number of times women worked outside local area.

Women who indicated that would accept job in another line of work with same pay and benefits as construction trades had lower scores on “Opportunity”, “Supervision”, and “Job in general”. In other words women would quit construction trades because of lesser opportunities, less satisfaction with supervision, and less satisfaction with job in general.

Table 4.8: Means by demographic variables

Demographic variable	Work	Pay	Opportunity	Supervision	People on the job	Job in general
Age						
21-40	44.31	30.25	22.38	39.69	39.00	44.25
41-60	41.73	36.00	17.73	38.00	37.05	42.14
Ethnic background						
African American	40.70	25.20	16.80	35.80	36.00	42.10
Caucasian	42.96	36.31	20.08	39.35	38.04	42.65
Other	51.50	40.00	29.00	45.00	45.00	52.50
Marital status						
Married	42.50	35.63	19.25	38.75	36.06	42.00
Single	44.17	32.00	20.33	39.08	41.33	46.00
Divorced	39.14	32.86	16.86	37.71	35.71	39.29
Widowed	43.00	32.00	34.00	41.00	36.00	46.00
No Response	50.00	30.00	22.00	38.50	40.00	45.00
No. of dependents						
0	42.62	37.54	21.23	37.92	37.92	44.31
1	43.36	31.64	15.64	40.09	37.55	42.55
2 or more	42.57	31.43	21.43	38.36	38.07	42.21
Union membership						
Yes	43.24	33.82	18.82	37.50	37.38	42.65
No	39.25	31.50	27.00	49.00	42.00	46.25
Is income primary source of support						
Yes	42.32	34.13	19.68	38.58	38.87	42.74
No	45.00	31.14	19.71	39.29	33.43	44.29
Current work status						
Yes	42.45	33.64	21.36	39.50	38.36	43.36
No	43.31	33.50	17.38	37.63	37.19	42.56
Work background						
Journeywoman	43.06	35.94	19.50	37.44	37.88	42.78
Apprentice	47.00	22.50	28.00	43.50	41.25	46.25
Other	30.50	18.00	6.00	49.50	31.00	40.50
No. of trade years						
0-10	42.19	26.75	17.25	36.19	36.06	42.81
11-20	43.25	38.00	23.38	42.19	39.81	43.19
21-30	43.33	40.00	16.33	36.17	37.50	43.17
Intention to quit						
Yes	42.00	31.57	14.70	35.61	36.96	40.39
No	43.93	39.29	28.57	44.29	40.07	47.50
Maybe	46.00	0.00	10.00	32.00	28.00	41.00

Table 4.9: Means by educational background

Educational background	Work	Pay	Opportunity	Supervision	People on the job	Job in general
No. of years of school						
10	38.50	33.00	29.00	32.50	44.50	38.50
11	42.00	31.00	23.00	54.00	29.50	45.00
12	43.12	33.77	18.94	38.18	37.97	43.18
General Educational Development (GED)						
Yes	39.60	28.00	24.40	42.40	37.60	41.20
No Response	43.30	34.42	18.97	38.15	37.91	43.30
Technical school						
Yes	48.57	34.00	16.86	41.86	36.71	47.00
No	41.75	32.75	18.25	38.38	38.50	42.63
No Response	41.44	33.74	21.04	37.87	38.00	41.96
Technical school degree						
Yes	49.00	32.67	21.33	42.67	36.33	49.67
No	41.69	33.50	17.63	36.56	39.31	42.56
No Response	42.79	33.79	21.16	39.90	36.90	42.37
College						
Yes	41.67	33.17	19.83	37.58	34.75	42.08
No	46.00	28.00	17.60	40.800	41.40	44.00
No Response	42.71	35.14	20.10	38.86	38.81	43.33
College degree						
Yes	46.67	50.00	35.33	44.00	41.00	47.00
No	40.84	27.79	16.42	37.11	37.16	41.58
No Response	44.44	37.38	20.63	39.63	38.13	44.00
No. of trade years						
0-10	42.19	26.75	17.25	36.19	36.06	42.81
11-20	43.25	38.00	23.38	42.19	39.81	43.19
21-30	43.33	40.00	16.33	36.17	37.50	43.17
Apprenticeship						
Yes	43.15	33.52	18.30	37.42	37.67	42.61
No	39.00	42.00	42.00	39.00	33.00	43.00
No Response	41.00	32.00	25.50	49.25	40.75	46.50

Table 4.10: Means by primary trade of the respondent

Primary trade	Work	Pay	Opportunity	Supervision	People on the job	Job in general
Carpenter	44.50	38.75	29.25	40.75	40.50	47.63
Electrical worker	43.17	33.83	18.33	37.00	35.75	42.25
Plumber or Pipe fitter	45.80	32.80	9.60	42.00	46.00	43.40
Roofer	37.50	29.50	22.00	30.75	32.50	40.75
Other	41.56	30.89	17.56	40.89	36.22	40.78

Table 4.11: Means by working weeks and hours

	Work	Pay	Opportunity	Supervision	People on the job	Job in general
No. of hours per week						
less than 40	37.50	29.50	22.00	30.75	32.50	40.75
40	42.61	34.57	19.00	39.86	38.32	42.93
greater than 40	47.33	31.67	21.33	38.67	39.33	45.00
No. of weeks per year						
less than 30	42.10	32.20	15.40	38.70	37.20	41.60
30-49	43.58	36.17	20.33	32.50	35.92	43.75
50-52	43.07	33.87	22.13	43.67	39.73	43.67
No response	37.00	12.00	18.00	39.00	40.00	39.00

Table 4.12: Means by working out of the region

	Work	Pay	Opportunity	Supervision	People on the job	Job in general
No. of times worked outside last year						
0	42.79	35.71	15.29	35.71	34.79	40.00
1-2	41.86	28.86	18.29	34.00	42.29	43.86
3	41.83	28.00	18.33	35.50	34.67	43.67
more than 3	48.86	41.14	34.57	47.43	44.00	49.43
No Response	35.50	29.50	13.50	47.00	35.00	40.00
No. of weeks worked outside last year						
0	42.27	30.13	13.47	35.87	35.40	40.13
1-9	46.14	33.14	25.71	37.43	42.86	46.57
10	39.00	42.40	28.00	32.00	37.60	41.40
more than 10	52.00	32.00	34.80	46.60	43.60	48.80
No response	35.83	36.67	8.67	46.33	33.67	42.67

Table 4.13: Mean comparisons using t-test

Demographic variable		Mean	t	df	Sig. (2-tailed)
Ethnic Background					
Pay	African American	25.20	-2.102	34	0.043
	Caucasian	36.30			
Union Membership					
Supervision	Yes	37.50	-1.809	36	0.079
	No	49.00			
No. of years in trade					
Pay	0-10	26.75	-2.214	30	0.035
	11-20	38.00			
Pay	0-10	26.75	-2.061	20	0.053
	21-30	40.00			
No. of weeks per year					
Supervision	30-49	32.50	-2.417	25	0.023
	50-52	43.67			
Work Background					
Pay	Journeywoman	35.94	1.807	34	0.080
	Apprentice	22.50			
Primary trade of the respondent					
Opportunities	Carpenter	29.25	2.705	11	0.020
	Plumber or pipe fitter	9.60			
Work	Carpenter	44.50	2.687	10	0.023
	Roofer	37.50			
Job in general	Carpenter	47.62	2.412	10	0.037
	Roofer	40.75			
People on the job	Electric worker	35.75	-2.337	15	0.034
	Plumber or pipe fitter	46.00			
Work outside local area					
Work	Yes	45.59	2.290	36	0.028
	No	39.00			
Opportunities	Yes	23.45	1.890	35.14	0.067
	No	14.50			
Job in general	Yes	45.54	2.133	36	0.04
	No	39.56			
No. of times worked local area					
Supervision	1-2	34.00	-2.446	12	0.031
	More than 3	47.43			
Supervision	3	35.50	-2.361	11	0.038
	More than 3	47.23			
Job in general	3	43.67	-2.525	11	0.028
	More than 3	49.23			

Demographic variable		Mean	t	df	Sig. (2-tailed)
No. of weeks worked outside local area					
Work	10	39.00	-3.438	8	0.009
	More than 10	52.00			
Will you accept job in another line of work with same pay and benefits					
Opportunities	Yes	14.69	-2.769	35	0.009
	No	28.57			
Supervision	Yes	35.61	-2.147	35	0.039
	No	44.29			
Job in general	Yes	40.39	-2.476	35	0.018
	No	47.50			

4.4.3 Correlation analysis

To determine the relationship between the variables, Pearson Correlation coefficients (two-tailed) were calculated. "Work" correlates strongly with "Supervision", ($r = 0.544$, $p < 0.001$) and has a weak correlation with "Opportunities in work" ($r = 0.413$, $p = 0.01$). Satisfaction with work increased as satisfaction with opportunities and supervision increased. "Work" is weakly correlated to "People on the job", ($r = 0.358$, $p = 0.027$). "Pay" has a weak correlation with "Opportunities in work", ($r = 0.425$, $p = 0.008$).

Job In General (JIG) reveals a strong correlation with all JDI scales except "Pay". JIG was correlated with "Work", ($r = 0.718$, $p < 0.001$); "Opportunities in work", ($r = 0.475$, $p = 0.003$); "Supervision", ($r = 0.643$, $p < 0.001$); and "People on the job", ($r = 0.467$, $p = 0.003$). Thus, overall satisfaction with the job tends to improve as opportunities, supervision and relationship with people on job improves. Satisfaction with "Job in General" is not affected by "Pay".

"Pay" has a weak correlation with the number of trade years ($r = 0.369$, $p = 0.018$). As the number of years in a given trade increases, women progress from apprentice to journeywomen status and their pay increased.

Table 4.14: Correlation coefficients

	Work	Pay	Opportunities	Supervision	People on job	Job In general
Work		0.181	0.413(**)	0.544(**)	0.358(*)	0.718(**)
Pay			0.425(**)	0.200	0.191	0.270
Opportunities				0.380(*)	0.379(*)	0.475(**)
Supervision					0.476(**)	0.643(**)
People on job						0.467(**)
Age	-0.066	0.235	-0.159	-0.068	-0.086	-0.076
No. of dependents	-0.022	-0.297	-0.045	0.117	-0.006	-0.101
No. of years of school	0.112	0.028	-0.150	-0.025	-0.053	0.087
No. of years of technical school	-0.19	-0.063	0.029	-0.103	-0.06	-0.19
No. of years of college	-0.013	0.124	0.03	0.015		
Trade years	0.034	0.369(*)	-0.097	-0.007	0.023	0.054
No. of hours worked per week	0.29	0.042	0.006	0.186	0.161	0.139
No. of weeks worked last year	-0.038	-0.115	0.12	0.075	0.083	0.075
No. of weeks worked outside local area	-0.287	0.125	-0.225	0.294	-0.144	0.03
No. of times worked outside local area	-0.247	-0.083	-0.081	0.266	-0.075	-0.083

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

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

5. Discussion, Conclusions and Recommendations

5.1 Discussion

Literature review on women in Non Traditional Occupation (NTO) suggests that women enter NTO including construction trades out of economic necessity. Eisenberg (1998) conducted a study on tradeswomen and found that providing opportunities for promotion and continuous training are essential for hiring and retaining women in trades. This exploratory study reveals that women at large are dissatisfied with opportunities for promotion as well as pay, benefits and job security. Unions and management can play an important role for promotion and career development by ensuring year-long employment and continuous training. This can result in better pay, benefits, and job security for tradeswomen. Mandatory requirements, i.e., separate and hygienic sanitary facilities, and accommodations for women during childbirth, will allow construction trades to be an inviting career option to women.

Construction workers reported a low level of satisfaction with work in a study by Maloney & McFillen (1985). However, in this exploratory study, women had high level of satisfaction with the nature of work in construction trades. Although there are differences in the needs and satisfaction reported by tradeswomen, it is important to note that this study is conducted on tradeswomen in the Cincinnati area and thus results cannot be generalized to all female construction workers in the US. Clearly, there is a need to study the differences in workers' perceptions of different elements of construction work by gender. Although the majority of tradeswomen in this study are union workers (89%),

it was not intended to include only union workers. Perceptions of non-union members can differ and should therefore be investigated.

An analysis of JDI & JIG showed that women had the highest score in overall job satisfaction followed by work, supervision, people on the job, and pay. However, job satisfaction scores are far from perfect and show that there is a wide scope for improving satisfaction with pay, supervision, and people on the job. "Job in general" correlates to all scales except pay. In other words, improving satisfaction with work, opportunities and co-workers will result in higher satisfaction with job in general. Women reported dissatisfaction with opportunities for promotion. Women expressing a desire to quit the trades reported low levels of satisfaction with opportunities and supervision. Therefore, it is important to manage dissatisfaction with opportunities in order to ensure the retention of tradeswomen. JDI & JIG means are significantly different depending on ethnicity, the number of years worked in trades, the primary trade of the respondent, and for those working outside the local area, but the results are inconclusive because of the sample size limitations.

This study is relevant to both researchers and industry practitioners. Labor shortage and a negative (i.e. male dominated) image of the industry are key issues facing the construction industry. Research on tradeswomen is essential and important as attracting and retaining women in trades will help mitigate labor shortage in the long run, improve the image of the industry, and provide ample benefits for all participants of an increasingly diverse workforce.

Construction work is arduous and dangerous in nature. In addition to the physical demands of the work women face isolation, inadequate facilities, lack of on the job

training, and harassment on the job sites. Understanding these unique circumstances under which women work, can help improve working environment for women. Initially, women can be accommodated in trades by assigning them in pairs, providing them with work assignments considering physiological limitations and supporting them during pregnancy and childcare. Developing and implementing training programs for supervisors (foremen, superintendents) focusing on communication, and effective techniques to manage diversity will be key in changing construction workplace culture. Utilizing visible images of women (women in hard hats) on recruiting materials can help generate interest and curiosity in trade jobs. It is observed from this study that women like nature of work in construction trades. Therefore owners, employers and/or unions should focus on providing inviting and encouraging work environment to attract and retain women in trades. Extensive research is required to assess the difference in perceptions of construction workers by gender, union/non-union status and apprentice/journeywoman status to evaluate and improve their performance and job satisfaction.

5.2 Conclusions

Research on women in construction trades is limited. Health and safety issues for tradeswomen and measures to attract and retain women in construction trades emerged as main focus of previous research. No study has provided empirical evidence regarding perceptions of tradeswomen about the different elements of construction work. Although female workers were surveyed in the studies on job satisfaction and motivation of construction workers, no study has compared their perceptions with the majority of the

respondents. In order to develop programs and guidelines to manage a diverse workforce, there is a need to study the perceptions of tradeswomen about their work.

It was observed from the exploratory study that the majority of women who enter construction trades do so through referrals, either from family or friends. Therefore, there is a need to generate more awareness about the prospects of such a career to attract women to construction trades. Women are satisfied with the nature of work in construction trades but are less satisfied with pay, benefits, job security and separate, hygienic sanitary facilities. Coworker support or treatment was not important to women and they were satisfied with people on the job. Women who worked outside the local area were more satisfied with the nature of work and JIG. Improved union and management support is required to improve the chances of women's success in trades. Finally, further research is required to identify differing perceptions regarding construction trades between women in and outside of unions, and between journeywomen and apprentices.

5.3 Recommendations

Majority of the research on job satisfaction of construction workers was performed in early or mid 80's. Tradeswomen being a small part of the workforce were neglected and their perceptions about work, health and safety issues were not investigated. This localized study identified the perceptions of tradeswomen about their work and level of satisfaction or dissatisfaction with different work elements. Clearly, there is a need to conduct an extensive nationwide study to assess the status of women in construction trades and their perspective on how to attract and retain women in trades.

More than half of the women from this study entered construction trades as a result of family or friend referral. Different initiatives such as advertising the prospects of career in trades in schools and colleges through workshops and seminars and its effectiveness should be investigated to attract women to construction trades. Fifty percent of the women from this study would like to quit construction trades. Causes for turnover and solutions to retain women in trades need to be studied to foster employment of women in construction trades.

Finally, comparison between attitudes of apprentices and journeywomen can provide vital information about the progress of women in trades and what needs to be done to improve to satisfaction with work for tradeswomen.

REFERENCES

Agapiou, A. (2002). "Perceptions of Gender Roles and Attitudes toward Work among Male and Female Operatives in the Scottish Construction Industry." *Construction Management and Economics*, 20(8), pp. 697-705.

Anderson, J. M., Dorsey, R. W., Minkarah, E. C., Norberg, D. R., Yeomans, D. D., and Young, R. A. (1991). "Attracting and Retaining Youth and Women." CII Annual Conference, August 13-15, Monterey, California.

Balzer, W. K., Kihm, J. A., Smith, P. C., Invin, J. L., Bachiochi, P. D., Robie, C., Sinar, E. E., and Parra, L. F. (1997). Users Manual for the Job Descriptive Index (JDI; 1997Revision) and the Job in General (JIG) Scales. Bowling Green, OH: Bowling Green State University Press.

Birkland, S. A., Federle, M. O., and Rowings, J. E. (1996). "Characteristics of the Craft Workforce." Journal of Construction Engineering and Management, ASCE, 122(1), pp. 83-90.

Boles, W., and Scott, W. (1996). "Emerging High-Tech Areas of Civil Engineering Attract Women." Journal of Professional Issues in Engineering Education and Practice, ASCE, 122(1), 42-43.

Borcherding, J. D., and Oglesby, C. H. (1974). "Construction Productivity and Job Satisfaction." Journal of the Construction Division, ASCE, 100(3), 413-431.

Dainty, A. R. J., Neale, R. H., and Bagilhole, B. M. (2000). "Comparison of Men's and Women's Careers in U.K. Construction Industry." Journal of Professional Issues in Engineering Education and Practice, ASCE, 126(3), pp. 110-115.

Eisenberg, S. (1998). We'll Call You If We Need You. Cornell University Press, NY.

Fielden, S. L., Davidson, J. M., Gale, A. W., and Davey, C. L. (2000). "Women in Construction: the Untapped Resource." Construction Management and Economics, 18(1), pp. 113-121.

Fields, D. L. (2002). Taking the measure of work: A guide to validated scales for organizational research and diagnosis. Sage Publications, Thousand Oaks.

Garrity, Kathleen. (1999). "No easy solutions to construction labor shortage." Seattle daily Journal of Commerce Online edition, <http://www.djc.com/special/construct99/10050580.htm> (Sep.15, 2004).

Goldenhar, L. M., Hunting, K. L., and Welch, L. (Spring 2000). "Women in Construction: Occupational Health and Working Conditions." Journal of the American Medical Women's Association, 55(2), pp. 89-92.

Goodrum, P. M. (2003). "Worker Satisfaction and Job Preferences in the US Construction Industry." *Proceedings of Construction Research Congress*, March 19-21, Honolulu, Hawaii.

Hopkins, W. E., and Maskell-Pretz, Marilyn. (1997). "Women in Engineering: Toward a Barrier-Free Work Environment." *Journal of Management in Engineering*, ASCE, 13(1), 32-37.

Kinicki, A. J., McKee-Ryan, E. M., Schriesheim, G. A., and Garson, K. P. (2002). "Assessing the Construct Validity of the Job Descriptive Index: A Review and Metaanalysis." *Journal of Applied Psychology,* 87 (1).

Lillydahl, J. H. (1986). "Women and Traditionally Male-Blue Collar Jobs." Work and Occupations, 13(3), 307-321.

Locke, E. A. (1976). "The nature and causes of job satisfaction." *The handbook of Industrial and Organizational Psychology.* p. 1331-1332. Edited by Dunnette, M.D., Rand Mcnally, Chicago, Il.

Maloney, W. F., and McFillen, J. M. (1986). "Motivational Implications of Construction Work." *Journal of Construction Engineering and Management,* ASCE, 112(1), 137-151.

Maloney, W. F., and McFillen, J. M. (1985). "Valence of and Satisfaction With Job Outcomes." *Journal of Construction Engineering and Management,* ASCE, 111(1), 53-73.

Martin, M. (1997). *Hard Hatted Women.* Seal Press, Seattle.

McIlwee, J. (1982). "Work Satisfaction among Women in Non Traditional Occupations." *Work and Occupations,* 9(3), pp. 299-335.

Mobley, W. H. (1982). *Employee turnover: Causes, consequences, and control*. Reading, MA : Addison-Wesley Publication.

Moccio, F., and Finklestein, M. (2000). "Literature Review: Working Paper Series: Tracking the Progress of Women in Non Traditional Employment." *Cornell University's Institute for Women and Work.*

Padavic, I. (1991). "Attraction of Male Blue-Collar Jobs for Black and White Women: Economic Need, Exposure, and Attitudes." *Social Science Quarterly,* 72(1), pp. 33-49.

Padavic, I., and Reskin, B. F. (1990). "Men's Behavior and Women's Interest in Blue Collar Jobs." *Social Problems,* 37(4), 613-629.

Paul, K., Kravitz, D., Balzer, W., & Smith, P. (1990). *The original and revised JDI: An initial comparison.* Paper presented at the annual meeting of the Academy of Management, San Francisco, CA.

Schrader, C. R. (1972). "Motivation of Construction Craftsmen." *Journal of the Construction Engineering Division*, ASCE, 98(2), pp. 257-273.

Smith, P. C., Kendall, L. M., and Hulin, C. L. (1969). *The measurement of satisfaction in work and retirement.* Rand McNally, Chicago, Il.

Spector, P. E. (1997). *Job satisfaction: application, assessment, causes, and consequences*. Sage Publications, Thousand Oaks, CA.

Stamps, P. L. (1997). *Nurses and work satisfaction: An index for measurement*. Health Administration Press, Chicago.

Vroom, V. H. (1964). *Work and Motivation*. Pg. 181-186. John Wiley & Sons, NY.

Yates, J. K. (2001). "Retention of Nontraditional Engineering and Construction Professionals." *Journal of Management in Engineering*, ASCE, 17(1), 41-48.

National Institute for Occupational Safety and Health (NIOSH) (1999). "Providing safety and Health Protection for a Diverse Construction Workforce: Issues and Ideas." Publication No. 99-140. < http://www.cdc.gov/niosh/topics/construction/default.html> (July 21, 2004).

"What Women Really Want?" National Association of Women In Construction (NAWIC) Survey, Construction Bulletin, 31 May 2004.

The construction chart book: The US construction industry and its workers. (2002). The Center to Protect Workers Rights (CPWR), Washington, D.C.

National Association of Women in Construction (NAWIC). (2001). <http://www.nawic.org/aboutna.htm> (Aug. 30, 2004).

U.S. Bureau of Labor Statistics. (2002). < http://www.bls.gov/oco/cg/cgs003.htm> (Aug. 30, 2004).

AFL-CIO Working Women. "Facts About Working Women."

< http://www.aflcio.org/issuespolitics/women/factsaboutworkingwomen.cfm> (March 14, 2005).

U.S. Bureau of Labor Statistics. (2004). < http://www.bls.gov/cps/> (March 2, 2005).

U.S. Bureau of Labor Statistics. (2003). <http://www.bls.gov/iag/construction.htm> (March 15, 2005).

APPENDIX I

Job Satisfaction of Women in Construction Trades

Dear Construction worker,

Researchers at University of Cincinnati would like to find out job satisfaction for women construction workers. With the help of this survey we want to understand the job needs and satisfaction of women in construction trades. Your participation is voluntary and you may refuse to participate at any time. This survey will take approximately 15 minutes of your time.

The answers you provide are completely confidential**.** Please do not write your name or any other information. Your responses will only be seen by research team. Questionnaires will be destroyed after recording the answers.

Please provide your honest response to the questions in the survey and please do not discuss them with other people. By answering these questions, you can help in providing valuable information to the researchers and to the industry.

Thank you for your time and cooperation. We hope that you find this survey interesting.

If you have any questions about your rights to participate in the study please contact UC Institutional Review at 513-558-5784.

Please keep page 1 with you for our contact information. Please return the remaining pages in the prepaid and preaddressed envelope.

Shilpa S Dabke
Graduate Student
Department of Civil Engineering
University of Cincinnati
513-260-3264
dabkess@email.uc.edu

Dr. Sam Salem
Assistant Professor
Department of Civil Engineering
University of Cincinnati
513-556-3759
osalem@uc.edu

Part 1: Demographics

The following information is needed to allow comparisons among different groups of construction workers.

All of your responses are strictly confidential; individual responses will be seen by the research team. We appreciate your help in providing this important information.

1. Zip code of the area where you are currently working: _____

2. Zip code of the area where you live: _____

3. Your age: _____ years

4. Are you – (Check one)

[1] African American [2] American Indian, Alaska native

[3] Asian [4] Native Hawaiian, Other Pacific Islander

[5] Spanish surnamed [6] Caucasian [7] Other

5. Are you – (Check one) [1] Married [2] Single

[3] Divorced [4] Widowed

6. How many dependents do you have (others who depend on your income for their financial support)? (Write in numbers)

_____ dependents

7. How many years of public or parochial school have you completed?

1 2 3 4 5 6 7 8 9 10 11 12

Elementary Junior High High School

8. What other types of schooling or training have you had?
(Check all that apply)

G.E.D. _____

Apprenticeship _____ Did you finish? [1] Yes [2] No

Technical school _____ How many years? (Write in number) _____ years
(Other than apprenticeship)

Did you get a technical school degree? [1] Yes [2] No

College _____ How many years? (Write in number) _____ years

Did you get a college degree? [1] Yes [2] No

9. How did you learn about construction trades?

[1] Family member or Friend [2] News paper or other advertisement

[3] School or College [4] Other Specify:
_____

10. Are you a member of: [1] Union [2] Non-union

The year when you joined your union, if applicable: _____

11. Is your income the primary source of financial support for your immediate family?
(Check one)

[1] Yes [2] No

12. How long have you been in your current trade? _____ years
(Write in number of years)

13. Are you currently working? (Check one) [1] Yes [2] No

14. When you are working, about how many hours do you usually work per week?
(Write in numbers)
_____ hours

15. How many weeks did you work last year? (Write in numbers) _____ weeks

16. Are you – (check one)

[1] a journeyman [2] an apprentice [3] other

17. What is your primary trade? (Check one)

[1] Asbestos workers [2] Boilermakers [3] Bricklayers

[4] Carpenters [5] Cement Masons [6] Electric Workers

[7] Elevator constructors [8] Equipment Operator

[9] Glaziers [10] Iron workers [11] Laborers

[12] Millwrights [13] Painters [14] Plasters

[15] Plumbers and Pipe fitters [16] Roofers [17] Sheet metal workers

[18] Teamsters [19] Tile, Marble and Terrazzo helpers

18. Do you travel to obtain work at projects outside of the local metropolitan area? (Check one)

[1] Yes [2] No

19. If you do travel to work outside of the local area, how long do you work on an out of the area project? (Write in number of weeks)

_____ weeks

20. How many times have you worked out of the area in the past five (5) years? (Write in numbers) _____ times

21. Will you accept a job in another line of work that offers same pay and benefits as you have now?

[1] Yes [2] No

Part II: Importance and Satisfaction

Here is a list of things you could have in your work. How important is each of the following to you and to what degree are you satisfied with each aspect of the work?

	Importance					Satisfaction				
	Not at all	Slight	Moderate	Very	Extreme	Not at all	Slight	Moderate	Very	Extreme
Task variety	1	2	3	4	5	1	2	3	4	5
The particular task assignment you receive	1	2	3	4	5	1	2	3	4	5
Work activities providing direct and clear feedback about job performance	1	2	3	4	5	1	2	3	4	5
Completion of whole and identifiable piece of work	1	2	3	4	5	1	2	3	4	5
Amount of freedom in your work	1	2	3	4	5	1	2	3	4	5
Ability to plan your work	1	2	3	4	5	1	2	3	4	5
Ability to execute your work	1	2	3	4	5	1	2	3	4	5
Participation in decision making	1	2	3	4	5	1	2	3	4	5
Adequacy of tools, equipment, machinery for job performance	1	2	3	4	5	1	2	3	4	5
Adequacy of technical supervision	1	2	3	4	5	1	2	3	4	5
Adequacy of job training	1	2	3	4	5	1	2	3	4	5
Special clothing for job performance	1	2	3	4	5	1	2	3	4	5
Personal protective equipment for job performance	1	2	3	4	5	1	2	3	4	5
Separate and hygienic sanitary facilitates on job sites	1	2	3	4	5	1	2	3	4	5
Effective workspace layout	1	2	3	4	5	1	2	3	4	5
Work pay	1	2	3	4	5	1	2	3	4	5
Work benefits	1	2	3	4	5	1	2	3	4	5
Job security	1	2	3	4	5	1	2	3	4	5
Bonuses	1	2	3	4	5	1	2	3	4	5
Monetary incentives	1	2	3	4	5	1	2	3	4	5
Opportunity for promotion	1	2	3	4	5	1	2	3	4	5

	Importance					Satisfaction				
	Not at all	Slight	Moderate	Very	Extreme	Not at all	Slight	Moderate	Very	Extreme
opportunity to learn new things	1	2	3	4	5	1	2	3	4	5
opportunity to do something that gives a sense of self esteem	1	2	3	4	5	1	2	3	4	5
Opportunity for challenging work	1	2	3	4	5	1	2	3	4	5
Opportunities to develop skills and abilities	1	2	3	4	5	1	2	3	4	5
Utilizing skills and knowledge	1	2	3	4	5	1	2	3	4	5
Friendliness of coworkers	1	2	3	4	5	1	2	3	4	5
Coworker support	1	2	3	4	5	1	2	3	4	5
Supervisor support	1	2	3	4	5	1	2	3	4	5
Feedback from coworker	1	2	3	4	5	1	2	3	4	5
Feedback from supervisor	1	2	3	4	5	1	2	3	4	5
Flexible work hours	1	2	3	4	5	1	2	3	4	5
Understanding of family responsibilities by supervisor and/or management	1	2	3	4	5	1	2	3	4	5
Support from management and/or union during maternity or other medical situations	1	2	3	4	5	1	2	3	4	5

Part III: Satisfaction with work elements

Work on Present Job

Think of the work you do at present. How well does each of the following words or phrases describe your work?

Circle: 1: for "Yes" if it describes your work
2: For "No" if it does not describe it
3: For "?" if you cannot decide

	Yes	No	?
Fascinating	3	0	1
Routine	0	3	1
Satisfying	3	0	1
Boring	0	3	1
Good	3	0	1
Gives sense of accomplishment	3	0	1
Respected	3	0	1
Uncomfortable	0	3	1
Pleasant	3	0	1
Useful	3	0	1
Challenging	3	0	1
Simple	0	3	1
Repetitive	0	3	1
Creative	3	0	1
Dull	0	3	1
Uninteresting	0	3	1
Can see results	3	0	1
Use my abilities	3	0	1

Pay

Think of the pay you get now. How well does each of the following words or phrases describe present pay?

Circle: 1: for "Yes" if it describes your pay
2: For "No" if it does not describe it
3: For "?" if you cannot decide

	Yes	No	?
Income adequate for normal expenses	3	0	1
Fair	3	0	1
Bad	0	3	1
Income provides luxuries	3	0	1
Less than I deserve	0	3	1
Well paid	3	0	1
Barely live on income	0	3	1
Insecure	0	3	1
Underpaid	0	3	1

Opportunities for Promotion

Think of the opportunities for promotion that you have now. How well does each of the following words or phrases describe your opportunities for promotion?

Circle: 1: for "Yes" if it describes your opportunities for promotion
2: For "No" if it does not describe it
3: For "?" if you cannot decide

	Yes	No	?
Good opportunities for promotion	3	0	1
Opportunities somewhat limited	0	3	1
Promotion on ability	3	0	1
Dead-end job	0	3	1
Good chance for promotion	3	0	1
Unfair promotion policy	0	3	1
Infrequent promotions	0	3	1
Regular promotions	3	0	1
Fairly good chance for promotion	3	0	1

Supervision

Think of the kind of supervision that you get on the job. How well does each of the following words or phrases describe this?

Circle: 1: for "Yes" if it describes the supervision you get on the job
2: For "No" if it does not describe it
3: For "?" if you cannot decide

	Yes	No	?
Asks my advice	3	0	1
Hard to Please	0	3	1
Impolite	0	3	1
Praises good work	3	0	1
Tactful	3	0	1
Influential	3	0	1
Up-to-date	3	0	1
Does not supervise enough	0	3	1
Has favorites	0	3	1
Tells me where I stand	3	0	1
Annoying	0	3	1
Stubborn	0	3	1
Knows job well	3	0	1
Bad	0	3	1
Intelligent	3	0	1
Poor planner	0	3	1
Around when needed	3	0	1
Lazy	0	3	1

People on Your Present Job

Think of the majority of the people with whom you work or meet in connection you're your work. How well does each of the following words or phrases describe these people?

Circle: 1: for "Yes" if it describes the people with whom you work
2: For "No" if it does not describe them
3: For "?" if you cannot decide

	Yes	No	?
Stimulating	3	0	1
Boring	0	3	1
Slow	0	3	1
Helpful	3	0	1
Stupid	0	3	1
Responsible	3	0	1
Fast	3	0	1
Intelligent	3	0	1
Easy to make enemies	0	3	1
Talk to much	0	3	1
Smart	3	0	1
Lazy	0	3	1
Unpleasant	0	3	1
Gossipy	0	3	1
Active	3	0	1
Narrow interests	0	3	1
Loyal	3	0	1
Stubborn	0	3	1

Job in General

Think of your job in general. All in all what is it like most of the time?

Circle: 1: for "Yes" if it describes your job
2: For "No" if it does not describe it
3: For "?" if you cannot decide

	Yes	No	?
Pleasant	3	0	1
Bad	0	3	1
Ideal	3	0	1
Waste of time	0	3	1
Good	3	0	1
Undesirable	0	3	1
worthwhile	3	0	1
Worse than most	0	3	1
Acceptable	3	0	1
Superior	3	0	1
Better than most	3	0	1
Disagreeable	0	3	1
Makes me content	3	0	1
Inadequate	0	3	1
Excellent	3	0	1
Rotten	0	3	1
Enjoyable	3	0	1
Poor	0	3	1

APPENDIX II

Dear Shilpa,

I hope you find the answers helpful. Although I am currently unemployed I based my answers on the last project and Superviser I worked with. I usually work for the same masonry Contractor but work under different foreman and supervisors. Each job is different and so is the way a foreman or Supervisor runs his job. There are some who appreciate my work and abilities and want me on their projects. I usually run the wet saw making cuts for the other bricklayers. This is not by choice that I always run the wet saw, but I am the best saw person in our shop. Most of the other journeymen feel the wet saw is some sort of punishment, or they are too good likes its a demotion. Our Contract States that the saw person makes 25¢ more on the hour. I always make sure I get my 25¢. I have no problem with speaking my mind. I don't take any crap from anyone. I am a strong minded woman and I make my presents Obvious. I don't take advantage of the fact that I am a woman in a mans field, but feel I have to give 120% everyday. IS not a woman

is looked upon as "Lazy" or "She is only here because she is a minority." I could have not survived in the trade 14yrs. if I don't give my best everyday. Although I am laid-off right now, I don't mind having some time off. It helps me keep my sanity. I'm tired of the trade but its hard to give up the money. For the most part I like the people I meet and being able to move from one project to the next. I also like the end result; when the project is complete there stands a building that will be around for years, long after I'm gone.

Thank you for your interest in women in the construction industry. I wish you all the best in your studies and choice of occupations. Maybe some day I will see the results of your work +

Thank you!

a Bricklayer by trade
a woman above all!