

DISSERTATION

WOMEN IN CONSTRUCTION MANAGEMENT:
CREATING A THEORY OF CAREER CHOICE AND DEVELOPMENT

Submitted by

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In partial fulfillment of the requirements

for the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

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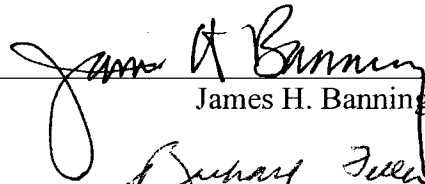
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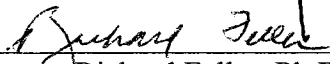
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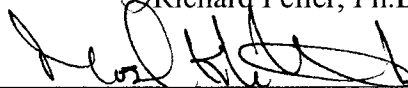
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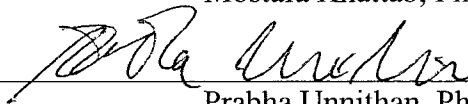
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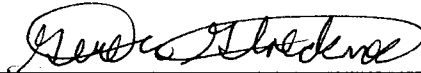
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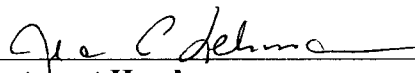
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ABSTRACT OF DISSERTATION

WOMEN IN CONSTRUCTION MANAGEMENT: CREATING A THEORY OF CAREER CHOICE AND DEVELOPMENT

The purpose of this study was to create a theory of women's career choice and development in the context of the construction industry. Focused on female constructors, or those engaged in the management of construction projects or companies, this study investigated the relevant factors, processes, and experiences of women who choose to enter the construction industry through construction management degree programs. The goal was to communicate as a theoretically and practically grounded theory of career choice and development an understanding of who female constructors are and those factors which led them to the construction industry and those influencing their career development.

As a grounded theory research design, qualitative research methods were employed as the primary means of collecting and analyzing data. Purposive and snowball sampling were used to garner a sample of 24 women who had graduated within a ten year period and were actively employed as constructors. Participants' views and experiences, captured through small focus group interviews, were analyzed with quantitative data of demographics, education, construction experience, self-efficacy, personality, and career satisfaction and commitment gathered from a written questionnaire, to create a profile of female constructors used in this theory.

The profiles completed from these data are complex, providing for an extensive understanding of their career choice and development process. The strongest common characteristic in the career development of these women was a mentor. This influence

cannot be overlooked, especially in light of the rather constant sense of isolation many of these women expressed as a significant minority in every facet of their careers.

Recommendations for academia and industry are in many ways related to these findings. Recommendations for recruitment center on educating youth and those able to influence the career choice making process of youth about the career paths available within the construction industry. Suggestions for retention centered on: a) the need for mentoring programs and support networks, and b) modification of industry demands to allow for a better work-family balance. In all, this study provides insights and recommendations for those focused on attracting, hiring, and retaining the employees necessary to meet ever-increasing staffing demands.

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CHAPTER 1

INTRODUCTION

A study of the Construction Industry Institute (CII) member firms found that between 1990 and 2000 total project management hires increased by 17 percent by responding construction firms. This amount, however, was anticipated as needing to increase by a total of 63 percent between 2000 and 2005 (Gibson, Davis-Blake, Dickson, & Mentel, 2003). The National Association of Home Builders has been cited as saying the construction industry should be adding about 225,000 workers per year to offset attrition and retirements to meet labor demands. Unfortunately, in recent years, the industry has fallen about 65,000 to 80,000 workers short of this goal in the United States (Challenger, 2003). In total, the construction industry will need to add more than one million engineers, construction project managers, and skilled trades persons by 2012 to meet the demand for workers (Wagner, 2005). This is a 15 percent increase in the number of wage and salaried positions (compared with the 16 percent increase projected for all Department of Labor industries combined) (Bureau of Labor Statistics, 2005a).

The shortage of construction personnel is not limited to the U.S. market. The United Kingdom reports parallel concerns with a potential shortfall of nearly 67,000 construction managers between 2001 and 2005 (Dainty & Edwards, 2003). Likewise, they expect another shortfall of around 370,000 in the next five years affecting trades across the board (Mann, 2004). Canada is feeling a similar pinch as, by the year 2020, it

is expected they will have a shortage of over one million skilled construction workers (Canada & the World Backgrounder, 2004). These trends hold throughout the world.

One cause of this shortage stems from the pool of employees and job applicants upon which the construction industry has traditionally focused their recruiting efforts. According to a report by the Hudson Institute, *Work Force 2000: Work and Workers for the 21st Century*, in the years between 1988 and 2000, only 15 percent of new entrants into the U.S. labor force were native-born white males. At the same time, white women made up 42 percent of new entrants with the remaining 43 percent from native non-white and immigrant populations (Nixon & West, 2002). This trend is expected to continue, as 85 percent of new entrants to the workforce by 2007 will be women or minorities (Hudson, 2003).

Despite these trends, the construction industry continues to predominately employ native-born white males. Narrowly behind manufacturing and mining, construction is the most segmented labor market with a significant overrepresentation of men (Charles & Grusky, 2004). Less than nine percent of the construction industry is female (Wraige, 2003), of which 2.4 percent work in the trades (Bureau of Labor Statistics, 2005c). Of the nine percent females working in construction, the large majority are employed in principally clerical, secretarial, personal and protective services. Additionally, 43 percent of these women are employed part-time (Fielden, Davidson, Gale, & Davey, 2000). Explanations for this segregation include the insular nature of the industry, the initial expansion in the late nineteenth and early twentieth centuries before the rise in female labor force participation, and the functional or symbolic association between industry and women's household roles (Charles & Grusky, 2004).

Regardless of these explanations, the reality for the construction industry is that it needs women. Many individuals agree (Black Enterprise, 2004; Debo, 2003; Nixon & West, 2002) that actively recruiting women into the industry is “the right thing--and the smart thing--to do” (Debo, 2003, p. 28). Increasing the number of women would be beneficial for individual women, the construction industry, and society. For the individual, such benefits include career options consistent with personality preferences and characteristics (Nauta, 1997) and economic advantages as construction pays significantly better than traditionally “female” occupations (Hesse-Biber & Carter, 2005). For the construction industry, women provide a means of filling some of the thousands of current and projected vacant positions, bringing with them a new perspective and skill set. For the larger society, opening up an industry as large and varied as construction will allow more women to meet their full workplace potential (Farmer & Associates, 1997).

There are other reasons the construction industry and companies should seek to ensure equality for women. Such equal opportunity policies: a) improve efficiency through recruiting and retaining the best staff available; b) increase employee involvement and commitment, resulting in a direct and positive effect on a company’s productivity and business performance; c) enable companies to make the most of the range of knowledge, skills, and attributes of its increasingly diverse workforce, reducing wastage on training costs; and d) increase a company’s ability to relate to its clients, who may be as diverse as the potential workforce and who are increasingly likely to be women (Fielden et al., 2000).

Background of the Problem

Many studies have been done to address the disparity of diversity in the construction industry. Most of their findings can be summarized with the following factors contributing to the lack of women in the industry: the industry's poor image; inaccurate or nonexistent career knowledge; selection criteria and male dominated courses; recruitment practices and procedures; sexist attitudes; male dominated culture; and a hostile work environment (Fielden et al., 2000). Together, these studies suggest that the industry suffers from institutional discrimination against non-traditional entrants (Dainty, Bagilhole, Ansari, & Jackson, 2002).

A first factor to consider in understanding the shortage of workers is the construction industry's problem with 'image', which makes both men and women reluctant or uninterested in the industry. This problem is compounded by a general lack of knowledge and information about the industry, the career opportunities available, and what qualifications are required (Fielden et al., 2000). A decade ago, Swoboda and Cieslik (1996) published a study of high school students' perceptions toward the construction industry and whether or not they would have an interest in construction as a career. Responding to a questionnaire, 61 percent of students said they would not consider a career in construction; 39 percent said that they would or might. Reasons for excluding construction as a career included, in order, "not interested", "work conditions", "did not know enough about it", and "low pay". Other responses like "construction is hard labor", "boring", "I'm a girl", "I like 'thinking' jobs", and "I don't want to be dirty all the time" showed the attitudes of this age group toward the construction industry (Swoboda & Cieslik, 1996).

Eight years later, Tarmac Construction Ltd. in Great Britain, conducted a similar study of young people on the appeal of construction as a career option. The research began by asking young people, aged 16 to 24 years across the UK, about their planned career path. The findings: Only two percent would choose a job in the construction industry. Factors such as poor working conditions, lack of job satisfaction, unsociable or inflexible hours, low pay, and job insecurity were cited. Interestingly, the study revealed that only one percent of surveyed women would choose a job in construction (Mann, 2004). Another study by the Construction Industry Training Board provides some explanation for this with its findings that parents, teachers, and school children believed that jobs in the construction industry were limited to bricklaying, joinery, painting, and decorating (Fielden et al., 2000). Clearly, the construction industry needs help in enhancing its reputation and improving its image to counter common stereotypes.

External, societal factors are also affecting the construction industry's ability to hire women. While there are various routes into the construction industry, either through the crafts and trades, higher education, or professional qualifications, almost all routes require prior education in subjects such as mathematics, science, and technical drawing (Fielden et al., 2000). An incredible number of studies have been conducted discussing the relationship of mathematics and science courses taken by girls and women to their career choices (e.g., Astin, 1993; Ethington & Wolfle, 1988; Garner, 2003; McIlwee & Robinson, 1992; Sells, 1973). Common to all of them is the finding that girls take fewer mathematics and science courses than boys in high school (Betz, 1994; Betz & Fitzgerald, 1987; Fielden et al., 2000). This disparity in education limits women's access to higher level courses and/or mathematics- and science-based majors in college such as

construction management and engineering. For example, 72,809 men, compared to 15,638 women, graduated with a bachelor's degree in engineering and engineering-related technologies majors in the U.S. in 2001-02 (National Center for Education Statistics, 2005).

Yet another impediment to the construction industry's hiring of women resides in its entrenched recruitment patterns and hostile work environment (Dainty et al., 2004; Fielden et al., 2000; Mann, 2004; Post, 2003; Whittock, 2000). Women are often deterred from applying for jobs within the construction industry by informal recruitment procedures; exclusive networks; advertisements and brochures displaying images reflecting masculine values and interests; unstructured interviews; discriminatory selection criteria; sexist attitudes; and a competitive and adversarial culture (Dainty et al., 2004; Fielden et al., 2000). Similarly, many women who have entered the industry have faced discrimination, harassment, and isolation and an environment perpetuating underachievement and stratification (Dainty et al., 2004; Fielden et al., 2000; Post, 2003).

A 2003 study, applying a new Equal Employment Opportunity index to six industries (i.e., manufacturing; mining and construction; transportation, communication, and utilities; retail and wholesale trade; service; and finance, insurance, and real estate), found the mining/construction industry to be the most inhospitable climate for women (Graham & Hotchkiss, 2003). Of the five index components (i.e., equal pay; occupational segregation; glass ceiling; hiring; and related discrimination), mining/construction (MC) scored quite poorly of three categories. MC was the worst performing industry in terms of gender-related occupational segregation with almost 70 percent of workers needing to change jobs to equalize the occupational distribution of

men and women. MC did not perform well in the glass ceiling component, with 75 percent of women at levels below that of managerial and professional, relative to the market norm of 59 percent. Finally, in the discrimination component, MC performed at approximately one standard deviation less than the norm (Graham & Hotchkiss, 2003). All of this indicates that the construction industry needs to change its labor practices to increase diversity and attract female workers. More research, however, is needed to identify ways to overcome barriers to a diverse workforce.

Statement of the Problem

Perhaps the greatest impediment to attracting women into the construction industry is found in the lack of understanding into girls' and women's career choice and development by those charged with their recruitment and retention. Despite a significant amount of research in the area of career choice and development, little progress has been made toward making such theories applicable to people other than white males (i.e., women and minorities) (Brown & Associates, 2002; Leong, 1995). Likewise, although some have suggested a converging of major theories or called for a unifying theory of career choice and development (Fassinger, 1985, 1990; Lent, Brown, & Hackett, 1994; Osipow, 1990), most recognize that this still has to be achieved (Brown & Associates, 2002; Farmer & Associates, 1997).

Also at issue is a lack of understanding of factors which attract some women into the construction industry. Studies have been done of women in other non-traditional fields such as mathematics, science, and engineering (Graham, 1997; Hyde, 1997; Nauta, 1997; Winkelman, 1999), but this researcher could find only one study specific to the construction industry which attempted to understand the experiences of women (Dainty,

Bagilhole, & Neale, 2000). There are many antidotal accounts of women's experiences (e.g., Miodonski, 2002; O'Dea, 1997; Post, 2003), but few studies have tried to tie their experiences together from a theoretical perspective to give larger meaning to career choice and development.

Purpose Statement

Therefore, the purpose of this study was to create a theory of women's career choice and development in the context of the construction industry. This research specifically targeted female constructors, or those in the professional ranks engaged in the management of construction projects and/or companies. The first step in this theory building process was to define those current, grand theories of career choice and development, focus on their more discrete components and limited sets of interacting variables, and explore in detail these components in the context of female construction professionals (Bandura, 1986b).

The second necessary step in this process was building a profile of women who enter and remain in the construction industry as professionals. Smaller sets of variables (see Farmer and Associates, 1997) and variables of non-traditional career choice were grouped into categories (see Graham, 1997) to guide this step of the theory building process. These variables were then intertwined with data collected from female constructors and, from such, a profile was created.

In the end, the goal of this research was to communicate as a theoretically and practically grounded theory of career choice and development an understanding of who female constructors are and what factors led them to the construction industry. Recommendations are then made to guide efforts of academia and industry focused on a)

recruiting women into construction management degree programs; and b) retaining these women in professional positions in the industry.

Research Questions

Focused on female constructors who have completed a degree program in construction management and who are now actively employed in professional positions in the construction industry, five broad research questions guided the study:

1. What factors shape the career choice making process of women entering construction management as a major and profession?
2. What factors influence (both positively and negatively) the career development of female constructors in the construction industry?
3. What factors influence (both positively and negatively) the feeling of inclusion for female constructors in the industry?
4. What recommendations can be made to academia and industry for the successful recruitment and retention of women into professional positions in the construction industry?
5. Are there associations and differences among factors that would provide a better understanding of the traits and characteristics of female constructors in the construction industry?

Definition of Terms

Career: Dimensions of career include structure, culture, and action. These are interrelated aspects--structure and culture arise out of actions and actions are influenced by structure and culture (Bourdieu & Wacquant, 1992, as cited in Evetts, 1996).

Structure is the reproduction of institutional forms and, while weakest in incorporating

change, includes the adaptation of 'new' forms to accommodate change. Culture includes the belief systems and controlling social institutions that influence occupational choice, as well as an analysis of gender differences in attributes, ways of working, and style. Understanding the action of career shifts the focus away from the system (i.e., structure and culture) toward the experiences of the individual (Evetts, 1996).

Constructor: Includes titles such as manager (e.g., project, purchasing, plans), engineer (e.g., project, office, field, cost), estimator, business development officer, contract administrator, and superintendent. These include positions responsible for the support of construction projects or construction organizations through procurement, scheduling, cost estimating and accounting, engineering design, construction administration, document control, field supervision, safety management, and so on (Gibson et al., 2003). This does not include labor, trade, apprenticeship, foreman, clerical, human resources, or sales and marketing positions.

Non-traditional Occupations: Occupations employing less than 30 percent women (Betz & Hackett, 1981). These occupations are characterized as male gender role specializations and positions that most women do not aspire to nor achieve (Winkelman, 1999).

Persistence: Refers to a behavioral tendency to persevere or persist and suggests an admirable striving against opposition (Reber, 1985, as cited in Graham, 1997). As part of this research, persistence is defined as having completed a bachelors and/or master's degree in construction management with current employment as a constructor within the construction industry.

Profile: An analysis of a person in the sense of a sketch or general representation of the personality traits and characteristics displayed, relative to a set of norms for the population as a whole (Reber, 1985, as cited in Graham, 1997).

Self-efficacy Expectations: A person's beliefs concerning his or her ability to successfully perform a given task or behavior. Bandura (1977), as the founding father of self-efficacy theory, postulated that these beliefs are the major mediators of behavior and behavior change. Betz and Hackett (1981) define self-efficacy expectations by their level (i.e., the degree of difficulty of the tasks the individual feels capable of attempting) and their strength (i.e., the individual's confidence in his or her capability). The former of these characteristics influences the kinds of behaviors attempted and avoided while the latter influences one's persistence of behavior when disconfirming or dissuading experiences are confronted.

Researcher's Perspective

As an academic adviser and the internship and job placement coordinator for the largest undergraduate construction management program in the United States, I have a vested interest in understanding what factors and experiences influence a student's selection and successful completion of a degree program, as well as what characteristics and strategies make graduates persist and thrive in the construction industry. Over the years, I've spent many hours talking with women in our program about their goals, dreams, fears, and frustrations with their academic program, their internship(s), and their prospects for employment upon graduation. At the same time, I've had the opportunity to work with hundreds of men and women in the construction industry who are seeking to hire these women--for reasons as varied as their individual skill sets (i.e., most qualified

individual for the position) to the filling of quotas (i.e., number of women and/or minorities on a job or in a company).

It is my experience that females who enter construction management programs have backgrounds as varied as those of male students and face many of the same academic challenges. They are, however, outnumbered in our program about 13:1. Over a year ago some of our female students contacted me about organizing a Women in Construction student club as a way of banding together and networking with other women in the construction industry. In our first year, we garnered a membership of nearly 30 students (mostly construction management majors and interior design majors with a minor in construction management), which is roughly half of our program's female student enrollment.

Overseeing over 100 placements and internships of women students over an eight year period, I believe there to be unique conditions affecting women's experiences in industry. Some of the organizations or individuals hiring interns have never employed or worked with women; others are specifically seeking to hire women (assuming appropriate qualifications). Many of our female students have questioned if they are getting a job offer based upon their qualifications or their gender (oftentimes the answer is both). Usually our female students are praised by their internship sponsors--often receiving some of the highest recommendations of any students for, among other things, their organization, communication skills, and technical knowledge. More often than not, female students will have multiple job offers upon graduation. We have, however, faced situations of sexual harassment and intimidation, and, some women have come back from

their internships questioning their career choice and/or place within the industry (e.g., type of position, type of work and/or construction company, balance of family and work).

I have had the opportunity to work with hundreds of students and industry members over the years, helping each navigate the search for “the right fit” or “a future leader in the construction industry”. I believe that the construction industry holds enormous potential for women and, likewise, can gain much unrealized benefit from their addition. Much, however, still needs to be done to create a feeling of inclusion to bring women into construction management programs and the construction industry.

Delimitations

Both a purposive sampling frame and snowballing were used. All participants in the study met the following criteria:

- Female;
- Have completed a degree (i.e., bachelors or master’s) in a construction management program between May 1994 and May 2004;
- Have at least one year full-time experience working in the construction industry post-college graduation; and
- Currently hold a professional position in the construction industry.

Going into the process of selecting participants, it was anticipated that a majority of participants would be graduates of the construction management program at Colorado State University (CSU) as, at about 13 percent female and the largest program in the country, CSU graduates more women than many other degree programs (i.e., more recent female alumni). Likewise, it was anticipated that the majority of participants would reside in Colorado as many alumni remain in the state after graduation and this is the

location of the researcher. Experience in the industry was anticipated to be of a broad range, but mostly at the entry- and mid-levels of project management and engineering. By selection, participants work for a variety of construction firms involved in the building and managing of construction projects.

Limitations

There were limitations within this study. As a methodology, data collected relied on participants' long-term memory recall and their perception of personal experiences. It is quite possible that some were unable to accurately recall the processes and influences of choice of major. Likewise, they may not have been consciously aware of the factors enabling their persistence in their degree program or in industry. Different people interpret events and situations differently; therefore, what is a difficulty or a challenge for one may not be for another. Finally, data collected were limited to what the participant wished to share--it is possible that all factors of career choice or experiences of persistence (e.g., very personal or traumatic) were not shared by each participant.

The study emphasized the experiences of women within a certain time frame (i.e., one to ten years post college graduation) and in a particular region of the country (i.e., Colorado). It did not include women working in the trades nor female constructors without a bachelors or master's degree in construction management. The purpose of this research was to create a theory of career choice and development specific to the population of women who enter and remain in professional positions from construction management degree programs. Such a methodology is concerned with 'analytic generalization' (Yin, 1994) or the building of conceptual categories and frameworks (Locke, 2001). The data and observations gathered from the participants are generalized

as part of the broader context of theory. As Locke (2001) states, “A conceptual category has analytic generalizability when it can plausibly account for a large number and range of empirical observations” (p. 39). As such, the data gathered to create a profile of female constructors were integrated with these conceptual categories to create a theory of career choice and development focused upon this particular population of women.

Overview of Study

This study followed the guidelines of a grounded theory research design. This means that the theory developed was “derived from data, systematically gathered and analyzed through the research process” (Strauss & Corbin, 1998, p. 12). As such, components of the research design and concepts were allowed to emerge during the research process. The goal of this approach is to build a “dense, well-developed, integrated, and comprehensive theory” of the topic (Strauss & Corbin, 1998, p. 33). The substantive theory of career choice and development formed from this study included components of the research (i.e., profile of women constructors) integrated with key components of prominent career development theories, as well as factors of non-traditional career choice, career development, and persistence.

Small focus groups resembling small group conversations and a written questionnaire were the methods of data collection. Such methods were appropriate as the intent of this study was to “make sense of (or interpret) the meanings others have about the world” (Creswell, 2003, p. 9). Participants’ views and the subjective meanings of their experiences, in their own words, were gathered and coded to develop a theory or pattern of meaning (Creswell, 2003). A similar qualitative research design has been used

by other researchers conducting similar studies (Farmer & Associates, 1997; Graham, 1997; Hyde, 1997; Miller, 2004; Winkelman, 1999).

Theoretical Framework

Theories of career development provided the theoretical framework for this study of women in the construction industry. Specifically, these career development theories included Krumboltz's (1979) (later Mitchell & Krumboltz, 1990, 1996) social learning theory of career decision making; Betz and Hackett's (1981) self-efficacy theory; Lent, Brown, and Hackett's (1994, 2002) social cognitive career theory; and Gottfredson's (1981, 1996, 2002) developmental theory of circumscription and compromise. Various factors of non-traditional career choice, career development, and persistence were also integrated into this framework.

Overview of the Chapters

Following this introduction, the specific components of the study are presented in Chapters 2 through 5. Chapter 2 provides a review of the literature. Chapter 3 contains the methodology and procedures utilized in the study. Chapter 4 presents the textual data and analysis of the findings, and Chapter 5 includes the study's summary, conclusions, and recommendations for future research. Materials relevant to the data collection and analysis are included in the Appendixes.

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this study was to create a theory of women's career choice and development in the context of the construction industry, specifically targeted to female constructors or those in the professional ranks engaged in the management of construction projects and/or companies. A critical first step in this theory building process was conducting a review of literature central to the topic. Within this review, theories of career choice and development and factors of non-traditional career choice are discussed in some depth. Constructs related to the retention of women in construction degree programs and, upon graduation, in professional positions are also explored within the context of campus and industry cultures.

Career Development Theories

Career choice and development theories are explanations of how the contexts in which people live interact with their individual traits, personality characteristics, and self-perceptions to influence their career development and decision making. All theories of career choice and development are rooted in one of two philosophical positions--logical positivism or social constructionism (Brown & Associates, 2002). The most common of these, logical positivism, takes the view that scientific knowledge is "the paragon of rationality"; that it must be based on *neutral* observation that is free of the interests, values, purposes, and psychological schemata of individuals (Howe, 2003, p. 35; italics in original). The other position, social constructionism, has steadily gained more

recognition in the past 25 years and is now firmly established in the field of career development theory (Brown & Associates, 2002; Young & Collin, 2004).

Social constructionism calls for a more narrative approach, seeking a holistic view of career which accounts for time and space (Cohen, Duberley, & Mallon, 2004). In such an approach, observation cannot be neutral in the sense of excluding interests, values, purposes, and psychological schemata. Rather, any investigation must aim for an interpretive understanding of one's place in the social world (Brown & Associates, 2002; Howe, 2003). This social world is made real (constructed) through an individual's social processes and interaction and, as regards careers, is part of the form or structure that an individual temporarily inhabits, constraining or enabling his or her journey through life (Cohen et al., 2004; Young & Collin, 2004). Social constructionism is concerned with how an individual's world is endowed with meaning, and how these meanings are reproduced, negotiated, and transformed through social practice (Cohen et al., 2004).

Theories about career choice and development date to the turn of the twentieth century with Frank Parsons' 1909 book, *Choosing a Vocation*. Parsons (1909) believed that if people actively engage in choosing their own career path, rather than allowing chance to find their vocation, they will be more satisfied with their careers, thereby decreasing employers' costs and increasing their own efficiency as an employee. Simply put, these trait-and-factors theories have their roots in Parsons' tripartite model where one's choice of career centers upon three broad factors:

A clear understanding of yourself, your attitudes, abilities, interests, ambitions, resources, limitations, and knowledge of their causes; a knowledge of the requirements, conditions of success, advantages and disadvantages, compensations, opportunities, and prospects in different lines of work; and true reasoning on the relations of these two groups of facts (Parsons, 1909, p. 5).

Since, many theories have emerged on the subject, most rooted in logical positivism or the “philosophical position asserting that foundations in the form of logical proofs and empirical bases can be built” (Brown & Associates, 2002, p. 12). This rather simple idea of matching person to job is the cornerstone of the dominant person-environment fit (P-E) career development model (e.g., Holland’s theory of personality and vocational choices (1985) and Dawis and Lofquist’s work adjustment theory (1984)) (Brown & Associates, 2002). Both theories posit that the degree of congruence between personality and the demands of an occupational environment determine occupational success, satisfaction, and tenure (Hackett & Lent, 1992). The P-E fit theories are concerned with the *content* of career choices, that is, *which* occupation is chosen (Hackett, 1995; italics in original).

Arguing that these trait-and-factor theories do not provide adequate guidance for persons other than white, middle-class boys and men, Osipow (1966) and others since have sought career choice and development theories which focus more on process and less on outcome of career choice (Farmer & Associates, 1997). They claim that this relationship of intellect to obtained educational and occupational levels holds reasonably well for men, but not for women (Betz, 1994). Existing theories are “formulated primarily to explain the career development of men, and since women’s career development is different from men’s, the existing theories are inadequate” (Brooks, 1984, p. 355). Therefore, as women’s talents and abilities are not being used to their full potential in educational and career pursuits, this matching model is not applicable to women (Betz, 1994).

In the new process paradigm, developmental and social learning theories dominate (Hackett, 1995). These theories focus more on the process than the outcome of career choice, positing that people will be most successful and satisfied in careers that utilize their individual abilities, talents, and interests. In his developmental theory, Super (1990) describes the tasks individuals negotiate, as a series of stages, in the course of career decision making and development. The social learning perspective of career development also emphasizes the process of career decision making, not through a framework of stages, but through learned interests, values, beliefs, and skills (Hackett, 1995).

Creating an inclusive theory of career choice and development is no easy task. Brown, Brooks, and Associates (1990) conducted an extensive review of career development theory, identifying three approaches being taken to develop a theory which more adequately explains the career choice and development of women. These approaches are: a) application of a theory from one realm to another (e.g., Betz and Hackett's application of self-efficacy theory to vocational behavior (1981)); b) creation of a new theory which is applicable to men and women (e.g., Gottfredson's developmental theory of circumscription and compromise (1981, 1983) and Astin's sociopsychological model (1984)); and c) suggestion of ways in which additional concepts can be incorporated into existing theories (e.g., Forrest and Mikolaitis' relational identity model (1986)).

Each of these theories is rooted in social constructionism or the tenet that "people actively construct their own reality; they are not simply passive recipients of it" (Brown & Associates, 2002, p. 13). While none of these theories provide a comprehensive theory

of women's career development, they are among several theories of career choice and development useful in understanding women's occupational choice and career development. From these theories, four were selected to provide the foundation for this study and build the framework of analysis of women's career choice and development.

Three of these theories, spanning three decades, have evolved from the work of Albert Bandura (1969, 1977, 1986a, 1986b). In 1979, Krumboltz set forth his social learning theory of career decision making. In 1981, Betz and Hackett were the first researchers to apply self-efficacy theory to the process of women's career development and, in 1994, Lent, Brown, and Hackett published their model of career decision making (Brown & Associates, 2002; Farmer & Associates, 1997).

Central to these theories is a) emphasis on the learning and behavior which results from the reciprocal interaction of the person with the environment; and b) Bandura's concept of personal "agency" or "the capability within each individual that gives a person a shaping influence over his or her attitudes and feelings, as well as the ability to anticipate outcomes, and to plan ahead" (Farmer & Associates, 1997, p. 6). Three assumptions underlie these theories:

1. Career planning takes place within a life planning framework and these plans must take into account other life roles such as spouse or partner and parent as well as other personal roles;
2. Choice of career field should be consistent with an individual's abilities, aptitudes, values, and interests, and should be realistic in light of societal opportunities and constraints; and

3. Women's full potential is not being used in the workforce. Betz and Hackett (1981) refer to the "null environment" that women experience with respect to their careers, an environment that appears indifferent to their interests in and their preparation for a career (Farmer & Associates, 1997).

The other theory included as a framework for this study is a newly developed theory designed to extend the applicability of career choice and development concepts to women. First published in 1981, Gottfredson's developmental theory of circumscription and compromise added a new set of constructs to the field of career choice and development theory (Brown & Associates, 2002). While somewhat an extension of Super's work where self-concepts such as self-efficacy, self-esteem, and role self-concepts influence one's career aspirations and choice (Super, Crites, Hummel, Moser, Overstreet, & Warnath, 1957), Gottfredson's own theory is based upon the assumption that "people embody inherent characteristics that distinguish them from others and that help make them who they are" (Gottfredson, 2002, pp. 86-87). This notion is especially useful when applied to women's career choice and development.

Social Learning Theory

Krumboltz's social learning theory of career decision making (Krumboltz, 1979; Krumboltz, Mitchell, & Jones, 1976) is an outgrowth of Bandura's (1977, 1986a) general social learning theory of behavior (Mitchell & Krumboltz, 1990). Social learning theory emphasizes Bandura's view of people's conceptions about themselves and about the nature of things as being developed and verified through the processes of a) direct recognition of the effects of their actions; b) observation of the effects of someone else's

behavior; c) verbal instruction and discourse; and d) self-generation of knowledge structures through reasoning processes (Krumboltz & Nichols, 1990).

The central concept in this theory is learning--knowledge accumulated over time through a complex combination of perception, information processing, and memory processes (Krumoltz & Nichols, 1990). People acquire their preferences for various activities through a variety of learning experiences and make sense of their activities based upon ideas they have been taught or have learned through experience. Likewise, they acquire beliefs about themselves and the nature of their world through direct and indirect educational experiences. Finally, they take action on the basis of their beliefs using skills developed over time (Krumboltz & Nichols, 1990).

Social learning theory proposes four categories of factors which influence the career decision making process (Mitchell & Krumboltz, 1990). These are:

- *Genetic endowment and special abilities.* These are the inherited qualities that may set limits on educational and occupational preferences and skills. Mitchell and Krumboltz (1990) believe that it is a “reasonable assumption” that special abilities such as intelligence, artistic ability, and muscular coordination, result from the interaction of inherited predispositions and exposure to selected environmental events (p. 148).
- *Environmental conditions and events.* These include social, cultural, political, and economic forces, as well as natural forces such as natural disasters and the location of natural resources. Such factors are often outside the control of any one individual and may be both planned and unplanned. They include the following: number and nature of job opportunities; number and nature of

training opportunities; social policies and procedures for selecting trainees and workers; rate of return for various occupations (e.g., monetary and social reward); labor laws and union rules; physical events (e.g., natural disasters); availability of and demand for natural resources; technological developments; changes in social organization; family training experiences and resources (e.g., family of origin); educational system; and neighborhood and community influences (Mitchell & Krumboltz, 1990).

- *Learning experiences.* People develop their preferences by interacting with their environment in a long and complex series of experiences (Krumboltz & Nichols, 1990). Social learning theory posits two types of learning experiences that result in “individual behavioral and cognitive skills and preferences that allow one to function effectively in one’s environment” (Mitchell & Krumboltz, 1990, p. 146). The first, instrumental learning experiences, are those which are developed through the consequences of repeatedly trying a variety of activities. Through instrumental learning experiences people develop a preference for activities in which they succeed or are rewarded, and they tend to lose interest in activities in which they fail, receive no reward, or are punished (Krumboltz & Nichols, 1990). The second, associative learning experiences, occur when individuals associate some previously affectively neutral event with an emotionally laden event. These experiences are often gained through vicarious experiences or those learned behaviors and skills gained by observation of others, books, movies, and television (Mitchell & Krumboltz, 1990). Such associations are not

necessarily consistent--they may be contradictory and include complex combinations of values involving prestige, financial reward, masculinity/femininity, variety, economic security, and altruism (Krumboltz & Nichols, 1990).

- *Task approach skills.* Through cognitive processes people are able to relate their observations of themselves to their environment and make estimates of the degree to which they would be able to perform various activities in the real world (Krumboltz & Nichols, 1990). The relationships between the self-observation generalizations, such as learning experiences, genetic characteristics, special abilities, and environmental influences, and the outside world are called task approach skills (Krumboltz & Nichols, 1990; Mitchell & Krumboltz, 1990). Task approach skills are learned cognitive and performance abilities used in the process of career decision making. These skills include performance standards and values, work habits, perceptual and cognitive processes, mental sets, and emotional responses (Mitchell & Krumboltz, 1990). Such skills change depending upon the situation and, therefore, influence outcomes.

Each society and culture has a particular set of environmental conditions, economic opportunities, institutions for learning, and political and social conditions that influence the nature of learning experiences. Self-observation generalizations and task approach skills depend on all of these factors (Krumboltz & Nichols, 1990). Such a realization is important in understanding women's career choice and development.

Self-Efficacy Theory

Based on social learning theory (Bandura, 1977; Krumboltz et al., 1976), the self-efficacy approach to women's career development proposed by Betz and Hackett (1981) postulates that one class of cognitive behavior (i.e., self-efficacy expectations) are relevant for understanding women's career development. Specifically, they propose that self-efficacy is significantly related to occupational choice and that gender differences in self-efficacy are predictive of gender differences in occupational consideration for certain types of occupations (Lent & Hackett, 1987).

Self-efficacy expectations are defined as "a person's beliefs concerning his or her ability to successfully perform a given task or behavior" (Betz & Hackett, 1981, p. 400). It refers to one's judgments about one's ability to organize thought, feelings, and actions to produce a desired outcome (Bandura, 1986b). Bandura (1986b) describes four areas of experience from which people derive their self-efficacy beliefs: achievements, vicarious experiences, verbal persuasion, and physiological state. One's own successful task performance (i.e., achievement) is the most influential experience affecting an individual's self-efficacy. Vicarious experiences (i.e., successful performance by role models or mentors), verbal persuasion and encouragement (i.e., being told one can "do it"), and physiological state (i.e., level of risk tolerance vs. aversion) are important, but less influential, sources of self-efficacy (Anderson & Betz, 2001; Vrugt, 1996).

Betz and Hackett (1981) discuss both the level and strength of one's self-efficacy as important in career choice and development. The *level* of self-efficacy, or the degree of difficulty of tasks one feels capable of attempting, influences the kinds of behaviors attempted and avoided. The *strength* of self-efficacy, or an individual's confidence in his

or her capability, influences persistence of behavior when disconfirming or dissuading experiences are confronted. For example, self-efficacy for academic milestones (i.e., strength of self-efficacy), in combination with other academic and support variables, has been found to be the strongest predictor of academic achievement of students enrolled in university-level engineering/science programs. Outcome expectations, vocational interests, and low levels of stress (i.e., level of self-efficacy) are the strongest predictors of academic self-efficacy (Hackett, Betz, Casas, & Rocha-Singh, 1992).

Academic self-efficacy denotes confidence in performing academic tasks. Stronger academic self-efficacy expectations, therefore, result in higher academic achievement as students with high self-efficacy perceive failure experiences as challenges rather than threats. Students with higher academic self-efficacy also indicate higher persistence intentions as their self-efficacy expectations lower academic stress and maintain psychological and emotional health (Torres & Solberg, 2001). Many studies support this notion that academic self-efficacy influences academic aptitude and achievement (Lent, Brown, & Larkin, 1984; 1986; 1987; Solberg, O'Brien, Villarreal, Kennel, & Davis, 1993; Torres & Solberg, 2001).

Self-efficacy expectations are also useful to understanding women's career development as career interest and career self-efficacy expectations have been shown to significantly predict the range an individual has of perceived career options. Similarly, career interest and sex role socialization predicts these self-efficacy expectations (Rotberg, Brown, & Ware, 1987). This is an especially important finding because the sex role socialization of females is less likely than that of males to facilitate the development of strong career-related self-efficacy. Women and girls are often not encouraged or are

actively discouraged from engaging in activities which serve to increase and strengthen expectations of personal efficacy (Betz & Hackett, 1981). For example, boys are more likely to gain experiences outside the home, such as carpentry, mechanical pursuits, and sports, than are girls, whose experiences are traditionally more focused on indoor and/or domestic activities (Maccoby & Jacklin, 1974, as cited in Lent & Hackett, 1987).

Betz and Hackett (1981) suggest that socialization-based differences between men and women in self-efficacy for traditionally gendered career fields may be a causal factor influencing the underutilization of women's talents and their underrepresentation in many male dominated careers (Lent & Hackett, 1987; Hackett et al., 1992). Whether it be fields such as law, medicine, mathematics, science, or engineering, skilled trades, managerial, or administrative positions, self-efficacy theory postulates that the underrepresentation of women is "at least partially due to low or weak self-efficacy expectations with regard to behaviors required for the successful pursuit and performance of those occupations" (Betz & Hackett, 1981, p. 400).

Social Cognitive Career Theory

Social Cognitive Career Theory (SCCT) embraces constructivist assumptions about an individual's capacity to influence their own development and surroundings, complementing and building upon other theories of career development (Lent et al., 2002a). Following from Bandura's (1986b) general framework, SCCT is linked to two branches of career inquiry which have already been discussed: Krumboltz's social learning theory (Krumboltz, 1979; Krumboltz et al., 1976; Mitchell & Krumboltz, 1990, 1996) and Betz & Hackett's (1981) self-efficacy theory (Lent et al., 2002a). SCCT is not a restatement of these theories, however, as there are important differences among them.

Likewise, SCCT has been informed by other cognitively oriented models of career and academic behavior; certain theories of work motivation; theory and research on women's and racial-ethnic minority members' career development; developmental-contextualist views on career behavior; and findings from behavior genetics, personality, and social psychology (see Lent et al., 2002a, p. 259).

SCCT represents a comprehensive conceptual framework for understanding vocational interest formation, career choice, and academic and career performance (Schwab & Tokar, 2005). It includes the interplay between cognitive-person variables (such as self-efficacy) and other aspects of the person, his or her behavior, and the context (e.g., gender, ethnicity, barriers, support systems) that may constrain or enhance personal agency (Lent et al., 2002b).

SCCT was designed to address issues of career development for a wide range of students and workers. Concerned with individual and contextual variables (i.e., gender, ethnicity, physical health or disability, genetic endowment, and socioeconomic conditions), SCCT considers these variables from a social constructivist point of view in which these attributes are interwoven features of the individual's socially constructed world, not simply inherited biological properties (Lent et al., 2002a). Bandura (1997) concluded that apart from the role of self-efficacy beliefs in promoting gender differences in occupational pursuits, "cultural constraints, inequitable incentive systems, and truncated opportunity structures are also influential in shaping women's career development" (as cited in Lent et al., 2002a, p. 283).

Bandura (1986b) saw SCCT as a complex interplay among goals, self-efficacy, and outcome expectations which self-regulate behavior. He believed that one's

perception of efficacy and other self-evaluative mechanisms foster the growth of intrinsic interests. As such, SCCT hypothesizes that person inputs (including predispositions such as personality traits) and background experiences affect career self-efficacy beliefs and outcome expectations by shaping learning experiences (i.e., accomplishments, vicarious learning, verbal persuasion, and psychological states). These self-efficacy beliefs and outcome expectations, in turn, affect the formation of career interests, which subsequently influence occupational goals, choice actions, and performance attainments (Schwab & Tokar, 2005).

SCCT posits that individuals are more likely to pursue and be successful in occupations for which they have high self-efficacy (Lent et al., 1994). Likewise, an individual is more likely to pursue a career that will result in positive outcomes such as gainful employment, self-satisfaction, and admiration (Lent et al., 1994). Similarly, Hackett and Campbell (1987) found that college students' self-efficacy ratings and task interest decreased as a result of failing a task. These authors also concluded that a lack of past performance accomplishments may be more detrimental to women's self-efficacy than men's as women equate "success" more often to luck and "failure" more often to performance (while men do the reverse) (Graham, 1997). Subsequent studies have supported this conclusion that occupationally relevant learning experiences inform anticipated outcomes largely through their effect on the self-efficacy beliefs derived from those same experiences (Diegelman & Subich, 2001; Lent et al., 2002b; Schwab & Tokar, 2005).

Developmental Theory of Circumscription and Compromise

Gottfredson's (1981) theory of circumscription, compromise, and self-creation emphasizes "explaining gender and class differences in career development, with particular attention to the barriers that individuals face". The revised (1996) theory "pays particular attention to the powers an individual has, but may not always exercise, to create a public self that resonates better with his or her unique internal self" (Gottfredson, 2002, pp. 85-86). Inclusive of concepts such as self-efficacy and self-esteem and the role self-concepts have in influencing one's career aspirations and choice (Super et al., 1957), Gottfredson's theory is based upon the assumption that "people embody inherent characteristics that distinguish them from others and that help make them who they are" (Gottfredson, 2002, pp. 86-87).

As a developmental model, Gottfredson proposes that people assess the suitability of a career choice or occupation according to their self-concept (i.e., one's view of oneself). They also hold "images of occupations" and occupational stereotypes of personalities of people in these occupations, the work they do, the lives they lead, the rewards and conditions of the work, and the appropriateness of that work for different types of people (often separated by gender). Individuals then bring these two concepts together, identifying the occupation(s) they most prefer by "assessing the *compatibility* of different occupations with their images of themselves" (Gottfredson, 2002, p. 91; italics in original). Occupations perceived as conflicting with core elements of the self-concept will be most strongly rejected. The most guarded of these core elements is the occupational image of masculinity and femininity (more than protecting social standing or ensuring fulfillment of activity preferences and personality needs) (Gottfredson, 2002).

Gottfredson (1981, 1996) outlines two processes in the development of occupational aspirations: circumscription and compromise. Circumscription is the process by which individuals limit their occupational aspirations to a zone of acceptable alternatives. Individuals then exchange their aspirations for more realistic occupational choices from the zone of acceptable alternatives as a process of compromise. There are two types of compromise: anticipatory and experiential. Anticipatory compromises are made when an individual perceives that a most desired occupation is not an accessible or realistic choice. In comparison, experiential compromises occur when an individual modifies aspirations in response to experiences had while seeking employment (Armstrong & Crombie, 2000).

According to Gottfredson's theory, the compromises made by an individual are influenced by the developmental process of circumscription as different aspects of an individual's occupational self-concept are incorporated during different development stages. Gottfredson (1981) suggested that occupational aspirations are created in a four-stage manner: a) orientation to size and power at ages 3-5; b) orientation to sex roles at ages 6-8; c) orientation to social valuation at ages 9-13; and d) orientation to the internal unique self at ages 14 and over. Aspects which are incorporated earlier (such as gender socialization) are more central to the individual's self-concept than those which are incorporated later (Armstrong & Crombie, 2000). As occupations become gender stereotyped early in development, about 6-8 years of age, the ramifications of incomplete or incorrect occupational images and stereotypes have a lasting effect on career choice (Gottfredson, 1981).

As children incorporate abstract elements of gender, social class, and the like into their images of self, they begin to rule out an ever-increasing range of occupations as the “wrong” sex type, too low level, or too difficult (Gottfredson, 2002). Gottfredson states this “narrowing of options is, in effect, irreversible because the rejected options are seldom reconsidered spontaneously” (Gottfredson, 2002, p. 95). Again, these career decisions are often made with missing or false information as, even in the 12th grade, many students have do not have accurate and extensive knowledge concerning employment opportunities (Walls, 2000).

Even when students are making career decisions with complete and accurate information, gender stereotypes can affect their choices. Davey and Stoppard (1993) provide an example of this, reporting that approximately one-third of the female 12th graders they surveyed expected to have occupations that were more traditionally female than their *most preferred* occupations. Gottfredson’s developmental model has been tested and credence has been given to this process of circumscription and compromise (Armstrong & Crombie, 2000; Gottfredson, 1996; Oswald & Ferstl, 1999; Walls, 2000).

Factors of Non-traditional Career Choice

In the context of this study, non-traditional refers to academic and career fields that are traditionally dominated by men. These occupations are characterized as male gender role specializations and positions that most women do not aspire to nor achieve (Winkelman, 1999). Although women are represented in all occupational groups, they are concentrated in the clerical and service occupations. More than 4 in 10 of all women (43 percent) who work full time do so in 20 occupations, and each of these occupations is 60 percent or more female (U.S. Department of Labor Women’s Bureau, 2003, as cited in

Hesse-Biber & Carter, 2005). Likewise, these occupations are often lower-level, lower-status, and lower-paying career fields (Betz & Fitzgerald, 1987).

Similar to theories of career choice and development, there is an abundance of literature related to factors of non-traditional career choice. Likewise, a significant number of factors have been shown to influence an individual's choice of occupation. Garner (2003) conducted a study to identify such factors for women engineers and found the following to be components of non-traditional career choice: taking of mathematics and science courses in high school; high levels of self-confidence; dismissal of stereotypes; encouragement from family, teachers, counselors, and friends; and opportunity for hands-on experiences related to science and engineering. A multitude of studies have similar findings (e.g., Borget & Gilroy, 1994; Chusmir, 1983; Ethington & Wolfle, 1988; Fitzgerald & Silverman, 1989; Graham, 1997; Stringer & Duncan, 1985; Ware, Steckler, & Leserman, 1985; Winkelman, 1999). Similar to Graham's (1997) study, as a means of organizing this information, factors of non-traditional career choice will be discussed in the context of three categories: a) family background variables; b) individual or psychological variables; and c) environmental or sociological variables.

Family Background Variables

Gender role socialization. Gender role socialization is the behavior and attitudes related to social roles males and females gain which are considered appropriate in a particular culture--femininity for girls and masculinity for boys (Golombok & Fivush, 1994; Sedney, 1987). It is the process of how one comes to think about and act in everyday life (Hesse-Biber & Carter, 2005). Variations in these roles reflect norms and values which exist externally to an individual (i.e., are part of the culture in which an

individual lives) (Beeghley, 2000; Evetts, 1996). Society (e.g., parents, teachers, religion, media) holds different expectations for males and females as boys and girls and, later, as men and women. Many have found this process of socialization to be greatest when one is young (Betz, 1994; Betz & Fitzgerald, 1987; Block, 1973; Foss & Slaney, 1986; Gottfredson, 1996; Katz 1979). For example, gender labeling, gender identity, sex-typed toy preferences, and awareness of adult sex role differences can be observed in children as young as two years (Weinraub, Clemons, Sockloff, Ethridge, Graceley, & Myers, 1984, as cited in Sedney, 1987).

An individual's first gender socialization experiences happen at home. Significant differences in reported childbearing emphases are found in parents at a variety of ages (Sedney, 1987). As early as 24 hours after birth, parents have differential expectations of sons and daughters (Rubin, Provenzano, & Luria, 1974, as cited in Sedney, 1987). Parents continue to transmit gender information both directly (e.g., division of chores, comments like "big boys don't cry") and indirectly by the toys they buy (e.g., pink dolls and toy kitchens for girls, blue cars and balls for boys) and the activities they encourage their children to pursue (e.g., dance class vs. team sports) (Hesse-Biber & Carter, 2005). As children enter school, parents typically have higher expectations for their sons' achievement in mathematics and science courses than they do their daughters' (Ware & Lee, 1987). Therefore, when high school students are given the option of selecting their own courses, significantly fewer women than men elect to take advanced mathematics and science coursework (Betz, 1994; Betz & Fitzgerald, 1987).

Gender role socialization, however, isn't confined to the home. Peers can affect this process both directly (i.e., making fun of the girl taking calculus) or indirectly (i.e.,

more attention given to how a girl looks than her accomplishments) (Eccles, 1987; Hesse-Biber & Carter, 2005). The media (i.e., newspapers, magazines, televisions, movies, advertising, radio) as an agent of gender role socialization both reflect the relationships and behavior of males and females in dominant society and influence our expectations and perceptions of gender roles. Quite often the media reinforce traditional gender stereotypes (i.e., men as aggressive, active, problem solvers vs. women as passive, more interested in relationships and keeping the house clean than in work, politics, and power) or overemphasize certain aspects of them to distortion (i.e., promoting the notion that men use their fists and guns on a daily basis to solve problems which makes the women--who they have rescued--love them) (Hesse-Biber & Carter, 2005). Schools, which will be discussed in a later section, are another arena in which gender socialization occurs.

The influence of gender role socialization is integral to an individual's sense of identity and eventual occupational choice (Graham, 1997). McIlwee and Robinson's (1992) study of women in engineering reflects this issue of gender role socialization with the defining of attributes such as individualism, self-esteem through competition, hands-on experience, and goal setting (interest congruence) to be more significantly associated with male, rather than female, development. Instead, women tend to define themselves through attachment relationships and a sense of care taking (Gilligan, 1993). Men are expected to develop personality characteristics associated with competency, instrumentality, competition, achievement, and control of feelings, whereas women develop nurturance, sensitivity, warmth, and emotional expressiveness (Betz, 1994; Block, 1973).

Men and women are brought up to behave in particular, culturally prescribed ways--men as the provider and women as wife and mother. Women are congregated in professions which are traditionally more nurturing and supportive (e.g., childcare, nursing, elementary school teaching), while men are more often in the more task-oriented and intellectually demanding jobs (e.g., doctor, lawyer, executive, crafts worker). Many women seek employment that allows them the flexibility to spend with their families, often forgoing training and other credentials which allow them to compete more effectively in the job market (Hesse-Biber & Carter, 2005).

A large-scale national survey of teenagers conducted in 2002 found that significantly more girls than boys say it is important to have a career in which they can help others and improve society (73 percent of girls vs. 55 percent of boys ranked "helping others" as extremely or very important in a career). This survey also revealed that, while 80 percent of girls expected to work full time as adults, almost 60 percent believed they would take time off from their jobs when they have children. In contrast, only 11 percent of boys expected to take a career break for family (Committee of 200, 2002, as cited in Hesse-Biber & Carter, 2005).

Likewise, gender role socialization is closely tied to occupational stereotypes or normative views of the appropriateness of various occupations for males and females (Betz, 1994). Such socialization is intertwined with almost every aspect of society and consistent with Gottfredson's (1981) tenet that by 6-8 years of age occupational choices begin to form. As young as age seven, girls have been found to demonstrate stereotyped attitudes in terms of their opinions about sex-stereotyped activities, female competence, own preference for work, and expected activities as an adult (Meyer, 1980, as cited in

Sedney, 1987). For example, if a girl prides herself in being a caring, person-centered individual, anticipating spending a substantial portion of her adult life actively involved in the roles of wife and mother, then she may rule out occupations she perceives as individualistic (such as engineering or science) or as demanding excessively high levels of time, energy, or geographic mobility (such as high-level management positions) (Eccles, 1987). Again, unfortunately, the stereotypes young women and men develop regarding various occupations are typically ill-informed and, often, adult life roles are based on outmoded, gender stereotyped scripts of family roles (Eccles, 1987).

Androgynous beliefs and behaviors are an alternative to these traditionally sex-typed behaviors and traits (Sedney, 1987) and better career and life-role counseling have been shown to be effective in helping young women develop more informed images of the occupational world and their own adult responsibilities and probable role demands (Eccles, 1987). Two factors have been shown to affect the development of androgynous children: a) a warm and supportive family atmosphere with psychologically healthy parents who are emotionally available to their children; and b) families in which the parents themselves exemplified androgynous personality styles and flexibility in their social role definitions (Sedney, 1987). Better counseling involves equalization of opportunities for male and female students, informed and accurate career and school counseling, and availability of same-sex role models (Hesse-Biber & Carter, 2005).

Parental influence. Social learning theory includes the role of socioeconomic status, gender, race, ethnicity, and culture in explaining an individual's occupational choice (Krumboltz, 1979). For years, researchers have shown that socioeconomic status, more than any other variable, predicts educational outcomes (Blau & Duncan, 1967;

Featherman & Hauser, 1978; Schnabel, Alfeld, Eccles, Koller, & Baumert, 2002; Shavit & Blossfeld, 1993; Weis, Farrar, & Petrie, 1989). Parental level of education and occupational attainment are the best predictors of socioeconomic status with higher levels of education often leading to more prestigious occupational attainment (Fitzgerald & Silverman, 1989). One's family background is significant in that it not only allows members to "obtain educational credentials that qualify them for better jobs, but also because it provides them with knowledge, interpersonal skills, social contacts, values, psychological traits, and other less obvious benefits that enable them to obtain and keep better jobs" (Beeghley, 2000, p. 53).

Parents of female engineers, for instance, are more likely to have college degrees and be employed in professional positions (Jagacinski, 1987). Likewise, females from families with high socioeconomic status more often choose non-traditional careers than do those from low socioeconomic status (Hannah & Kahn, 1989). Research shows that fathers of female engineers are typically employed in engineering (Fitzgerald & Silverman, 1989) and a mother's choice of employment (i.e., traditional or non-traditional) influences the career choice of daughters (Foss & Slaney, 1986). O'Connell, Betz, and Kurth (1989) found that fathers of daughters who choose non-traditional careers had significantly more education than fathers of daughters in traditional occupations. Likewise, in whatever occupation, fathers often proved to be most influential in their daughter's non-traditional career choices (Whittock, 2000).

Individual or Psychological Variables

Mathematics and science ability and achievement. A study by Ethington and Wolfle (1988) found that the number of mathematics and science courses taken in high

school was the single greatest factor in a women's choice of a quantitative major (i.e., computer science, engineering, science). A number of studies support this claim. Sells (1973, 1982) highlighted the importance of mathematics to career options and job opportunities for women; McIlwee and Robinson (1992) cited poor preparation in mathematics and science as a major reason female students quit engineering programs; Astin's (1993) study focused on the necessity of a student's self-efficacy in mathematics and/or science curriculum; and Garner (2003) concluded that the number of mathematics and science courses taken in high school was the greatest factor in choice of engineering as a college major for female students.

Yet, girls take fewer mathematics and science courses than boys in high school (Betz, 1994; Betz & Fitzgerald, 1987). Ulik's (1994) study found that, in one school district, 37 percent of the students in honors calculus were female while 62 percent of the students in honors English were female (as cited in Graham, 1997). As girls advance through school, their interest in mathematics and science coursework decreases, and those girls taking such courses are only half as likely as boys to feel competent in them (Hesse-Biber & Carter, 2005). Thus, there is a lack of both confidence and experience in mathematics and technical skills for many college-bound women (Winkelman, 1999).

This lack of participation in mathematics and science coursework is not due to a lack of ability, but rather to a variety of social factors: exposure to mathematics; perceptions of the value of mathematics; mathematics anxiety; mathematics self-efficacy; and parental attitudes and influence (Graham, 1997). Mathematics exposure and ability have been found to be the most influential indicators of mathematics achievement (Ethington & Wolfle, 1986). Likewise, boys tend to value mathematics more than girls,

perceiving both mathematics and science to be more relevant to their futures (Brush, 1985; Eccles, Wigfield, Harold, & Blumenfield, 1993). For boys, estimates of value were related to past performance and the influence of teachers and parents; for girls, estimates of value were unrelated to any of these measures (thereby leading the researchers to speculate that social and attitudinal factors have a stronger influence on girls) (Eccles & Jacobs, 1986). The ramifications of these two factors converge when girls enter high school and their participation in these classes decrease.

Mathematics anxiety, likewise, plays an enormous role in course participation and achievement. Eccles and Jacobs (1986) found mathematics anxiety among women to be high and often perpetuated by gender-stereotyped beliefs of parents. Parents own gender role socialization and background influence gender stereotypes. The media also influences and reinforces these stereotypes (Hesse-Biber & Carter, 2005) as do peers (Pettitt, 2004). Self-efficacy, or self-confidence, can combat this anxiety. Such self-efficacy is critical as Orenstein (1997) found that a loss of confidence, rather than actual ability, in mathematics often precedes a drop in achievement for many females.

Finally, parental attitudes and influence significantly affect the behaviors and attitudes their children have toward math. Jacobs and Bleeker (2004) found that parents promote mathematics and science activities largely on the basis of gender. Parents were more likely to purchase mathematics and science items for sons than for daughters, regardless of child's age. Although boys were provided with more opportunities to experience mathematics and science toys, more parents were involved in their daughters' mathematics and science activities. This may have been due to parents' (both fathers and mothers) perceptions that daughters needed more help (Jacobs & Bleeker, 2004).

Dimensions of personality. One of the oldest ideas in psychology is that productivity and satisfaction are directly related to the fit between the characteristics of individuals (i.e., ability, personality, temperament) and the demands of the job (Furnham, 1992). As a broad definition, personality refers to those characteristics of the person that account for consistent patterns of feeling, thinking, and behaving (Pervin, Cervone, & John, 2005). Much like career choice and development theory, there are many theories of personality development. However, few of these career choice and development theories explicitly include traditional personality and individual difference variables (Furnham, 1992; Seibert & Kraimer, 2001). As people differ in their abilities, interests, and personalities, a closer look at personality variables is necessary.

Since the 1980s, a general consensus has been reached in the personality trait research community that individual differences of personality can be organized in terms of five broad dimensions (Goldberg, 1990; McCrae & John, 1992; McCrae & Costa, 2003). These ‘Big Five’ trait dimensions are widely recognized and, while slightly different terms may be used by different researchers, the definitions are quite similar. The ‘Big Five’ were designed to capture those personality traits that people consider most important in their lives (Pervin et al., 2005). This study will use the terminology of Costa and McCrae (1985, 1992).

Table 1 illustrates the meaning of the factors. Extraversion and Agreeableness both summarize interpersonal traits (i.e., what people do with each other and to each other). Conscientiousness describes task- and goal-directed behavior and socially required impulse control. Neuroticism contrasts emotional stability with a broad range of negative feelings, including anxiety, sadness, irritability, and nervous tension. Finally,

Openness to New Experience describes the breadth, depth, and complexity of an individual's mental and experiential life (Pervin et al., 2005).

Table 1

The 'Big Five' Personality Trait Factors, Costa and McCrae (1985, 1992)

Trait Characteristics	Description	Trait Characteristics
EXTRAVERSION talkative, assertive, adventurous, energetic, bold	Quantity and intensity of interpersonal interaction; activity level; need for stimulation; and capacity for joy.	INTROVERSION silent, unassertive, unadventurous, unenergetic, timid
AGREEABLENESS kind, generous, cooperative, unselfish, trustful	Quality of one's interpersonal orientation from compassion to antagonism in thoughts, feelings, and actions.	ANTAGONISM unkind, stingy, uncooperative, selfish, distrustful
CONSCIENTIOUSNESS organized, responsible, hardworking, practical, thorough	Degree of organization, persistence, and motivation in goal-directed behavior.	LACK OF DIRECTION disorganized, irresponsible, lazy, impractical, careless
EMOTIONAL STABILITY relaxed, at ease, stable, contented, unemotional	Adjustment versus emotional instability.	NEUROTICISM tense, nervous, unstable, discontented, emotional
OPENNESS TO NEW EXPERIENCE imaginative, creative, curious, reflective, sophisticated	Proactive seeking and appreciation of experience for its own sake; toleration for and exploration of the unfamiliar.	CLOSEDNESS unimaginative, uncreative, uninquisitive, unreflective, unsophisticated

(Costa & McCrae, 1992; Pervin et al., 2005).

Recent studies have shown that personality traits affect career success. Career success encompasses both "extrinsic" externally visible success elements such as salary level and promotion, and "intrinsic" subjectively defined success elements such as career

or job satisfaction (Judge, Cable, Boudreau, & Bretz, 1995). Extraversion has been related positively to both extrinsic salary level and promotions and intrinsically to career satisfaction (Boudreau, Boswell, & Judge, 2001; Seibert & Kraimer, 2001). Neuroticism or low self-control of emotions, on the other hand, has a negative relationship to career satisfaction (Boudreau et al., 2001; Pulkkinen, Ohranen, & Tolvanen, 1999; Seibert & Kraimer, 2001). Individuals displaying high self-control of emotions (constructiveness, stability, and compliance) show higher “career orientation” as measured by occupational status, education, present work situation, and career stability (Pulkkinen et al., 1999).

Other personality traits, which one might assume to be positive characteristics, have been found to negatively affect career success. Conscientiousness, while mostly unrelated to extrinsic success, has been found to be negatively related to intrinsic success (Boudreau et al., 2001). Likewise, agreeableness has been shown to negatively relate to both extrinsic success such as salary level (Boudreau et al., 2001; Seibert & Kraimer, 2001) and intrinsic career satisfaction (Seibert & Kraimer, 2001). Openness was also shown to relate negatively to salary level (Seibert & Kraimer, 2001). Such findings are important as personality characteristics have been shown to accentuate career stability more so in women than in men (Pulkkinen et al., 1999).

Additional researchers have developed sub-categories to these ‘Big Five’ trait dimensions for increase specificity and detail to help understand the intricacy of human personality. Lombardo and Eichinger (1996), for example, have translated the ‘Big Five’ into a series of 67 competency areas. In a series of studies, 27 of these competencies were found to relate to the ‘Big Five’ traits for managers as:

- Extraversion: Customer Focus (15); Timely Decision Making (16); Interpersonal Savvy (31); Command Skills (9); Comfort around Top Management (8); Conflict Management (12); Political Savvy (48); and Managing Vision and Purpose (65).
- Agreeableness: None
- Conscientiousness: Action Oriented (1); Career Ambition (6); Functional/Technical Skills (24); Perseverance (43); Planning (47); Process Management (52); Results (53); Standing Alone (57); and Time Management (62).
- Emotional Stability: Composure (11); Dealing with Ambiguity (2); and Perseverance (43).
- Openness to New Experience: Decision Quality (17); Creativity (14); Learning on the Fly (32); Perspective (46); Self Development (54); Problem Solving (51); and Strategic Agility (58). (Lombardo & Eichinger, 1999)

Self-efficacy. Career self-efficacy, or expectations of one's confidence in career-related pursuits, has been found to be related to occupational choice, academic achievement and persistence in college major, and career choice processes (Hackett et al., 1992). Self-efficacy expectations are particularly useful to the understanding of women's career development because the sex role socialization of females is less likely to facilitate the development of strong career-related self-efficacy expectations than that of males (Betz & Hackett, 1981). Betz and Hackett (1981) suggest that socialization-based differences between men and women in self-efficacy for traditional occupational domains

may be a causal factor influencing women's underutilization of talents and underrepresentation in many male dominated occupations.

In their original study, Betz and Hackett (1981) found women's self-efficacy for traditionally male occupations to be lower and weaker than that of their male counterparts across the six of Holland's occupational themes. Other studies have shown a correlation between individuals who have high self-efficacy in the Realistic and Investigative categories and their pursuit of careers in engineering, science, and technology where women have been historically underrepresented (Betz & Schifano, 2000; Lent, Larkin, & Brown, 1989). Self-efficacy expectations of males are equivalent across traditionally male and female occupations, but women's self-efficacy beliefs vary according to the gender-appropriateness of the occupation, with higher self-efficacy expectations for traditionally female occupations and lower self-efficacy expectations for male dominated occupations (Lent & Hackett, 1987). For example, in Betz and Hackett's (1981) study, only 30 percent of the women surveyed felt they could successfully complete the requirements of an engineering degree, the fewest of any occupation measured. These gender differences suggest that the subjective meaning and interpretation of success and failure, not just the objective outcome, may be important in determining an individual's career behavior (Nauta, 1997).

Betz and Hackett (1981) also related self-efficacy to academic ability, expressed vocational interests, and range of perceived career options. Researchers have found academic self-efficacy to be a strong predictor of higher college grade point averages (Lent et al., 1984; Hackett et al., 1992). Technical and scientific self-efficacy was predictive of grades in technical courses, persistence in a technical major, and range of

career options considered (Lent et al., 1986). Particularly in mathematics, self-efficacy is a significant predictor of mathematics-relatedness of college major choice (Hackett, 1985). Social self-efficacy, defined as one's ability to engage in the social interactional tasks necessary to initiate and maintain interpersonal relationships in social life and career activities, has been reported to affect academic performance, career indecision, and career decidedness (Anderson & Betz, 2001).

Findings indicated that both level and strength of self-efficacy ratings were significantly related to occupational interests (Lent & Hackett, 1987). Lent et al. (1987) support this conclusion, identifying both career interest and career self-efficacy as important variables in the career decision making of women. Many identify interests as the stronger predictor of career choice and self-efficacy as the better predictor of career success and persistence (Betz & Schifano, 2000; Borget & Gilroy, 1994; Hackett et al., 1992; Lent et al., 1987; Lent et al., 1989; Wetzler, Marlowe, & Sanderson, 1994). Post-Kammer & Smith (1985) found the role of interest to be gender specific with both interests and self-efficacy significant predictors of occupational choice for women, while only interests were predictive for men.

Finally, self-efficacy is related to perceived career options. Many researchers have found a significant relationship between self-efficacy and career choice (Ayers, 1980; Betz & Hackett, 1981; Layton, 1984; Post-Kammer & Smith, 1985; Wheeler, 1983). Researchers have found that women who prefer non-traditional occupations demonstrate higher career self-efficacy than those preferring traditional ones and women in non-traditional careers have higher self-efficacy for working with things, while women

in traditional careers have higher self-efficacy for working with people (Betz & Schifano, 2000; Mathieu, Sowa, & Niles, 1993).

Environmental or Sociological Variables

Role models and mentors. A role model is someone whose life and activities influence another person in specific life decisions, such as career choice and behavior decisions (Basow & Howe, 1980). The term role model draws on two theoretical constructs. The first of these is the concept of role and the tendency of individuals to identify with people occupying important social roles (Bell, 1970; Katz & Kahn, 1978; Slater, 1961, as cited in Gibson, 2004), and the second is Bandura's (1977, 1986) concept of modeling defined as the psychological matching of cognitive skills and patterns of behavior between a person and an observing individual (as cited in Gibson, 2004). These constructs emphasize the notion that individuals are attracted to people whom they perceive some similarity with and also suggest that individuals identify role models because this is helpful in learning new tasks, skills, and norms (Gibson, 2004).

Mentor is a closely related term, defined as people who provide advice, support, information, and professional sponsorship to protégés, share their values, and help them gain access to networks through interactive relationships (Higgins & Kram, 2001; Olian, Carroll, Giannantonio, & Feren, 1988). They take "an active interest in and action to advance a protégé's career by providing developmental assistance" (Higgins & Kram, 2001, p. 268). Mentors provide career functions that encompass preparation for organizational advancement and psychological functions that provide a sense of self-worth, identity, and effectiveness (Kolbe, 1994; Kram, 1986). Typically, they are senior

people in an organization or within a career field, who help junior individuals navigate psychosocial and career-related issues (Kram, 1985).

Role models and mentors are essential for girls and women of all ages and races at every developmental stage of the life span (McDaniels & Gysbers, 1992). Role models hypothesized to influence women's career development include parents and family, teachers and counselors, spouses, employees in career fields the woman is considering or has entered, and other significant adults (Astin & Leland, 1999; Basow & Howe, 1980; Betz & Fitzgerald, 1987). Research has indicated that the presence or absence of role models may affect a woman's work status, choice of career, and persistence in science and engineering field (see Nauta, 1997). Girls and women, however, face a unique set of challenges in the traditional role modeling and mentoring relationship.

Essic (1999) identified four areas in which traditional mentoring relationships encounter challenges: availability; skills for acquisition; cross-gender issues; and political issues. Traditional mentoring relationships frequently have not been as available for women as they have been for men (Essic, 1999; Keyton & Kalbfleisch, 1993; Ragins & Cotton, 1996). In high school, girls with non-traditional career goals have been shown to receive less encouragement from teachers and counselors to pursue these goals despite having higher than average SAT scores (Lauria et al., 1983, as cited in Graham, 1997). Likewise, a lack of women in non-traditional academic and career fields (i.e., science and engineering) to act as role models has been cited as a factor in the underrepresentation of women in such fields (Cosgrove, Blaisdell, & Anderson, 1994; Evans, 1993, as cited in Graham, 1997; Hackett, Esposito, & O'Halloran, 1989; Lewis, 1991; Subotnik & Steiner, 1992).

Historically, the mentor system within business has been male dominated and focused primarily on helping men (i.e., males tend to prefer to mentor other males). This problem is compounded as there are significantly fewer women in roles of power and influence in organizations and, therefore, fewer senior females available to act as role models or enter into mentoring relationships with junior females. Additionally, of those women who have advanced into the management ranks and who could mentor others, only a small number of women are doing so (Essic, 1999).

Most women lack the skills and knowledge of the necessity to attract and secure mentors for themselves (Essic, 1999). Women, lacking prior role models and not having learned skills such as assertiveness and self-, mentor-, and career-assessment strategies, are often less aware of how they can enter into and benefit from a mentoring relationship (Kram, 1986; Ragins & Cotton, 1996). Women are taught to “be perfect” and not make mistakes, to focus on helper rather than leader roles (Essic, 1999), thereby they are not as inclined to seek out mentors.

When women do seek out mentors, as the large majority of qualified people to fill these roles are male, cross gender issues can become a major concern. Such issues include sexual, values differences, and different mentoring instruction than that for men. Sexual issues can include confusion and anxiety about how to work closely with someone of the opposite sex; the effect of gender role socialization on relationship dynamics; and the added notice and negative pressures from peers and others that cross-gender mentoring relationships tend to attract (Kram, 1986). Value differences can come in communication styles and preference for style of relationship. Men tend to value demarcated channels of communication and rational relationships, while women tend to

value more personal lines of communication and relationships that are spontaneous and open (Gilligan, 1993; Kalbfleisch & Keyton, 1995; Kram, 1986; McBroom, 1986).

Finally, studies indicate that men tend to mentor men differently than they do women.

Males are given more instrumental assistance and sponsorship while women are given more self-esteem building activities, more emotional support and personal advice, and more general information related to company politics, career moves, and personal weaknesses (see Essic, 1999).

Although most women can understand the visible organization and learn how it operates, they are not privy, by virtue of their gender and minority status, to the informal political system that controls the power (Essic, 1999). As women attempt to advance in their careers, having less access to inside information and less training from childhood in areas essential to business success, the role of mentor is crucial in their navigation of organizational politics and culture (Ragins & Cotton, 1996; Reich, 1985). Mentors help women learn when to be competitive, when to be part of the team, and how to forge strong connections to appropriate sources of power within an organization (Essic, 1999). Role models and mentors are primary resources in aiding women's understanding of how to cope effectively and advance in male dominated organizations and career fields (Essic, 1999). For women considering non-traditional careers, role models and mentors may serve the important functions of providing information about negotiating the demands associated with having a career and a family and providing information used in making self-efficacy evaluations (Nauta, 1997). Strong mentors who can effectively help career advancement and support career paths are, therefore, a key component of career success.

Structure of opportunity. Society not only holds different expectations (i.e., traditional gender norms) for girls and boys, women and men, but it also perpetuates inequality through institutionalized discrimination. Institutionalized discrimination can occur from occupational segregation and ensuing lower wages (Beeghley, 2000) or when there are limited numbers of women in a work setting (i.e., Kanter's "tokenism"). Sex segregation of occupations (e.g., managers, engineers, clerical positions) and industries (e.g., construction) has been and remains a defining element of the American occupational structure with women concentrated in low-paying, female dominated positions and industries (Jacobs, 2001).

The level of labor force sex segregation, slowly but steadily, declined in the 1970s and 1980s, but has remained relatively unchanged since the 1990s. In 1997, 54 percent of employed women would have had to change occupations in order to be distributed in the same manner as men (U.S. Census Population Survey, 1997, as cited in Jacobs, 2001). Likewise, there is significant segregation among industries, with construction among the most segregated (Bureau of Labor Statistics, 2005c). Such segregation has accounted for over a third of the wage gap between men and women (see Jacobs, 2001; Schiller, 2004).

Patterns of this segregation are widespread. Figure 1 represents 2002 percentages of women and men in eight major occupational categories. At quick glance, one can see that women are primarily employed in administrative support and service occupations. Far fewer work as precision production, craftspeople, or operators. Additionally, as an overall percentage of the workforce, women appear to have more equal representation to

men in the management and professional specialty ranks (Bureau of Labor Statistics, 2005b). This broad breakdown tells only part of the story, however.

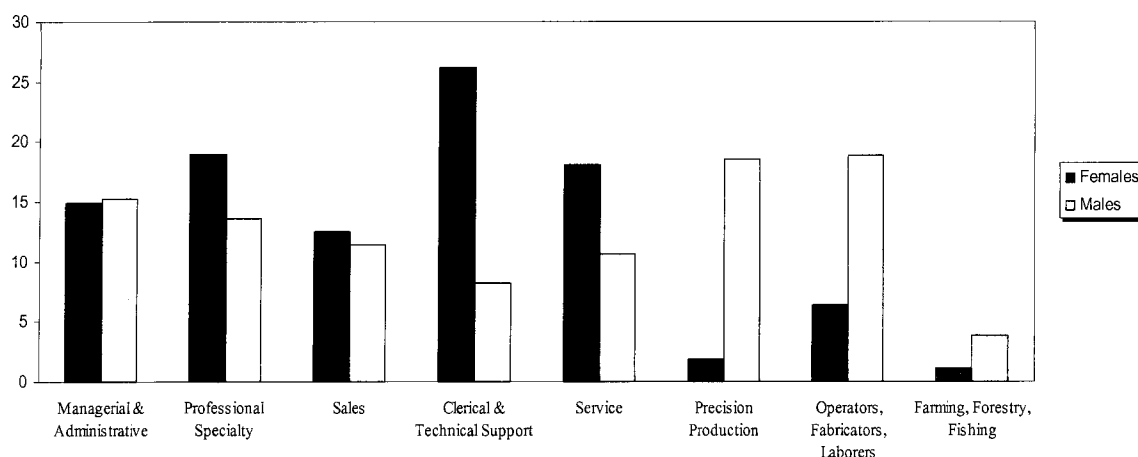


Figure 1. Percentage of persons employed by major occupation and sex, 2002 annual averages.

There are many within group disparities which account for a median weekly earning of full-time female workers (\$511 in 2001) to be only three-fourths that of male workers (\$672) (Schiller, 2004). For example, 79 percent of all administrative support workers are female, compared to 55 percent of all professional specialty workers. Of the professional specialty workers, women are concentrated in professions such as elementary school teacher, registered nurse, and social worker significantly more so than architect, engineer, or physician. Similarly, 60 percent of all service workers (e.g., bartender, private household, protective services) are female, compared to 8 percent of all precision production employees (e.g., mechanics, industrial and construction workers). Within the service industry, 66 percent of all retail sales clerks are women, compared to 44 percent of all sales representatives. In the same way, 20 percent of all protective service workers, who are primarily police officers and firefighters, are women, compared to 95 percent of all private household workers, who are primarily childcare workers and

maids (Bureau of Labor Statistics, 2005c). Table 2 illustrates these occupational divisions.

Table 2

Women as a Percentage of the Workforce by Major Occupational Categories, 2002 Annual Averages

	Traditional Jobs for Women	Percent of Jobs	Non-traditional Jobs for Women	Percent of Jobs
Managerial and Administrative	Dental hygienist	98	Construction inspectors	5
	Speech therapist	94	Dentists	19
	Medical and health	78	Funeral directors	24
	Personnel	75	Physician	31
Professional Specialty	Registered nurses	93	Engineers	11
	Dietitians	90	Clergy	14
	Teachers, elementary	83	Architects	20
	Social workers	74	Lawyers	29
Sales	Retail and personal services	63	Commodities	25
Clerical and Technical Support Service	Secretaries	99	Messengers	28
	Receptionists	97	Mail carriers	30
	Bookkeepers	93	Shipping/receiving clerks	31
	Childcare	98	Pest control	1
	Household cleaners	94	Firefighter	4
	Waiter/waitresses	75	Police and detectives	18
Precision Production	Dressmakers	87	Construction trades	2
	Optical goods workers	68	Extractive	2
	Bakers	50	Mechanics and repairers	4
Operators, Fabricators, and Laborers	Sewing machines	77	Welders and cutters	5
	Laundry/dry cleaning	70	Heavy equipment	5
	Photo processing	61	Truck drivers	5
Farming, Forestry, and Fishing	Animal caretakers	68	Forestry and logging	7
	Graders and sorters	68	Groundskeepers	8
			Farmers	26

(Bureau of Labor Statistics, 2005c).

A popular explanation for these job and pay disparities is the lesser involvement of women in the labor force perpetuating their segregation in lower paying, less professional occupations (Schiller, 2004). Causes for this lesser involvement are traditional gender norms which include beliefs that women should focus their energy on family obligations (Beeghley, 2000). As a result, many women within the paid workforce either start their careers after having children or interrupt their careers for that purpose (Schiller, 2004). Others do not work for pay or are employed part-time to care for their families. This interruption and instability within the paid labor market translates into lost job experience and thus less human capital development (Schiller, 2004). Likewise, regardless of paid work hours, women spend 33 hours to men's 14 hours per week on household tasks (Beeghley, 2000). Women are also more inclined to put their family ahead of their career as shown in McIlwee and Robinson's (1992) study in which nearly 68 percent of the female engineers claimed that they would only be able to accept a promotion that required them to move if their spouse was sure of obtaining a satisfactory job. By contrast, 70 percent of the male engineers reported that they would move to accept a promotion regardless of their spouse's job status.

Another explanation is that women choose different occupations than men because they are socialized to prefer different types of work (i.e., girls play with dolls and learn to take care of others, becoming elementary school teachers or nurses, while boys play with truck and building blocks, becoming truck drivers and engineers) (Jacobs, 2001). In this view, sex role socialization plays a crucial role in reflecting occupational segregation and inequality in the workplace. Not all researchers agree with this thesis, however, as it assumes that an individual's career aspirations are stable throughout time

and change is only possible with a new generation taught more androgynous beliefs and behaviors (Jacobs, 2001).

Instead, many see the blocking of women's opportunities in the professions and management as a product of discrimination or the "glass ceiling" phenomenon (Hesse-Biber & Carter, 2005; Schneer & Reitman, 1995; Shiller, 2004). The policies and practices of an organization (or sometimes as a collective industry) often encourage sex segregation and depressed wages. As part of an organization's culture, deeply ingrained traditional assumptions about the roles of men and women are gender stereotypes that influence employers' decisions and behaviors in a variety of ways--from hiring and evaluation to promotion practices and policies. More visible representations of culture are found in mission statements, official documents, written policies and procedures, or artifacts (Hesse-Biber & Carter, 2005).

In construction, the male dominated culture is persuasive--messages of sex segregation are seen in current employment practices (e.g., women fill receptionist or office manager positions, while men construct and run the company); titles (e.g., craftsman or foreman); speech patterns (e.g., "looking for a young guy to fill this position"); "old-boys network" and formal organizational activities; and through a multitude of other messages. Sexual harassment (either by pressure for sexual contact or by intimidation and the creation of a hostile environment) is a real threat for some women (Beeghley, 2000). Even when attention is given to breaking down the male dominated culture of an organization, residual components remain.

Another consequence of the male dominated culture is the apparent wedding of professional and managerial occupations to a particular view of success as based on a

traditional male life cycle. This “sprint” model assumes early and intense devotion to career, with employees expected to devote countless hours in its pursuit. Women find, as they encounter the heavy demands of both work and family, their career paths veer off of the “sprint” model and they, not the organizational culture, are to blame. It is, therefore, concluded that women are less motivated and less committed to their jobs (Hesse-Biber & Carter, 2005). Even when women fit this model (i.e., less likely to be married or have children; work an equal amount of hours per week), they are paid 19 percent less than their male counterparts and hold positions inferior to those with equal education and training (Schneer & Reitman, 1995).

Finally, Kanter’s (1977) theory of tokenism looks at the types of people within groups (i.e., organizations and industries) as having a direct effect on the interactions between group members and on group members’ success. Kanter’s stance is that members of the group’s numerical minority are held to stricter standards of performance than the majority group members and, because they appear different, minority group members are not treated as individuals but according to the stereotypes surrounding their group (Rogers & Menaghan, 1991). Likewise, when a minority group is proportionately smaller, members of that group will experience declines in performance, self-esteem, and satisfaction (Sax, 1996). Many researchers agree that this sense of tokenism can have a negative impact on a women’s career (Hesse-Biber & Carter, 2005; Kanter, 1977; Rogers & Menaghan, 1991).

Educational climate of schools. The educational system is a major source of sex bias and sex role stereotyping (Betz & Fitzgerald, 1987). Schools are social institutions that reinforce gender-appropriate behavior, interests, and occupations (Garrahy, 2001;

Kahle, 1996; Kelly, 1988; Lee, Marks, & Byrd, 1994). Many researchers agree that the differences in boys' and girls' experiences begin in pre-school and continue throughout children's educational careers (Betz & Fitzgerald, 1987; Kahle, 1996; Koehler, 1990; Spade, 2001). Some of these differences occur from socialization (i.e., reinforcement of expectations that define and maintain gender differences) and others are a product of the structure of the educational system (Spade, 2001).

Researchers have reported a variety of sometimes subtle and other times overt differences in experiences and expectations of boys' and girls' in elementary and secondary schools. Some of these findings include: Almost 50 percent of classrooms are segregated by gender; girls' tend to stress values of being popular, nice, and the "perfect student", while boys' focus on being strong, a good student, and a good athlete (Grant, 1985; Sadker & Sadker, 1994); and teachers tend to give boys more attention in the classroom, being called on more often and receiving more criticism, help, praise, and correction (Hesse-Biber & Carter, 2005; Kelly, 1988; Lee et al., 1994; Sadker & Sadker, 1994). Boys are rewarded for calling out during classroom lessons by engagement with the teacher, while girls, when calling out, are reminded to raise their hands and wait their turn (Golombok & Fivush, 1994; Orenstein, 1994; Sadker & Sadker, 1994). All of this leads to "benign neglect" of girls in the classroom (Sadker & Sadker, 1994, p. 44).

Differences in gender are especially evident in whole-class activities (Kahle, 1996). Teachers often do things for girls while they show boys how to do things for themselves (Sadker & Sadker, 1994; Sadker, Sadker, & Klein, 1991). Teachers wait longer for boys to respond to questions, allowing them time to think through their responses (Sadker et al., 1991). Additionally, classroom activities and discussions tend to

be dominated by a few, usually male, students (Eccles, 1992; Kelly, 1988; Lee et al., 1994; Tobin & Gallagher, 1987). Over time, girls become less assertive, especially in science classrooms where they are less likely to have experience with the instruments, materials, and techniques (AAUW, 1992; Sadker et al., 1991), and in both science and mathematics classrooms where they are less likely to be included in classroom activities and discussion (Eccles, 1992; Leder, 1990).

More overt examples of a gender gap are found in textbooks, history lessons, and standardized tests (Spade, 2001). Women are largely left out of textbooks and history lessons, segregated from men, and are largely overrepresented in chapters representing the stereotypical role of women in society in domestic roles, and as more helpless, more emotional, and less adventuresome than men (Hesse-Biber & Carter, 2005; Sadker & Sadker, 1994; Sadker et al., 1991). Bias in standardized tests, often used to determine college and professional school admission, scholarships, and educational loans, continues to widen the gap between the genders (AAUW, 1995; Kahle, 1996; Sadker & Sadker, 1994).

There are factors which further impact women's experience and success in education at the collegiate level. Sandler (1996) posited that the differences boys and girls experience in elementary and secondary school are carried through into the college setting. For example, women are more likely to be interrupted, not called upon as often, and receive less praise, less criticism, less help, and less attention from their college professors (Sandler, Silverberg, & Hall, 1996). A "chilly climate", characterized by competitiveness, negative treatment and hostility, gender neutrality or discrimination, tokenism and isolation, can also dampen the classroom participation, ambition, and self-

esteem of women (Sandler et al., 1996). These differences contribute significantly to the underrepresentation of women in science and engineering (Blaisdell, 1994).

Sexual harassment, discrimination, and stereotyping are additional factors leading to the attrition of women from non-traditional college programs. Studies have shown that women encounter sexist remarks and gender role stereotyping by their male peers (Gardner, 1990), as well as discrimination by some faculty members and counselors (Cosgrove et al., 1994; McIlwee & Robinson, 1992). Gardner's (1990) longitudinal study found a lack of support, social acceptance, and discrimination to be principal causes of women leaving college engineering programs throughout the United States.

Structural components of the educational system further reinforce gender segregation. Schools reflect the gender hierarchy in society, with men in higher-level and supervisory positions. In a 1993 study, women were approximately 7 percent of all superintendents, 24 percent of all assistant superintendents, and 34 percent of all principals (Tallerico, 1997, as cited in Spade, 2001). Today, women are 98 percent of pre-kindergarten and kindergarten teachers, but only 43 percent college and university teachers (Bureau of Labor Statistics, 2005c).

At the college and university level a similar pattern of segregation exists. Only 17 percent of full professors and 30 percent of associate professors are women, compared to 50 percent of instructors and lectures, which are positions which carry the least prestige and lack benefits and voting rights (NCES, 1997, as cited in Spade, 2001). Women comprise 4 percent of engineering professors and 9 percent of professors in the physical sciences, but only 0.3 percent of women engineering professors and 4.4 percent of women physical science professors are full professors (Ginario, 1995). This lack of

women in science and engineering has also been cited as a factor in the underrepresentation of women in such fields (Cosgrove, Blaisdell, & Anderson, 1994).

Counseling and advising. Students require guidance from their high school teachers and guidance counselors to plan their future academic careers (Levin, Wyckoff, & Hussey, 1994). The knowledge and perception of non-traditional careers that teachers and counselors have often translates to the types of occupations students seek out. These counselors, role models within occupations of interest, and exposure to related research have been found to be instrumental in non-traditional career choice of young women (McNamara & Scherrei, 1982). When stereotypical and discriminatory views of teachers, counselors, or others are experienced by young women, they are less likely to seek out such career paths (Cosgrove et al., 1994; Hackett et al., 1992; McNamara & Scherrei, 1982). One study found that 60 percent of undergraduate women and 57 percent of graduate women enrolled in a college of engineering and applied science felt a lack of encouragement in high school was a cause for underrepresentation of women in science and engineering (Cosgrove et al., 1994).

This need for counseling and advising does not dissipate at the post-secondary level. Mentoring and guidance in the college years is a critical factor to women's achieved occupational status (Kaufmann, 1999; Kaufmann, Harrel, Millam, Woolverton, & Miller, 1986). This guidance is provided not only by mentors, but also by teachers and counselors who help young women recognize their talents and see how their individual talents can be used to their fullest potential (Kerr & Robinson Kurpius, 2004). Likewise, counselors can help young women become involved in their chosen career by connecting them with role models and mentors, thereby allowing them to really connect to their

academic programs and futures. Kerr (1997) found that having a strong identification with one's chosen profession was the most prominent characteristic of successful career women.

Panitz (1995) identified seven guidelines for effective advising at the collegiate level: a) up-to-date information on the curriculum and university policies and procedures; b) strong listening and communication skills; c) effective counseling skills; d) knowledge of referral services; e) ability to accurately assess the student's ability to persist; f) ability to provide career information and guidance; and g) willingness to go the extra step by providing such services as a personal touch, computer-assisted advising, group advising, and the formation of networks. Graham (1997) found that students expect their advisers to be accessible, flexible, helpful, knowledgeable, up-to-date with information, consistent, open-minded, and willing to look at options. Unfortunately, advising like this is the exception, with advisers often relaying incorrect information or too busy to get to know students (Graham, 1997; Panitz, 1995).

Persistence in Construction Management

Identifying factors of non-traditional career choice is a necessary first step in creating a profile of female constructors. A second, equally important, step in creating this profile is identifying the barriers to career development women in construction management face and the ensuing strategies of persistence they employ to enter and remain in the industry. In this study, these strategies of persistence are specifically related to the retention of women in construction degree programs and, upon graduation, in professional positions in the construction industry.

Persistence is defined as a behavioral tendency to persevere or persist and suggests an admirable striving against opposition (Reber, 1985, as cited in Graham, 1997). Two primary theoretical models explain the phenomenon of persistence: the attrition model and the integration model. Both models are similar in all respects except the factors (i.e., external, social, psychological) which cause an individual to persist or non-persist (Graham, 1997). This difference is important as often researchers “fail to distinguish between involuntary departure resulting from academic dismissal and voluntary departures occurring despite the maintenance of adequate grades” (Tinto, 1993, p. 33).

The attrition model theorizes that dropping out of college (i.e., non-persistence) is a result of student and school-environment interaction, while the integration model sees persistence (or non-persistence) an effect of student choice (much like that of employee turnover) (Cabrera, Castaneda, Nora, & Hengstler, 1992). Despite their differences, numerous studies support each model (Davey & Stoppard, 1993; Enman & Lupart, 2000; Hayden & Holloway, 1985; Lent et al., 2002b; Levin & Wyckoff, 1991, 1995; McIlwee & Robinson, 1992; Torres & Solberg, 2001).

Persistence in Academia

Using engineering as an example, Winkelman (1999) posits that non-traditional programs have an intrinsic culture about them in which dominant groups (i.e., men) perpetuate their power through social organization and interpersonal relationships. Overtime, subculture groups become institutionalized, carrying implicit and explicit values that dictate behavior and acceptance. Women must, therefore, confront, conform, or quit academic programs that perpetuate male attributes derived from social values

(Winkelman, 1999). McIlwee & Robinson (1992) state that it is important to understand the accommodations women make to “fit the mode” of an engineer (p. 19).

In a 2002 study, Lent et al. found that college-age women cited a variety of barriers in implementing their career goals. Several of the more frequently mentioned barriers were a reflection of the individual’s perceived environments or interactions among their various life roles (e.g., financial concerns, negative social/family influences, role conflicts), while a number cited primarily personal factors, such as personal adjustment difficulties and ability limitations, as impeding their career choice (Lent et al., 2002b). Davey and Stoppard (1993) found maternal employment, gender self-concept, life roles orientation (i.e., career and family values), perception of gender discrimination in the workplace, influence of significant others, and cost of education to be contributing factors as well.

External environmental and sociological factors have been shown to play a major role in persistence of women in non-traditional academic programs. For students, being included or excluded from peer groups either enhances their perception of acceptance or provokes a sense of isolation within the campus culture (Hayden & Holloway, 1985). For those women who experience isolation and lack congruence with their classmates, persistence is negatively affected (Hayden & Holloway, 1985; McIlwee & Robinson, 1982). Women in Engineering (WIE) programs are becoming more common around the United States, having an impact on increasing the retention rate of women in engineering (Graham, 1997). Similarly, a characteristic of many persisters is their heavy involvement in study groups, which provides both a source of academic and social support (Collins, Bayer, & Hirschfield, 1996).

Social support and encouragement from a variety of sources (e.g., family members, friends, teachers) has been shown to be a vital support factor for many women in non-traditional academic programs. Other largely contextual support factors cited as helpful in overcoming barriers include access to role models or mentors and financial resources (Lent et al., 2002b). Collins et al. (1996) cite persisters as more likely to approach faculty and place a high value on such interactions. Likewise, they react positively to such interactions and develop a stronger rapport than non-persisters.

Individual and psychological factors play a part in persistence also. As has been discussed, several studies have examined the role of self-efficacy in persistence in non-traditional majors (Anderson & Betz, 2001; Hackett et al., 1989; 1992; Eccles, 1987; Lent et al., 1984; 1986). In particular, expectations of success, perceptions of ability, and subjective task values (intrinsic value more so than utility value) have been shown to predict academic choice and persistence (Enman & Lupart, 2000). Lent et al. (2002b) found that personal strengths (e.g., self-confidence, perseverance) and goal setting were strategies women employed to overcome barriers in non-traditional academic programs. Hackett et al. (1989) found that self-efficacy beliefs (i.e., “I can do it”) were more determining of career choice and persistence than actual abilities.

Persistence in Industry

“The construction industry does not have a good track record in terms of equal opportunities,” Dainty et al. writes (2004, p. 76). Underrepresentation of women and ethnic minorities, individual and institutional discriminatory practices, overt and covert sexism and racism, inflexible working structures, and an unhelpful environment for the reconciliation of work and family commitments have all been cited as barriers to the

career development of women (see Dainty et al., 2004). Likewise, the job of a construction project manager is significantly more stressful than that of managers in other industries (Sommerville & Langford, 1994; Sutherland & Davidson, 1993). Much of this stress is due to the competitive and conflictive nature of the industry (Dainty et al., 2000), as well as the demands to complete a project on time, to a desired quality, and within budget to a wide range of, often conflicting, stakeholder objectives (Sutherland & Davidson, 1993).

Specifically, causes of stress have been identified as long working hours; insufficient leisure time; paperwork; insufficient family time; travel; architects; poor communication; staff shortages; and imbalances of power and responsibility (Sutherland & Davidson, 1993). Haynes & Love (2004) found workload to be the greatest “high pressure” stressor for a sample of 100 male construction managers, with long hours and insufficient time spent in family/home environments not far behind. Loosemore & Waters (2004) conducted a similar survey of 131 construction professionals (84 men and 47 women) and found that the greatest sources of stress for both men and women related to the pressurized and confrontational nature of the industry; the high levels of responsibility given to individuals; and the diverse, fragmented, and transient nature of the workforce. Factors measured as greater causes of stress for women than men included opportunities for personal development; rates of pay; keeping up with new ideas; business travel; the accumulative effects of minor tasks; and factors not under their control (Loosemore & Waters, 2004).

In a recent grounded theory study of women's career underachievement (Dainty et al., 2000), eight categories emerged from the data to explain why women's careers do not develop as fully or as successfully as men's in the construction industry:

- *Entrance to the industry: the younger women became disillusioned with their career choice more rapidly than men, and sought to leave the industry early on in their careers.* Reasons for this disillusionment were cited as recruitment campaigns which oversold opportunities and provided a poor understanding of the culture and inherent difficulties of working in such a male dominated and oriented environment (Dainty et al., 2000). Dainty et al. (2004) found that very few women had been advised to join the industry by friends or family and, therefore, had a poor initial understanding of the culture of the industry and the inherent difficulties of working in such a male dominated and oriented environment. Construction higher education was found to provide a sheltered environment and an unrealistic interface between career choice and working life within the industry, thereby providing poor "real-world" preparation for women (Dainty et al., 2000). As such, women were surprised to find barriers to their progression (i.e., sexist behavior, harassment, deliberate attempts to undermine workplace contribution, work/family conflicts). Being ambitious and high academic achievers, this lack of progression quickly led to dissatisfaction (Dainty et al., 2000). Many studies have cited issues of discrimination, disadvantage, and underrepresentation of women in the construction industry (Court & Moralee, 1995; Dainty & Edwards, 2003;

Dainty et al., 2000; 2004; Fielden et al., 2000; Lingard & Lin, 2004; Sommerville, Kennedy, & Orr, 1993).

- *Entrance to organizations: most women found the process of entering organizations more problematic than men, both in terms of their initial entry to employment, and in their subsequent attempts to move between different organizations.* Reasons for this were cited as the informal recruitment and selection processes used by operational managers (those who have primary hiring responsibility) which favor the networks common to men. Likewise, women were often excluded by stereotyped expectations of their career and personal priorities made during the recruitment process. Consequently, entry to employment was difficult for women, especially those in their late 20s and early 30s, where ingrained opinions of women's likelihood of having children were held by those with recruitment responsibility (Dainty et al., 2000). Other studies have made similar findings, noting discriminatory practices of male managers concerned about investing in the development of women with current, or anticipated, family responsibilities (Itzin, 1995; Lobel & St Clair, 1992; Metcalfe & Leighton, 1989).
- *Context of a career in construction: women are often allocated to office based support positions.* Despite preferences to maintain a close proximity to technical work and their chosen role as a construction professional, this study found that many organizations prescribed gender roles that tended to allocate female staff to office based support positions rather than front-line site based management positions. These roles heavily impacted opportunities for career

advancement (Dainty et al., 2000). Other studies have found that the more gender segregated an occupation, the more sex-based ascription and promotional immobility occurs for female workers (Cassirer & Reskin, 2000; Reskin & McBrier, 2000).

- *Structural organizational processes: women found developing their organizational careers problematic within operating frameworks which favored male career patterns and needs.* Changing job titles, shifting responsibilities, and a frequently changing internal shape characterize construction organizations, leaving communications and management of staff to an informal network. As such, staff allocation (i.e., who works on which job, when, and where) was often carried out with little regard for employees' personal lives, often making combining of work and family difficult for women. Additionally, performance appraisal systems used within organizations favor men, often being carried out by male managers who gave women lower appraisal scores, made unfair assessments of women's training needs, or used them to restrict intra-organizational mobility (Dainty et al., 2000). Other researchers have found differences in workplace opportunities for males and females (Cassirer & Reskin, 2000; Schein, 1994; Schnerr & Reitman, 1995) and that gender dissimilarity (i.e., males evaluating females) can negatively bias performance appraisals (Hartel, Douthitt, Hartel, & Douthitt, 1999)
- *Cultural organizational processes: organizations often impede women's equal participation and achievement through the maintenance of a workplace*

environment which excludes and undermines women through the synergy of discriminatory and exclusionary workplace cultures. The culture of the construction industry and construction organizations was found to be highly competitive, controlled by senior male managers who often resist change to procedures which threaten their organizational power. As such, women are forced to comply with male-oriented work practices, further maintaining the existing structures, and exacerbating work and family role difficulties. The competitive environment was also seen as leading to overt resentment from women's male peers and managers, increasing the likelihood of discrimination, harassment, and exclusion from the social circles acknowledged to be essential to career development in such informal working cultures (Dainty et al., 2000). Again, numerous studies have found a discriminatory and exclusionary environment within the construction industry affecting work and family roles (Lingard & Lin, 2004), promotions and career development (Cassirer & Reskin, 2000), conformity to stereotypes (Fraser, 2000), and a commonly hostile and stressful workplace (Dainty et al., 2000; Haynes & Love, 2004; Loosemore & Waters, 2004).

- *Individual characteristics and circumstances: most women perceived they had to make a choice between a career or a family-oriented lifestyle. Men were more likely to combine successfully their work and family lives.* Construction work, and particularly site-based roles in national companies, is demanding and time-consuming and impinging on social activities and family responsibilities. To counter this, 59 percent of the men in this study had

supportive non-working partners who took on the responsibility of child care and other domestic duties. This was compared to just seven percent of the women in the study. Some 55 percent of these women believed that they had to make a choice between having a successful career or a family-oriented lifestyle. Unsurprisingly, women's career motivation tended to decline in relation to their experience, as the salience of family issues became more significant, and as they realized the inherent difficulties of combining work and family lives (Dainty et al., 2000). Recent research suggests that job demands borne by construction professionals are damaging to their personal lives (Lingard & Lin, 2004; Lingard & Sublet, 2002). As women bear the primary responsibility for domestic duties (Hesse-Biber & Carter, 2005), they are more likely to experience conflict between work and home life in employment situations such as construction in which long and rigid work hours are the norm (Blair-Loy, 2003; Coyne, Coyne, & Lee, 2004; Lewis, 2002; Lingard & Lin, 2004).

- *Career strategies: women's career strategies centered on inter-organizational mobility within a multi-organizational framework. Men's were focused on proactive intra-organizational career development within their existing organization.* Explanations for women's movement to different construction organizations were cited as reactions to overt and covert discriminatory actions. Such inter-organizational mobility put them at a disadvantage for career progression relative to their male counterparts who developed their careers within a familiar cultural and structural organizational environment

(Dainty et al., 2000). The phenomenon of relocating or changing organizations for advancement is well documented (Brett & Stroh, 1994; Stroh, Brett, & Reilly, 1996; Tharenou, 2002).

- *Future expectations, opportunities, and threats: women embraced the structural organizational and industry-wide change which had affected the industry in the past decade. Men opposed such changes and sought to maintain existing hierarchies and work practices.* These changes include the de-layering of structures and less conflictive procurement and partnering systems. Women did express a fear that men's resistance to change may lead to a gradual regression towards conflictive methods, threatening the continued inroads that women are making into the industry. The likelihood of a continued lack of recognition of the benefits that diversified workplaces could provide was believed by women to present the greatest barrier to their acceptance in the industry in the future. Finally, many women believe that younger male entrants to the workforce, however accepting of change at the outset of their careers, will likely be indoctrinated into maintaining current attitudes and practices by those with influence and control over their development in the early years of their careers (Dainty et al., 2000). While many have called for changes to the culture of the construction industry (Dainty et al., 2002; 2004; Fielden et al., 2000; Gibson et al., 2003; Lingard & Lin, 2004), wide-scale change has yet to occur.

These barriers to women's career development are similar, although exacerbated by the male-culture of the construction industry, to those women in most professional and

managerial positions face (Hesse-Biber & Carter, 2005). Yet, women are succeeding in business by implementing a variety of coping and persistence strategies. Much of the research, by design or findings, focuses on the individualistic perspective and role of self-efficacy traits in persistence (Dunahoo, Geller, & Hobfoll, 1996).

Many studies have supported this individualistic perspective, finding that female upper and mid-level executives place the most importance to their career success and advancement on their own abilities and ambitions (Astin & Leland, 1999; Gaskill, 1991) and in their ability to consistently exceed performance expectations, develop a style comfortable to male managers, and seek out difficult or high-visibility assignments (Catalyst, 1996, as cited in Burke & Nelson, 2002). Self-confidence has been found to be a primary component of career success (Astin & Leland, 1999; Vinnicombe & Bank, 2003). Such confidence breeds resilience, a characteristic aiding many women in overcoming barriers. Self-promotion, as not being afraid to put oneself forward for acknowledgement and reward, is another key component of persistence and career development. Self-promotion is done by building good relationships and having the awareness and confidence to let supervisors know about one's successes and ambitions (Vinnicombe & Bank, 2003).

A qualitative study of successful women in leadership positions reported many shared qualities and experiences. These women describe themselves as having high activity and energy levels; appetites for challenge, problem solving, and risk taking; obstacles and personal setbacks to accept and overcome; intellectual competence and underpinnings of strong academic backgrounds; personal awareness and confidence,

continuously honed by wide exposure to life experiences; and support for their commitment from family and friends or role models and mentors (Astin & Leland, 1999). They described themselves as having good physical stamina (i.e., need for little sleep and ability to work very hard for long periods of time), intelligence, assertiveness, and determination. They used words like “energy”, “loyalty”, and “commitment” most to describe themselves. High endorsement was also given to traits such as “intuitiveness”, “resourcefulness”, “self-confidence”, and “adaptability” (Astin & Leland, 1999, p. 127).

Summary

This chapter has summarized the literature relevant to women and career choice and development. Within this review, similar constructs of four theories of career development were discussed to provide the theoretical framework for this study of women in the construction industry. Literature relevant to factors of non-traditional career choice followed in three broad categories: a) family background variables; b) individual or psychological variables; and c) environmental or sociological variables. In the final section, constructs related to the retention of women in construction degree programs and, upon graduation, in professional positions were explored within the context of campus and industry cultures.

CHAPTER 3

METHODOLOGY

The purpose of this study was to create a theory of women's career choice and development in the context of the construction industry, specifically targeted to female constructors or those in the professional ranks engaged in the management of construction projects and/or companies. A second, but equally important, component to creating this theory was the development of a profile of women who enter and remain in the construction industry as professionals. Qualitative methods of research provided the most appropriate framework for this study and best answered the majority of the research questions. As a component of the data collection process provided quantitative information helpful in developing this profile of female constructors, an additional, quantitative, research question was added to the study. This chapter discusses those research questions, describes the qualitative research design, and lays out the procedures of data collection and analysis used to answer the research questions.

Research Questions

Focused on female constructors who have completed a degree program in construction management and who are now actively employed in professional positions in the construction industry, a set of umbrella and sub-set questions guided this study:

Research Question 1

What factors shape the career choice making process of women entering construction management as a major and profession?

- How does gender role socialization influence this selection?
- What aspects of one's family influence this selection?
- How do academic skills and interests influence this selection?
- What dimensions of personality influence this selection?
- What aspects of self-efficacy influence this selection?
- How do role models and mentors influence this selection?
- How does structure of opportunity influence this selection?
- How does the educational climate of schools influence this selection?

Research Question 2

What factors influence (both positively and negatively) the career development of female constructors in the construction industry?

- What dimensions of personality influence this development?
- What aspects of self-efficacy influence this development?
- How do personal goals influence this development?
- How do others influence this development?

Research Question 3

What factors influence (both positively and negatively) the feeling of inclusion for female constructors in the industry?

- How does the culture of construction management degree programs influence this feeling of inclusion?
- How do perceptions of the culture of the construction industry influence this feeling of inclusion?

- What experiences of women working in the construction industry influence this feeling of inclusion?
- How do views of women and men in the construction industry influence this feeling of inclusion?
- How does gendered minority status influence this feeling of inclusion?

Research Question 4

What recommendations can be made to academia and industry for the successful recruitment and retention of women into professional positions in the construction industry?

Research Question 5

Are there associations and differences among factors that would provide a better understanding of the traits and characteristics of female constructors in the construction industry?

- Is there an association between age and self-efficacy, personality, career satisfaction, and career commitment?
- Is there an association between years of employment and self-efficacy, personality, career satisfaction, and career commitment?
- Is there an association between number of employers and self-efficacy, personality, career satisfaction, and career commitment?
- Is there an association between self-efficacy and career satisfaction and career commitment?
- Is there an association between personality and career satisfaction and career commitment?

- Is there an association between number of children and self-efficacy, career satisfaction, and career commitment?
- Is there an association between amount of household chores done and self-efficacy, career satisfaction, and career commitment?
- Is there an association between GPA and self-efficacy?
- Is there an association between personality and self-efficacy?
- Is there an association between self-efficacy experience and career task self-efficacy?
- Is there a difference between those married and unmarried and years of employment, career satisfaction, and career commitment?
- Is there a difference between annual volume of employer and personality, self-efficacy, career satisfaction, and career commitment?

Research Design and Rationale

Qualitative research methods were employed as the primary means of collecting and analyzing data to create this theory of career choice and development of women constructors. The study proceeded inductively, with the purpose of exploring and developing a hypothesis or theory rather than deductively using a hypothesis or theory testing approach (Locke, 2001; Merriam, 1998). This approach focused on interpretation of actions. As with most qualitative research, this included a combination of the unexpected and the interaction of data and theory as opposed to simply interpreted behavior (Neuman, 1991). Qualitative methods were most appropriate as they allow for an in-depth probing of interrelationships, conditions, and emergent patterns (Miles & Huberman, 1994).

This process of probing is known as ‘emergence’ (Glaser & Strauss, 1967; Locke, 2001; Strauss & Corbin, 1990; 1998). In qualitative research both the design and the concepts must be allowed to emerge during the research process. As concepts and relationships emerge during the on-going analysis process, the researcher can use this information to decide where and how to go about gathering additional data to attain the goal of furthering the evolution of the theory. Grounded theory, as a strategy within the qualitative research design, is particularly emergent as the process of theory development involves the use of multiple stages of data collection and refinement and an interrelationship of categories of information (Strauss & Corbin, 1990; 1998).

Qualitative research is based on the view that reality is constructed by individuals interacting with their social worlds (Merriam, 1998). As such, Merriam (1998) defines key characteristics of qualitative research as including:

- *Interest in understanding the meaning people have constructed*--how they make sense of their world and the experiences they have in the world. This understanding is from the participants’ perspective, not the researcher’s.
- *Researcher as the primary instrument for data collection and analysis*. This is rather than an inanimate inventory, questionnaire, computer, or the like.
- *Usually some amount of fieldwork*. Researcher physically goes to the participants in their natural setting to observe and collect data.
- *Primary employment of an inductive research strategy*. That is, qualitative research builds abstractions, concepts, hypothesis, or theories rather than tests existing theory. Qualitative researchers build toward theory from observations and intuitive understandings gained in the field formed of

themes, categories, typologies, concepts, tentative hypotheses, even theory, which have been inductively derived from the data.

- *A product which is richly descriptive.* Words and pictures, rather than numbers, are used to convey what the researcher has learned.

Neuman (1991) refers to this type of research as first-order interpretation (or the learning of motives and reasons behind the human behavior), second-order interpretation (or the examination of human action in the setting or events that are related), and third-order interpretation (or the linking of the first and second-order interpretations to theory). Creswell (2003), building upon the characteristics advanced by Rossman and Rallis (1998), views qualitative research as including: natural setting; use of interactive and humanistic methods; emergence in design; an interpretive nature; a holistic interpretation; reflexivity of researcher; complex, simultaneous, and iterative analysis and reasoning; and inclusive of multiple strategies of inquiry.

Using a triangulation of research methods, this study included each of these components of qualitative research to build a substantive theory of career choice and development for female constructors. These methods included:

- An extensive content analysis of theory and research in the areas of career development, factors of non-traditional career choice, and characteristics and strategies of persistence;
- A written questionnaire gathering data relevant to: demographic information of the participant and employer; current and family of origin; climate of secondary and post-secondary education; level and length of construction

experience; level of career satisfaction and commitment; and scales assessing the participant's self-efficacy and dimensions of personality; and

- Small focus groups centered on aspects of the career decision making process; factors of non-traditional career choice; challenges and strategies of career development; and recommendations for recruitment and retention of future female construction professionals.

Denzin (1970) suggests the use of triangulation of information as “the flaws of one method are often the strengths of another, and by combining methods, observers [researcher] can achieve the best of each, while overcoming their unique deficiencies” (as cited in Merriam, 1988, p. 69). Strauss and Corbin (1998) focus less on this traditional definition of triangulation, but make the similar point that “to build dense, well-developed, integrated, and comprehensive theory, a researcher should make use of any or every method at his or her disposal” (p. 33). In this study, the content analysis created the theoretical framework and guided the collection of data. The use of both written and oral communications enhanced the data collection process as they allowed individuals with different communication preferences and strengths to fully participate in the study. Likewise, the written questionnaire was designed to gather detailed, quantitative information quickly, allowing the focus groups to delve into more of the participants' experiences and perceptions.

Based in the disciplinary traditions of American pragmatism and ‘symbolic interactionism’ (term coined by Blumer in 1969), grounded theory rests on three premises:

1. *People interpret the meaning of objects in the world and then act upon those interpretations* (i.e., meanings inform and guide action). In work organizations, objects include language, physical objects such as dress codes, mission statements or written policies, social gestures and situations, and even particular types of people (e.g., inspectors or subordinates);
2. *Meaning arises from social interaction*, namely communication between and among individuals, and not from objects. An example may be an organization's policy for paid time off--the real meaning of this policy is not in the written policy itself, but in the member's experiences of the policy in the context of communication and interaction with others; and
3. *Meaning is handled in and modified through an ongoing interpretive process*. That is, meaning is not fixed or stable; it is always in process. Interpreted meanings are continuously revised, thereby changing behavior. Blumer and Mead focused on the concept of self (i.e., our ideas of who we are and our inner experiences) as a fundamental basis for the formulation of meaning and experiences individuals' hold (Locke, 2001).

Grounded theory is derived from data, systematically gathered and analyzed through the research process. It is intended to offer insight, enhance understanding, and provide a meaningful guide to action (Strauss & Corbin, 1998). "Developing *theory* is a complex activity", say Strauss and Corbin (1998, p. 21; italics in original). A theory is a set of well-developed concepts related through identification of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena. Theorizing, as a process of theory creation, entails conceiving or intuiting

ideas (concepts) and then formulating them into a logical, systematic, and explanatory scheme (Strauss & Corbin, 1998). “A theory is like a map”, Krumboltz states, “both are intended to give us a big picture about a certain area of interest” (Krumboltz & Nichols, 1990, p. 159).

A theory is more than a set of findings. It is constructed to serve the specific purposes of its users--whether that is to understand a complex phenomenon, make predictions about future outcomes, or decide on a course of action (Krumboltz & Nichols, 1990). In this study, the purpose of the theory development is to understand the phenomenon of career choice and development of women who enter the construction industry through degree programs into professional positions. The intent is to provide more than a general understanding of the topic, rather a theory which will enable “users to explain and predict events, thereby providing guides to action” (Strauss & Corbin, 1998, p. 25).

Some theories are substantive focused upon one identifiable area, while others may be considered formal or apply to a wider range of disciplinary concerns and problems as they are less specific to a particular group and/or place (Glaser & Strauss, 1967; Strauss & Corbin, 1998). This study incorporated central components of formal career development theories and integrated these with a study of a specific population, female constructors, to create a substantive theory of career choice and development.

Conceptual Map

A conceptual framework explains the main dimensions of a study, often as a graphic representation of the key factors, constructs, or variables, and the presumed relationships among them (Miles & Huberman, 1984). Such graphic representation is

particularly useful in the development of a theory as it can change direction easily and refocuses data collection as needed (Glaser & Strauss, 1967; Miles & Huberman, 1984).

In the form of a conceptual map, Figure 2 identifies the key constructs of this study.

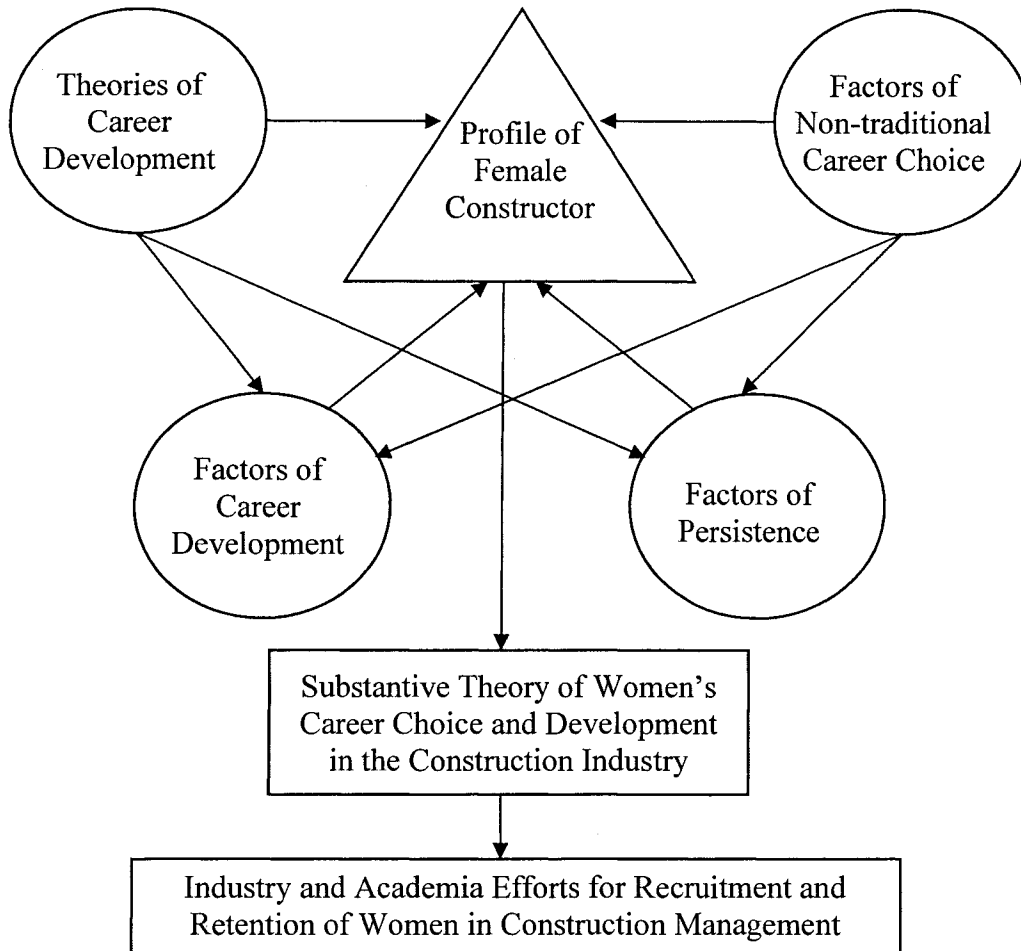


Figure 2. Conceptual map for creating a theory of women's career choice and development in the context of the construction industry.

Selection of Research Participants

As with most qualitative studies, participants are from a purposive, rather than random, sampling selection frame. Purposive means that participants are recruited after aspects of the study have been defined (Miles & Huberman, 1994). An initial sample of participants was garnered from a list of women graduates (May 1994 - May 2004) of the construction management department at Colorado State University (CSU) who reside in

Colorado. This list included 59 individuals, but not all were located for invitation as all alumni do not keep current contact information listed with the university. Of these, 22 were able to attend the focus groups and consented to participate in the study.

A snowball sampling procedure was then employed to increase and diversify the sample of participants. Those alumni contacted were asked to identify female colleagues (i.e., non-CSU graduates) working in the construction industry who fit the defined criteria so that these individuals could be contacted and asked to participate in the study.

Unfortunately, no additional individuals were added as participants through this process of snowballing (many of the alumni responded that the women they knew in industry were fellow alumni). A final resource in identifying potential participants were notices published in state and regional industry association newsletters and announcements to the department's Professional Advisory Development Board briefly describing the study and participants' criteria and extending an invitation to contact the researcher should the individual fulfill the criteria and have interest in the study. Another two individuals contacted the researcher from these notices for a total sample of 24 study participants.

All participants in the study met the following criteria:

- Female;
- Have completed a degree (i.e., bachelors or master's) in a construction management program between May 1994 and May 2004;
- Have at least one year full-time experience working in the construction industry post-college graduation; and
- Currently hold a professional position in the construction industry.

While not specific criteria for inclusion, diversity among participants was sought so as to include as realistic a sample of the entire female population of constructors as possible. Ages of participants ranged from 24 to 50 years, with a mean age of 31.6 years. Of the 24 participants, 22 characterized themselves as Caucasian; 2 checked Spanish/Hispanic/Latino. Years with a construction management (CM) degree completed ranged from 2 to 14 (mean 5.7) and years of employment ranged from 2 to 24 (mean 9.1). Again, of the 24 participants, 22 had completed a bachelors degree in CM; 2 has completed a master's degree in CM (both had a non-CM bachelors degree). Ten of the participants were not married; 14 were. Fourteen of the participants did not have children, 3 had one child or were pregnant, and 7 had two children currently or were pregnant with their second child. In addition to their personal demographics providing a good amount of diversity, their professional demographics were also representative of the industry (as shown in Tables 3, 4 and 5).

Table 3

Professional Demographics of Participants – Type of Work

Type of Work Company or Division Does	Number of Participants
Commercial Builder	12
Construction Manager/Owner's Rep	3
Heavy/Highway/Civil	2
Industrial Builder	1
Residential Builder/Developer	4
Other	2
Total	24

Table 4

Professional Demographics of Participants – Corporate Volume

2004 Annual Corporate Volume	Number of Participants
\$500M or more	7
\$50M - \$499M	10
\$49M or less	7
Total	24

Table 5

Professional Demographics of Participants – Job Titles

Job Titles	Number of Participants
Owner/Co-Owner	3
Vice President	1
Project Manager	2
Assistant Project Manager	1
Project Engineer	6
Estimator	4
Manager (purchasing, plans, etc.)	3
Safety	1
Contract Administration	1
Cost Engineering	1
Designer	1
Total	24

Data Collection

This study employed a triangulation of data collection methods to build a theory of career choice and development for women in construction management. This triangulation included an extensive content analysis of relevant literature, a written questionnaire, and small focus group interviews.

Content Analysis and Theoretical Comparison

Content analysis is “a research method that uses a set of procedures to make valid inferences from text” (Weber, 1990, p. 9). The central idea is that copious amounts of material found in texts be classified into fewer content categories by which to make more valid and reliable conclusions. The researcher’s job is to narrate the study by a chronology of major events, followed by up-close or detailed perspectives of a few incidents (Creswell, 1998). With the abundance of written material related to career choice and factors of non-traditional career choice and development, these procedures of content analysis were vital to this study.

A content analysis of career choice and development theories was conducted from a variety of written sources. Texts and articles providing an overview of major theories related to this area of research (i.e., Brooks, 1984; Brown & Associates, 2002; Brown, Brooks, & Associates, 1990, 1996; Hackett, Lent, & Greenhaus, 1991; Osipow & Fitzgerald, 1996; Walsh & Osipow, 1990) as well as recent dissertations on the topic (Graham, 1997; Hyde, 1997; Nauta, 1997; Winkelman, 1999) were used to identify major career choice and development theorists. From these, the original writings of the theorists were analyzed, many published in edited volumes and vocational behavior and counseling psychology journals.

Once identified, theories were categorized. A first step in this process was to identify and separate positivist and social constructionist theories of career theory. This was an important step as each approach has implications for what and how career development theory is studied (Cohen et al., 2004). Specifically, the *what* studied in the social constructionist approach encourages researchers to question conventional definitions of career (i.e., our assumptions about what constitutes viable career paths and notions of acceptable career behavior) (Cohen et al., 2004; Young & Collins, 2004). It highlights the importance of historical and cultural context in framing career thinking and action (i.e., the interaction between individuals and their social worlds). Social constructionism also leads researchers to question the effects of power and ideology in career sense-making and action (i.e., why certain careers are seen as legitimate and valued while others are not) (Cohen et al., 2004).

Likewise, social constructionism affects *how* we approach career research. Researchers from this epistemology seek approaches of career research that elucidate the socially and culturally embedded nature of career, facilitating a greater understanding between individual agency and social context. Methods are sought which bring contradictions and struggles over meaning to the surface, and awareness of the researcher's own frames of meaning or bias are critical to the research process (Cohen et al., 2004). Social constructionism is asking "a new set of questions--often evaluative, political, and pragmatic--regarding the choices one makes" (Gergen, 2001, as cited in Young & Collin, 2004, p. 375).

A second step in this process involved the categorization of theories as being either psychologically based or sociologically based. Psychologically based theories are

those in the tradition of Parsons (1909) who believed that if people actively engage in choosing their career, rather than allowing chance to intercede, they will be more satisfied with their choice. These theories dominate the thinking and practice of psychologists and career counselors (Brown & Associates, 2002). A list of 23 reviewed psychologically based theorists is located in Appendix A.

Sociologically based theories take a different view of career choice and development. The sociological framework for analyzing career paths of individuals considers the interplay between an individual's choices (i.e., psychological factors) and the constraints on those choices imposed by the labor market and other social influences (Hotchkiss & Borow, 1990). Sociologists are more interested in the ways career choices are facilitated or constrained by ascribed characteristics, educational and labor market institutional arrangements, and local contexts than they are the personal choice of occupation (Johnson & Mortimer, 2002). Appendix A also includes a listing of 21 reviewed theories in the sociological tradition.

While the psychological and sociological theories have (and in many ways still do) differ dramatically in their fundamental characteristics and premises, some theorists are starting to integrate components of sociological thought into psychological paradigms recognizing the influence of social setting and ascribed characteristics (i.e., socioeconomic status, gender, ethnicity, community size, and family of origin features such as number of siblings and birth order) (Johnson & Mortimer, 2002).

As the purpose of this study was to create a substantive theory of women's career choice and development, the first step in building this theory was identifying those few formal theories of career choice and development which would serve as the framework of

the study. With so many well-respected theories to choose from this was no simple task. Based upon the research questions, theories within the psychological paradigm were chosen to provide the theoretical framework; however, constructs from the sociological paradigm were integrated into this framework's underlying factors of non-traditional career choice and development.

Once the general paradigms were established, the task of identifying the specific theories began. The guidelines suggested by Brown and Associates (2002) of how to judge the value of career choice and development theory proved to be helpful. First, key constructs (i.e., more well-known and influential) of the major theories were defined. Next it became necessary to identify the interrelationships among these constructs and how they interact in the career choice-making and development process. As these theories have many constructs, only those most important (as defined by the theorists) were used as part of this analysis. Then the focus shifted to identifying those theories that facilitated the understanding of the “what” and the “why” of career choice and development. “Why that choice [of career and occupation] is made is the more crucial question, particularly if we want to influence the antecedents to occupational choice and thus the choice itself”, Brown writes (Brown & Associates, 2002, p. 9). Finally, theories were evaluated on their comprehensiveness (i.e., inclusion of women and/or minorities) and their ability to facilitate the understanding of past, present, and future events.

Through this process four theories of career development were chosen to provide the framework for the study. These career development theories included Krumboltz's (1979) (later Mitchell & Krumboltz 1990, 1996) social learning theory of career decision making; Betz and Hackett's (1981) self-efficacy theory; Lent, Brown, and Hackett's

(1994, 2002) social cognitive career theory; and Gottfredson's (1981, 1996, 2002) developmental theory of circumscription and compromise.

It then became necessary to select and define the constructs of interest.

Constructs describe the phenomena being studied in measurable terms (i.e., the researcher can observe them or can construct instruments that can be used to infer their existence) (Brown & Associates, 2002). As there are many constructs within each of these theories, it was necessary to break each of them down and focus on the smaller discrete parts of their models with a limited set of interacting variables (Bandura, 1986a). Once defined, these parts could be analyzed in more detail in the context of female construction professionals. Using the suggestions of Farmer and Associates (1997) to define these smaller sets of variables, the following constructs were identified:

- The interaction of gender and socioeconomic status with a set of relevant cognitive variables such as outcome expectations and goal setting;
- The role of social variables--interpersonal (i.e., role models) and contextual (i.e., structure of opportunity)--on career choice;
- The relationship of androgynous beliefs and behaviors and career choices;
- The role of and relative strength of the social, behavioral, and cognitive sources of career self-efficacy; and
- The relationship of personality factors and career choice and development.

As many of these constructs include sociological variables, components of sociological career development theory were integrated with factors of non-traditional career choice and development. These factors were grouped into three categories: a) family background variables, such as gender role socialization and socioeconomic status

and parental education; b) individual or psychological variables, such as mathematics and science ability and achievement, dimensions of personality, and self-efficacy; and c) environmental or sociological variables, such as role models and mentors, the structure of opportunity, educational climate in the schools, and counseling and advising (see Graham, 1997).

Figure 3 provides a theoretical framework of the literature relevant to the study. Use of a visual summary allows a researcher to understand how the study of the topic adds to, extends, or replicates research already completed (Creswell, 2003). Literature maps can be organized in different ways; however, the hierarchical structure seemed most appropriate for this study with a top-down presentation of the literature review ending with a proposed study (i.e., substantive theory of career choice and development) which will, in turn, extend the literature (Creswell, 2003). The arrows represent the direction of the influence each theory and construct has in the development of the theoretical framework toward its final outcome of a substantive theory of career choice and development for female constructors (Miles & Huberman, 1994).

Prior research and general theory of career choice and development alone, however, are not enough to create this substantive theory of career choice and development. As the next section will discuss, creating a profile of women in construction management degree programs and professional positions in the construction industry through written and oral data collection was a central component of this grounded theory study.

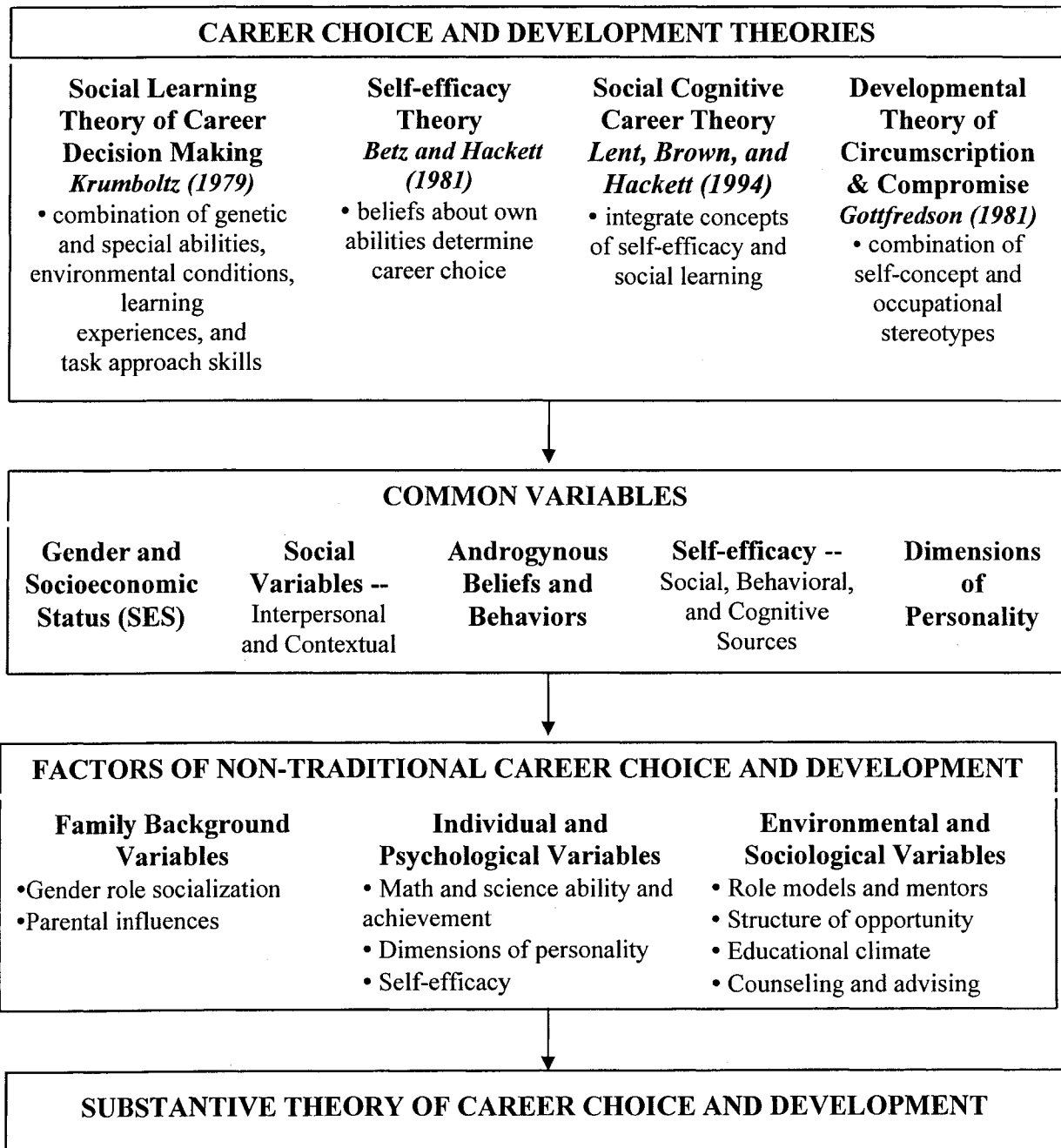


Figure 3. Theoretical framework of career choice and development for female construction professionals.

Written Questionnaire

There are many advantages of written document review as a data collection method. Some of these advantages include: enabling the researcher to obtain the language and words of participants; accessibility to data at a time convenient to the

researcher; representative of data that are thoughtful, in that participants have time to compile and complete; and savings of time and transcription expense (Creswell, 2003).

A written questionnaire was included in this study for all of these reasons.

The written questionnaire gathered information pertaining to the following:

- Demographic information of the participant (i.e., age and race) and the her employer (i.e., type of work and annual volume);
- Family of origin variables such as parental level of education, occupation, and family socioeconomic status; current family status of marriage, children, and household responsibilities; and familial influences to career choice;
- Educational background (post-secondary and secondary), including degrees awarded; coursework taken; academic achievement; description of school culture; and academic influences to career choice;
- Construction experience, including listing of level and length of construction experience; number of employers; evaluation of personal and career goals; a scale measure of career satisfaction and career commitment; and industry influences to career choice and career development;
- Self-efficacy, both career task and experience, measured on a 5-point Likert scale; and
- Dimensions of the 'Big Five' personality traits, measured on 25 scale items.

Career *task* self-efficacy scales measure a person's self-efficacy for occupational tasks (i.e., strive to maintain a safe environment for self and coworkers) instead of occupational *titles* (i.e., construction manager) (Lucas, Wanberg, & Zytowski, 1997; italics in original). It is operationalized as the individual's self-report of confidence or

efficacy to successfully perform competencies (Rooney & Osipow, 1992). Many have suggested that it is important to study career self-efficacy at the task level to better understand career development (Bandura, 1977; Betz & Hackett, 1983; Lent & Hackett, 1987; Osipow, 1991; Rooney & Osipow, 1992). Various career task self-efficacy scales (Johnson, 1996; Kuder & Zytowski, 1991; Lucas et al., 1997; Taylor & Betz, 1983) were reviewed and, from them, the researcher determined to use a 5-point Likert scale.

Content of the tasks included on the scale were originally developed as part of an Intern Performance Appraisal document utilized by Kinetics Systems Inc. (2004). Larger categories of performance included description of specific tasks for the participant to evaluate their degree of confidence to successfully perform or demonstrate. These categories include: job knowledge; planning and organizational skills; human relations skills; problem solving; communication; adaptability and flexibility; cost control; function as part of team; safety; creativity; and high quality of work and productivity. In addition to their practical use of performance appraisal in industry, these categories and task descriptions had been used by the researcher in a prior study (Moore & Plugge, 2006); therefore, the researcher was confident in their validity and reliability as an evaluation of career task self-efficacy.

The final component of the written questionnaire included the 'Big Five' personality traits (Costa & McCrae, 1992). These personality traits include: extraversion (vs. introversion); agreeableness (vs. antagonism); conscientiousness (vs. lack of direction); emotional stability (vs. neuroticism); and openness to new experience (vs. closedness) (Pervin et al., 2005). Characteristics of each of the paired traits were

described with a scale between the extremes. Participants were asked to assess along the scale where they believe their personality most aligns presently.

The written questionnaire (see Appendix F) was included as an attachment with a reminder e-mail sent 7-10 days prior to the focus group (see Appendix E). The written questionnaire was designed to take 20-25 minutes to complete. Participants were asked to complete the questionnaire and return to the researcher prior to the focus group by either e-mail or by fax to the researcher's private fax. Information given on the written questionnaire remained confidential and was not referred to in the focus groups. The researcher did review the completed questionnaires prior to the focus group for general knowledge about the participants and their academic and personal backgrounds. Following each focus group, data collected from the written questionnaire were analyzed both qualitatively and quantitatively in conjunction with that collected from the focus groups.

Focus Group Interviews

Focus groups are a way of collecting data through group interaction on a topic determined by the researcher (Morgan, 1997). The goal is to delve into attitudes and feelings about a particular topic, to understand the "why" behind a certain behavior (Greenbaum, 2000). Focus groups can be distinguished in terms of the research purpose they serve, the types of information and knowledge they produce, their scientific status, and methodological factors (Fern, 2001). Of the three types of focus groups (i.e., exploratory, experimental, and clinical), exploratory is useful for theory development as its central tasks are to create new ideas; collect unique thoughts; and identify needs, expectations, and issues of a particular topic (Fern, 2001). "Exploratory tasks for theory

applications include generating theoretical constructs, causal relationships, models, hypotheses, and theories,” states Fern (2001, p. 7).

There are seven components to the general focus group process. These include group cohesion; the discussion process; the outcome; group composition; research setting; the moderator; and group process factors (Fern, 2001). Some of these are controllable by the researcher while others are not. The central component is the discussion process--each of the other factors influences the discussion process and the exchange of information. The discussion process, in turn, affects the nature of the focus group outcome (Fern, 2001).

Group cohesion. Group cohesion is important to the success of a focus group as it provides the reason for participants to contribute to the discussion. Group composition and the focus group setting affect cohesion, both directly and in combination (Fern, 2001). Focus groups are generally comprised of 6 to 10 individuals (Fern, 2001; Greenbaum, 2000; Morgan, 1997). Smaller, mini-group, focus groups are also common with 4 to 6 participants (Fern, 2001). The amount that each participant has to contribute to the discussion is a major consideration in determining group size. Small groups work best when the participants are likely to be both interested in the topic and respectful of each other and when the researcher desires to gain a clear sense of *each* participant’s reaction to the topic (Morgan, 1997). As this was the case in this study, and upon review of a similar study by Graham (1997) which included 2 to 5 individuals per focus group, the researcher determined to invite 4 to 6 individuals to each focus group. This size included the recommendation to over-recruit by 20 percent to cover no-shows (Morgan, 1997), anticipating that most of the focus groups would be comprised of 3 to 5

individuals. In reality, of the six focus groups held, two included three participants, two included four participants, and two included five participants.

Compatibility is the chief concern when determining the composition of focus groups. As Morgan (1998) states, “When the participants perceive each other as fundamentally similar, they can spend less time explaining themselves to each other and more time discussing the issues at hand” (p. 59). The classic way to achieve compatibility is by bringing together homogeneous participants. Background or demographic characteristics (i.e., gender, race or ethnicity, age, location or residence, education level, occupation, income, marital status or family composition) are a common basis for this selection (Morgan, 1998). Too much homogeneity, however, can restrict the range of issues and positions discussed; therefore, a degree of heterogeneity was sought in the sample selection.

Gender and general occupation were assumed homogeneous demographics within the study, but the researcher also determined a certain amount of homogeneity by adding criteria of education level (i.e., having completed a bachelors or master’s degree). Location or residence of participants was homogenous based upon the sampling methods and the geographic location of focus groups (most participants had resided in Colorado for multiple years). Age and income was assumed to be somewhat homogenous based upon the criteria of graduation dates (i.e., May 1994 – May 2004) and current employment as construction professionals, although some diversity was expected as age at degree completion and years of employment varied. Participants were sought out from a range of employers with an array of job functions so as to have a degree of heterogeneity among members. More heterogeneity than originally expected was found

with regard to marital status and family composition; however, this was more by chance than design as the researcher had no way to identify this prior. Finally, no effort was made to sample participants based on race or ethnicity as there was not a large enough population of non-Caucasian female alumni to sample from to reach much heterogeneity.

The setting refers to the space in which the focus group occurs. Considerations for setting include the ambient (i.e., formal to informal; artificial to nature), human (i.e., number and placement of individuals for optimum amount of privacy and personal space), and material (i.e., tangible or physical characteristics of room--tables, chairs, recording equipment) (Fern, 2001). Location and times of focus groups were determined upon identification of participants so as to be as convenient (i.e., driving time and distance) as possible for all (Morgan, 1998).

The offices of the Associated General Contractors of Colorado (AGC) on the outskirts of downtown Denver was the primary location for the focus groups. This determination was made as a) AGC offered their facilities at no charge; b) the facilities have training rooms suitable for focus groups; c) free and secure parking is available on site; and d) and the majority of participants live and work in the Denver Metro area. The one focus group not held in the AGC offices was held on the Colorado State University campus in the Department of Construction Management's conference room. Both settings accounted for ambience (informal and familiar to most participants), human (adequate space and privacy), and material (Fern, 2001). Figure 4 is a diagram of the room setup in each location.

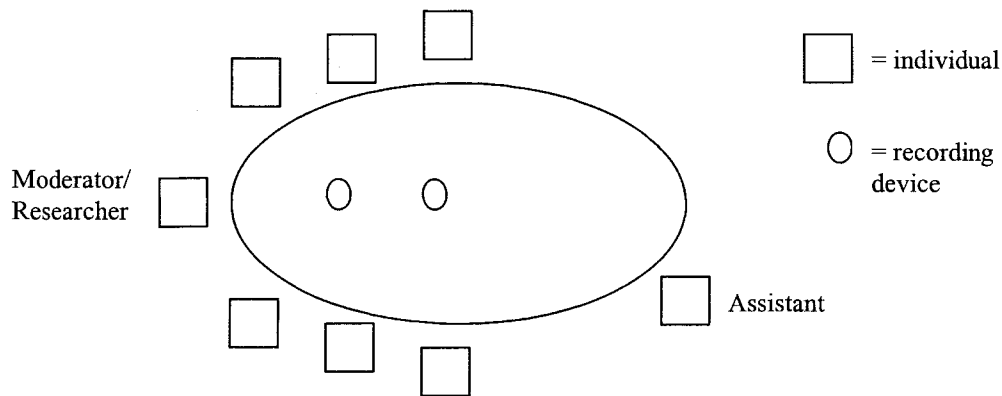


Figure 4. Setup for focus groups in AGC and CSU facilities.

Originally, eight focus groups were scheduled in a four week time period (see Appendix D). Consideration was made by the researcher before the focus groups began that if, either because pre-scheduled dates did not fill or more data were needed to reach saturation, additional focus groups would be scheduled. Likewise, consideration was made that if pre-scheduled dates did not fill but saturation was reached, fewer than eight focus groups would occur. Flexibility of dates was also possible with each of the locations. Saturation was determined by the end of the sixth focus group. These focus groups were completed in a period of four weeks, the first occurring on July 21 with the last two on August 17, 2005. Options for dates and times were chosen that the researcher felt would be convenient for the participants and, when recruited, participants were allowed to choose their focus group session based upon fit of their schedule with the options of date and time (Fern, 2001).

Suggestions about the optimal number of focus group sessions range from 2 to 8 (Fern, 2001). While most focus group research shows that fewer than five groups is adequate, if the purpose of the research, as with this study, is to collect a total population of thoughts rather than common or unique ones, more groups may be necessary (Fern,

2001). Likewise, as mini-groups are being used (i.e., 3 to 5 participants), more sessions compensate for fewer participants and allows the profile created to be more representative of the population.

Morgan (1997) identifies other considerations in determining the number of focus groups. Probably the most important is the variability of the participants both within and across groups. Within groups, more heterogeneous participants will typically need more total groups to sort out the different sets of opinions and experiences. Degree of structure of the interview also impacts the number of groups. Less structured interviews, with lower levels of moderator involvement, require more groups. Another significant consideration concerns the availability of participants. If there are few potential participants available or if they are highly dispersed, several smaller groups of smaller size are required to address the criterion of saturation. All were considered in determination of the final number of focus groups facilitated.

Discussion process. Foulkes (1964, as cited in Fern, 2001) provides a series of factors which guide the focus group discussion process. These factors represent sequential stages in the group discussion. The first factor, *social integration*, is the opportunity for equal participation of all group members in the discussion. The second, the *mirror reaction*, is individual participants' realization that others share similar ideas, anxieties, or impulses and this then relieves anxieties they feel related to participation in the focus group. *Condenser phenomenon*, as the third factor, is an activation of the collective conscious and unconscious that makes it easier to talk about issues raised in the discussion. Finally, *exchange*, is the process of sharing information and explanations that makes up the bulk of the discussion.

In the 90 minutes scheduled for each focus group, the first 10 was devoted to the first two factors, social integration and mirror reaction. This included time for participants to check in and become acclimated to the room, gather some refreshments, and engage in light conversation with the researcher and other participants. Introductions were made and participants got to know a little about each other. Participants were then asked to take a seat around the table and Informed Consent Forms (see Appendix C) were distributed. In going through the consent form, the researcher set the stage in terms of the role of the researcher (as group moderator), the purpose, and the ground rules (i.e., use of audio recorder, role of assistant moderator) for the session (Greenbaum, 2000). Once consent forms were completed and collected, participants were asked to introduce themselves and the focus group proceeded into the third and fourth of Foulkes stages, condenser phenomenon and exchange.

Interview questions were tailored for about 80 minutes of discussion. Each focus group was conducted in a moderately structured manner. As such, the researcher was guided by a set of questions (see Appendix G), but neither the exact wording nor the order of questions was predetermined. Likewise, the questions themselves were adjusted from focus group to focus group as information gleaned and data analyzed from prior groups was used to guide each subsequent group. This balance of structure was determined based upon the goal to inductively create a profile of female constructors. A fully structured style was not used as this research is exploratory and the intent was to determine the participants' perspectives. On the other hand, a fully unstructured style was not used as the researcher did have insight into the relevant discussion topics (from

an extensive review of literature and personal experience) and wished to be able to compare and combine group responses.

Generally, each focus group began with each participant providing a brief personal introduction and explanation of her experience in the industry. From here, questions were directed at uncovering the factors relevant to the career decision making process. Factors of non-traditional career choice and development followed, adding to the data collected from the written questionnaire. The intent of this questioning route was to facilitate the involvement of all participants in the discussion and to maintain a level of comfort with the procedures and setting. The line of questioning then moved into a lengthier discussion of the challenges faced by women in academic programs and the construction industry and the strategies of career development these women have employed to persist. The focus group wrapped up with a brief discussion as to the future of women in construction management and recommendations for industry and academia focused on recruiting and retaining women in construction management.

A final important component to the discussion process is the moderator. In a focus group, the moderator is a facilitator or discussion leader, not a discussion participant (Fern, 2001). Two important considerations in deciding on moderator(s) are prior experience and relationship to the participants (Morgan, 1998). Having these qualifications, the researcher made the determination to moderate the focus groups with the aid of an assistant. Likewise, the smaller size of the focus groups made this option more feasible.

Focus group outcome. The focus group outcome refers to the success of achieving the researcher's goal. McGrath and Hollingshead (1994, as cited in Fern,

2001), define outcome as a) task performance effectiveness (i.e., quality, quantity, and the cost of information); b) the user's reaction (i.e., satisfaction with the process and output); and c) group member relations (i.e., cohesive, compatible, and lively groups). Outcome is the total effect of the other six components discussed earlier in the intended consequences of the focus group (Fern, 2001).

The type, quality, and quantity of information produced in a focus group make up "output". This output may take on one of several formats depending on the researcher's needs (Fern, 2001). Moderator (and assistant moderator) notes, audio recordings, transcriptions, and the written questionnaire were all output within this study. During the focus group, careful attention was paid to the nonverbal aspects of communication. The recording of nonverbal communications, identification of speakers, and operation of the audio recorders were the responsibility of the assistant moderator. Additional notes were taken on the focus group question guide by the researcher as a means of facilitating the discussion and recording notes and observations. Detailed note taking was not required as all focus groups were audio-taped and subsequently transcribed. Transcripts and the written questionnaire provided additional output. The day after the focus group, each participant was contacted via e-mail for a thank you and invited to add any additional comments (which they could e-mail in the next few days).

Pilot Study

Both the written questionnaire and the focus groups were piloted with a small group of current construction management students and alumni. These women were chosen by the researcher for their class standing (three junior-level, one senior-level and currently on internship, and one alumnus in the first month of her first post-graduation

job) and for their availability during the summer months. Similar scripts were used to correspond with pilot study participants and the focus group was held in the Department of Construction Management's conference room. The purpose of the pilot study was to test the procedures, specifically the written questionnaire, the focus group interview guide and questioning route, and the audio recording equipment. Following the completion of the written questionnaire and during the pilot study focus group, participants were asked to provide feedback on the wording and content of questions. Revisions were made to both the written questionnaire and the focus group question guide from this pilot.

Data Analysis

Data analysis is about making sense of collected data. It is a complex process that involves consolidating, reducing, and interpreting to make meaning (Merriam, 1998). Creswell (2003) defines a six step generic process of qualitative data analysis which guided the data analysis process. Within this generic process, are a series of systematic procedures which Strauss and Corbin (1990, 1998) identify for the building of grounded theory. These procedures help provide standardization and rigor to the qualitative data analysis process. This process is dynamic and fluid, but generally broken down into a series of activities which include open coding, axial coding, and selective coding. Strauss and Corbin (1998) define the following as:

- Open coding is the “analytic process through which concepts are identified and their properties and dimensions are discovered in data” (p. 101).
- Axial coding is the “process of relating categories to their subcategories... linking categories at the level of properties and dimensions” (p. 123).

- Selective coding is the “process of integrating and refining theory” (p. 143).

Step 1: Organize and prepare the data for analysis. Preparing the data for analysis involves transcribing interviews, optically scanning material, typing up fieldnotes, or sorting and arranging the data into different types depending on the sources of information (Creswell, 2003). As a triangulation of research methods, including an extensive content analysis of relevant literature, a written questionnaire, and small focus groups, a large amount of data were collected by a variety of methods.

An extensive review of theory and research in the areas of career choice and development, factors of non-traditional career choice, and characteristics and strategies of persistence was done prior to the collection of data from study participants. This information provided the theoretical framework of the study and guided the initial data collected from study participants. This immersion in the literature, however, continued throughout the duration of the study as part of the data analysis process. This was especially true in the areas of non-traditional career choice and strategies of persistence as additional factors were identified through written and oral communications with participants.

Data collected from the written questionnaire was separated first into qualitative data to be coded and quantitative data to be statistically analyzed. The qualitative data were sorted into separate categories of family background variables; education variables; and construction experience. Within these categories, data related to influences of career choice and development; parental education and occupation; characteristics of education; positions held in industry; and reasons for attrition were analyzed. Proper statistical techniques were used to analyze numerical and categorical data specific to demographics;

socioeconomic status; marital status; number of children; household responsibilities; grade point average (GPA); years of employment; number of employers; career satisfaction; career commitment; career task self-efficacy; experiences of self-efficacy; and dimensions of personality. Once focus group transcriptions were complete, the written questionnaires were matched by participant to the transcripts.

As the third component of the research, small focus groups were conducted with participants discussing aspects of their career decision making process; factors of non-traditional career choice; challenges and strategies of career development; and recommendations for the future. Immediately following each focus group, tapes were transcribed and interview logs typed up so that data analysis (in the form of open coding) could occur before the next focus group. This analysis was an ongoing process, influencing features of data collection and determining the point of saturation (Eisenhardt, 2002).

Step 2: Read through all the data. Tesch (1990) provides a useful process for data analysis which begins with reading through all of the data to obtain a general sense of the information, reflecting on its overall meaning (as cited in Creswell, 2003). Merriam (1998) suggests reading through the transcripts, field notes, and documents, jotting down notes, comments, observations, and queries in the margins. In an effort to be able to fully complete this step between each focus group, the researcher committed to transcribing herself the tapes from each focus group. This allowed for a shortened time span between focus groups as well as an intimate knowledge and understanding of what was said and in what context. Additionally, attention was given to participants' voice of self and ways of talking about relationships (such as institutionalized restraints and

cultural norms and values) (Brown & Gilligan, 1992). Another step taken by the researcher was the review of notes taken by the assistant moderator to further gain a clear picture of the group dynamics. Notations made during this step so as to guide subsequent focus groups were generally those bits of data that struck the researcher as interesting, potentially relevant, or important to the study (Merriam, 1998).

Step 3: Begin detailed analysis with a coding process. The second step in Tesch's process is to pick one document (i.e., one focus group transcript) and focus on its underlying meaning, writing thoughts in the margins (Creswell, 2003). The identification of topics were both predetermined by the researcher (as based upon the literature) and emerged from the participants' vocabulary (Merriam, 1998). This process was repeated for each document and then a list made of all topics. Similar topics were clustered and then formed into a table and arranged as major topics, unique topics, and leftovers (Creswell, 2003). Once general areas of meaning were defined, the process moved toward an analysis focused on substance.

Again, it was important to return to the data. This time, however, the list of topics was abbreviated as codes and these codes were written next to the appropriate segments of the text (Creswell, 2003). Strauss and Corbin (1998) refer to this process as microanalysis, or the "detailed line-by-line [i.e., word-by-word] analysis necessary at the beginning of a study to generate initial categories (with their properties and dimensions) and to suggest relationships among categories" (p. 57). Microanalysis includes open and axial coding and is focused completely on the data collected to identify emerging categories and codes.

Step 4: Use the coding process to generate a description of the setting or people as well as categories or themes. Still within this process of microanalysis, topics must be turned into categories. These categories were reduced by grouping related topics and, once this process was complete, lines were drawn to show interrelationships between categories (Creswell, 2003). Procedurally, this process of axial coding was the act of relating categories to subcategories to form more precise and complete explanations about the phenomena (Strauss & Corbin, 1998). This process continued until all categories are identified and codes made. Finally, selective coding, as a process of integrating and refining categories, was used to integrate these major categories into a larger “theoretical scheme” (Strauss & Corbin, 1998).

Step 5: Advance how the description and themes will be represented in the qualitative narrative. There are several techniques used to aid integration of central categories and concepts. These may include a narrative passage such as a discussion or chronology of events, a detailed discussion of themes (complete with sub-themes, specific illustrations, multiple perspectives from individuals, and quotations), or use of diagrams (i.e., visuals, figures, or tables) (Creswell, 2003). All of these techniques were used to integrate and represent the data in outline form.

Step 6: Make an interpretation or meaning of the data. Once an overarching theoretical scheme was outlined, it was time to refine the theory. Refining the theory consists of reviewing the scheme for internal consistency and for gaps in logic, filling in poorly developed categories and trimming excess ones, and validating the scheme by comparing it to raw data or by presenting it to participants for their reactions (Strauss & Corbin, 1998). The refined theory then answers “what were the lessons learned”

(Lincoln & Guba, 1985, as cited in Creswell, 2003). A detailed discussion of this step is included in following chapters.

Evaluation of Grounded Theory

In all research, validity and reliability are major considerations (Merriam, 1998). A grounded theory methodology allows important strengths, like novelty, testability, and empirical validity, to arise from “the intimate linkage with empirical evidence” (Eisenhardt, 2002, p. 32). Strong studies are those which “present interesting or framebreaking theories which meet the tests of good theory or concept development (e.g., parsimony, testability, logical coherence) and are grounded in convincing evidence” (Eisenhardt, 2002, pp. 32-33).

Pragmatically Useful and Credible

Glaser and Strauss offer ways to think about and evaluate the overall “goodness” of a composed substantive grounded theory. Specifically, they use the concepts of “pragmatically useful” and “credibility” for evaluation (Locke, 2001). Pragmatically useful is an acknowledgment that grounded theory has philosophically pragmatist roots, thereby seeking usefulness to social scientists and laypersons. Glaser and Strauss (1964) discuss a developed theory’s value as a practical guide to action through the use of four terms: fit, understandable, general, and control. Fit is the cohesiveness of theory and data. Understandability must include those individuals working in the kinds of social situations studied--for this study that would be those seeking to recruit and retain female constructors into degree programs and the construction industry. Generality would include the theory’s relevancy to different conditions and situations in the practice setting--in various construction management degree programs and across the spectrum of

the construction industry (i.e., various types of construction, companies, locations, positions). Finally, control speaks to usability--is the theory useful in everyday situations (Locke, 2001).

Credibility within a grounded theory can be evaluated on a variety of components. Again, Glaser and Strauss provide guidelines for this evaluation. First, as part of the research process, analytic generalizability must be assessed. This generalizability is extended through a comprehensive and complete sampling and data collection process. Langley (1999) refers to this as “data density”. Glaser and Strauss (1964) also insist that the conceptual elements of a theory must be sensitizing. A term originally coined by Blumer in 1954 about the nature of social theory, sensitizing implies that social concepts included within the theory must “guide readers in developing a picture of the empirical instances to which they refer” (as cited in Locke, 2001, p. 60).

There are also methods within the writing process that a researcher can employ to increase credibility. Clearly identifying and defining the theoretical framework is imperative. Theory cannot stand alone, however, as Glaser and Strauss (1964) caution that it must produce a sufficiently vivid description of the context being studied so that readers are able to “almost literally see and hear its people--but in relation to the theoretical framework” (as cited in Locke, 2001, p. 60). A second critical component of credibility garnered within the writing process is a researcher’s disclosure of his or her own subjective experiences. Within this disclosure, Glaser and Strauss see a sense of conviction about the theorizing coming through the researcher’s words, thereby increasing the credibility given by the reader (Locke, 2001).

Validating Findings

Validity and reliability can be ensured through careful attention to a study's conceptualization, the way the data is collected, analyzed, and interpreted, and the way the findings are presented (Merriam, 1998). There are several strategies of enhancing internal validity, reliability, and external validity in qualitative studies. Some qualitative researchers prefer terms such as "credibility", "fittingness" and "auditability" to convey these concepts (Guba & Lincoln, 1981).

Internal validity addresses how one's findings match reality (Merriam, 1998). In qualitative research, validity refers to the relationship between an event or account and something outside of this account, whether this something is construed as objective reality, the constructions of actors, or a variety of other possible interpretations (Maxwell, 2002). As observers and interpreters of the world, we are inextricably part of it; therefore, it is always possible for there to be different, equally valid accounts from different perspectives (Maxwell, 2002). However, there are a variety of strategies which researcher's can employ to add credibility or internal validity to a study.

During the data collection and analysis processes, triangulation (i.e., use of different data sources), peer debriefing (i.e., reviewing and discussing focus group transcripts with the assistant moderator to clarify impressions and check for accuracy), and clarification of researcher's bias (i.e., assumptions, worldview, and theoretical orientation) were all strategies utilized to add credibility (Creswell, 2003; Merriam, 1998). During the writing process, peer debriefing (i.e., involvement of additional persons to review and evaluate the study) was another strategy used to gain credibility. Validation processes such as these are strengths of qualitative research to determine

whether the findings are accurate from the standpoint of the researcher, the participants, and the readers (Creswell, 2003).

External validity refers to the fittingness or generalizability of the study to new settings, people, or samples (Creswell, 2003). In a qualitative study such as this, the purpose is to provide “thick description” from a relatively small group of individuals within the context of a particular setting (Morgan, 1988). Strauss and Corbin (1998) state, “The purpose of using a theory-building methodology is to build theory” (p. 267); therefore, interest lies in “explanatory power” rather than generalizability. This explanatory power is the ability to explain what might happen in a given situation. Clearly specifying the conditions that give rise to the phenomena under study and explaining the consequences which occur as a result of these conditions is an integral part of this explanatory process.

There are strategies qualitative researchers can use, however, to enhance generalizability. Multisite designs, or the use of several cases to maximize the diversity of the phenomenon of interest, allows for application of findings by readers to a greater range of situations (Merriam, 1998). Sampling is the important aspect here--the more systematic and widespread the theoretical sampling, the more conditions and variations that may be discovered and built into the theory and, therefore, the greater its explanatory power (Strauss & Corbin, 1998). The delimitations of the sample in this study were chosen with care. Use of rich, thick description and discussion of typicality of participants (i.e., how typical participants of this study are to the larger population of female construction professionals) are also fundamental components of a well done qualitative study (Merriam, 1998). As Strauss and Corbin (1998) state, “The real merit of

a substantive theory lies in its ability to speak specifically for the populations from which it was derived and to apply back to them” (p. 267).

Reliability refers to the extent to which research finding can be replicated (Merriam, 1998). Such a definition does not fit in the multifaceted and high contextual realm of qualitative research (how can one replicate human behavior?); rather, Lincoln and Guba (1985) suggest thinking about the consistency of the results. Auditability or consistency is, therefore, ensured through the coding of the data collected in such a manner that another person could understand the themes and arrive at similar conclusions (Morgan, 1988). Researchers can ensure reliability of results in qualitative research by clearly explaining the researcher’s position (i.e., clarification of researcher’s bias), use of triangulation of data sources, and making an audit trail (i.e., clearly describing how data collected, how categories derived, and how decisions made throughout the inquiry) (Merriam, 1998). In this study of women’s career choice and development in the context of the construction industry, studies of women’s career choice and development in similar non-traditional fields (i.e., engineering and science) were used to guide the research (Farmer & Associates, 1997; Graham, 1997; Winkelman, 1999). In a sense, this is a process of developing credibility as it allows for comparisons of findings.

Presentation of the Results

Results in Chapter 4 are presented in categories of findings relevant to career choice and development in a non-traditional field. Such categories were defined initially as those within the review of literature as family background variables (i.e., gender role socialization, parental influence); individual or psychological variables (i.e., mathematics and science ability and achievement, dimensions of personality, and self-efficacy); and

environmental or sociological variables (i.e., role models and mentors, the structure of opportunity, educational climate in the schools, and counseling and advising). Categories were then expanded or adjusted based upon the data collected from the written questionnaire and focus groups.

CHAPTER 4

RESULTS

The purpose of this study was to create a theory of women's career choice and development in the context of the construction industry, specifically targeted to those in the professional ranks engaged in the management of construction projects and/or companies. As a qualitative study, this study followed the guidelines of a grounded theory research design. This means that the theory developed was "derived from data, systematically gathered and analyzed through the research process" (Strauss & Corbin, 1998, p. 12). As such, components of the research design and concepts were allowed to emerge during the research process. The goal of this approach was to build a "dense, well-developed, integrated, and comprehensive theory" on the topic (Strauss & Corbin, 1998, p. 33).

The substantive theory of career choice and development formed from this study included components of the research (i.e., profile of female constructors) integrated with key components of prominent career development theories, as well as factors of non-traditional career choice, career development, and persistence. Focused on female constructors who have completed a degree program in construction management and who are now actively employed in professional positions in the construction industry, five broad research questions guided the study:

1. What factors shape the career choice making process of women entering construction management as a major and profession?

2. What factors influence (both positively and negatively) the career development of female constructors in the construction industry?
3. What factors influence (both positively and negatively) the feeling of inclusion for female constructors in the industry?
4. What recommendations can be made to academia and industry for the successful recruitment and retention of women into professional positions in the construction industry?
5. Are there associations and differences among factors that would provide a better understanding of the traits and characteristics of female constructors in the construction industry?

While each participant was asked to complete the same written questionnaire focused on gathering data relevant to demographics, family of origin variables, educational background, construction experience, self-efficacy, and dimension of personality, the questioning route for the focus groups was modified slightly after each focus group. Although the focus group questioning guide was organized to maximize components of the general focus group process (Fern, 2001), it was adjusted as needed to best allow themes within the data to emerge in an inductive manner. In periods where time allowed (i.e., except when focus groups were on the same evening), focus group transcripts were coded and data analyzed through a process of open coding prior to the next focus group so as to allow themes and categories of information to be identified (Creswell, 2003; Strauss & Corbin, 1998). A constant comparative approach was used to identify saturation of these categories (Creswell, 2003). Once saturation was achieved, qualitative data from both the written questionnaires and focus groups were coded

through a process of axial and selective coding. The discussion to follow is the presentation of this data.

Career Choice Making Process

Influences on the career choice making process of women entering construction management as a major include a host of variables. Some similarity of family backgrounds, individual and psychological characteristics, and environmental and sociological circumstances were found among participants, but a host of intervening variables and chance were identified as significant factors for many of these women. Interestingly, just 1 of the 24 women in this study entered a construction management (CM) program as her first major in college immediately following high school. The others were all second degree or transfer students into a CM program.

The career choice process for many of these women was a long and winding road. Prior majors or degrees included: architecture; engineering (civil and mechanical); business (administration, accounting); sports medicine; exercise and sports science; animal science; liberal arts; education; interior design; nutrition and dietetics; housing and design; computer science; and open option. Reasons for changing majors included: not liking job prospects (i.e., pay and responsibilities) or aspects of the job in current major (i.e., sitting all day, designing rather than building); “bored to death” and disliking classes in current major; interest in CM curriculum or liking of introductory CM course(s); high placement rates of CM graduates and range of job options; ability to transfer much of prior coursework into degree; alienation from peers in current major; need/want to stay at current university and CM was closest fit to interests; and encouragement from co-workers, friends, family, or advisers to enter CM program. The

most frequent remark made, however, was “I didn’t know there was a CM program”.

Repeatedly, comments were made such as

When I first came to CSU I was [name of major]. I didn’t even know anything about CM. I had no idea there was even a program here. [1010]

I think if I would have known about this degree then I would have went straight into CM because I just like watching stuff built. [1013]

For some, transferring into CM was “a matter of circumstances, chain of events, choices made along the road” or “the feeling more than a person”; for others the change was more of a sudden thing (i.e., went to a jobsite and “feel in love with it”) or an “I’ll try it” attitude. One participant remarked,

It was exciting for me to be able to figure out that there is actually a degree out there tailored to exactly what I want to do. [1001]

Family Background Variables

Prior research has shown that a host of family background variables influence the career choice making process. This research supported these prior findings, showing a commonality of androgynous gender role socialization and strong family ties influencing and/or supporting a non-traditional career choice despite varying family background demographics. Asked to recall the socioeconomic status of her family while growing up, 13 participants described themselves as middle class. Of the remaining 11, seven described themselves as lower-middle class and four as upper-middle class. Educational backgrounds of parents varied also as shown in Table 6. Thirteen of the 24 women had or has a parent whose occupation is somewhat related to the construction industry. These occupations include realtor (2); drafter; painter; electrician; cabinet maker; industrial arts teacher; engineer (2); and owner of general contracting firm. One father works for a

construction equipment firm and two others are employed as project managers for construction companies.

Table 6

Educational Background of Parents--Frequency Counts

Highest Educational Level Completed	Mother	Father
No Diploma	0	2
High School	10	10
Associate Degree	1	1
Bachelors Degree	9	6
Master's Degree	4	4
Professional or Doctorate Degree	0	1
Total	24	24

Specifically, gender role socialization and parental influence were investigated as non-traditional career choice factors. Within these broad career choice factor categories common themes emerged.

Gender role socialization. “Balanced” was the word most commonly used to describe gender roles. One described herself as

I was a tree climber and a dirt digger, but I also played with baby dolls and did all of the girly things too. Wore dresses, pig tails, and everything else. I did ballet for 11 years. I don't remember that there was ever a point in time where I stopped and said I can't do that because I'm a girl. [1001]

Another said

Gender roles weren't ever really pushed on me as a kid. I could build a fort one day and play Barbies that afternoon or whatever so I wasn't really pushed. Once again, my parents just felt that you really need to do what you want to do. [1009]

Many of these women described themselves both as a “tomboy” and a “girly girl”

growing up, saying

I didn't think of myself as the feminine type and that I absolutely had to fill certain roles so I kind of just did my own thing. [1039]

Did the girly things too, but then I was with my banana seat bike doing the dirt bikes, jumping the hills with the guys, playing chicken with my bike. [1013]

In youth, sports and competition were a usual pastime for many, as was playing with

legos and link-n-logs. Discussion surrounding Barbie was mixed and came up time-after-time. For example

My mom would never let me have a Barbie or anything like that...she was pretty adamant about [that]. I got one, but then I'd have to go over to my friend's house for clothes and the car. [1035]

We [older sister and self] had Barbies. We had all the Barbies and all the Barbie stuff. We had the town house. We had two of them so I made it into a two-story. When we played Barbies, Barbie was a professional woman and had a job. [1026]

I loved my Barbies, but don't mess with me on the basketball court. [1025]

Just 3 of the 24 women described learning about gender roles as being “real specific, not equality”. One stated

There were so many things growing up that boys did and things that girls did, but there was some mix in there too. I was never allowed to mow the lawn--that was a boy's job, not a woman's job or a girl's job. It's so funny now because I love to mow the lawn--I mean I love it! I was a tomboy, but sometimes I don't think my dad wanted me to be a tomboy, but he was still supportive no matter what. But I remember that he would be the one to take me shopping to buy a dress for the first day of school and I was like I really don't want to wear a dress. But I had to wear a dress the first day of school kind of thing. I wanted to play baseball and my dad was like “girls do not play baseball” and things like that. [1010]

Another said

Generally I'd have to say it was still the female does, you know, she cooked, she cleaned, she has her specific role, she takes care of the kids, and then the male does, he brings in the bigger paycheck, he makes the majority of the money and,

therefore, has control over it, and mows the lawn and does all of the manly things outside. [1041]

In a more androgynous fashion, most described learning of gender roles similar to

I helped out with the house, the cooking, cleaning, dishes, mowing the lawn, washing the cars, working on the cars. I just kind of helped out everywhere I could. I don't think I got a straight line. [1033]

We were taught how to sew, cook, clean. I was taught how to use power tools. Both male and female stereotypical things. [1032]

I definitely didn't get a straight line. I think I always learned how to be independent. If my car breaks down, how to change my oil and replace my tire. My dad actually taught me how to cook. There was never a defined line. It was always independence. All the way. [1037]

In most instances, siblings were treated similarly by parents. One participant recalled being lumped in with her younger brothers, saying

My dad treated me like a boy. I had younger twin brothers and my dad made no separation for girl/boy. We were all the same. It's funny--one time we were at the store and I really wanted a pair of dress shoes with little tiny heels and my dad would not buy them for me. I always wore jeans and a t-shirt and that was just the way I grew up. [1007]

More commonly responses were like

My sister and I, they [parents] didn't have any boys in the family, but growing up they'd always encouraged us to do whatever we wanted to do. So we played sports, we were in art classes. We could do pretty much whatever and they would support us. [1039]

I had a younger sister and we did all the girly things too. But we were out with our brother on our dirt bikes jumping also so both my parents were great about trying everything. [1014]

Many of these women grew up in homes where both parents worked. A handful grew up with their mother or father as a stay-home parent. Just one grew up in a single-parent home. Those with stay-home parents had different memories of their parents' gender roles, including

My dad was very, very controlling of my mom growing up. He wanted her home, doing laundry, whatever...the very traditional Mexican family. And she didn't work and there were times when he wouldn't give her money and I am not ever going to rely on someone like that. [1007]

My mom didn't start working full-time until after I graduated from high school...she started teaching. So I had a mom, she cooked and cleaned, and my dad went to work and that's how it was. [1038]

My dad was retired when I was in first grade and my mom worked...forever. They were like 13 years apart. Having a stay-at-home dad...it was a little bit different. He was like "oh, you scraped you arm--get over it". It wasn't like let me cuddle you. I liked that my mom worked because I think it gave me that assertive, competitive edge, but it also allowed me to know that I can decide what I want to do and it's not something that I have to be pigeoned into something. [1034]

While gender role socialization for these women was for the most part similar, regardless of differences in parental roles or their own inclination to be a "tomboy" or "girly girl", these women were given the encouragement and support to try new things and to seek out a major in college that they would enjoy and a career in which they could find fulfillment.

Parental influence. Positive parental support was a commonality for these women as they made their decision to enter a construction management degree program. Only 3 of the 24 women said that they encountered any sort of discouragement from their parents, saying

I grew up in a building family so I was trained at a young age...I knew what the industry was. I knew what it involved and there was daily conversation at the dinner table what work was like. So, ironically, I was raised to be a builder, but when I wanted to go to college my father said, "You can't go into construction, it's a horrible industry, it's too hard, and if you love it then you should go study architecture." [1008]

My dad is an electrical engineer. He wanted me to be an engineer. He thought I'd coped out to the CM route. [1026]

With my parents it was kind of like I'm going to go from mechanical engineering to construction management so my mom was picturing me from wearing a business suit to work to wearing jeans and boots and a hard hat...right now I can laugh at it with my parents. Back then it was not a happy time for them. [1013]

One participant made the comment

My parents wanted me to think hard when deciding on CM as a career due to gender biases as well as it not being a stable industry job-wise. They, however, supported me in all aspects during [my] college career. [1032]

More commonly, parents were described as having a belief that self-fulfillment in career choice was more important than the traditional nature of the career itself. The requirement for many was to go to college, but from there the choice of major and career path was wide-open. Comments included

My parents never said "oh you're a girl" ...I have a younger sister and I was a tomboy and so was my sister. I grew up riding horses and it was never an option. It was like you're graduating high school, you're graduating college, and then after you do those things you can do what you want and whatever you want. [1020]

My father was formative in treating us all the same, especially with us girls in that we would be whatever we wanted and it was absolutely part of his philosophy that you be fulfilled as a person, whatever that is. [1008]

My parents just felt that you really need to do what you want to do. They didn't really have a comment, just really, "Oh, okay. I didn't know they had a program in CM." [1013]

For some, parents played an active role in encouraging them to enter construction management as they were in the industry themselves or had construction-related hobbies. Of this, some commented

My mother had an appreciation of all things built; my father encouraged us to do what we loved, not what everyone else thought we should; and my grandfather was a career homebuilder. [1001]

My dad and my grandpa built houses. My dad's a painter. They would take us to the jobsite, it was our playground however dangerous that was. Then we went to school. It's what they knew so it's what they showed us. [1007]

My dad is a teacher. He teaches woodshop and drafting so I've kind of had the background and he does house building during the summer and so it's just something I've always...I'm daddy's little girl. We have always been very close and shared our interest in building architecture and building materials. [1027]

I am a second generation CM grad so I kind of lived and breathed construction my whole life...my father was my role model. He's been in construction for 30+ years and his job always interested me. I wanted to be able to drive by something and tell someone that I built that like he did. [1032]

Just one participant had grown up around the industry and yet had not thought of it as a career path for herself, saying

My dad works for [name of construction firm]. He's worked for [firm] for about 20 years selling equipment for them. I'd always been around a lot of construction folks through my dad's work and actually in high school worked for an excavation company doing all kinds of stuff. I've always been around it but it never occurred to me that it was actually a profession that would be for me. [1010]

For others, while the family history within construction wasn't there, parents still played an important role in encouraging and/or supporting non-traditional career goals. Many of the women made comments like

My father was very encouraging with if you want to do it than you figure out a way to get it done. He was all for non-traditional career choices and was also very supportive of non-traditional gender roles as well. [1001]

My dad was kind of influential in saying "women bring something different and you'd be really good to have out" even though he knew nothing about construction. [1035]

My mom's a teacher and she thinks it's just the coolest thing to be in a male dominated field and be successful and all that. She just thinks it's so amazing...that it would be forging new frontiers. [1025]

My mom, being a strong personality, probably helped in my decision to go into CM and in my own personality being able to be comfortable in this sort of position. [1026]

Fathers were most often mentioned as providing a strong influence in these women's lives and in their choice to seek out a non-traditional major such as construction

management. Mothers were also mentioned by many of the participants, but rarely as a primary influence. As a group, these women seem to have a strong connection to their fathers, spending a lot of time with them in childhood and adolescents and, now as adults, many refer to their fathers as primary influences and support. Discussion in one focus group provides illustration of this phenomenon

He's [father] so proud of me now because I'll go home now or whatever and we'll talk about construction stuff and my mom and my sister roll their eyes at us because they don't understand any of it. That just makes my dad so happy that I can talk intelligently about construction...he loves that. [1027]
I get that too. My mom and brother roll their eyes [asking], "What are you talking about?" [1033]
I get that too. My mom is like "Can we talk about something else?" [1032]

Individual or Psychological Variables

In addition to family background variables, several individual or psychological variables were found common and influential in a non-traditional choice of major. Three of the most prominent include high school academic skills and interests, personality, and strength of self-efficacy.

Mathematics and science ability and achievement. Participants were asked to write on the written questionnaire classes they excelled in and/or enjoyed most in junior high and high school and then, conversely, those classes they struggled in and/or disliked the most in their secondary education. Incredibly, 18 of these women singled out mathematics as a subject area they liked and/or excelled in while just two noted a struggle or dislike of mathematics (two did note they liked geometry but disliked algebra). Similarly, 10 of the participants listed science as an academic subject they enjoyed while two said that they did not like their science courses. Interestingly, nine of the participants identified English (including literature and composition) as a subject area

they disliked most in their secondary education. These findings are consistent with the research saying that girls and women who are exposed to mathematics and science and tend to value and enjoy these subject areas are more likely to enter non-traditional majors in college.

Still, those identified in high school as liking mathematics and sciences were introduced to engineering rather than construction management. Some remarked

In high school I knew I liked the math and sciences so engineering was always in the back of my mind, but I didn't want to go full blast engineering either. My brother, who's not too much older, had a lot of friends in engineering and I think I heard a million times, "If you want to have a miserable college life than go ahead, be an engineer." And that's probably what kind of held me back from that. [1014]

A lot of my teachers in high school just influenced me because I was excelling in math and science, but English was really a poor subject for me. So they said to go into engineering.... So after a year-and-a-half that really sucked and I hated studying myself...I had to get out. Not only were the core classes just ridiculous but the people I really didn't mesh well with. [1034]

Dimensions of personality. One of the oldest ideas in psychology is that productivity and satisfaction are directly related to the fit between characteristics of individuals (e.g., personality) and the demands of the job (Furnham, 1992). As a broad definition, personality refers to those characteristics of the person that account for consistent patterns of feeling, thinking, and behaving (Pervin et al., 2005). Similar to other studies, Cheng and Dainty (2005) have identified 12 behavioral competencies of a good project manager as: achievement orientation; initiative; information seeking; focus on client's needs; impact and influence; directiveness/assertiveness; teamwork and cooperation; team leadership; analytical thinking; conceptual thinking; self-control; and flexibility. These women exemplified many of these personality traits.

As part of the written questionnaire, participants were shown a list of 25 opposite pairs of personality trait descriptors (e.g., silent and talkative, unkind and kind) and asked to assess on a continuum which trait best described them typically. These 25 pairs of trait descriptors were based on the work of Costa and McCrae (1992) and their 'Big Five' personality trait categories. From these pairs of trait descriptors, it was possible to get a score (on a scale of 1 to 5) for each of the 'Big Five': extraversion (vs. introversion); agreeableness (vs. antagonism); conscientiousness (vs. lack of direction); emotional stability (vs. neuroticism); and openness to new experience (vs. closedness) (Pervin et al., 2005). Table 7 provides a summary of this data showing that, as a whole, these women view themselves as conscientious and agreeable. Likewise, these are the only two of the 'Big Five' in which a participant scored a high of 5.0 (one for agreeableness and three for conscientiousness).

Table 7

Responses to the 'Big Five' Personality Traits

	Extraversion (E)	Agreeable- ness (A)	Conscientious- ness (C)	Emotional Stability (S)	Open to New Experience (O)
Mean	3.892	4.117	4.275	3.475	3.883
SD	.6014	.5895	.4748	.4286	.4967
Minimum	2.4	3.2	3.4	2.8	2.8
Maximum	4.6	5.0	5.0	4.4	4.6

Participants were also asked to identify 3 or 4 of the 50 personality traits shown as those they felt best described them. As might be expected from the results shown above, 4 of the 6 most common words used fit into the conscientious category. Table 8 lists in order of commonality the personality trait descriptors identified by the participants as

best descriptors with their corresponding 'Big Five' category. Seven additional descriptors were identified by one participant each: reflective (O), imaginative (O), contented (S), stable (S), unadventurous (E), selfish (A), and generous (A).

Table 8

Self-Reported Best Personality Trait Descriptors

Personality Trait Descriptor	Frequency	'Big Five' Category	Personality Trait Descriptor	Frequency	'Big Five' Category
Responsible	13	C	Trustful	4	A
Hardworking	8	C	Thorough	3	C
Practical	6	C	Cooperative	3	A
Organized	6	C	Curious	3	O
Kind	6	A	Talkative	3	E
Creative	6	O	Relaxed	2	S
Assertive	5	E	Emotional*	2	S
Energetic	5	E	Adventurous	2	E

* Note: Emotional is scored as a negative to emotional stability.

When describing their own personalities, these women made comments such as

The word can't is not in my vocabulary basically. If you don't succeed, then try again. [1013]

I always got along really well with guys. I mean I didn't necessarily want to go into a male dominated field, but knew that I could handle it and might even fit in a little bit better with the women I would meet in the industry and with the guys. [1035]

The attraction to a construction management major, for many, lied in their love of the built environment and the tangible aspect of the work. Comments were made such as

I loved the building industry, and putting things together, and the engineering behind it, and the scheduling behind it. So that's what got me into it. [1041]

I think kind of what drew me to it is the fact that you can see a completed project and that it's not the same routine everyday. It's really varied. You can be part of something that's a lasting product. [1040]

So once I got closer to the construction side of it and actually watching things come together it was just so exciting...something you could really see. It was tangible. [1021]

One participant expressed another common reason individuals enter the construction industry

The other important aspect was the opportunity to exercise my entrepreneurial desires. Because I had always at a young age had entrepreneurial tendencies...I have been able to build a business and tailor that to my lifestyle which was very important to me. [1008]

For others, entering a CM program was a way to transfer out of another major they disliked. One remarked of her interior design major

It was way too pretentious for me. I couldn't handle it. I just didn't fit. [1009]

Another said

Being around a bunch of ID [interior design] majors was just a horrible experience. I'm sure they are wonderful people but it just seemed a lot cooler to me to be in CM. It wasn't really the construction part that attracted me, I think it was kind of the feeling in the department, sort of. I didn't really have a huge love for construction. Nobody in my family was in construction, but classes seemed really interesting. [1031]

Another remarked of her civil engineering program

I was halfway through my sophomore year and I was miserable...and it wasn't due to classwork or the work itself because I was a very good student...it was more or less I didn't really enjoy the people I was in the classes with, I didn't see that I was going to get out of school and get the job I wanted, the internships were very sit down and draw a sewer, design roads, and that wasn't what I wanted to do. [1001]

Yet another said of her architecture program

I started my college career studying architecture at [school]. I studied there for two years and through those two years, more and more I started thinking this is really not what I want to do. Everything seemed so creative and out there,

everything is aesthetic...we're not learning how the building goes together. I was frustrated with the artistic...there's so much artistic stuff we were learning and not enough nuts and bolts so I changed my major after two years of studying that.
[1039]

There is a strong similarity among these women. They are strong-willed, good-humored, intelligent, reliable, and hard-working. Perhaps the most notable commonality in their personality is not that they are all of an identical personality type, but rather that they all share a strong sense of self-confidence.

Self-efficacy. Research has shown that self-efficacy, or one's degree of self-confidence, is related to academic ability, expressed vocational interests, and range of perceived career options (Betz & Hackett, 1981). Specifically, researchers have found that women who prefer non-traditional occupations demonstrate high career self-efficacy (Betz & Schifano, 2000; Mathieu et al., 1993). This study further confirmed this research. Given a series of 12 career task areas relevant to the field of construction management, participants were asked to evaluate to what degree they felt confident in successfully performing each task. On a scale of 1 to 5 (5 highest degree of confidence), participants responded with a mean score of 4.12 ($SD = .39$). The minimum score recorded was 3.5; one individual reported a complete degree of confidence (5.0) in all career task areas.

Repeatedly, when asked who or what was most influential in making the decision to enter construction management as a major, these women identified themselves as the primary source of their confidence. Only one spoke of lacking confidence in herself either during or upon graduation with her degree. These statements were further substantiated by responses made on the written questionnaire asking participants to

identify how influential four types of experience are to their confidence in successfully performing a given task or behavior (i.e., degree of self-efficacy).

The two experiences which focus on oneself (i.e., personal achievement and own physiological state to risk of success or failure) significantly outscored those focused on the actions and encouragement of others (i.e., vicarious experience and verbal persuasion and encouragement). Again, on a scale of 1 to 5 (5 highest degree of confidence), participants responded with a mean score of 4.38 ($SD = .647$) to personal achievement and 4.00 ($SD = .722$) to own physiological state. The means were much lower and the standard deviations greater to the influence of others on self-efficacy with a mean score of 3.79 ($SD = .932$) related to verbal encouragement and 3.29 ($SD = .859$) to vicarious experience. This self-efficacy was highlighted in the focus groups with comments like

So when I transferred here, I knew this program existed. At this time I had sloughed off the "oh, you can't do that". I decided I could do whatever I want. I don't follow your rules anymore. [1008]

Sort of the same thing going into CM and going into industry...I was like oh yeah, I can do this. I think that's part of it. I really enjoy proving everyday that this does not take a certain body part to do. [1034]

Environmental or Sociological Variables

Much as family background and individual or psychological variables were found to influence non-traditional career choice, so too were a variety of environmental or sociological variables identified as being influential in these women's choice to enter construction management as a major. Role models, mentors, and significant others were found to be the greatest positive environmental influence. Educational climate of schools (i.e., junior high and high schools) was found to be the greatest negative environmental influence.

Role models, mentors, and significant others. Significant others (e.g., boyfriends, husbands, and friends) were identified most often as an influence in making the decision to enter a construction management program. The influence of role models (e.g., fathers, co-workers, teachers) and mentors (e.g., former bosses) were also acknowledged by the participants. Comments included

I didn't even know that there was such a thing as construction management until I met my husband. I was like what major are you in? I didn't know anything. I didn't know there was a certain major. I think he kind of gradually, and plus I took the classes in my previous degree and I really enjoyed them...I think that's probably why. [1041]

I would say that I definitely wanted to go back to school for me, but I would say it was my peers and my husband now [were] the reasons why I went into the field. [1010]

I met [another female student] and she was a huge support. I think we both were for each other for going we can do this. Even now we'll call each other and if we bitch about something we're like yeah, but we knew what we were getting into. [1035]

I got into CM by a friend of mine. He works in construction. He's a superintendent. He told me what he did and was like, "Why don't you just come out with me to a jobsite?" So, he showed me what he did and I just kind of fell in love with it from when he took me out to the jobsite. [1013]

Role models were also mentioned as significant influences. Responding to the question "Can you identify a most influential person in your decision to enter CM?" one participant said

I would say it'd be me and also the influence of my father. He's been a terrific mentor, encourager, and supporter of my career. [1008]

Others had high school teachers or college counselors or professors who played a major part in their decision to enter a construction management program. Some said

My drafting teacher led me to it...I had kept in contact with him. He told me about it and I said done, I'll switch, I hate accounting [former major]. [1038]

Not until I had a counselor at CSU...he saw which classes I liked, he saw which classes I would maybe like to take more of, showed me exactly what [we] are talking about...the little sheet that says you take this many business classes, this many engineering classes, and then you get these fun building ones in there too and I was like that would be pretty cool. And he said, "Besides that, we place like 97 percent of our students directly into jobs and as a woman probably even higher." And I went, sign me up, I'll try it. [1014]

A friend persuaded me to sit down and talk with the department head and adviser in that program [construction management]. I spent 2-3 hours in their office...it was the first time anyone in the university had actually sat down with me and really went through what my wants, desires, and needs were. After I left that and knew what the curriculum was, there was no turning back. I knew that was exactly where I wanted to be and what I wanted to be doing. [1001]

Others specifically identified individuals who had played a mentorship role in their lives.

One of the participants with a master's degree in construction management said

I had some really, really great mentors throughout my career and one of them was at that point in time that just really encouraged me. So that was how I decided to get into the industry. [1021]

Later she further remarked

I definitely had...my original mentor. I can point directly to him and say it was absolutely...his enthusiasm. He loved what he did. He would be in the office at 5:00 in the morning and it was like "I can't wait to get started" and it was the enthusiasm for what you are doing. He had a way of sucking you into that and stirring up the excitement. [1021]

Similar comments were made such as

My boss at [former employer] where I first started learning civil engineering when I was an inspector. He taught me a lot...it was great...and he's a good friend to this day. He's the one who encouraged me to go back to school and to do CM. Today he's probably the biggest support I have. [1026]

My former boss was an influence by being a mentor and an advocate of me personally, by affording me opportunities of advancement and growth in his company before I gave up on my engineering pursuit. [1027]

I was lucky in the sense that I had a great mentor that hired me on and really pushed me to be successful and follow a very successful route. [1001]

Whether by chance or planning, these women seem to surround themselves with positive influences. For many, these influences were instrumental in their decision to enter a construction management program.

Educational climate of school. Research has shown that the educational system is a major source of sex bias and sex role stereotyping (Betz & Fitzgerald, 1987).

Schools are social institutions that reinforce gender-appropriate behavior, interests, and occupations (Garrahy, 2001; Kahle, 1996; Kelly, 1988; Lee et al., 1994). In large part, this study reinforced these findings. One participant, age 27, when asked on the written questionnaire about the educational climate of her junior high and high schools commented

Everyone thought I was weird to choose my major. My schools were behind the times and did not encourage girls to pursue non-traditional, non-female oriented careers. They didn't encourage girls to think outside the box when choosing a career. Girls were supposed to be nurses and teachers--not engineers. [1032]

She reinforced this later in the focus group, saying

...once I got to school it was like, oh no, girls have to be a nurse or a teacher. You're encouraged to take home-ec[onomics] or art or whatever. Stereotypical girl stuff. Not like girls like me who wanted to take math and science and drafting and all that stuff. So it was kind of hard to adjust to that. [1032]

Another posed a question related to the image of construction prevalent in schools, asking

But don't you think it also still is like construction...I want to be an engineer? It's like construction is stupid. It's still like thought of as hicky...like you're a hick, or grungy, uneducated. I think that's what comes to peoples' minds when they think of construction...uneducated. [1038]

Others made similar remarks

I just think that if I would have known about that [a CM program] in high school...my high school didn't know anything about that at the time. It was not very big about women to go into engineering back then either. The attitude was more it's a man's world. They were more of the nursing or stuff that are typical woman jobs. [1013]

I knew that I wanted to be in the building environment. But the way that I was counseled because coming out of high school...my high school counselors did not know about a degree in construction. Who would have ever thought people get degrees in construction is, I guess, what the mentality was. So I was counseled into...I could either go architecture or civil engineering and do structural engineering. [1001]

Many others remarked that they received neither encouragement nor discouragement while in secondary school to enter a construction management program. Most often the remark was

I think when I was going through high school this [construction management] as an industry wasn't presented ever, at all, to women as an option. [1039]

Structure of opportunity. Much of the information related to structure of opportunity for these women has already been discussed within each of the above categories. As research has shown, one's family background and socialization, own psychological make-up, and environmental factors all play a significant role in structure of opportunity.

Many of the women spoke of their families as major influences. This influence was not bound by age as similar themes emerged across the generations, including women with 20 years difference in age. Two of these individuals, one in her 40s and the other in her 20s, shared their stories saying

My family taught me I could do whatever I wanted to do. They encouraged me just to do whatever it was that was going to make me happy. [They had] mostly been raised that life is hard, life's a grind, you do what you have to do. They wanted their kids to think differently...to be able to be free to do whatever and believe in themselves. I'm the youngest of five and there is a huge age gap between me and my oldest brother. They came from the depression era and it was very, very different for them. Life is what it is and it's going to stink and whatever you have today you're not going to have it tomorrow. That's how they were raised and they wanted better for their kids. [1021]

and

I think I really didn't ever have support. When I look back, I feel lucky because I didn't really ever have the adversity of having someone telling you that you can't do it, you'll never make it. My dad actually did pass away the December right before my last semester [of college]. So I got home from my internship and my dad passed away within like the first week of the semester and so when I graduated I felt more like oh yeah, I'm going to do this. So I had just that boost of confidence--it wasn't like I ever lost his support. [1034]

With the support of individuals around them and from their own internal sense of self-efficacy, these women were drawn to construction management for a variety of reasons.

A range of comments included

That's kind of how I ended up in there [a CM program] and when I got in I really liked it. I liked the people a lot, and I think that was key. Kind of knowing like oh, I get to work with these people when I get out in the industry. [1035]

CM seemed the closest to CE [civil engineering] and a lot of my credits transferred, but I was also working for [construction company] when I decided to switch my major so that had a lot of influence working with the people there and just talking to them about it. They kind of pushed me in that direction and I really liked working there. That's kind of how I decided to get into CM and finished my degree in CM really quickly. Love it. [1027]

I started out, too, as a civil engineering major. Spent a semester in that and it was boring. Then I was like well maybe I'll just go into CM because it kind of encompasses CE and other stuff and I thought they don't have a well-rounded career so that's kind of why I did it. I've always liked building things...always been interested in that. [1032]

I really wanted to be an architect...bad. My talents were art and math, strongly in both categories. I actually did a little two day internship with an architect when I was in high school and all of the architects I talked to at the firm were like "you don't want to be an architect". So they said to go into civil engineering...so I'm like alright. Then I come to find out...I'm two years into the program...that [the program] has nothing to do with construction, vertical, and [university] is totally the wrong school. So then I was just like I'm just going to go to school for architecture from here. Somebody said wait a minute, before you do that go talk to [adviser] over in the construction management department. So I went and talked to him and he said, "You can get your four-year degree in construction management with a minor in art and if you still want to be an architect you can go on and get a master's and be better off than those people in pre-architecture or you can get a full-time career, 100 percent placement and great salary, and you're done." So then I stayed and got my degree in construction...decided maybe I don't want to be an architect at that point I guess. [1037]

For some, environmental factors were a major influence

I grew up in Minnesota. Women are different there. The culture of the socialist state of Minnesota created, in general, opportunities for women which I think you may not find elsewhere in the country. So I was doing woodshop when I was in second grade. Also part of the socialist structure is that you get woodshop and art; you don't get grammar, history [laugh]. It's not the classical education...so I was literally building with wood when I was 7 or 8. And that was normal where I came from. Girls were in woodshop with all of the boys. [1008]

It started off as a summer job for me when I was 16. I had no job and dad said you gotta go to work so he put me to work on his crew and I started off as a laborer and then I was a concrete finisher for three years during the summers. It just sounded like fun so that's how I got started and I've just went from there, started in school, and love it even more. [1033]

Others remarked of experiences they'd had as major influences

For me, when I was studying architecture, I worked on a low income housing project...kind of like Habitat for Humanity but different. I wasn't getting paid, but I was out there hammering nails and carrying wood and doing whatever the superintendent told me to do. It was really satisfying to see that whatever we had been studying in architecture was on the plan and we were putting it in the ground. It was probably around that time that I started to think that I'd really rather be building this stuff instead of designing it so I switched over [to CM] soon thereafter. [1039]

When I was 14 I went on a mission trip with my church group and we went and rebuilt homes and that was the first time that I actually learned how to use power saws, drills, and hammers...nothing was off limits. The program was very focused on there are no girl-roles and there are no boy-roles so if you want to learn to use the power saw you jump up and do it. So from that point on it was very empowering to know that I knew how to do these things, and I loved doing them. That was probably the pivotal moment for me knowing that I actually didn't need to be a designer, I didn't need to be an architect, I could be out there in the field, driving the nails, building the home, and finishing it. [1001]

One of the two participants who had received a master's degree in construction management said of her decision to enter the program

It took a long time for me to really reach management status and I realized that if I was ever going to be taken seriously I was going to have to get a master's degree. There was nobody in industry who encouraged me to do that. I was usually surrounded by a lot of professionals. But I knew that no one was ever going to even look at me twice unless I got a little bit of an edge and I think if I

perceptions are, and what their experiences working in industry have been. This discussion begins here and then move into four broad factors of influence: personality, self-efficacy, personal goals, and influence of others. To conclude, information related to factors of career development is summarized into what these women define as their major career development considerations and the best and worst parts of their jobs and the construction industry.

Initial Perception of the Construction Industry

Aside from those who had grown up around the construction industry or were already working in the industry, most of these women knew very little about what their futures might hold with a degree in construction management. Those that changed their major often did so with very little information about the construction industry or the role of a constructor. Remarks included

It was really kind of all of a sudden thing. I just looked at the studying I was doing and was like this is not what I want to do. So I started looking into other majors and decided to go into construction management. At that time I had no idea what I was going to be doing in the industry. Just knew that I'd rather be building the project than designing it. [1039]

I always knew that I loved reading plans and drawing plans so it was like good enough, I'll do that. I didn't know what I was getting into, but I was like there's plans, I can read them. [1038]

Others said

Once I got into it I don't think I really realized what I'd be doing in the industry. [1041]

I had no perception at all. [1014]

I really didn't know what I was getting myself into. [1034]

One participant highlighted what the research has found to be a common misconception of the construction industry, saying

would have gotten my undergraduate degree more closely related to construction management or even engineering that would have been fine. This is the industry I wanted to be in, to stay in, to take on more responsibilities, so that's why I decided to do it. [1019]

One participant captured the feeling of the others related to structure of opportunity and non-traditional career choice, saying

I don't think [there were] challenges or barriers getting into it [the CM major]. We're in a generation where there have been women before us getting into it. [1027]

Most Significant Career Choice Factors

As a way of bringing the data collected together, Table 9 provides a summary of participants' responses to the question posed on the written questionnaire: "What was the most significant factor in your decision to enter a construction management program?".

Table 9

Most Significant Career Choice Factors

Participant Code	Response
1001	Personality of professors and overall feeling of the college
1007	Enjoyed introduction to construction class lab; hands-on work
1008	Wanted to own/operate a business in a construction-related field
1009	Career opportunity; scholarship
1010	Working for design/build firm who offered to pay for education if went CM
1011	Location of university (where fiancé was completing education); nearest major to architecture
1013	Liked construction aspect
1014	University counselor adviser telling of program; ability to transfer coursework
1019	Loved industry; as woman felt needed "more of an edge" in the construction industry

I didn't know that it could be a profession. I thought that I would have to start off in high school digging a dirt hole to ever be in this industry. I mean the fact that...I have respect for the people in the field, but the business side of it...that was never even remotely relayed to me. [1009]

For many, internships proved to be an invaluable experience and their first chance to get a feel for the industry in which they were preparing to enter. Some said

I think my moment where I was excited was when I had my internship. Up in Idaho we were building the hospital and for three months I was posting drawings. Every so often I could go out and take some pictures...I was like [sarcastically] this is a lot of fun. They let me go up to the second floor of the patient rooms and I was standing and I looked down and I was like I know where I am on the drawings. I was so excited that I actually knew where I was and was actually kind of a part of it. I was like thank goodness...I like what I'm doing. That made me want to keep going with the internship and with the job and actually do construction. [1020]

I think the classes prepare you. I think it was more or less I learned a lot through my internship of what I was going to be doing. [1034]

Construction was just something that I was drawn to and thought that I could do and do fairly well because I was organized. Doing the internships was obviously key for me too, to kind of know what I was getting into.... [1035]

One participant expressed her perception of the industry as

As far as preconceptions go, I guess I figured that I was going to be graduating from college and going to work for a large general contractor. And that's exactly what I did. I guess I felt like I would end up in the field faster than I did. They tended to hire guys right out of college and put them in the field, but the women tended to get office jobs right out of college. [1001]

Current Perception of the Construction Industry

While these women may not have had a lot of preconceived notions as to what the construction industry was or what their role might be within it upon entering a construction management program, they expressed some very strong sentiments about what they view the reality of the industry to be for them now. Generally, their comments centered upon a theme of double-standards. Some remarked

1020	Taking and liking AutoCAD class
1021	Working in industry; felt degree was relevant and interesting
1025	Adviser said CM was like engineering but with more personal interaction
1026	Wanted CE degree but did not want to spend another four years getting it; could finish CM in two years
1027	Father greatest influence
1031	Adviser in CM program; “made the program sound like it was perfect for me”
1032	CM gave tools to do a variety of jobs instead of focusing on just one
1033	Worked in field as laborer through high school and “loved it”; wanted to make career
1034	Disliked course content of engineering; found CM to be similar but with less physics
1035	Range of job options in construction field after graduation
1037	Wanted to be an architect; CM adviser talked me into a 4 year degree in CM (with an option to get a master’s in architecture) vs. transferring schools
1038	Always enjoyed reading blueprints and drafting
1039	Realized not happy in architecture so looked for alternative major
1040	Took introductory CM classes; liked them
1041	The job market; liked introductory CM classes had taken

Career Development Factors

While discovering the factors of non-traditional career choice was a necessary first step in this research, having an awareness of the factors which influence (both positively and negatively) the career development of female constructors is a vital second step in creating a theory of women’s career choice and development in the context of the construction industry. As a point of reference, it is important to understand what these women had as an initial perception of the construction industry, what their current

I think if you are going to be in this industry you have to want to be there. I don't think that there's any room for oh, I might want to do this. My experience has been you have to work your butt off to get the knowledge to be ahead of everybody and if you don't it's blatantly pointed out to you. And so if you don't put that extra effort in you probably wouldn't be too successful. I haven't met any women in construction who aren't successful and I think that's probably why...because they have to work at it. [1009]

I think, as with any other construction company, we have a lot of good-old-boys in our company and a lot of them that would tell you straight out that they don't think women belong in the field or in the industry. It's kind of like why do I have to have that extra burden of proving to you that I can do it. [1035]

Do you feel like sometimes the more competent you are, the more organized you are, the more you show them up, the more bitchier they think you are? That's how I feel sometimes. It's like just because you don't have your game together don't even...with a man they'd be like, "Wow, they've really got their stuff together, they're really good", but with a woman they a lot of times go "She's such a...." It's like, I don't get it. [1010]

The thing that is annoying is if a guy acted like that and demanded that they [subcontractors] get stuff done it's like, "Oh he's a hard ass" ...I do it and it's like "What a bitch!" That's kind of annoying. [1035]

Others commented

We have to work harder...to gain that respect. [1026]

I think once you are in a place where you feel comfortable and you kind of have mutual respect for the people around you it's not necessarily so uncomfortable and it can be fun...it's not that awkward. [1034]

Yeah, I think that's a big part of it. Once you gain the respect and they see that you can do the job and that you're not just "a dumb girl" that it gets much better. [1026]

Perceived barriers to career development fell into two main areas, namely

I think the barriers are definitely when you do get married and have children how do you balance family and work. I see that as my toughest obstacle to overcome. When we do decide to have a family, how are we going to work that out? [1027]

and

The glass ceiling. Working for a larger company like I do...getting to be a project manager...it's just a lot harder unless I were to focus on being in charge of a

business unit. I think as I question my career it's possible...but since there hasn't been one before and there isn't one now [project manager] I think it's very much that stigmatism of "so you are going to be a project engineer for the rest of your career, maybe a project manager but in a smaller business unit working on smaller projects...maybe interior finishes". [1034]

Dialogue between two participants working for the same company highlighted the trepidation with which many of these women view their futures in construction

I'm pretty ambitious I guess. I'm single and I just support my dog so I think I am doing pretty good for myself. I think the biggest challenge that I face is I'm trying to bust into a field management role where right now I've always been an assistant and that's not...I'm not taking on all of the responsibility of completing a project and making sure it gets done on time. [1039]
And you're going to be the first female superintendent at [company]. [1038]
Yeah...right now I'm not sure. I think I've gained enough respect from the field guys to do what I am doing now, but whether that will carry though if I were considered their boss in the field I don't know. I'm a little leery about it but I'm going to try for it anyway so we'll see. I know I need a lot more experience, but it's still one of those things I'm a little leery about. [1039]

Still, participants were optimistic about the construction industry. As example, two participants made reference to what they are seeing now in industry as compared to when they began their careers

I think there's been actually a lot of changes in the last eight years. We call it the old school of construction. A lot of newer guys are coming in...whether there's more women or not, they realize either the benefits or they realize...I think they do realize the benefits of working with them [women] in the sparse places they are at. [1014]
I think it's also the newer generation of construction workers are educated as well. Not necessarily our laborers or our sub-workers, but the people that are managing the projects and coming out...it's mostly college people. I kind of find that when I'm working with people...if they are under 40 they are a lot easier to deal with. [1001]
Somehow the construction industry is getting a lot more males through college. More college educated ones are choosing to be in construction. [1014]

Experiences in the Construction Industry

Even more so than perceptions, these women elaborated on their experiences in industry. In large part these women are enjoying their careers in the construction industry and facing whatever challenges may come in stride. Many commented, saying

It's something different everyday and it's a lot of fun and also a big challenge too. [1011]

I enjoy what I do and everyday's a challenge. [1013]

I've had a great experience with working with men and in the construction industry in general. [1038]

I've been in the industry for about 25 years, and it's just kind of what I know. There's always room to grow and to learn and it's exciting because we are the minority and it's challenging in some ways and fulfilling in others. [1019]

Others tempered their responses a bit, remarking

I've had a few negative ones, but I've had a lot of positive ones. [1034]

With a few bad experiences that I had in the field...other than that I feel that everyone's really respectful and they are interested in why you are there...some of them are. [1031]

There was...I don't think that I've ever had anybody stop me from doing anything, but I think I've probably had to get creative a number of times. [1001]

Some of those preconceived notions where "it's a man's job" and you're going to run into the "good-old-boys club" and all of this, I haven't run into that very much at all. [1039]

Loved being out in the field...one of my immediate supervisors was probably the most apprehensive about me, but he was at least open enough to kind of sit back and watch me sink or...I think that was kind of his attitude at first. Once he saw how the women can relate to them [men in the field] ...and it wasn't because I started yelling or cussing or did anything differently than what I would normally do...he was one of my biggest proponents after that. [1014]

One remarked

I hit a [glass] ceiling pretty quickly right out of college. [1001]

For some, their experiences in the construction industry are internalized

For me, the challenges in the industry are emotional challenges and that need of a mentor and the knowledge that women are doing well in industry...had I at the time seen a table like today of beautiful, articulate, well paid, excelling in your careers...had I seen that it would have been really encouraging emotionally. And to have that networking contact...to have that networking would have offset some of the challenges. [1008]

It's a lot less thankful of a job than I thought it would be. You don't really get a "nice job" and I don't know if that's something I need...but it's a little different. [1025]

Now I just found that I like the challenge. Because it is thankless and it's kind of an uphill battle all the time, but I think its fun. It's interesting, everyday is different. [1034]

For others, the challenges faced in the construction industry come from a variety of external sources. As one participant said

Most of my bad experiences have been with subcontractors. [1026]

This was repeated numerous times, especially by those primarily employed on the job site. Comments ranged from

A lot of people...I run into more than anything else is just the look when people come in. I think part of it is one, being female and, the other, looking young. [1035]

I get that a lot. People are like "how old are you? Are you old enough?" [1025]

"That hardhat looks really big on you." You know...I'm like I'm not going to grow anymore. Haven't had a growth spurt in 12 years...I don't think I'm going to have a growth spurt now. But that's definitely been a problem. And I'll get irritated and I'll get irritated every time. And I don't know why. It's one of those things that when people start...when I feel like people are attacking my ability to do stuff then I start getting more defensive. [1035]

to

I don't know how many times I've been called a firecracker which...my Superintendent was like "that's code for bitch" and I'm like that's fine if they get their stuff done...but why are you going to call me a firecracker? [1035]

I had one call me a bitch. [1034]

I was told I had a good bitch-factor. [1026]

More than once, participants made reference to the 'Spanish Serenade'

I know people make comments, I mean I'm not naïve, and I know that people talk...probably not the best ways...but like that one example was when I knew that somebody was talking about me and had kind of like whistled in my direction...that's when I draw the line. And I mean I'm not going to go around and be like I think you were just whispering about me when I turned the corner so...I want you off my job, but if it's blatant I'll definitely stand up and be like absolutely not. [1035]

We had a bunch of Mexican drywallers and I walk inside and you'd just hear them and I'd be like that would be the best time to know Spanish right now. [1020]

The experience of being stereotyped into a more traditional role such as project assistant or secretary was a common experience. Many commented on this, saying

I guess for me that I've had some challenges, especially as I'm out in the field more often. With the guys that I work with from [company] I haven't had any problems at all. A lot of times they will give me a task that it seems sometimes they'll expect me to fail at or won't get it or whatever and I come back in a short amount of time with it completely done and I can prove that I can do the job so I haven't had troubles inside the company. The challenges that I've had are dealing with subcontractors out in the field. They come into the trailer and I've got my hardhat on and my boots on and I'm reading plans and showing them how to build the building and they assume that I am the project secretary in the trailer. It's always a challenge. Every job you meet one other guy that has some preconceived notion about what I am supposed to be doing out there and I change their mind most of the time. [1039]

I've definitely discovered that until I prove to them [subcontractors] that I can answer their questions and...I know that it's not being female, it's lack of experience the reason I can't answer them right away but I will get back to them. I think that's a challenge. I get a lot of...when people first walk in the trailer I was the first one they see...and they are like, "Is the Superintendent on site?" I'd be like "No, can I help you?" -- "No, I don't think so". [1035]

Oh this guy [subcontractor]. He goes, "Well, who's in charge here?" I'm like "Our superintendent". "Where is he?" I said, "He isn't here. Can I help you?" He's like, "I ain't talking to no dang secretary. Tell me who's in charge here."

"Seeing as I'm the only person on site and the project engineer looks like me."
[1033]

I've only had a few instances and that's been with people outside of my company. It's been where they assume I'm the secretary or the receptionist and they'll ask for the superintendent. You know, I'm the project manager sitting next to him, and he's like, "Oh, way to go, you finally got an assistant" and I'm like no. I mean it's just people who just don't know and they assume and you really can't blame them...that's what their knowledge base is. [1040]

Two participants remarked of the experience, saying

I always get accused of being a secretary which annoys me. [1032]
I love messing with the people who think I'm a secretary. [1033]
I used to have a sign above my desk that said, "I'm Not a Secretary." [1032]

Negative experiences are not limited to the field, however, as some with more office-related positions spoke of incidents, saying

Sitting down and negotiating as a woman has been [like] "How long have you been doing this? I can't believe you are in this industry." And then I've heard some comments afterwards like "God, she's a bitch" because I have a number I want you to meet and I need to meet that for my company. I'm like what's the issue. It's tough sometimes. [1011]

I had struggled and that is what got me into the design side. It was the only side I could grow in. They hired me as an assistant superintendent and then never put me out in the field. They kept me in the office and I filed for my first three months...filed, that's it. I've really been struggling. A lot of lateral moves, a lot of coordinator to coordinator, which is a secretary. I was the production coordinator, which is the secretary...I answered the phones, I filed, I got the permits ready. Then I was the warranty coordinator...answered the phones, filed, made all the files for the closed homes. For me, I haven't felt like I've had the opportunities to grow on the construction side.... [1041]

I have definitely worked with some guys...just a few months ago we had a senior estimator who would make comments like "you're a girl". I was like you really shouldn't...HR...but you don't want to be the person that if anything happens that sounds like a weird comment you're going to go running to HR [human resources] or be the person, the girl that can't take it. So you just kind of...have a tough skin. [1020]

The only people...I had an occasional little sexual harassment issue at other companies...you have those. But the people that don't like me in general are women in the office. They can't stand that I don't have to answer the phone. And

I'm not talking about women in the same line of work. It's the women outside my line of work that have been the most difficult. It took three years for the women in the office to realize that I didn't have to work the phones at lunch. But the company was smaller when I first started too, so every woman in the office, no matter what position, they would have to work a lunch period every other week or something like that. I was really the only woman in the office that didn't do that. [1038]

Perhaps the most telling example of what it is like to be a female working in the construction industry was captured in dialogue among all members of one of the focus groups. This discussion captures some of the everyday, but starkly unique, experiences of women in the construction industry.

*Can't wear anything cute. It gets dirty or torn or... [1025]
It's hot and you're running all over the place. That's why my boots are pink--part of them are painted pink from marking streets. [1026]
I go through so many pairs of shoes. [1025]
I have friends who actually survey all day who work for [same company] on the east coast, because that's where you start out, you are a surveyor. I look at it and go "thank God I'm in the office". I don't know what I would do if I was out there because they ruin a pair of pants a week. [1034]
Yeah, I don't buy nice clothes anymore. [1025]
Yeah, I don't either. [1026]
It's amazing, I still have a bunch of clothes I wore in high school that I just wear to work. I buy t-shirts when I go work clothes shopping. You got t-shirts and the crappy jeans. And then I have nice clothes when I'm going out with my friends. I mean I don't get really done up anyway, but I'm always wearing my nicer clothes because I can't wear them to work. [1035]
I don't even buy the nice clothes. I'm always like "what should I wear?" [1025]
I don't either. Yeah, when it comes time all I have is faded jeans with pink paint and grease on them. [1026]
I have a friend who buys all these super cute clothes... [1025]
Because she can wear it to work. [1034]
I'm like "I'm on a jobsite". My office is a field office. [1025]
I have no running water. [1026]
I have a lock on my outhouse door. [1025]
You know how excited I am about that lock? You always have to time it right too. I can't get like really close because my lock doesn't work. The women that have come up to our trailer are like, "How do you not have running water?" I guess I've just gotten used to it. I have the hand sanitizer. And that lock on the door is the greatest thing ever. I get endless grief for it too. [1035]
The guys are like, "Why do you need to lock that?" It's like "too keep you out!" [1026]*

There's two girls for ours and there's another for like the rest of the jobsite. There's like 150 other guys. [1025]
I love my lock. I went out and bought it...I mean I bought it with the company credit card, but it comes with me. Everywhere. I'm not going to rely on anyone else to get me a lock because that will never happen. So anyway... [1035]
Trials and tribulations. [1025]
I'm glad to hear that I'm not the only one to lock up the outhouse. [1035]
These are like the things that when you go through CM they don't tell you about being out in the field and working with the guys. I hate porta-potties. I have a huge phobia. Its painful everyday, but you know...you have the lock and there's certain things that you can do to make it a little better. Tricks of the trade. [1034]

Despite some negative experiences working in industry, all of these women spoke of the positive aspects of their work and their companies or businesses.

Factors of Career Development

As would be expected, a set of similar variables have been shown to influence career development as those which affect one's career choice making process. Based upon prior research, factors such as personality and degree of self-efficacy were explored as having some bearing on career development. Additional, perhaps greater, factors of career development which emerged during this study include conflict or convergence of personal and career goals and the influence of others (e.g., mentors). Many other considerations were discovered and are identified in the discussion to follow.

Personality. As was highlighted prior, these women share a variety of personality traits which match well with the demands of their positions in the construction industry. As they have entered and progressed in the construction industry, many have learned to accentuate some of their more helpful personality traits while moderating others. Organization, independence, determination, and creativity are all traits which serve these women well in their careers. Highlighting this, some commented

I am really organized and I make sure that I am on top of my game because I am not going to show up in front of some man and be incompetent. I guess that is more of a fear than anything.... [1007]

I decided that I never wanted to stay home, that I always wanted to be independent. [1019]

I'm the type that if I'm going to do something I'm going to give it my all, and if I fall down I know I'll get back up and try it again. [1007]

...the guys in the field were kind of intimidated because I brought that sense of I'm not going to stop at 3:00 and have a beer with you guys or Fridays I'm not going to leave at noon. It's more of a work, want to get stuff done, not lackadaisical. [1041]

I think its fun though, early on, where you can come up with value engineering where people are like "oh yeah, I didn't think about that". That part's exciting. The challenge is researching new products that no one's ever used. It can be fun trying to come up with things. [1037]

Others have found that stepping back and tempering some of these traits has helped them in their careers when working with others. Two remarked

I still tend to play that mediator position. I have been sent in by partners and other business professionals into difficult situations because they know that they will react differently to me than they will to other men. I guess because I'm not going to raise my voice they don't feel like they can raise their voice. I'm not going to get harsh or brass about things either. I'm going to look at it from a business perspective and make a business decision and for the most part try to keep emotions out of it...it's hard. I would definitely say it's hard as a woman to keep emotions out of your business decisions. [1001]

I think sometimes you have to...like you said...sometimes you defer. Even if you know the answer and there's somebody out there who thinks they know it all and they're like "let me show you this little lady"...by just letting them do that...it's huge. Because then all of a sudden we have some common ground... "she's going to learn from me...she's going to listen to me...she doesn't think she knows it all". And I think that's been really important. [1021]

Some have sought outlets for aspects of their personality either within their job description or within their construction organizations. Of this, two remarked

I have such a short attention span that what I'm doing now really suits me. [1031]

For me, I've always done volunteer work since high school. So I've actually gotten my company to sign up for lots of things which is the best part because I'm raking money out of them. I love it because we're going to do Rebuilding Together and we've done Habitat for Humanity and we do the MS Walk and we do a lot of things which is awesome because without that I don't think I would enjoy it as much. But it sometimes makes it a little easier to go to work because I'm like oh yeah, I'm doing this. It's one of those added bonuses. Without finding that I think it's hard for anybody. [1034]

Only one expressed disconnect between key aspects of her personality and her work in the construction industry. Of this she said

I kind of got into the whole construction management on a whim and it was a complete accident. I've enjoyed it, but there's always that little part of me that's like there's something out there that I'm supposed to be better at. Like I'm such a people person, like I want to make people happy so much. My goal is to make people smile and you just don't get that pushing paper around. [1025]

Self-efficacy. A strong sense of self-efficacy or self-confidence is a central component to the career development of women in construction management. From this research it seems that self-efficacy can be drawn from many different sources, often intertwined or changing throughout one's career.

For many, and the most individualistic aspect of self-efficacy, attitude is everything. Many spoke of their own internal sense of self and the ability of this to carry them through challenges.

I have run into...there were people when I went out on my own...the owner of the company looked at me and said "the water's deep and the water's cold, but if you want to jump in, dive right in". To me that was like "you're going to fail and you're not going to be successful"...so it was almost war words for me. Don't challenge me...I'm going to show you that I can. [1001]

Ironically, I think the source of confidence that I have has to do with overcoming failure. There isn't much that I haven't failed at, but I try to do that only once. So surviving and enduring not only brings confidence but peace...a peaceful confidence. [1008]

But it's hard...it's those inner victories, because external...it's like nothing. I definitely know if I screw up...that will be in the newspaper...but the internal praise is all I get really. [1009]

As a means to persevere many said

Just have the confidence...patience, confidence, thick skin. [1019]

Best for me is knowing that I do a good job. It's important to me to know that I do a good job. [1026]

It's just deep down inside of you--you gotta do it, you can do it. [1021]

I think a lot of it is just...when you walk in if it's unfamiliar in some fashion you just say "I can do it". [1019]

Others find a major source of confidence to come with their preparation. As example

I find great satisfaction in that first appearance when I'm first working with a new project team and here comes little girl [name], okay let's schedule. But I do request the drawings in advance and I study them all the way from site work to punchlist and I know those drawings. I know those drawings better than the superintendent who's focusing just on site work and to all of a sudden ask them intelligent questions, if they ask me an intelligent question and I can answer it, and then all of a sudden the next time it's like night and day. And they are like "what do you think, what needs to happen for us to reach the next phase?" That is one of the best satisfactions, even though it's a huge challenge, I love doing that. I love coming into the next meeting and being like "okay, I've got a question to ask of you"--I love that! Even though it sucks that first meeting, my heart's pounding, but I do love that. [1009]

I actually felt good, I actually felt better than the guys. I would go into our meetings and I felt...this is terrible...I felt like I was smarter than them. They weren't organized, they didn't have their work orders done, they didn't have subs called or anything scheduled. I had everything scheduled...I had it scheduled, had the work order, had contacted the sub to schedule it, called the buyer, and these guys didn't have any of it. [1041]

In this sample, two participants had sought out additional education (i.e., an MBA degree) to feel more confident in their roles within the construction industry. Of this decision to continue their education with an advanced degree beyond their undergraduate CM degree they remarked

You know what you were saying about feeling smarter than the men, I always felt that need too. That's why I got the master's degree. I wanted to say, okay, I need to have something you don't have. I am the only person in my company, there's 70 people, and I'm the only one with a master's degree. In construction it's really not a lot of people and that's why I went out and did it. I said, nobody else will have this and I've got something over them. They have more experience, or they have more knowledge because they were a framer in the summer or whatever...I don't, I don't frame, I never did roofing, I wasn't a mason, I didn't do that kind of thing. I worked in concrete, but I told the guys where they needed to be and I ordered concrete and I watched them lay the forms. Did I do it...no, I don't want to do that. But that's why I felt like I needed that. As I didn't have the experience of actually holding a hammer I wanted to make sure I had something else they didn't have. [1038]

I felt that I was limited with my CM degree after working in industry about three-and-a-half years or so, so I decided to go back to school and get a master's degree in Business Administration because I felt that if I can't do construction or get fired I can do some type of business too...I can start my own business. [1007]

For some, experience (e.g., time doing the work) is a significant source of strength as they progress through their careers.

Experience. [1019]

Yes, familiarity. [1021]

Now that I've had a little more field experience I jump right in. If there's a problem I'll help to try to solve it as best I can and when I come to the end of my experience where I can't figure out the answer to whatever it is that day then I'll ask for help. At this point I don't think self-confidence is really a problem...at work at least. [1039]

While internal motivation and confidence were identified as a primary source of self-efficacy, many of these women also rely on others as a source of confidence. Some found this reassurance in co-workers, saying

I believe in gaining confidence in learning. A year ago I was a whole lot more timid about talking to anybody. Then, after awhile they get to know you and I feel lots more confident a year down the road. Knowing that everybody in the room had gone through the same thing before, 15 years before, a day before. But they've all felt the same thing. [1020]

I do feel confident in the support of the team that no matter what you get into there's always going to be somebody there that can help you though it if you don't know it. [1031]

For me it's the same thing, go and find somebody who maybe has that experience or, a lot of times it's just verbalizing it, telling somebody. Getting it off my chest and just talking about it. A lot of times after you talk it through you realize that it's maybe not such a bad thing...I probably could handle that. [1040]

I think whenever I am faced with a challenge at work I usually rely on co-workers that I know have a lot of experience and especially with people problems or subcontractor problems or what it is there is always somebody that knows how to handle that situation even if I don't. [1039]

Others find this source of confidence in their family and friends, saying

Mine's family and friends. I think I have a pretty good self-confidence, but when that starts to lag a little bit I've got people there cheering me on...rebuilding that little bit of lack of self-confidence. [1001]

I have a picture of my daughter on my desk so that I just look at that and realize that there is more to my life than that current situation at work and it helps me handle it and not get worked up. [1041]

Personal goals. Finding the balance between often competing personal and professional goals was identified as the single most significant barrier to career development for these women. With 14 of the 24 women married, eight of these with children under the age of five, the discussion surrounding personal goals was extensive and filled with emotion. Those that had children or were thinking of having children in the near future expressed a great deal of concern about balancing the demands of their positions within their construction organizations and their responsibilities to their families. Even those without children or spouses spoke of the challenge of finding enough time to enjoy their lives outside of work and meet the expectations their positions hold. Only a few stated that their personal lives and goals were aligned with their professional roles so that there was little to no conflict between the two.

Many of the women shared stories of their experiences juggling family and work, often asking each other for advice or suggestions of how they might cope with the challenge. Some of the experiences shared include

I think that most definitely, I mean I hate to say it, I love my children, but it is one of the biggest struggles of my career because not only are you in an all-male dominated industry...most males aren't the prime person taking kids to daycare and picking them up and being there if they are sick...the guys aren't staying home. My husband is a superintendent for a commercial builder so it's very difficult...so he's always got to be there and when the kids are sick...guess who's home and guess who's...I mean it's a lot of stress, it really is. That is definitely the most stressful part of my job. If I don't have everything done when I leave...you know how sometimes you can go oh, I can get that done first thing in the morning...if my kid wakes up with a fever, my whole day is gone...yet you've got to be out the door at 5:00. There's no options. It's frustrating as a family. [1010]

When my daughter was young, she's my four-year-old, we went through that first year. I took my three months off, started back up part-time until she was one, and then started back up full-time. We went through a lot of tug-o-wars, my husband and I...why can't you take off today? I'm out of vacation time. Well, I've already used up another week beyond my vacation, and personal, and sick...and working part-time I wasn't making it. I think that now that she's four, just now we've finally found the balance and he understands that I have to be at work too. And actually our salaries are equal now so that helps. But...it's been hard. How do you find that balance? I think it's just the natural movement of your family, trying to get through what your priorities are. Obviously your kids come first, and then the job. [1011]

I think my priorities have changed drastically from when I graduated five years ago 'til now. Five years ago, being single and being completely career driven, I moved to California right away and wanted to work for the biggest, hottest company...which I did. But after being there for a year and experiencing stuff...it wasn't even so much the construction industry as just the real world kind of made me alter my priorities. And then I came home and got married and I've been with [company] for four years now and everyday I think my priorities are turning just that much more to being...I want to be a mother and I want to be a wife and that's very hard to do in construction. The hours, the responsibility, the stress...it's just not conducive to having that other side of your life. I don't know. I think...and [company] is a huge company and you are expected to put in 50-60 hours a week, you are expected to take it home with you, and that's fine and good but I've seen what it's doing to everybody above me too. Not being able to see their kids grow up and being at the office until 10:00 at night and just being constantly stressed out. I don't want to be that. I don't. So, I missed my promotion this summer

which was kind of crappy, but in a way I'm really relieved because I'm like you and I don't want that. [1027]

All the male things you deal with in construction I thought that was fine...it's working the family in I think is more difficult than anything. Family challenges far outweigh anything else that comes, had to do before. I want to work, but I want to be a mom too. I don't want to be a full-time worker so it's just trying to find that happy medium where you actually can do both without working 80 hour weeks. [1014]

One of the participants, a project manager eight months pregnant with her first child thinking of the future ahead of her, reflected on an experience in her past, saying

The first project manager I worked for told me one time that her kids called her by her daycare lady's name. She had her kids so much at daycare. I'm thinking how horrible is that. [1007]

She followed this comment up with

I really like my job, but I don't feel like I could be an effective PM working 40 hours a week--you just don't work 40 hours a week. You just don't. [1007]

The male dominated environment of the construction industry was identified as a primary source of the strain, whether it from male supervisors or, interestingly, their wives. Two participants made reference to this, commenting

If it was my career or my kids, it would definitely be my kids. I've had a few conversations with my direct report and his wife doesn't really work, or she works a little, and she takes care of the kids. He thinks I should be there when I need to be there...as for alternatives, there really isn't. [1010]

Most of the wives of the men I work with stay home, not all, but a lot and...and you know the women ask me...why do you do this? Why are you not with your kids? Like I'm some sort of horrible person because I don't want to be home with my kids. The guilt is there, but I've got a college education...I do want to stay home with my kids at some point, part-time work and more hours home, because I'm right now 40-50 hours a week, but I just look at it as a financial investment in our family. [1011]

As a means to meet the challenge of bridging personal and professional goals, these women are employing a variety of coping strategies. While their own learning of gender

roles was relatively androgynous, some of these women are finding themselves resorting back to “traditional” gender roles, saying

...now that we have children I've fallen back into the traditional gender roles. He [husband] tried to stay home [with the children], he really did, but he can't do it. He just can't do it. I'd get home and he'd be like "do you want some dinner?" Yeah, I just worked 11 hours today, I want dinner. So I'm just like fine, let's quit fighting the system, I do it better, the children are better off anyways, I'll work part-time, you work full-time. That's how we've fallen back into it...I think you tend to fall back into it, but women are just better at certain things and men just can't do it. It's a special man that can stay home full-time, there are those men, but my husband's just not one of them. He's just not. I quit fighting it. It took me about three years to figure it out after I had children...it just wasn't worth the fight. That's when I went part-time. [1038]

...my priorities are changing and I feel like I need to be that wife and that mother. I mean we don't have kids yet, but I feel I'm not doing my job because I don't do laundry all the time and I don't do the cooking and cleaning all the time. But we share those roles right now. Someday if I'm going to stay home with the kids then I feel like then that would be my job because [husband] would be out making the money and supporting the household. [1027]

Others are adjusting work schedules or just making do with the time that they have.

But at 4:00 is when I go home. Between 4:00 and 8:00 when they go to bed is when I am off. And if I need to work after 8:00 when they go to bed...you know that does happen sometimes. But 4:00 to 8:00 I demand that time. I absolutely demand it. [1009]

I don't know...I think all of us with kids just do the same thing. It's just must be the thing to do. But ideally it would be like 20 hours a week to work. We all know that 20 hours in this industry--there's no way. [1010]

I've got work and I've got family and there's that hour left over...you have no time for yourself but that's okay. [1011]

Still others are at a point where they are questioning their circumstances and what their goals are and how to best meet them. This uncertainty is not limited to those with spouses or children. Remarks related to this include

My biggest difficulty is knowing when to move on. It's like you get comfortable and it like, yeah, you work with great people but I'm still young and when is a good time to move on and try something new. [1020]

There's a lot riding on me. Everybody's looking at me thinking she's got to be career driven, but I'm not. That's a big challenge. How am I doing to balance being a project manager someday and a wife and a mom? [1033]

Or even just having a life. Going out with friends after work rather than sitting there at the computer. [1027]

I feel old. [1033]

No, I feel old. [1032]

That's a challenge...getting a balance in life. [1033]

I think I'm right on the line of do I just want to stay where I am or do I want to go into management. With a family now my outlook on my career has changed. I really am not concerned about stepping up the ladder. I'm really concerned about being able to support my family and being happy. I don't want to work 50 hours, I don't want to have to come in on the weekends, I don't want to have to have the stress of having employees or having...I could never do that, I don't think...that could change. But that's my biggest thing is what do I want. And where do I want to go. I don't know what's more important. [1041]

The two participants who expressed congruence between personal and professional goals were the two oldest in the sample, both married, but neither with children. These individuals commented

Balance...that's just not a problem. I don't have children, I have a very supportive husband who does...the good news/bad news is that he does like to spend time with me. [1019]

I work in a small company so promotion opportunities are definitely limited. As far as balance, fortunately for me my husband is as passionate about his career as I am. So that has never been an issue. I've really been fortunate because I've worked with a lot of women who really struggle with "I got to go home, I've got to do this...". My husband's always been incredibly supportive. The biggest challenge as I look down the road is probably...how do I stay passionate about what I am doing? A lot of it becomes the same-old, same-old and that's when I just get bored. I have to wake up in the morning and just be...I'm excited to go to work, there's something new, there's this new challenge and if I don't have that it's really hard for me. [1021]

Influence of others. Repeatedly these women spoke of those they have worked with as having a positive influence on the direction of their careers and their confidence in the construction industry. These findings are consistent with the literature related to the impact of mentorship. Comments included

The little barriers, the little challenges...it could possibly be because I've always been under the protection of my mentor. But I've never felt that I've ever been passed up for any opportunities. I just haven't experienced that. [1021]

My confidence has come from my boss actually. He's been really supportive and even when I first started, he's been my boss since I first started, so eight years, even when I screwed something up he backed me up in front of other people. And then we'd talk about it. It's always been that way. [1011]

One thing when I went to work here in town I had a project manager who looked out for me and really pushed for me...so I think a mentor is a huge bonus, it makes a huge difference. [1007]

Even coincidental events can have a major influence on career development. One participant's example of how a simple comment can impact perception, confidence, and development is a valuable finding of this study. She said

It's interesting because we'd sit around a table at these design meetings and I'd bring up an idea and nobody would even acknowledge it. Well there was another woman in there, she was an engineer and she had some construction experience, and she kept speaking up for me. So she'd say, "Hello, did you hear what [name] said? You guys, listen to her." She kind of took me aside after some of these design meetings and she's like, "I know because I was in the same boat you are not long ago." She was like you just gotta speak up, your ideas are good, you just gotta not be afraid to tell them. So I think since then it's really helped me...a lot of those ideas we've used now and I think I was hesitant to really put my ideas out there on the table. [1040]

Major Considerations

As a way to summarize the factors which influence career development, the women were asked to identify the single most critical factor in their career decision making process. These considerations include a host of factors such as flexibility of schedule and hours, level of comfort with company and co-workers, location and moving requirements, and type of work (i.e., construction projects).

Comments related to flexibility of schedule and hours include

Started my own construction company here in town because I was raising two children and needed flexibility and I had always been attracted to residential. [1008]

After I had my daughter I decided to leave the field, primarily because of the hours involved being in the field. I wanted to be able to take her to school in the morning at a reasonable hour and pick her up at a reasonable hour. So, I work currently three days a week in the office doing joint-venture work and then I own probably four other companies. I've been working on my own so long that I know that I could never work for anybody else again. The flexibility of what I need to do for my family and what I need to do for myself, that's probably what's driving my decisions at the point and time. I know that I don't want to travel because it's really hard when you have little-bitties at home. My husband goes crazy whenever I say I need to take a business trip. I travel once a quarter...I probably travel for three days once a quarter. I guess my perspective has changed into how to make the most profit in the least amount of time and to really focus that around my family. That's what drives my career these days...being able to take naps [being many months pregnant]. [1001]

That's definitely what is driving mine right now [also pregnant]. After doing it for 9-10 years, I felt like I was on the fast-track and I was getting promoted and all this stuff was great. But I kind of feel like I've done that now and I need to kind of cut back and be around for my kids and just figuring out how to work that out without totally giving up your career. [1014]

Flexibility with my family life and my son. I think that was the major factor for me when I was comparing companies...that was huge. [1040]

Others characterized this flexibility as working for a "family-oriented" company, saying

I don't have a family, but I cherish my free time. But, I chose [company] because it is a family-oriented company and family does come first over work there. There's people that leave in the middle of the day because they need to see their kids do something. They are okay about that as long as you get your job done. They are pretty good too about not overloading you, but there's just...there's always times when it's inevitable...you're going to have to work weekends, you're going to have to work until 10:00pm. And I do it. [1037]

[Company] has a different philosophy. They don't say you have to be here at a certain time. They want you to get your work done, they want to know that you are putting in an effort, but there are times where you are working...it balances out in the company and people see that. It's really a family-oriented company. Picnics, safety meetings, the Christmas party...everyone's invited. They put on a fancy party and the whole company, even down to our laborers, everybody's invited. I see that I really like this company. [1033]

Still others defined a major consideration as a level of comfort with the company, stating

I was pretty comfortable with them right off the bat. I was willing to try anything and I was, as I said, comfortable with them. [1014]

I chose [company] because of the whole package they had to offer. I loved [name] who was the President...he was great. He made me feel good, he made me feel like they wanted me because I was really reserved. When I graduated I was scared and I didn't have the self-confidence being a female. I mean how many were there, so I was really reserved because some of my interviews...things and questions they would ask I'm like oh my gosh, I'm never going to get hired. No one's going to hire me to be an assistant super...nobody's ever had one before. So, I loved them and that's why I've stayed with them because they are a great company and they have great benefits, great training all around. And I saw that from them...a lot of growth. [1041]

I think people make a huge difference...I think mutual respect is probably the biggest thing. [1031]

Similarly, the location of the company (i.e., proximity to family) and travel requirements are a major factor for many of these women. Some said

During that time I also got pregnant and decided that I didn't want to move around. [1009]

...got pregnant...at the time I was traveling back and forth to the Springs and staying over night and things like that and probably could have stayed at the company I was at, but I felt that it was time to move on and do something that was less hours. General contracting to me was a lot of hours so I went to work for a developer.... [1010]

I chose [company] because they were here in Denver...it was a tough choice. There was one in LA that I really liked, but then I would have had to live in LA and I don't think I wanted to do that...not going to fit in out there. [1035]

For me, it's not having to move every two years. It's hard, especially when you're married to uproot your spouse. That and knowing that you're going to be promoted and not be stuck behind. [1032]

I wanted to stay here in Colorado and that was my main concern so out of the companies that I interviewed with here [company] was the best fit. They had a lot of training that they offered and this program that they have to help you understand all of the different career paths. It was a good fit for me at the time and still is so I'm happy. [1039]

For others, often with less familial responsibilities, the type of construction projects and/or their position within the construction organization are major career considerations.

The range of comments include

I graduated two months after September 11th [2001] so...I originally would have rather gone into, like everybody, the custom homes and all the fancy stuff, but they weren't really hiring. When I got to [company] and was able to go into the healthcare division...I mean that's a whole 'nother bag of beans with requirements for infections control and...there's so many clean rooms and specifications that you have to have for health care building. It's pretty in-depth and pretty different aspect...it's kind of the custom homes of building...I like it. I'm glad I'm not building office buildings. [1025]

I really wanted a large GC after doing my internship in California. I just wanted the opportunity to move other places...I took it because I thought it was exciting and that they have a lot of opportunities, but like any construction job...the opportunities you have to take them when they come. [1034]

The position that I'm in is kind of a unique position and I'm kind of my own boss in a way. I mean that I answer to somebody, but he's not looking over my shoulder constantly and constantly questioning what am I doing and where am I. I get to do my own thing and run my own schedule, and cost accounting, and everything. I like that. [1026]

People are asking me "do you want to be a superintendent?" and I'm like I don't think I'm up for the fight, honestly. It's too much of a pain...I mean it's hard. It's hard now and I just don't think I'd want to wake up everyday to a struggle of being out there and by the time everyone starts respecting you the job's almost done. [1035]

Best and Worst Parts of Job and Construction Industry

As with any career, there are positive and negative aspects of one's job. The construction industry is no different. Understanding what women view as the best and worst parts of their positions within the construction industry and the industry in general is critical to fully understanding what it is that attracts and retains them in industry and what those factors are that challenge them in their career development. While these factors are not unique to women in the construction industry, they may provide a point

for academia and industry to better accentuate the positives and prepare future employees for the demands of the industry.

Best aspects of the job and the construction industry fell into three primary categories: variety and challenge of work, tangible evidence of a finished project, and people within the industry. Almost equally, each was considered a key factor of career choice and retention. Those speaking of the variety and challenge of the work they are able to do as part of their positions said

The best part for me is every project is different. You do the same thing, but there's different challenges within every project.... You finish a job and you look forward to the next project. [1007]

The best part for me is using my creative instincts. I can make it in my mind, and a year later, well sometimes six years later, it's there in 3D and it's real and I made it happen. To make things happen, especially things that nobody else has tried...it's kind of cool to make that happen. [1008]

The best part is working with some of the people and getting to work on lots of different projects. In pre-con[struction] we see tons of different projects go through...sometimes we're working 60-70 hours, all day long, weekends, and at other times we're waiting for the next project to come along. But the full days are the best. [1020]

I think the best is the challenges, the variety. There's always something new everyday and I never get bored. And the people I work with are great. [1040]

The best is it's pretty challenging and we get to...I enjoy the magnitude of what we are dealing with. You get to do some \$20 million jobs. It's kind of neat to say that's my job. [1038]

Others spoke of the tangible quality of the work performed as the best part of their work

I'd say for me the best part is...as I'm driving down the road with friends or whatever, I'll say I built that building. You have a lot of satisfaction in what you do really. [1039]

I love seeing the finished product. I love dealing with people and the different people you meet, even with the vendors and our supers...I love getting to work with them because I learn so much from them. [1041]

I would say the best part is completing a project and knowing that something that you poured a lot of your heart and soul into is done and is tangible. [1001]

The best part is the little successes. And just to be associated with this project...everyday you think wow, what a privilege. [1019]

That will last forever. Every other week when I fly out of DIA [Denver International Airport] I still get this little...I helped build this...this is my airport. You'll always have that. [1021]

For so many others, the people they work with are the best part of their experiences in the construction industry. Many made comments such as

I think the people...that's what makes my company. Makes me continue to work with the company. I think that if you don't like the people you work with, you work with them 8-10 hours a day, if it comes to a point that I just can't stand the people anymore than I won't work there. [1013]

You gotta go with the people that you respect...it's all about the people. [1014]

Best part is easily my team. I have just an incredible team...they're just awesome, wonderful. That's easily the best part. [1021]

Best is the people I work with right now. We have a really good team. [1025]

Others elaborated, saying

Some of my favorite days are when my good subs...when they are excited to talk to me and I get their answers for them and it's kind of like that good feedback from people...and I get to be nice to someone instead of calling them up and bitching at them all of the time. I think subs can be the best and worst part of the industry. And obviously the people I work with. The superintendent I've been working with...he was a PE [project engineer] before...graduated from the CM program and he's just been awesome for me...someone that will be willing to teach me stuff and not just be like "do it". [1035]

I think the best part is the relationships. I really miss being in the field because you get to interact with the subs so much more and your own field guys and even the owner to a certain extent. But that's what I love about my job is the relationships and talking to people and actually getting to know them and care about them. [1027]

I think the best is you know you'll probably see them on another job. There's not that many contractors honestly. I think the best part...you realize how many people you actually know in the state. It's pretty cool. [1033]

The other thing is a lot of people that we work with...most of the guys have a really good sense of humor. So, even though we are working on a really difficult project and there are horrible challenges that we have to deal with everyday, everybody keeps it light and can still laugh and can still have fun at work. [1039]

A few extended this relationship building and working with people to the owners or other individuals impacted by the construction project, saying

The most rewarding part of my job is building people's home...it's cool. [1011]

Everybody thinks that construction is bulldozing things down and builders who don't care about much of anything, but I've been on some very neat projects. The Children's Hospital in New Mexico, or the hospital up here, schools.... Like you said, it's going to be changing people's lives, its tangible evidence of work that you've been a part of. I just like that. [1009]

One spoke of the chance to perhaps influence others as a best aspect of her work, stating

There are a few girls that worked in my office or were temporary, just filling in during their high school years. I think one of them ended up going to CSU for construction management. I remember feeling...it just made me feel great. I think I had a lot to do with it. They saw what all I was doing with the company and were like "that doesn't look too bad" and I was kind of proud of myself for trying to be a little bit of a mentor I guess. [1014]

Worst parts of their jobs identified by these women include long work hours, interaction with unreliable or unpredictable people, unrealistic expectations, and the monotonous nature of some tasks. Long hours jumped out as the most common remark, with many commenting

The worst part is sometimes you just have to stay there and do whatever it takes--the project schedule and you're supposed to be done--you do what it takes to get it done. [1007]

The hours. That's my worst. [1013]

Long hours, probably the worst. [1031]

The worst is sometimes, and this is probably mostly self-inflicted, I put in long hours. And that's my decision. [1040]

That's what I was going to say when you're full-time. Full-time means 50, 60, 70 hours a week. [1038]

Long hours is one bad thing. If I have some other plans and it's ruined by having to work long hours, but otherwise I've gotten used to it by now. [1039]

For others, people they work with are often the most difficult aspect of their work.

Unreliable subcontractors were identified as the most common culprit with participants saying

The worst part I would say is probably dealing with people who don't do what they say they are going to do when they say they are going to do it. But that's just part of our industry and part of the problem solving. [1001]

The worst part is obviously crappy subs because I hate spending my day bitching at people and I hate going home being I was such a bitch today. And I hate calling them up and being like, "When are you going to get this done? You're lying to me. When are you going to get this done?" To me that is so annoying. [1035]

I'm kind of a control freak sometimes and with some subcontractors it doesn't matter what you do, you can't control them. There's nothing that you can do to make them do what they are supposed to do. It's like you tell them to do something, they say they are going to do it, they don't do it. And it drives me nuts. [1039]

For one individual working for a residential builder, the unpredictability of homeowners is sometimes a challenge. She remarked

The worst thing are the fire drills. People are unpredictable and you have homeowners that...you go through so many homeowners and you never know when one is going to come back to bite you and that's what I don't like. But it's 1 in 50. [1041]

At opposite ends of the spectrum, high expectations and ensuing stress were named as the worst part of the job, while, for others, mundane everyday tasks were identified as a low point. Comments ranged from

The worst part is unrealistic expectations...by senior management. [1021]

I think the biggest barrier that I'm dealing with is the stress. Oh my gosh. This job is just about to kill me. The stress of getting stuff done and your expectations of the expectations that are given for me. For a while there I was like is two hours of sleep really worth it. Now I'm getting six so it's getting better, almost eight. [1033]

to

The worst part is probably counting toilet accessories, counting doors. [1020]

For me I think the worst part is the paperwork, bureaucracy, things you have to deal with on every job. The systems you have to go through to get stuff done. It's annoying. [1037]

Feeling of Inclusion

As a significant minority in both their degree programs and the construction industry one might wonder if women in construction are able to have a sense of inclusion. Based upon this research it seems that this feeling is pervasive among construction management degree programs, with female students generally enjoying the environment, faculty, and their peers. This feeling fades dramatically once one begins to work in the construction industry. As a result, these women have some strong opinions about the various factions of men and women they work with in industry. These impressions, along with perceptions of what it's like to be a woman in construction, are discussed in the pages to follow. In the end, one gets the impression that while there are a host of challenges faced in the construction industry which could (and have at times) had the ability to alienate these women from their chosen profession, many have developed strategies and networks to help them feel more a part of the construction industry.

Culture of Construction Management Degree Program

Twenty of the 24 participants graduated from the same construction management degree program with a bachelors of science degree. Another two graduated from the

same master's program at this university, while just two graduated from programs outside this university. While this would presume to lend the data collected to have a high degree of similarity, it is important to note that there was a fair amount of diversity among participants as to age, prior industry experience, and backgrounds. Generally speaking, most of the women characterized their academic experience as

The program for me was wonderful. It definitely meshed with my interests and aspirations. [1008]

For many, this positive experience was largely shaped by their mostly-male peers in the program. Some spoke of these peers in a very personal way, saying

It was like you always had a built in security system because they all felt like you were a part of them. You'd go out and hang out with each other and they'd watch out for you. It was fun. [1027]

Yeah, you'd like go into class and you knew all the guys and you had every class with them. You'd go out to the Pickle Barrel for lunch and it was just like a big group of friends and everyone was friends. That helped...you didn't feel alienated. [1033]

With school it was such a struggle to get through...five years of school and just knowing that I had all the people in the class and we were going through the exact same thing together. We all kind of pulled together and were always studying together, or homework, or we could just rely on each other when we needed a break. It was just knowing that there were all these other people that were in the same boat as I was and it was like we just got to get through it and then we'll be good to go. That made me get through it and then...that was worth it. [1020]

I don't think they treated us any differently. It was like having a bunch of brothers. [1032]

Others remarked of their peers in a broader, still positive, way

I had a great time. It was a great social group, we did a lot of things together. We went to Florida together, we kind of traveled the United States going from convention to convention. I always felt like I was part of a great group of people. [1001]

I loved being surrounded by people in the industry who had experience and the whole bit. That was kind of fun...that was like the shot in the arm that I needed. [1019]

When I first switched over from architecture to construction management I was a little bit intimidated by the fact that I was coming from classes where it was half women and half men to all of a sudden I was the only girl in the whole class. After a while, like they were saying, everybody is down-to-earth and once you get to know everybody those were the people that I can relate to...those type of people. [1039]

As such as large component of their academic program, many times these women spoke of the relationships with their peers within the context of group assignments, homework, and projects. For some, this was a very positive, reinforcing experience.

I really liked the teamwork part of it actually. I was usually on an all male team and I think they were appreciative to get a little bit different perspective of input and I appreciated...you know a large group of women can be pretty caddy a lot of times. I actually really liked it and think projects went better that way. [1010]

I think some of them thought we were smarter. Like if we were sitting in steels class or whatever and so and so didn't get his homework done, who did he come to first? [1031]

Mine was fine. I only had one class that I had a problem with, but besides that all the guys were great. It was like high school to me. You knew everybody, everybody was very accepting. Nobody ever looked down on me. In fact, a lot of times they came to you as, "Can you help me with this?" For me it was great. I didn't have a problem. I loved it. [1041]

For others, experiences in group work were a bit more mixed.

I was always more comfortable with guys anyway so the group projects, working with guys, was not a problem. I do remember a couple of our group projects with guys who had already been in the industry...as far as I could see it we were divvying up some of the work and by the time I could get there to help a lot of it was maybe more administrative stuff...a lot of it was getting it into the computer, getting it to project form, getting it to what we could actually submit to school. If they hadn't had me there for that part they would have never, never have gotten any of that done. I think the guys saw that a lot at the end of our project, even though they were mad at me at the beginning, that "wow, she was pretty helpful here". I just remember that was kind of an eye-opener to me because I was hoping I could still be a good asset to it...I wavered...I wasn't by any means a straight A student going through or anything because it was hard for me. I

wavered through a lot of it...that kind of helped keep me going through the classes too. [1014]

I almost felt like sometimes you had to prove to some of the guys at first because they didn't know...once they got to know you are actually serious about what you are doing then they were really good about having you in their group. Sometimes you almost felt like there was a click. A certain group of guys because they had done construction...I didn't know what the hell I was doing sometimes...but after I got a little experience then I was fine with it. Once they got to know I was serious and I knew kind of what I was doing... [1013]

Like getting picked last for kickball... [1014]

Yeah, that's how it was sometimes. But after your junior and senior year they knew that you were serious and knew what you were doing. Almost got picked first sometimes. [1013]

I probably got tagged to do a lot of the group projects because they knew that I would get it done and get it done okay...well, I should say well. I think sometimes we had some group projects where I had to mediate. [1001]

I think they were less apt to warm up and to partner. I hated group projects when I didn't know anybody.... The guys were like...and plus my experience was a little different because I was a lot older...I was 30 when I started the program. That made me stand out a little more. [1026]

Faculty were also identified as a factor in the feeling of inclusion, both positively and negatively.

I never had any problems. Sometimes...I think the classes...maybe this is why I was so comfortable there. Everybody in the program seemed so down-to-earth, really easy going, easy to get along with...not that I got along with everybody, but it's just overall, in general, the people I was taking classes with, the instructors, faculty...it seemed like more relatable to me. It was more like the instructors really wanted you to learn. It wasn't this come to my class and leave that I got in some of the other classes on campus. It was a good experience for me. [1040]

I also had a lot of faculty who had daughters that were close to graduating from high school or close to my age and they wanted me to be very successful because they felt like if they were helping me than somebody else was probably helping their daughters as well. I felt like...not that I got special attention...but that they were helping me make life decisions through the process of doing this. [1001]

When I was going to school I had the impression...I was 1 of 3 women in the program at the time...and the other women who were in my classes were interior design students with a CM minor and I was always referred to as an interior

design student because there was just the assumption that I am a woman, therefore I must be interior design. [1008]

Many of the women recognized and commented on the experience of being a minority in their academic program. Of the overall experience, two captured the perception of the larger group, saying

It didn't occur to me, as naïve as this sounds, that this was going to be such a small group of women. I think I had 4 or 5 women out of 90 of us in a graduating class. It just didn't occur to me until I walked into the doors that there were so few women. Which is so obvious now, but I just never thought of it at the time. [1011]

Even though my program really welcomed me with open arms, and was really excited that I as a female wanted to join the program, I don't think that they were necessarily pursuing females. [1001]

Others spoke of the minority experience in more specific terms. Again, some recalled positive experiences and the chance for opportunity.

I think within the teachers and professors...doing the construction competitions that was definitely beneficial being a female for that because they obviously wanted females on the team...there weren't a lot to choose from...so that was a big opportunity. That was good...that was one thing where I think being female really helped in probably a totally biased way...but it worked out really well for me. [1035]

I don't think it gave me any special favors, but you're noticed. And it's not in a way like "can I carry your books and do your homework for you", but you do get singled out. I felt like...then you get guys that are scared to talk to you too. I don't think you get any special privileges, but you do get recognized. You stand out a little bit. [1034]

I would have to say no barriers [in CM degree program]. If anything, maybe an opportunity because we were the only two girls...we were almost like a novelty in this class of 20. If anything, it was probably an opportunity. [1021]

Some recalled less affirming events, saying

I think I stood out a lot and the guys that wanted to work with me, at least in the beginning, really only wanted to work with me to hit on me. That's what I found out. [1035]

I thought one of you might say oh, my dad was a contractor or something like that because it seemed like so many of my fellow students that's what they were. I wasn't.... Once I got into the classes I liked the engineering classes, I did good in all of the math ones. My construction ones were probably the hardest as they tailored, or at least a lot of them went over my head, because a lot of the people in there already knew so much from growing up with it I think. I still remember that first construction class where you had to build the wall and I was the last one in there trying to hammer in my nails and stuff. I've obviously come a long way since then. [1014]

Many others spoke of their experience of being about 1 in 20 within the student body, saying

I kind of felt like I stood out because they all knew who I was and I didn't necessarily know all of their names. [1001]

The thing that I thought was funny is that all of the guys knew your name and you didn't know any of them. [1032]

Perception of Culture of Construction Industry

The general perception of the construction industry was one of

I definitely see more barriers out in the workforce, especially the more responsibility I get. I see the chauvinism. [1007]

However, there was still a strong sense of optimism and opportunity.

I think that there's a lot of opportunity in the industry, a lot of acceptance, especially for women just starting. Their peers may be closer to their age. I just think that there's more acceptance and more opportunity than there ever has been before. [1019]

I would tend to agree that there's a lot more opportunity, more general acceptance. Not quite as much of a novelty. [1021]

As regards the role of women in the industry, many challenges were identified but not dwelt upon. Resistance to women in construction was perceived to be within all areas of the industry, from the business and financial to the job site. Of this, some said

You're automatically...and I get it...but it's automatically assumed that you have no idea what you are talking about. Unless I'm in a role where I have to take on the command I just kind of sit back and watch what's going on until I know that

there's a convenient spot. I think it's a big challenge to win people over and you can't do it in an abrupt fashion. [1019]

So there are power-based elements that are necessary for doing business in construction and those are a real challenge for any woman in this business. I don't take it personally, I don't think it's me. [1008]

People don't expect to see you there [in the field]. But if you overcome it...it's their thing. It makes them look like idiots more than anything else. [1031]

I will also say that maybe you have to prove yourself a little bit more. But the sense that I get, at least on this project which is a real diverse group of people from different agencies, is that women are pretty well accepted. Although we are the minority in managerial positions. You gradually prove yourself. The more as you go down the pecking order, the food chain, and get into the field there's much more resistance. [1019]

Just as the perceptions of the construction industry were comparable among participants, so too was there a common link to their explanations of coping with perceived challenges. As one participant said

My big barrier wasn't my decision [to enter a CM program] but it was my experience. The best experience I had was when I took the internship with [company] and I was up in the mountains working on this huge commercial site and it was my first day on the job and I was like I'm the only girl here. Really feeling my heart pounding, and saying okay, let's do this. Let's show them. [1009]

Experiences in the Construction Industry

As one might expect, many of these women shared similar experiences of working in the construction industry. Interestingly, it was often other women (e.g., project assistants and secretaries) that were identified as providing the most resistance to their non-traditional roles as constructors. Related comments were consistent and included

The project administrator at first...I kind of had a harder time...and I think they did too with a female project engineer coming to them and not really telling them what to do, but.... It wasn't a tension, but it was a little weird for them. They didn't really know what to expect from me. I think they kind of wanted to gossip

with me a little bit too being a female, but at the same time, I was the engineer out on site...it was just different for them. [1035]

I don't think I could recall a blatant conversation with a guy or a superior or whatever when they're like you can't do this because they are all...at [company] they are very supportive.... But the administrators...when I first moved back to Colorado Springs and the secretary thought...first she thought we were going to be best friends and we'd go have lunch together and we would do each others hair...then it turned out...she started to realize that she worked for me kind of doing what I needed to do and all that stuff. One day I handed her a stack of submittals that I had to get out to whomever and she just went off...that was her button. [1025]

It was hard for me to get adjusted to. I'm the first project engineer [company] has hired and so I come in and I'm in and I'm not a PA [project assistant] and that's what all the women have been, PAs or accountants, and they don't know how to react to me because I was their boss. And I'm not, I'm not anybody's boss, we work for the project manager. But it was hard...the jealousy started coming out. It got bad for a while with some of the PAs I had to work with. Now we've hired two more female project engineers and things are getting a little bit better and they are treating us better. [1033]

We do our work [self and another female estimator] and we can show the guys we know what we are doing, we have fun while we are doing it, but the women are still like, "How are you guys doing up there? Are the guys treating you okay?" [1020]

Highlighting the sense of isolation being a minority can bring, one participant followed up the discussion of conflict with female project assistants with the comment

Sometimes, though, on the working with women...like out in the field I'll sometimes miss not having a woman out there. Because sometimes...I don't want to chat all day...but sometimes I have a story I want to tell people and there's no one to listen. There's my superintendent, but he's like "shut up...I don't want to talk about this". But it's a really good story. I find that's sometimes hard. [1035]

Another said

I think it's completely a random mix. Because you can get women that work with you...but literally I think you get those women who hate working with other women and you get other women who are like "oh, let's be friends, let's go shopping together" and those girls are kind of nice because you are like okay, we can be friends. I think, too, you have to keep that certain balance because you don't want the guys to be "oh, she's going to be one of those girls". [1034]

Experiences related to the men they work with varied more. Some recalled situations in which men they work with expressed surprise at their presence in the field, saying

Every single trip with the railroad we'd meet these guys...we'd go through this. I'd get out of the vehicle and they'd be whispering "you work...she's the boss lady" and it was so funny. Getting through that...it was great. [1021]

What I've found is that the superintendents are always looking at the girls like "what are you doing out on site" and so I feel like I have to placate them a little bit more than the PMs or the PEs. They've been through more schooling rather than the real life experience that most of the Supers have been. There are more women out there, but some of the Supers haven't realized that yet. [1020]

I saw that with the president of our company is much older...we have a really young company...but he's much older and I think it was harder for him than anybody when I said that I wanted to go into the field. Not that he objected, but he wanted to know what my goals were, why, what I was going to do there. Same thing everybody else does. That's where I noticed a difference. I'd been fine with him all along, but then when I said that I really wanted that field experience because that's where I am going to learn how to estimate better and things like that.... [1040]

Others commented on the relationships they've had with the wives of their male co-workers as both positive and negative experiences. Two different perspectives were expressed as

What always happens is the foreman that I'm working with and everything wives will come to the jobsite because they hear about me all the time. I'll end up going out and talking to them more than the foreman. I love their wives. I've actually been going out with all of the wives more than the guys at work. [1033]

and

I have run into problems, when I was working in the field, that the field guys' wives didn't like me right off the bat. Having never met me, because I was a female in the field. They didn't know anything about me, but that I was with their husbands everyday...that really bothered them. [1027]

Oftentimes, though, men they worked with were recognized as primary sources of encouragement and support. Some said of their experiences

Our foreman who is in his early 60s...he knows everything about the job...and I would go over and tell someone to do something and they would ask him. He would be like "she's the boss, absolutely you have to do it"...that was the best back up for me. To know that someone wouldn't be like oh, don't listen to her. He will always call me the boss in front of people and as minor as that is it's probably really good for the subs to be like "she is in charge, her people listen to her" and that's key for me to know. [1035]

I had to kick someone off my jobsite...I had no idea what he said, but I know he said something in Spanish and I called the superintendent and...I've never seen him so angry in my life. He like lined them up and was yelling at all of them "you're never coming back on the job" and I was like wow--that's some power. [1035]

There was also a time when I was in the field with [company] and I did mostly surveying but I was in charge of safety and QC. At the end of the day I would walk the job. And I was just an intern, I hadn't even finished school. And I was walking around and I ran across this pipe installer and he's working up in the grids without his hardhat on and I ask him to put his hardhat on. He just goes off on me...took his hardhat and threw it across the room and said every profanity and I didn't know anything about anything. So I walked away. As I go along my way I find this electrician on the roof and he's sleeveless and I'm like no, you have to have 4" sleeves. He's like "you don't know crap about anything"...every profanity again. I was so upset...emotions are going strong. I go into the trailer and the superintendent is like what's wrong and I tell him. He didn't say a word. He just went out there and got both those guys kicked off the job. It wasn't because I was female, it was because I was inexperienced. I felt like am I ever going to be able to get the experience to be respected. [1037]

Finally, even casual comments have had an effect on the feeling of inclusion for these women. Two such comments include

So this guy today said, "I just think it's wonderful. We need more women around because it adds that different dynamic and maybe it's just me, because I have a lot of strong women in my family, but I just think it's great." So that added extra encouragement. [1034]

So many buyers...I've built so many houses now...and so many are like "it's so nice to have a woman building it"...our attention to detail and all those other things you hear. [1014]

Views of Women and Men in the Construction Industry

As can be inferred from prior discussion, these women have strong views related to the women and men they work with in the construction industry. In general, they enjoy working with both genders in the industry. Viewpoints expressed included

I enjoy it because I don't enjoy working with a lot of women. [1038]

Me too. [1040]

I mean an occasional women I have to work with... [1038]

But when you do they are more like you.... [1040]

Still, there were many preconceived notions and prejudices expressed regarding women and men. Such viewpoints began in college and have continued through their careers.

College observations included

I try not to say because I was a woman I got so many [job] offers...I had like six offers and a lot of the guys they had 1-2 offers, but all the women in my class we had at least 6-7 offers each. I think it's still like that being a woman. I think it's also...I was heavily involved with all of the clubs back then. I think you are always going to be titled as being a woman...getting more offers is because of that. I sometimes don't think that's fair, but its part of reality. [1013]

When I graduated there was only four in addition to me that graduated at the same time. I would say that all of us were high GPA, magna cum laude, and then probably tied into hundreds of extra activities. And my male counterparts probably didn't pursue...a lot of them actually went to work for their dads. I didn't have that option. [1001]

Their dad's had companies, their uncle's had companies, they already had jobs. They didn't have to worry about their GPA. And I think maybe that is what encouraged us to work harder--we didn't have that. No one in my family has ever been in construction. I'm the very first one in my family. I think sometimes it's not fair...I think sometimes with the guys, it's like their dad wants them to get a degree and they settle. [1013]

Related to this, some spoke of the career choice process for women and men as starkly different, saying

They [women] default into teaching. They're like, "If I don't get into this I'll get into teaching." Guys are like, "If I don't get that job, advertising or a lawyer, I'll go into construction." [1020]

Some of the men are doing this because it's a traditional job, they've been in it for years, their parents are in it, and maybe they're not doing as good of a job because they've not had to work for it, had to climb the ladder and push a little harder. [1011]

I noticed this when I was just coming into construction, is that women, or at least in my case, I felt like I had to...I had something to prove really. I know that I'm going to be up against some challenges and I understand that I am competing for this job against five guys or whatever so I really have to try harder to keep this job or to do the best job that I can or whatever where the guy assumes this is what I was meant to do, my dad works in construction...sometimes it seems like the guys they don't have to try so hard, or to take specialty division seriously because he was meant to do this. [1039]

The results of this difference are often perceived as bringing top-quality women into the industry--women that have made a conscious choice to be in the industry and perform at a high level. Many commented on this, saying

I feel that the women that want to be in it are going to be the ones that are going to excel more...they're going to be the good ones, they're going to get weeded through. The 100 that start out, but only 15 will end up. But they're going to be the good 15 and that's what you are going to want to build a building or whatever. And that's positive, definitely. [1020]

Thinking of the women I've known during the years that I've worked, I have admired and respected all of them. I think the women in this industry are made of different stuff than...I don't mean to generalize against nursing or teaching just because that's a traditional career...but sitting in meetings, just speaking to them...women do a good job in this field. I think that there are certain experiences that we've all had that have...what is the word...that have made us stronger. Not so accepting of mediocrity. [1011]

I think the productivity of a lot of women is perhaps a little more efficient. The time that they are there they don't mess around. [1019]
Most of the women that have ever worked for me are more...they get more done in 40 hours that I do in 60. They're like...they've got families at home...I will work from 8:00-5:00, maybe 5:30, but they get so much done in that period of time. [1021]

When I first went to work for [company] I went to work for a female project manager and she was very organized, very on top of her game. At times I really thought she was a bitch, but she was good. And now I look back and I understand why she was the way she was. [1007]

Women are...there's probably a higher ratio of women to men that are over-achievers...in this field. [1019]

Compliments weren't limited to female colleagues. All of the women spoke favorably of many of their male co-workers. Some commented

I like working with the guys. A lot of the guys are just down-to-earth, they don't talk behind the women's back. [1020]

There are times when they [men] absolutely...a lot of times...when they do know more. Absolutely. They've been out there pounding the nails, they know what they are talking about. Maybe a lot of them have a lot more technical knowledge. So you have to appreciate that. [1019]

I have found the men in the trades to be wonderful to work with because there is always the common dominator of money. If I make them money, they like me, they respect me, there are no gender issues or limitations. The hindering issue of being a woman in my industry is power-based men. Some realtors, definitely bankers. [1008]

I see a lot of support from men in the industry. A lot of people ask me, "How did you get into construction management? Why did you choose this?" And then their next reaction is, "Well, I'm really glad to see it." They appreciate the input...the other point of view that women bring. Like you were talking about earlier having that communication, more open communication when a woman is sitting around the table. I think just different viewpoints that women can bring. A lot of men have mentioned to me that they appreciate having a woman on their team. [1040]

The men have been so easy if they think you are not some head-case or flake-off kind of thing, they love working with you. I think they like the fact that...women are like "where are you going, what are you doing, why are you doing that"...that kind of thing. Men, when they work together, they don't talk much and I think that's what men like about working with women. We relate a lot better and we get everybody in the group relating better, in fact. Just by having a woman in the group everybody talks more. [1038]

One participant identified a viewpoint expressed to her regarding the value of women in construction as

Our owner...he's an old guy...old school type of guy. He is convinced that we get jobs because I go to presentations, because there's a chick there. Women can communicate with women on the side of the owner. He's gotten comments to that effect...certain school districts that we work with or whatever. They are

impressed that there's a woman in the room presenting this information to them. I think there's some feasibility to that. [1031]

Challenges, however, were also identified. These included

I think for any gender that [disillusionment] can happen, but I think especially because we do take so much crap that it just builds...it eats you away faster. [1034]

I think as long as they know that you want to do it...that's important. I think a lot of women that I see in the industry are like well, I'm not sure if I want to do this or that...hey, pick a path and go so they take you seriously. If you kind of screw around and are like maybe I'll do this, maybe I'll do that, then they don't take you seriously. Men don't like you to be indecisive, in general. They take you very seriously if you are like, hey, I'm going to be an estimator and that's what I'm going to do in this life. Then they are like, well, I'll put effort into you. If they think you are like I'm going to be an estimator, or a superintendent, or a project manager, I'm just not sure, then they are going to be like I'm not wasting my time on you. [1038]

Interestingly, differing opinions were expressed on the topic of work-life balance.

It kind of makes you happy that you are a woman because you think about the guys you work with whose wives are home with the kids and they have no choice. They have to do this job in order to support their family and, thankfully, I'm not supporting my husband and we don't have kids but still that situation is totally different. [1031]

It is different, and I also think that the guys that do have wives that stay home all day long don't understand what it's like to have a two-income house. They don't get that because they have someone at home who does that all day long. I don't know...I think a lot of the guys' wives choose to stay home, which they can afford to do because construction does pay very well, but I think it really distorts their view of what it's like to be a woman in the industry. I don't think they have a clue. [1027]

Gendered Minority Status

What does gendered minority status mean? In school, it may mean being 1 in 20 students--the only female in a class, in a group, on a team. In industry, it may mean being the only female in the company, in the office, on the job-site. More importantly, gendered minority status often means that few, if any, have proceeded before you into

positions of management. It may also mean that there are limited opportunities for peer support or mentoring by other women in the industry, leading to feelings of isolation.

The women in this study include business owners and construction executives, project engineers within the first few years of their careers, and those holding positions in-between (e.g., project manager, estimator, etc.). They work for large, mid-size, and small companies. They are involved in the construction of commercial, residential, infrastructure, and civil projects. As somewhat a surprise, there were four companies represented which employed more than one of the study's participants. Pairs of co-working participants include: [1025] and [1027]; [1032] and [1034]; and [1033] and [1035]. Additionally, three participants, [1037], [1038], and [1039], all work for the same company. Yet, a similar theme of their experiences is that of being the only, or one of very few, females in their companies and facing challenges unique to women in the industry.

Descriptions of some of the companies these women work for and their experiences as a minority within include

With our company we have a 1000 employees nationwide...but we have no women superintendents, in upper management (VP and president) there's no women, we have one woman as a project manager, and we have a couple of women field engineers. We have not had yet a woman as a superintendent. They want one, but they haven't gotten a woman to that field, that part. [1013]

I'm seeing more. The company I'm with right now we had two women builders, just one now. [1014]

I was the first one [female] in our Denver office. Now there's two more. [1027]

We probably have 95 percent guys in the construction part and then there are lots more women in accounting and project assistants and everything. But when I first got to the company I was the first female estimator, the first woman on the 4th floor...this was just a year ago. There were three women up there, but they are

all project assistants or the receptionist or something.... About six months later we got our second female estimator. [1020]

I've kind of had a mixed bag. It seems like my company here...most of the women are administrative or accounting. There's probably five women project engineers, there's no women project managers or superintendents, so it's a little different. When I was in Texas we had more across the board. [1032]

When I worked for [company] the vice president was female, there were female project managers...[company] had maybe half women throughout the company so there wasn't anything there. Not at all. With [current company] I didn't feel anything until I was in the field. There's no female project managers, there's one female project engineer...for the most part there's just three of us. [1037]

So far, really the only ladies that work at [company] with the exception of us three are administration or accounting so there...I'd say as far as women in management go [name] is probably the highest in the chain of command. So far, we're breaking new ground. We don't have any women project managers or project executives or anything. [1039]

Conversely, two spoke of the few women in their companies as being in executive positions, remarking

In my company...it's 85 percent male...and the really fun thing is our two largest metros are managed by women. They've earned it...it wasn't because they were women...I didn't go seek a woman to put into this position. [1021]

All of the executives of my company are women. The president is a female, the VP of operations is a female. There's never been a project manager that's a female, but I think it's pretty awesome that these two women are running all of Colorado. But as far as the field goes there's really nobody. I was the only one, and still am the only one, that was ever a female in the warranty department. How did they get there...that's what I want to know. [1041]

One participant summarized the feeling of many others regarding the experience of being a female in the construction industry, saying

It's interesting because I really liked it in school, but now it seems like when you are the only woman with a bunch of men it's a little bit different and sometimes, you know, you do have barriers. If you can get over those then it's spectacular. [1010]

Another described a common experience working in the field as the only female as

I got transferred as a field engineer to Atlanta for two years and so I worked in the field. The project that I worked on was about 220 employees...I was the only female on the jobsite. It was very...a lot of guys who've never worked with a woman. So I was out there in the field doing all of the layout and a lot of the guys were very hesitant on how to approach me, and how to talk in front of me...that's always still very...when they cuss they're like "oh, I'm sorry" and then they hear me two minutes down the road doing the same thing. It's kind of interesting to see how they approach you at first and then once they get to know you. [1013]

Those early in their careers focusing on promotion made comments such as

[Company] doesn't have a female project manager...they have one that does really small projects. And there's now three female PEs so there's that added "well, which one of you is going to make it? Which one of you is going to be the first project manager?" They're working on getting up to speed on women being project managers, but it's definitely a little bit harder there I think. [1035]

They are training me to either be a superintendent or project manager so everybody is trying to get used to the fact that we're going to have a female project manager...oh my gosh! [1033]

Others spoke of the unique experience of being used as a recruiting tool (for other female employees) and the opportunities available to women for employment.

A lot of companies now...I feel like they're kind of playing...oh we've got lots more women in the company now. [1020]

...I think they [company] also use me as marketing because I am female. They are like, "Oh, we've got girls that work for us and you should come work for us. And [self] is going to be a project manager soon." So I think they take advantage of it too. [1027]

Oh yeah, I know they do. When I met [name], one of our PEs, she goes, "Man, I finally got to meet you. It's all they talk about." [1033]

Companies will hire you because you're female. [1034]

It's like appealing for companies to actually hire women. That's all my company hired last year...one girl. [1033]

While these women recognized and addressed many of the challenges unique to them as a gendered minority within their companies and in their jobs, there were ambivalent and

mixed reactions on the subject of how best to alleviate some of the isolation and conflicts present in their jobs. Two sets of dialogue on the topic captured these feelings

My friend's like you really need to get...he's like you really need to look into that kind of group [e.g., NAWIC] or something to get some kind of support from people that are in the same sort of situation as you because it's [support] not going to happen at the jobsite most of the time. That's important, the support. And to know that you are not the only one that is being treated this way or this is normal. [1026]

Yeah, I think that would be good. And also, what I was saying before, to meet people that are probably more like you. I found that I don't really have a lot of friends from work...because I'm in the field all the time. Who do I talk to? Our laborers and our carpenters. That's all I see. [1035]

Even if there is a portion of some of the classes that addresses this kind of an issue. Even if the guys can be enlightened on this is what they [women in construction] deal with, this is what happens to them, and make them understand and maybe be a little more sympathetic in the field or on the job or whatever because it's brutal. [1026]

In that respect, too, I think it's a catch 22 because you want to point it out, but in so many ways you don't. It's like you should not expect to be treated differently. But I think it's more of a sensitivity issue. [1034]

I don't think it's asking them to treat us differently. I think it's just asking them to realize what we experience and maybe it will help them understand our reactions. [1026]

I think if you are going to do that you might as well as ask them to go through childbirth too. No, I mean I wish that they could. But honestly, guys...sometimes they just can't comprehend exactly what it feels like. Probably because they are not as normally as sensitive as we are. [1035]

Recruitment and Retention of Women

The final line of questioning for the participants in the study was related to their perceptions regarding the future of women in the construction industry and any recommendations they would make to academia and industry for the successful recruitment and retention of female constructors. Overwhelmingly, these women had a positive outlook on the future of women in the construction industry. Some anticipated growth in numbers of women, others did not, but all believed there was a place in the

profession for women. Finally, suggestions were made for the recruitment and retention of women into industry.

Future of Women in Industry

Opportunity. With tempered optimism, many of the women expressed a belief that the future holds great promise for women in the construction industry. Many made parallels to more traditional fields of teaching and nursing, saying

It's such a slow thing...a 100 years ago we had no opportunities outside of the home, 50 years ago our opportunities professionally would have been nursing or teaching, and now legally and curriculum-wise we have as many opportunities as men. [1008]

I think as more people know about it and the more females that are involved with it, it is just going to be...growing up you are going to see more women doing that so you're going to maybe want to do that too. And so, like teaching or nursing, I think it's going to be a huge thing because I think that women have great attributes. [1041]

I do think it is kind of gradual, but I don't think it will ever...everyone like "oh, women will be just as many". I don't think it will ever be that way. It's kind of like nurses...there's lots more men being nurses too, but there will always be more women. [1020]

Others remarked of the potential in more general terms

I think it's going to be growing for women. I think the opportunity will always be there. [1013]

I think it's positive. I think it's gradual. I think you'll see more women in managerial; I don't think you're going to see a lot more women in the trades. But I could be wrong and that would be fine too...that would be great. [1019]

I think it will grow. Just what I've seen, which is very little, there are more girls coming. [Company] is hiring more girls...slowly and surely we are making a point--we can do this, we will do this, and you will listen to us and you will be affected by us. It is something that is...it's an aspect that is changing. Twenty years ago...nobody. [1025]

I see it growing...I mean look at all of us right here. We all have really great jobs and we're moving up the ladder. I think this generation is making the way. I

think it's going to be very common now to start seeing women in construction. [1033]

Some spoke of the diverse opportunities available to women in the industry, making note that not all will or must travel down the “traditional” construction manager path.

There's so many related industries that are great for women. There's all of the trades, all of the peripheral, banking, inspectors, corporate reps meeting clients...it's all related. There are so many opportunities. [1008]

Now I think that there is just a ton of opportunity in the industry. And there's so many facets in the industry. And now I've kind of landed in this engineering field...engineering versus more general contracting. Certainly in engineering there is even more acceptance of women. There's still that diverse ratio. I think there's a lot of opportunity in the industry, a lot of acceptance, especially for women just starting. [1019]

Many saw this growth a product of family and the sharing of experiences with their children as a powerful educational tool. Others saw the need for this sort of openness to non-traditional careers to extend to society in general for true change to occur. Related comments included

I think there's more opportunity as we start having kids and our daughters start seeing what we do and the barriers get broken down...I think it's definitely going to get better. I think a lot of this will come from role modeling. [1007]

My daughter's greatest aspiration at age five was to be a backhoe operator. I took her out to all of the jobsites...she is now engineering bound and I think she'll be well-calibrated gender-wise because she had a working mom. [1008]

I think it's really coming down to...our generation of children will generally be 3-4 times as much because they've got moms in the industry. I mean if you ask my little girl she says, “Can I go to work and build buildings with my mommy?” She doesn't want to go to school, she wants to go build buildings with mommy. I think it's an awareness. I don't think our fathers and mothers necessarily knew that, one, that you could get a degree in something like that, or two, that it was open for their daughters to be part of it. [1001]

It's how we raise our children. It's the only thing that's going to change...and it's not going to be just us women in the industry raising our children, it's in general. [1008]

A few saw education, college in particular, as playing a role in increasing the number of women in industry, saying

I think in the future it probably will still be a male dominated field...you'll still have a lot more men going into construction in general, but I haven't had too many people that are really against women in construction. So I think as just since this whole construction management as a bachelors degree has come into play there are a lot more women interested in going into the field instead of something else...it's an option now.... I think it is a growing field for women, but it will still always be male dominated. [1039]

Much more integrated. It's amazing how many [women] that are out there now. I think I graduated with two other girls. It's amazing how many they [universities] are churning out now. [1038]

Limitations. While optimistic about their own careers, others were less confident in the chances for an increase in the number of women in the construction industry. A variety of issues were discussed as to why, but in general these centered back to the primary challenges they saw facing themselves in their own careers: psychological challenges, demands of the work, and conflicting personal and professional goals. Of psychological challenges, some remarked

It's these soft issues that limit us which really comes down to self-esteem. The only true limitation is self-esteem...how do you get that? [1008]

*There's a lot of obstacles men don't have to... [1025]
Yeah. I think it will be a little while, honestly, before women are an equal presence in construction because it's just going to take the time to get more interested and more to stay on... [1035]*

Related to demands of the work itself, two stated

It's male dominated and I think it will be for even 20 more years in our industry. I'm sure we'll get more and more women in the field but, overall, I think it will always be male dominated because the industry is primarily for males to work it. I think it will still be the same in 20 years. [1013]

I think it's a battle. I think women could run stuff more smoothly and everyone would get along and be happy, but on the other hand it's not necessarily how...I mean sometimes the job gets done because the guys are willing to really piss

people off and like yell and scream at people. A lot of times it's hard. Because I think a lot of times then if I start out in a company and don't like it then you drop out of the industry and there's not necessarily the staying power because you run into so much of the stuff we are talking about right now and you're like I'm burnt out. [1035]

As the most significant challenge (i.e., conflict of personal and professional goals) to their own careers, one participant made the observation

I think, in general, you're probably seeing the max as far as numbers of women. I really think it will decrease. The reason I say this is because, in general, more women and couples are making choices...more women are staying home.... The more people I talk to...people are re-evaluating their lives and they're saying, "Is this really worth it? My God, look at my kids, they are out of control, they are being raised by the nanny." I see a lot of couples with two people who have really high powered careers where they are stepping back and saying, "This isn't worth it. I need to stay home and raise my kids." And I don't think in most construction jobs, unless it's a very administrative role, you don't have the flexibility, unfortunately, to do that. I guess, from my standpoint of seeing more women, I'm a little bit pessimistic about it. And it's not just construction, it's in general. [1021]

Later she continued

But the roles that women are going to take are the roles that have always been more geared toward women where they've realized that if they want to attract women they need to make it very, very conducive to having a family--the hours have to be friendly, all of these incentives. You're going to get a segment of women that are really focused on their career and this is what they want, but it's not going to be this "oh yeah, I'm going to get into construction and have my family and do it all". That's the number one challenge. [1021]

A final conclusion reached as part of this discussion was the considerable role the company one works for plays in this process of recruiting and retaining female constructors. Two participants spoke of this, saying

I don't know what you do to...how you make it more appealing. I haven't seen many more women come through our company. We've had a few and they haven't worked out and I don't know why that is. They've gone to other companies and done really well. My personal view is that it's pretty much just being...just how it's always been. There's a few, but not a huge growth. [1031]

I used to think that it was growing. I went to work for [company] and there was so many women working there. And then I go to work for this GC and when I went to work for them there were no women project managers or project engineers. There was a woman in estimating and she was a lead and that was it. And I was like, okay, this company has some growing to do. I go to CU or CSU and do interviews and I don't think I've seen it grow really. I think it's kind of hard to tell, unless you knew the statistics. I think it really depends on the company. [1037]

Recommendations for Recruitment

Resoundingly, the recommendations for recruitment centered on getting into elementary and secondary schools and talking with students about the opportunities available within construction industry. This recommendation was not made specific to the recruitment of girls and women; however, it was seen as especially useful to showing them the possibilities of such a career path. Many of the women in the group had participated in such activities either through their companies or other construction organizations. Examples include

One thing we did this year is we brought in kids from middle school and we showed them what it's like to estimate and what it's like to be in the field and what we do and I think that was surprising. It wasn't just to focus on women, it was to focus on the whole class, but I think anybody who is clueless about construction and they think that you're out there with a hammer...it's not like that. I think it's just to show them...I think it's to show them that you're not out there with a hammer. You're out there delegating, working with paper, trying to figure stuff out. You don't need to be a tough guy necessarily. [1037]

One thing we did as a company, a bunch of us work with AGC, we all got trained to go out to elementary schools and high schools and talk to classes and the girls are just amazed to look at us. "What do you do?" and I tell them and they are like "really, we could do that?" If we go to them young it completely, completely opens their mind to a whole different world. Where if you're a senior in high school you're going to be" yeah, right", but an 8th grader who has no clue what she wants to do and her mind is just so fresh and young and it like opens them up to the opportunities while they're young. [1033]

I was a field engineer on an elementary school and there were kids walking through that were in 2nd grade and I had my hardhat on and there was this little girl and she came up to me and she's like pulling on my arm and is like "are you

a construction worker?" And she was asking all these questions and stuff and I was like this is perfect and she's like "how come you are doing that?" and I was like "you can do whatever you want" and she's like "really?" [1031]

I volunteered for the Society of Women Engineers that does things at the Adams Mark Hotel every year. They get all middle schools girls that are science- and math-oriented and get them in there and they get to take workshops all day long. [1027]

Others volunteered themselves for future activities

Call on us to talk to your high school students. I think you probably need to talk to some of them...talk with them about the creative parts...not just the math and sciences. I would say that there's probably a lot of students that are artsy too that would fit right into the building industry because it's really creative problem solving is what it comes down to...more than anything I think. [1001]

I would love to go in and talk to schools...do something to get them just out there building and see how much fun and that they actually can do it for a living. [1014]

I think if you place that bug in someone's mind that it is an option than more women would choose that as their major as they graduate from high school. It would probably take people from industry like ourselves to go to high schools or junior high schools and present that as an option on career day or something. [1039]

Some saw a more hands-on approach as the way to entice young people into construction.

Yeah, you need a building camp. Come hand out and do projects. [1001]

Or even a class...I know ACC does this and one of my friends did this. They built a house for Habitat for Humanity for the semester. To be involved...I know women would love it if they knew about it. [1041]

Those with experience volunteering, however, made mention of the sometimes

conflicting demands of their work hours and the time needed to actively recruit

individuals into industry, saying

I think getting people like us or ABC or whatever to do the school-to-work type of thing is probably the best thing. The best thing is if you have really dedicated people to really do it. [1031]

That's hard too, trying to find people to sacrifice time to extracurricular stuff when they are already working so many hours. [1027]

Another primary area for recruitment was identified as better coordination and communication between secondary schools and post-secondary construction management degree programs. Much of this discussion focused on the necessity of educating young people on the breadth of positions and career paths available within the construction industry. Many remarked

I think there is a lot of lack of communication between what the high schools and college of professional...what you can do professionally in construction. But as far as being a woman and knowing that you don't have to start in the field...this needs to be somehow communicated to high school kids...junior high. [1009]

I think not only the shop class kind of thing, but also the estimating. I mean letting women know there's things besides just working in the field because I think that's kind of the stereotype. When people hear construction in high school they think "I don't want to use a shovel the rest of my life". [1040]

You want to focus on the positives. Being able to be an estimator, being able to be in the field...there are so many different aspects of the industry. [1041]

But I think that's what the girls in junior high and high school need to know. You don't necessarily have to swing a hammer to be able to estimate. I mean you need to know how it goes together, but you can learn that. [1040]

I think that's something...it should start there too. Get middle school and high school girls into tech-ed and show them... [1031]

The role of industry was not overlooked in this discussion of recruitment, however, as one participant made the comment

To bring them in you need to figure out a way to show them that at the end, after all this hard work, there is balance. You have to change the thinking of the industry to say...you're missing a whole sub-segment of really talented employees here. In many cases a lot of the bosses that I have had have said you're a lot better employee than a man because there are certain characteristics that women have that they feel make me better at certain things. And so if you can, and I have no idea how you do this, if you can get the narrow-minded industry, or somewhat narrow, to realize that...to look outside and see the value...because it would be a total shift of job sharing, all of those types of things. Things they say "what? How is that going to work?" But outside of that I think it will be difficult. [1021]

Recommendations for Retention

Suggestions for the retention of women were a bit more varied and showed the complexity of the issue surrounding the recruiting and retaining of women in the construction industry. Some offered ideas related to the role of academic programs, others the industry and individual construction organizations, while some offered personal observations and advice. Recommendations for academic programs included a wide-range of items such as

I think getting women out into the industry...internships are good, but getting them to shadow women. Those of us out there need to make an effort to come back...it's up to us to come back and share what we learned so they can see there's not just men out there in industry. [1007]

I applaud the WIC [Women in Construction] club...I think that's great. [1008]

I think that's one thing that school didn't prepare us for. Like you said earlier, school prepared us for reviewing submittals, doing RFIs, all the technical stuff that you have to know how to do to do your job well. [1025]

There's not Taking an Ass-Chewing class. [1034]

Or putting out fires. [1026]

Trying to get people to do what you want them to do, yesterday. [1025]

Spanish should be required also. [1026]

Comments regarding industry efforts and changes were more focused on addressing the personal and professional goal conflict so often encountered. Some said

You go through the program and do all of this work and then...that's about the same time you're realizing hey, if I'm going to have a family I need to do it now...and you're just up against a wall of I can't do it all so I need to make a decision. [1021]

I think having a company that can be flexible with that kind of stuff...modify positions so that they can be part-time when they do have children might be something if...because if a woman looks at a position...oh my God, it's 80 hours a week and I'll never be able to have a family. That might be something, to just modify a position so that they are not needed 80 hours a week or maybe that they can work part-time or even work from home. [1037]

Related, others remarked of their own experiences and pondered upon the more personal aspects of retention, saying

As far as retaining them, the women that we've had as project engineers that didn't work out I don't know why they didn't...I think that one was over-emotional...that is a woman thing...and the other one I don't think she really cared. She wanted to be married and have a family more than a career or something...and that's a woman thing too. So how you keep people from having emotions and wanting to have a family I don't know. [1031]

You have to roll with the ups and downs. I've had highs and lows at this job, but I always know it will come back.... It's a good industry if you can find your thing. [1038]

Quantitative Analysis of Data

The purpose of this research was to create a theory of career choice and development specific to the population of women who enter and remain in professional positions from construction management degree programs. Such a methodology is concerned with 'analytic generalization' (Yin, 1994) or the building of conceptual categories and frameworks (Locke, 2001). The data and observations gathered from the participants are then generalized as part of the broader context of theory. As Locke (2001) states, "A conceptual category has analytic generalizability when it can *plausibly* account for a large number and range of empirical observations" (p. 39; italics added). As such, the data gathered to create a profile of female constructors are intended to contribute to a theory which will enable "users to explain and predict events, thereby providing guides to action" (Strauss & Corbin, 1998, p. 25).

Quantitative statistical analysis is another means of creating this profile of female constructors and testing variables for correlations and between group differences. The written questionnaire gathered quantitative data pertaining to the following:

- Demographic information of the participant (i.e., age and race) and the her employer (i.e., type of work and annual volume);
- Family of origin variables such as parental level of education, occupation, and family socioeconomic status; current family status of marriage, children, and household responsibilities; and familial influences to career choice;
- Educational background (post-secondary and secondary), including degrees awarded; coursework taken; academic achievement; description of school culture; and academic influences to career choice;
- Construction experience, including listing of level and length of construction experience; number of employers; evaluation of personal and career goals; a scale measure of career satisfaction and career commitment; and industry influences to career choice and career development;
- Self-efficacy, both career task and experience, measured on a 5-point Likert scale; and
- Dimensions of the 'Big Five' personality traits, measured on 25 scale items.

This information was then sorted and analyzed based upon the suggestions of Farmer and Associates (1997) as a way to define large sets of variables into smaller, more clearly defined constructs. As the fifth and final research question of this study, statistical analysis was used to answer the broad research question: "Are there associations and differences among factors that would provide a better understanding of the traits and characteristics of female constructors in the construction industry?" This broad question was then broken-down into a series of sub-set questions to test for

associations and between group differences of individual constructs. Originally planned sub-set questions included:

- Is there an association between age and self-efficacy, personality, career satisfaction, and career commitment?
- Is there an association between years of employment and self-efficacy, personality, career satisfaction, and career commitment?
- Is there an association between number of employers and self-efficacy, personality, career satisfaction, and career commitment?
- Is there an association between self-efficacy and career satisfaction and career commitment?
- Is there an association between personality and career satisfaction and career commitment?
- Is there an association between number of children and self-efficacy, career satisfaction, and career commitment?
- Is there an association between amount of household chores done and self-efficacy, career satisfaction, and career commitment?
- Is there an association between GPA and self-efficacy?
- Is there an association between personality and self-efficacy?
- Is there an association between self-efficacy experience and career task self-efficacy?
- Is there a difference between those married and unmarried and years of employment, career satisfaction, and career commitment?

- Is there a difference between annual volume of employer and personality, self-efficacy, career satisfaction, and career commitment?

Upon review of the data, it became clear that two additional sub-set research questions should also be investigated:

- Is there an association between number of hours worked weekly and self-efficacy, career satisfaction, and career commitment?
- Is there a difference between those who work for a commercial general contractor and those who do not and personality, self-efficacy, career satisfaction, and career commitment?

Association of Independent Variables (I.V.) Age, Years of Employment, and Number of Employers with Dependent Variables (D.V.) of Self-Efficacy, Career Satisfaction, Career Commitment, and Personality

To investigate for a statistically significant association among age and dependent variables of self-efficacy, career satisfaction, career commitment, and the ‘Big Five’ personality traits, a correlation was computed. As age was skewed (skewness = 1.27), and the assumption of normality violated, the Spearman rho statistic was calculated. Table 10 shows that 5 of the 36 pairs of variables are significantly correlated. The strongest positive correlations, which according to Cohen (1988) have a much larger than typical effect size, are between two pairs of personality traits. These pairs are extraversion and agreeableness, $r(24) = .648, p < .001$, and conscientiousness and agreeableness, $r(24) = .644, p < .001$. This means that individuals in this study who are relatively extraverted and conscientious are likely to also be agreeable in nature. Career satisfaction is also positively correlated with career commitment ($r(24) = .471, p = .02$) and emotional stability ($r(24) = .425, p = .04$) with a medium to large effect size. A final

pair of positively correlated variables are the personality traits of conscientiousness and emotional stability ($r(24) = .461, p = .02$) which also have a medium to large effect size.

Table 10

Intercorrelations, Means, and Standard Deviations for Age and Dependent Variables of Self-Efficacy, Career Satisfaction, Career Commitment, and Personality

Variable	1	2	3	4	5	6	7	8	9	<i>M</i>	<i>SD</i>
1. Age	--	.12	.31	.08	.18	.17	.39	.34	.11	31.58	6.24
2. Self-Efficacy	--	--	.10	.18	.25	.26	.31	.29	.00	4.12	0.39
3. Career Satisfaction	--	--	--	.47*	-.02	.27	.19	.43*	.11	3.71	0.46
4. Career Commitment	--	--	--	--	-.27	-.09	-.13	.40	-.00	3.92	0.65
5. Extraversion	--	--	--	--	--	.65*	.38	.21	.27	3.89	0.60
6. Agreeableness	--	--	--	--	--	--	.64**	.28	.04	4.12	0.59
7. Conscientiousness	--	--	--	--	--	--	--	.46*	.02	4.28	0.47
8. Emotional Stability	--	--	--	--	--	--	--	--	.22	3.48	0.43
9. Open to New Experience	--	--	--	--	--	--	--	--	--	3.88	0.50

* Significant at the 0.05 level

** Significant at the 0.01 level

Using years of employment (skewness = 1.27) as the independent variable and testing for a statistically significant association with the same dependent variables of self-efficacy, career satisfaction, career commitment, and personality traits, a Spearman rho statistic was again calculated. Table 11 shows 6 of the 36 pairs are significantly correlated. As with age, the strongest positive correlations, which according to Cohen (1988) have a much larger than typical effect size, are between extraversion and agreeableness, $r(24) = .659, p < .001$, and conscientiousness and agreeableness, $r(24) = .646, p < .001$. Again, career satisfaction is positively correlated with career commitment ($r(24) = .462, p = .03$) with a medium to large effect size. Emotional

stability was found to be positively correlated with career satisfaction ($r(24) = .434, p = .04$), career commitment ($r(24) = .460, p = .03$), and conscientiousness ($r(24) = .466, p = .03$) which also have a medium to large effect size. This means that participants who are relatively emotionally stable are likely to also have a strong sense of career satisfaction and commitment, as well as be conscientious in behavior.

Table 11

Intercorrelations, Means, and Standard Deviations for Years of Employment and Dependent Variables of Self-Efficacy, Career Satisfaction, Career Commitment, and Personality

Variable	1	2	3	4	5	6	7	8	9	<i>M</i>	<i>SD</i>
1. Years of Employment	--	.12	.02	-.05	.26	.08	.26	.06	.03	9.07	6.14
2. Self-Efficacy	--	--	.07	.09	.27	.27	.31	.31	.01	4.11	0.40
3. Career Satisfaction	--	--	--	.46*	-.01	.27	.19	.43*	.11	3.70	0.47
4. Career Commitment	--	--	--	--	-.26	-.13	-.16	.46*	.02	3.87	0.63
5. Extraversion	--	--	--	--	--	.66**	.38	.19	.27	3.90	0.61
6. Agreeableness	--	--	--	--	--	--	.65**	.27	.04	4.10	0.60
7. Conscientiousness	--	--	--	--	--	--	--	.47*	.02	4.27	0.48
8. Emotional Stability	--	--	--	--	--	--	--	--	.22	3.49	0.44
9. Open to New Experience	--	--	--	--	--	--	--	--	--	3.88	0.51

* Significant at the 0.05 level

** Significant at the 0.01 level

As a final independent variable correlated with self-efficacy, career satisfaction, career commitment, and personality traits, number of employers (skewness = 1.3), a Spearman rho nonparametric correlation was used to test for statistical significance. Very similar results were found to correlations including age and years of employment. As Table 12 shows, 5 of the 36 pairs were again statistically significant. These pairs again include agreeableness with extraversion ($r(24) = .648, p < .001$) and

conscientiousness ($r(24) = .644, p < .001$); career satisfaction with career commitment ($r(24) = .471, p = .02$) and emotional stability ($r(24) = .425, p = .04$); and conscientiousness and emotional stability ($r(24) = .461, p = .02$). According to Cohen (1988), the first two have a much larger than typical effect size while the others have a medium to large effect size.

Table 12

Intercorrelations, Means, and Standard Deviations for Number of Employers and Dependent Variables of Self-Efficacy, Career Satisfaction, Career Commitment, and Personality

Variable	1	2	3	4	5	6	7	8	9	<i>M</i>	<i>SD</i>
1. Number of Employers	--	-.15	-.28	-.08	.37	.02	.10	-.11	.11	3.21	1.79
2. Self-Efficacy	--	--	.10	.18	.25	.26	.31	.29	.00	4.12	0.39
3. Career Satisfaction	--	--	--	.47*	-.02	.27	.19	.43*	.11	3.71	0.46
4. Career Commitment	--	--	--	--	-.27	-.09	-.13	.40	-.00	3.92	0.65
5. Extraversion	--	--	--	--	--	.65**	.38	.21	.27	3.89	0.60
6. Agreeableness	--	--	--	--	--	--	.64**	.28	.04	4.12	0.59
7. Conscientiousness	--	--	--	--	--	--	--	.46*	.02	4.28	0.47
8. Emotional Stability	--	--	--	--	--	--	--	--	.22	3.48	0.43
9. Open to New Experience	--	--	--	--	--	--	--	--	--	3.88	0.50

* Significant at the 0.05 level

** Significant at the 0.01 level

Association of Self-Efficacy and Personality (I.V.) with Career Satisfaction and Career Commitment (D.V.)

To investigate for a statistically significant association among self-efficacy and career satisfaction and career commitment, a Pearson correlation was calculated (assumption of normality found). The only finding of statistical significance in this test

was found between career satisfaction and career commitment ($r(24) = .489, p = .02$), which has a large effect size.

Looking for statistically significant correlations among the 'Big Five' personality traits and career satisfaction and career commitment, a Pearson correlation was again calculated. Findings among these variables are very similar to those found with the addition of age and number of employers with the primary difference of an even larger effect size. As Table 13 shows, the same five pairs were found to be statistically significant. These pairs again include agreeableness with extraversion ($r(24) = .675, p < .001$) and conscientiousness ($r(24) = .682, p < .001$); career satisfaction with career commitment ($r(24) = .489, p = .02$) and emotional stability ($r(24) = .421, p = .04$); and conscientiousness and emotional stability ($r(24) = .458, p = .02$). According to Cohen (1988), the first two have a much larger than typical effect size while the others have a medium to large effect size.

Table 13

Intercorrelations, Means, and Standard Deviations for Personality and Dependent Variables of Career Satisfaction and Career Commitment

Variable	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>
1. Extraversion	--	.66**	.40	.18	.02	-.06	-.29	3.89	0.60
2. Agreeableness	--	--	.68**	.18	.07	.23	-.13	4.12	0.59
3. Conscientiousness	--	--	--	.46*	.05	.18	-.09	4.28	0.47
4. Emotional Stability	--	--	--	--	.13	.42*	.37	3.48	0.43
5. Open to New Experience	--	--	--	--	--	.07	.05	3.88	0.50
6. Career Satisfaction	--	--	--	--	--	--	.49*	3.71	0.46
7. Career Commitment	--	--	--	--	--	--	--	3.92	0.65

* Significant at the 0.05 level

** Significant at the 0.01 level

Association of Number of Children, Percentage of Household Chores, and Number of Hours Worked Weekly (I.V.) with Self-Efficacy, Career Satisfaction, and Career Commitment (D.V.)

To investigate for a statistically significant association among number of children and dependent variables of self-efficacy, career satisfaction, and career commitment, a Pearson correlation was calculated (assumption of normality found). The only finding of statistical significance in this test was identical to that of self-efficacy and career satisfaction and career commitment with significance found between career satisfaction and career commitment ($r(24) = .489, p = .02$), which has a large effect size.

Another Pearson correlation was run to test for statistical significance among percentage of household chores done and these same dependent variables of self-efficacy, career satisfaction, and career commitment. Once again, the only statistically significant finding was between career satisfaction and career commitment ($r(24) = .489, p = .02$), which also has a large effect size.

As a final test of association with the variables of self-efficacy, career satisfaction, and career commitment, a Pearson correlation was run with the independent variable of number of hours worked weekly. Just as with the others, the only statistically significant finding was between career satisfaction and career commitment, once again with $r(24) = .489, p = .02$). This, too, has a large effect size.

Association of College GPA and Personality (I.V.) with Self-Efficacy (D.V.)

To investigate for a statistically significant association between college GPA and self-efficacy and personality and self-efficacy, Pearson correlations were again calculated (assumption of normality found). There was no statistical significance found between college GPA and self-efficacy, but there was quite a bit of significance found between

various personality traits and self-efficacy. As Table 14 shows, 4 of the 15 pairs were found to be statistically significant. The strongest positive correlations, which according to Cohen (1988) have a much larger than typical effect size, are between the agreeableness and conscientiousness ($r(24) = .682, p < .001$) and agreeableness and extraversion ($r(24) = .675, p < .001$). This means that participants who are relatively agreeable are also likely to be relatively extraverted and conscientious in nature. The personality trait of emotional stability was found to be correlated with the variable of interest, self-efficacy at $r(24) = .409, p = .05$, and another trait of conscientiousness at $r(24) = .458, p = .02$. Each of these has a medium to large effect size.

Table 14

Intercorrelations, Means, and Standard Deviations for 'Big Five' Personality Traits and Dependent Variable of Self-Efficacy

Variable	1	2	3	4	5	6	<i>M</i>	<i>SD</i>
1. Extraversion	--	.68**	.40	.18	.20	.15	3.89	0.60
2. Agreeableness	--	--	.68**	.18	.07	.13	4.12	0.59
3. Conscientiousness	--	--	--	.46*	.05	.23	4.28	0.47
4. Emotional Stability	--	--	--	--	.13	.42*	3.48	0.43
5. Open to New Experience	--	--	--	--	--	-.03	3.88	0.50
6. Self-Efficacy	--	--	--	--	--	--	4.12	0.39

* Significant at the 0.05 level

** Significant at the 0.01 level

Association of Self-Efficacy Types

A final test of association among variables was that of overall self-efficacy and the four types of career self-efficacy (i.e., prior achievement, vicarious experience, verbal encouragement, physiological state to risk success/failure). Again, a Pearson correlation was calculated with a statistically significant association found among 3 of the 10 pairs of

variables. As Table 15 shows, the strongest positive correlation, which according to Cohen (1988) has a larger than typical effect size, is between self-efficacy and prior achievement ($r(24) = .549, p = .01$). This means that individuals in this study who have a high degree of self-efficacy are likely to gain the greatest amount of confidence from their own prior achievements. This is an especially important finding when taken in view that there was no significance found between self-efficacy and any of the other types of career task self-efficacy.

Table 15

Intercorrelations, Means, and Standard Deviations for Self-Efficacy and Dependent Variables of Career Task Self-Efficacy

Variable	1	2	3	4	5	<i>M</i>	<i>SD</i>
1. Self-Efficacy	--	.55**	.19	.11	.29	4.12	0.39
2. Achievement	--	--	.26	.06	.00	4.38	0.65
3. Vicarious Experience	--	--	--	.03	-.42*	3.29	0.86
4. Verbal Encouragement	--	--	--	--	.45*	3.79	0.93
5. Physiological State	--	--	--	--	--	4.00	0.72

* Significant at the 0.05 level

** Significant at the 0.01 level

Statistical significance, however, was found among some of the career-task self-efficacy types. There was a positive association found between verbal encouragement and physiological state ($r(24) = .452, p = .03$) leading to the conclusion that the more one relies on verbal encouragement as a means of building self-efficacy, the greater their ability to face the risk of failure. Conversely, a negative correlation was found between vicarious experience and physiological state ($r(24) = -.421, p = .04$). This would imply that watching the successes and failures of others does not build confidence in one's own

ability to face the risk of failure; rather, it may have the reverse effect. Each of these correlations has a medium to large effect size.

Difference of Marital Status (I.V.) with Years of Employment, Career Satisfaction, and Career Commitment (D.V.)

To see if there is a difference in years of employment, career satisfaction, and career commitment for those married and those unmarried, an Independent Samples *t* test was done. Inspection of the two groups indicates that there is no significant difference in these variables. As Table 16 shows, the mean years of employment differ slightly for those never married with those married (8.3 and 9.5, respectively), but the mean scores for career satisfaction and career commitment are almost identical for those married and unmarried.

Table 16

Comparison by Marital Status with Years of Employment, Career Satisfaction, and Career Commitment (n = 14 married and 10 unmarried)

Variable	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Years of Employment					
Married	9.54	5.58			
Unmarried	8.33	7.20			
			-.45	22	.657
Career Satisfaction					
Married	3.71	.50			
Unmarried	3.70	.48			
			-.07	22	.943
Career Commitment					
Married	3.93				
Unmarried	3.90				
			-.10	22	.919

Difference of Employer's Volume and Type of Work (I.V.) with Personality, Self-Efficacy, Career Satisfaction, and Career Commitment

Using a one-way ANOVA, a statistically significant difference was found among the three levels of company volume on the personality traits of agreeableness, $F(2, 21) = 4.42, p = .025$, and conscientiousness, $F(2, 21) = 4.27, p = .028$. However, as there is a

very small sample size, the reader should be cautioned when interpreting significance.

Table 17 shows that the mean scores on agreeableness are relatively similar for those who work for companies with annual volume of \$499M (million) or less (4.29 for \$99M and less; 4.34 for \$100M-\$499M), but is dramatically lower (3.63) for those who work for companies with annual volumes in excess of \$500M. Similarly, the mean score for conscientiousness is 4.43 for those with small firms (\$99M or less) and 4.44 for those with mid-sized firms (\$100M-\$499M), but drops to 3.89 for those with large builders (\$500M and more). Table 18 provides a summary of the One-Way ANOVA calculations. Post hoc Tukey HSD tests indicate that those who work for mid-size and large volume employers differ significantly in the personality traits of agreeableness and conscientiousness ($p < .05$; $d = 1.41$ and 1.43 , respectively). The strength of relationship or effect size in both cases is significantly much larger than one would typically find in this field.

Perhaps more interesting is, while not statistically significant at $p = .141$, there was a .40 and .43 mean score difference (on a 5-point scale) between the polar levels of annual volume with regard to career satisfaction, with a greater degree of career satisfaction for those with small companies (4.00) than those with medium firms (3.60) and large firms (3.57). At $d = 1.55$ and 1.61 , respectively, this too is a much larger than typical effect size.

Table 17

Means and Standard Deviations Comparing Three Company Volume Groups

Company Volume	<i>n</i>	Extraversion		Agreeable-ness		Conscientious-ness		Emotional Stability		Open to New Experience	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
\$99M-less	7	3.94	.48	4.29	.51	4.43	.50	3.66	.55	3.86	.75
\$100M-\$499M	10	3.96	.69	4.34	.56	4.44	.36	3.36	.25	3.94	.35
\$500M or more	7	3.74	.63	3.63	.45	3.89	.41	3.46	.50	3.83	.44
Total	24	3.89	.60	4.12	.59	4.28	.47	3.48	.43	3.88	.50
Company Volume	<i>N</i>	Self-Efficacy		Career Satisfaction		Career Commitment					
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
\$99M-less	7	4.06	.40	4.00	.00	3.86	.38				
\$100M-\$499M	10	4.09	.35	3.60	.52	4.00	.47				
\$500M or more	7	4.23	.48	3.57	.54	3.86	1.07				
Total	24	4.12	.39	3.71	.46	3.92	.65				

Table 18

One-Way Analysis of Variance Summary Table Comparing Employer Annual Volume on Personality, Self-Efficacy, Career Satisfaction, and Career Commitment

Source	<i>df</i>	SS	<i>MS</i>	<i>F</i>	<i>p</i>
Extraversion					
Between groups	2	.22	.11	.29	.755
Within groups	21	8.10	.39		
Total	23	8.32			
Agreeableness					
Between groups	2	2.37	1.18	4.42	.025*
Within groups	21	5.63	.27		
Total	23	7.99			
Conscientiousness					
Between groups	2	1.50	.75	4.27	.028*
Within groups	21	3.69	.18		
Total	23	5.19			

Emotional Stability					
Between groups	2	.37	.18	1.00	.385
Within groups	21	3.86	.18		
Total	23	4.23			
Open to New Experience					
Between groups	2	.06	.03	.11	.898
Within groups	21	5.62	.27		
Total	23	5.67			
Self-Efficacy					
Between groups	2	.12	.06	.36	.699
Within groups	21	3.45	.16		
Total	23	3.57			
Career Satisfaction					
Between groups	2	.84	.42	2.15	.141
Within groups	21	4.11	.20		
Total	23	4.96			
Career Commitment					
Between groups	2	.12	.06	.13	.880
Within groups	21	9.71	.46		
Total	23	9.83			

* Significant at the 0.05 level

** Significant at the 0.01 level

As a second test for difference with variables of personality, self-efficacy, career satisfaction, and career commitment, an Independent Samples *t* test was done among participants who work for commercial general contractors and those who work for other types of construction companies ($n = 12$ each). As Table 19 shows, a statistically significant difference was found in career satisfaction among the groups ($p = .002$), with those working for non-commercial companies reporting a higher career satisfaction score (4.00) than their commercial counterparts (3.42). The difference between the means is .58 on a 5-point scale. The effect size d is approximately -.225, which is much larger than typical. Likewise, a significant difference was found between those working for non-commercial rather than commercial companies on the personality trait of emotional stability ($p = .043$). A mean difference of .35 on a 5-point scale was found for their respective means of 3.30 and 3.65. Again, the effect size d is approximately -.91, which

is large much larger than typical. Both show that there is a negative relationship to career satisfaction and emotional stability for those working for commercial companies.

Table 19

Comparison of Commercial and Non-Commercial Employer with Personality, Self-Efficacy, Career Satisfaction, and Career Commitment (n = 12 each)

Variable	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Extraversion					
Commercial	3.88	.68	-.07	22	.948
Non-Commercial	3.90	.54			
Agreeableness					
Commercial	4.07	.53	-.41	22	.687
Non-Commercial	4.17	.66			
Conscientiousness					
Commercial	4.23	.39	-.42	22	.677
Non-Commercial	4.32	.56			
Emotional Stability					
Commercial	3.30	.28	-2.15	22	.043*
Non-Commercial	3.65	.49			
Open to New Experience					
Commercial	3.93	.42	.49	22	.633
Non-Commercial	3.83	.58			
Self-Efficacy					
Commercial	4.03	.31	-1.12	22	.277
Non-Commercial	4.21	.46			
Career Satisfaction					
Commercial	3.42	.52	-3.92 ^a	11.0 ^a	.002**
Non-Commercial	4.00	.00			
Career Commitment					
Commercial	3.75	.75	-1.27	22	.219
Non-Commercial	4.08	.52			

^aThe *t* and *df* are adjusted because variances are not equal.

* Significant at the 0.05 level

** Significant at the 0.01 level

Summary

This chapter presented the family background variables (i.e., gender role socialization, parental influence); individual and psychological variables (i.e., mathematics and science ability and achievement, dimensions of personality, and self-

efficacy); and environmental and sociological variables (i.e., role models and mentors, the structure of opportunity, educational climate in the schools, and counseling and advising) found relevant to the career choice and development of 24 female constructors actively employed in the construction industry. Additional themes emerged during this study which included: their perspectives as to their initial and current perceptions of the construction industry and the men and women who work within; their shared experiences of working in the construction industry and balancing their personal and professional goals; their defined best and worst aspects of their jobs and the construction industry; and their shared experiences of being a minority in the industry with recommendations for the recruiting and retaining of women in professional positions in the future. Finally, the data were statistically analyzed for associations and differences among a range of variables to help create a profile of female constructors.

Chapter 5 provides a summary of these findings with a profile of female constructors, conclusions, suggestions for further research, and recommendations for secondary and post-secondary education programs and the construction industry.

CHAPTER 5

CONCLUSION

The purpose of this study was to create a theory of women's career choice and development in the context of the construction industry. Focused on female constructors, or those in the professional ranks engaged in the management of construction projects and/or companies, this study investigated the relevant factors, processes, and experiences of women who choose to enter the construction industry through construction management degree programs. The goal of this research was to communicate as a theoretically and practically grounded theory of career choice and development an understanding of who female constructors are and those factors which led them to the construction industry and those influencing their career development.

This study followed the guidelines of a grounded theory research design. This means that the theory developed was "derived from data, systematically gathered and analyzed through the research process" (Strauss & Corbin, 1998, p. 12). As such, components of the research design and concepts were allowed to emerge during the research process. The aim of this approach is to build a "dense, well-developed, integrated, and comprehensive theory" of the topic (Strauss & Corbin, 1998, p. 33). The substantive theory of career choice and development formed from this study included components of the research (i.e., profile of female constructors) integrated with key components of prominent career development theories, as well as factors of non-traditional career choice and persistence.

Overview of the Study

Theories of career choice and development provided the theoretical framework for this study of women in construction management. Career choice and development theories are explanations of how the contexts in which people live interact with their individual traits, personality characteristics, and self-perceptions to influence their career development and decision making. A wide-range of theories were reviewed (see Appendix A), with four selected to provide the foundation for the study, providing the framework for analysis of women's career choice and development.

Three of these theories, spanning three decades, have evolved from the work of Albert Bandura (1969, 1977, 1986a, 1986b). In 1979, Krumboltz set forth his social learning theory of career decision making. In 1981, Betz and Hackett were the first researchers to apply self-efficacy theory to the process of women's career development and, in 1994, Lent, Brown, and Hackett published their model of career decision making (Brown & Associates, 2002; Farmer & Associates, 1997).

Central to these theories is a) emphasis on the learning and behavior which results from the reciprocal interaction of the person with the environment, and b) Bandura's concept of personal "agency" or "the capability within each individual that gives a person a shaping influence over his or her attitudes and feelings, as well as the ability to anticipate outcomes, and to plan ahead" (Farmer & Associates, 1997, p. 6). Three assumptions underlie these theories:

1. Career planning takes place within a life planning framework and these plans must take into account other life roles such as spouse or partner and parent as well as other personal roles;

2. Choice of career field should be consistent with an individual's abilities, aptitudes, values, and interests, and should be realistic in light of societal opportunities and constraints; and
3. Women's full potential is not being used in the workforce. Betz and Hackett (1981) refer to the "null environment" that women experience with respect to their careers, an environment that appears indifferent to their interests in and their preparation for a career (Farmer & Associates, 1997).

The other theory included as a framework for this study further extended the applicability of career choice and development concepts to women. First published in 1981, Gottfredson's developmental theory of circumscription and compromise added a new set of constructs to the field of career choice and development theory (Brown & Associates, 2002). While somewhat an extension of Super's work where self-concepts such as self-efficacy, self-esteem, and role self-concepts influence one's career aspirations and choice (Super et al., 1957), Gottfredson's own theory is based upon the assumption that "people embody inherent characteristics that distinguish them from others and that help make them who they are" (Gottfredson, 2002, pp. 86-87). This notion is especially useful when applied to women's career choice and development.

Each of these theories is rooted in social constructionism or the tenet that "people actively construct their own reality" (Brown & Associates, 2002, p. 13). Social constructionism calls for a more narrative approach, seeking a holistic view of career which accounts for time and space (Cohen et al., 2004). In such an approach, observation cannot be neutral in the sense of excluding interests, values, purposes, and psychological schemata. Rather, any investigation must aim for an interpretive understanding of one's

place in the social world (Brown & Associates, 2002; Howe, 2003). Social constructionism is concerned with how an individual's world is endowed with meaning, and how these meanings are reproduced, negotiated, and transformed through social practice (Cohen et al., 2004). As with the four foundational career choice and development theories, social constructionism is central to the substantive findings of this research.

A second component of the literature review was identifying factors influencing the non-traditional career choice of women. Previous research in this area had found that these factors often fall into three broad categories: a) family background variables; b) individual or psychological variables; and c) environmental or sociological variables. Components of these variables were investigated and findings were similar to prior research showing that factors such as gender role socialization, parental influence, mathematics and science ability and achievement, dimensions of personality, self-efficacy, role models and mentors, structure of opportunity, and educational climate of schools do seem to influence non-traditional career choice. These variables did not, however, provide a definitive understanding for career choice and, as will be discussed in the summary of findings, characteristics of these variables were not common to all participants in the study.

Additionally, as a means of identifying the barriers to career development women in construction management face and the ensuing strategies of persistence they employ to enter and remain in the industry, a final aspect of the literature review focused on strategies of persistence. These strategies of persistence were specifically related to the retention of women in non-traditional degree programs and non-traditional career fields.

Previous research in this area had found that non-traditional academic programs have an intrinsic culture about them in which dominant groups (i.e., men) perpetuate their power through social organization and interpersonal relationships. As such, women must, therefore, confront, conform, or quit academic programs that perpetuate male attributes derived from social values (Winkelman, 1999). For the most part, this study did not support these findings.

Prior research related to persistence in industry has cited factors such as underrepresentation of women, individual and institutional discriminatory practices, overt and covert sexism, inflexible working structures, and an unhelpful environment for the reconciliation of work and family commitments as barriers to the career development of women (Dainty et al., 2004). Other studies have focused on similar personality traits and the role of self-efficacy as a means of addressing and overcoming such barriers (Astin & Leland, 1999; Dunahoo et al., 1996). The findings of this study supported this prior research, elaborating and identifying additional challenges women face in the construction industry and their strategies of persistence.

As a grounded theory research design, qualitative research methods were employed as the primary means of collecting and analyzing data. Purposive and snowball sampling were used to garner a diverse sample of 24 women who had graduated from a construction management degree program within a 10 year period and were actively employed in the management of construction projects and/or companies. Small focus groups, resembling small group conversations, facilitated the collection of participants' views and experiences related to aspects of their career decision making process, factors of career choice, challenges and strategies of career development, and

recommendations for recruitment and retention of future female construction professionals. Additionally, a written questionnaire gathering qualitative and quantitative data relevant to demographics of participant and her employer, current and family of origin, climate of secondary and post-secondary education, level and length of construction experience, self-efficacy, personality, and levels of career satisfaction and commitment was completed by each participant prior to the focus group. The profiles completed from this data are complex, providing for an extensive understanding of the career choice and development process of women in construction.

Summary of Findings

The women in this study were diverse in their ages, construction experience, marital status and family characteristics, job positions, and employer work and size. Just 1 of the 24 women in this study entered a construction management (CM) program as her first major in college immediately following high school; the others were all second degree or transfer students. In the same way, their family backgrounds, individual and psychological characteristics, and environmental and sociological circumstances also varied to some extent. A variety of factors were found to influence the career choice making process and the career development of participants. Similarly, these women identified an array of coping strategies used to overcome barriers faced in the construction industry. A summary of these findings follows.

Factors of Career Choice

Family background variables. A commonality of androgynous gender role socialization and strong family ties was found to influence and/or support a non-traditional career choice despite varying family background demographics. Parental

educational levels ranged from less than a high school degree to a Ph.D., with participants reporting varied socioeconomic levels in their youth. Many of the participants grew up in homes where both parents worked; a few grew up with their mother as a stay-home parent (one had a stay-home father). Just one grew up in a single-parent home. While these women were given the encouragement and support to be both a “tomboy” and a “girly girl” in their childhood activities, the gender roles of their parents were largely traditional with the father as the primary financial contributor and the mother as the caretaker of the children and the home. This traditionalism in upbringing has had a strong influence on the career and family choices many have made.

Just over half of the participants had or has a parent employed in an occupation related to the construction industry. This did not seem to be a determining factor in the choice to enter a CM program for most of the participants however, rather just a means of knowledge about the industry. The greater factor in parental influence was the requirement to go to college, but the belief that one should seek out self-fulfillment in career choice more than any traditionalism of the career itself. As a group, these women have a strong connection to their fathers, spending a lot of time with them in childhood and adolescents. This comfort with the male gender at a young age seems to translate into adulthood and the relationships they’ve had with male peers in college and colleagues in industry.

Individual or psychological variables. In many respects, individual variables could also be called family variables in that parents, by heredity or socialization, greatly influence psychological characteristics of their children. This influence was especially evident in the individual trait of self-efficacy, or one’s degree of self-confidence. Every

participant in the study reported a high degree of encouragement and support by their parent(s) or another family member growing up and, as such, each is very confident in herself and her abilities. This confidence was, especially for those without any prior link to the construction industry, tested in their academic program. When faced with new or challenging situations in college, these women succeeded through their own personal sense of strength and in their ability to seek out others to help build their confidence. A large majority of these women greatly enjoyed their CM degree programs and felt very comfortable among their male peers and CM faculty, gaining confidence in their abilities every step of the way. Those that did struggle were often either those without prior construction experience (but this was usually overcome by their junior year) or those older than the traditional student (difficulty fitting in with peers in the program).

Personality is another variable which the research identifies as a common factor in non-traditional career choice. Of the 'Big Five' trait categories (Costa & McCrae, 1992), these women are overwhelmingly conscientious (mean 4.3 on a 5.0 scale; $SD = .47$). The most common descriptors chosen to describe themselves all fit into the conscientious category: #1) responsible; #2) hardworking; and tied for #3) practical, and organized. Based upon the literature of the necessary competencies of a good project manager (Cheng & Dainty, 2005), these would be as one expects. However, also tied as the third most common descriptor are kind (agreeableness category) and creative (open to new experience category). These last two contradict the image of the construction industry and the role of a constructor within it striving to finish construction projects with ever-tightening budgets and schedules.

A final individual variable investigated as a component of career choice was that of mathematics and science ability and achievement. Similar to prior studies, these women showed an interest and aptitude for mathematics and science in their secondary education. Unfortunately, an either/or attitude pervades with nine of the participants expressing a like of mathematics or science countering this with a strong dislike for English (including literature and composition). As a result, many were introduced to engineering (rather than construction management) by their high school teachers and counselors. Important to note, and not discussed in prior research, is that others expressed a strong interest in subjects such as art, music, and history. While this study supports the well-documented necessity to provide academic environments conducive to furthering mathematics and science ability and achievement of students, it also raises the question of the dichotomy between the “hard-skills” of mathematics and science and the “soft-skills” English and the arts.

Environmental or sociological variables. Role models, mentors, and significant others were found to be the greatest positive environmental influence on the decision of these women to enter a CM program. Role models included fathers, co-workers, and teachers while mentors were most often identified as former bosses. Significant others included boyfriends, husbands, and friends. Whether by chance or planning, these women surrounded themselves with positive influences that provided support and encouragement in their decision to enter a CM program.

Research has shown that the educational system is a major source of sex bias and sex role stereotyping (Betz & Fitzgerald, 1987). Schools are social institutions that reinforce gender-appropriate behavior, interests, and occupations (Garrahy, 2001; Kahle,

1996; Kelly, 1988; Lee et al., 1994). The findings in this study were consistent with this prior research with the majority of participants recalling the messages of their high school teachers and counselors to be that girls and women should remain in traditional fields such as nursing and teaching or, that if one wanted to work in the built environment, they could go into either architecture or engineering. Many believed that their teachers and counselors were unaware of construction management as a viable college degree and profession. Similar to the findings in Graham's (1997) study, although secondary school teachers and counselors are in the position to be, and should be, key players in the career choice process of students, very few played any sort of positive role in these participants' career choice processes. Instead, it seems as if college counselors are filling this role, unfortunately often after the student has "wasted" a year or two (and tuition dollars) in another major.

A final variable investigated was the influence structure of opportunity has on the career choice making process of women. As research has shown, one's family background and socialization, own psychological make-up, and environmental factors all play a significant role in structure of opportunity. Regardless of differences among these variables, each participant found an aspect(s) of her life and used this as the platform from which she entered a CM degree program. A common theme among the participants, and good news for those trying to recruit women into the construction industry, was captured in the words of one participant who said, "I don't think [there were] challenges or barriers getting into it [CM program]. We're in a generation where there have been women before us getting into it."

Factors of Career Development

While the factors of career choice were fairly straight-forward and similar to those identified in prior research, factors of career development identified within this study varied and were more complex in nature. Aside from those who had grown up around the construction industry or were already working in the industry, most of these women knew very little about what their futures might hold with a degree in construction management. Those that changed their major often did so with very little information about the construction industry or the role of a constructor. For many, internships proved to be an invaluable experience and their first chance to get a feel for the industry in which they were preparing to enter.

Once in industry, barriers to career development fell into two main areas: conflict of personal and professional goals (i.e., balance of family and work) and institutionalized discrimination (i.e., glass ceiling). These findings are incredibly consistent with the literature. Hesse-Biber and Carter (2005) identify both these barriers as common to male dominated fields, such as construction, in which messages of sex segregation are part of current employment practices. In the same way, the women often spoke of a double-standard as one participant remarked, “We have to work harder...to gain that respect.” Generally, factors of career development were explored in the context of four areas: personal goals, personality, self-efficacy, and influence of others.

Personal goals. Finding the balance between often competing personal and professional goals was identified as the single most significant barrier to career development for these women. With 14 of the 24 women married, eight of these with children under the age of five, the discussion surrounding personal goals was extensive.

Those married and thinking about having children in the near future also expressed concern with balancing demands of their jobs with the responsibilities to their families. Just a few stated that their personal lives and goals (none of which had children or intended to have children for quite some time) were aligned with their professional roles. As one participant said, “All the male things you deal with in construction I thought that was fine...it’s working the family in I think is more difficult than anything. Family challenges far outweigh anything else that comes, had to do before.”

The research supports these finding, identifying a consequence of a male dominated culture as the apparent wedding of professional and managerial occupations to a particular view of success based on a traditional male life cycle. This “sprint” model assumes early and intense devotion to career, with employees expected to devote countless hours in its pursuit. Women find, as they encounter the heavy demands of both work and family, their career path veers off of the “sprint” model and they, not the organizational culture, are to blame. It is, therefore, concluded that women are less motivated and less committed to their jobs (Hesse-Biber & Carter, 2005). This experience was expressed by almost all of the women married with children, and anticipated by others anticipating having children in the near future. It became an either/or decision for many of them, leading them to choose between a higher-status and better paying career path or a more supportive position (e.g., less responsibility, less prestige, less pay), but one which allows more flexibility of schedule and less travel. Others have shifted to part-time employees, while some have started their own businesses to allow for more flexibility.

While marital status, number of children, percentage of household chores, and number of hours worked weekly had no statistical significance on reported self-efficacy, career satisfaction, and career commitment levels, discussion in the focus groups often converged on these topics. Repeatedly, these women spoke of the stress added to their lives by trying to juggle the needs of their families and their work. Two remarked

I think that most definitely, I mean I hate to say it, I love my children, but it is one of the biggest struggles of my career because not only are you in an all-male dominated industry...most males aren't the prime person taking kids to daycare and picking them up and being there if they are sick...the guys aren't staying home. ...that is definitely the most stressful part of my job. There's no options. It's frustrating as a family. [1010]

We went through a lot of tug-o-wars, my husband and I...why can't you take off today? I think that now that she's four, just now we've finally found the balance and he understands that I have to be at work too. And actually our salaries are equal now so that helps. But...it's been hard. How do you find that balance? I think it's just the natural movement of your family, trying to get through what your priorities are. Obviously your kids come first, and then the job. [1011]

The general perception was that the work-life balance sought was exacerbated by the male culture of the industry. As one participant commented, "I think a lot of the guys' wives choose to say home...but I think it really distorts their view of what it's like to be a woman in the industry. I don't think they have a clue." These findings are supported by the literature. Dainty et al. (2000) report that 59 percent of the men in their study of constructors had supportive non-working partners who took on the responsibility of child care and other domestic duties compared to just seven percent of the women. Over half of the women surveyed in this study (55%) believed that they had to make a choice between having a successful career or a family-oriented lifestyle. Unsurprisingly, in both Dainty et al.'s study and this one, women's career motivation tended to decline in relation to their experience, as the salience of family issues became more significant and

they realized the inherent difficulties of combining work and family responsibilities. In an industry already lean and facing a significant shortage of construction professionals in the near future (Gibson et al., 2003), losing qualified individuals in the prime of their careers presents a monumental problem.

Personality. As discussed prior, these women largely identify themselves as conscientious and agreeable. Descriptors of these categories used by the participants to describe themselves include: responsible, hardworking, practical, organized, thorough, kind, generous, cooperative, and trustful. While one might assume these to be positive characteristics, prior research has shown them to negatively affect career success. Conscientiousness, while mostly unrelated to extrinsic success (i.e., externally visible success elements such as salary level and promotion), has been found to be negatively related to intrinsic success (i.e., subjectively defined success elements such as career satisfaction) (Boudreau et al., 2001; Judge et al., 1995). Likewise, agreeableness has been shown to negatively relate to both extrinsic success (Boudreau, et al. 2001; Seibert & Kraimer, 2001) and intrinsic career satisfaction (Seibert & Kraimer, 2001). Openness was also shown to relate negatively to salary level (Seibert & Kraimer, 2001). On the other hand, extraversion and emotional stability have been related positively to both extrinsic and intrinsic success (Boudreau et al., 2001; Seibert & Kraimer, 2001).

This prior research is interesting in light of the findings of this study. As Table 20 shows, there were five pairs of statistically significant correlations among the 'Big Five' personality traits and career satisfaction and career commitment. These pairs include agreeableness with extraversion ($r(24) = .675, p < .001$) and conscientiousness ($r(24) = .682, p < .001$); career satisfaction with career commitment ($r(24) = .489, p = .02$) and

emotional stability ($r(24) = .421, p = .04$); and conscientiousness and emotional stability ($r(24) = .458, p = .02$). According to Cohen (1988), the first two have a much larger than typical effect size while the others have a medium to large effect size.

Table 20

Intercorrelations, Means, and Standard Deviations for Personality and Dependent Variables of Career Satisfaction and Career Commitment

Variable	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>
1. Extraversion	--	.66**	.40	.18	.02	-.06	-.29	3.89	0.60
2. Agreeableness	--	--	.68**	.18	.07	.23	-.13	4.12	0.59
3. Conscientiousness	--	--	--	.46*	.05	.18	-.09	4.28	0.47
4. Emotional Stability	--	--	--	--	.13	.42*	.37	3.48	0.43
5. Open to New Experience	--	--	--	--	--	.07	.05	3.88	0.50
6. Career Satisfaction	--	--	--	--	--	--	.49*	3.71	0.46
7. Career Commitment	--	--	--	--	--	--	--	3.92	0.65

* Significant at the 0.05 level

** Significant at the 0.01 level

Although the variables measured do not include a measure of extrinsic success, career satisfaction is a valid measure of intrinsic success. Interpretation of these findings shows a complex association among personality traits, with 4 of the 5 significant pairings among the traits themselves. As agreeableness is the most significantly correlated with extraversion and conscientiousness, perhaps there is some sort of trade-off among personality characteristics affecting career satisfaction and commitment. A review of Table 20 does not seem to support the prior research that extraversion is positively related to intrinsic success, while agreeableness and conscientiousness are not. It does, however, support the prior findings that emotional stability is positively related to career satisfaction. Unfortunately, emotional stability is the lowest scored component of

personality among these women with a mean score of 3.5 on a 5-point scale and no one scoring this trait above 4.4. Such findings are important as personality characteristics have been shown to accentuate career stability more so in women than in men (Pulkkinen et al., 1999).

Self-efficacy. Prior research has shown that a strong sense of self-efficacy is a central component to career development, especially for women in non-traditional occupations (Betz & Schifano, 2000; Mathieu et al., 1993). The findings within this study support this claim, with participants referring to an internal sense of confidence as the primary source of strength in overcoming challenges in the construction industry. For many, this confidence is something deep within them, an internal sense of self, an attitude. For others, this confidence is something that they have sought out or developed through time (e.g., preparation, additional education, experience) or someone in their lives who provides reassurance and encouragement when needed.

The concept of self-efficacy is a critical one in the career development of women in the construction industry. Research has shown that self-efficacy expectations of women in male dominated fields are lower than that of women in traditionally female occupations (Lent & Hackett, 1987). Therefore, the construction industry and those supervising and supporting the careers of women in construction should pay careful attention to providing appropriate and helpful sources of encouragement.

As part of this study, a test of association was done among the overall self-efficacy score of participants and the four types of career self-efficacy (i.e., prior achievement, vicarious experience, verbal encouragement, physiological state to risk success/failure). A correlation calculation found a statistically significant association

among 3 of the 10 pairs of variables with, as Table 21 shows, the strongest positive correlation between self-efficacy and achievement. This means that individuals who have a high degree of self-efficacy are likely to gain the greatest amount of confidence from their own prior achievements. This is an especially important finding when taken in view that there was no significance found between self-efficacy and any of the other types of career task self-efficacy.

Table 21

Intercorrelations, Means, and Standard Deviations for Self-Efficacy and Dependent Variables of Career Task Self-Efficacy

Variable	1	2	3	4	5	<i>M</i>	<i>SD</i>
1. Self-Efficacy	--	.55**	.19	.11	.29	4.12	0.39
2. Achievement	--	--	.26	.06	.00	4.38	0.65
3. Vicarious Experience	--	--	--	.03	-.42*	3.29	0.86
4. Verbal Encouragement	--	--	--	--	.45*	3.79	0.93
5. Physiological State	--	--	--	--	--	4.00	0.72

* Significant at the 0.05 level

** Significant at the 0.01 level

Statistical significance, however, was found among some of the career-task self-efficacy types. There was a positive association found between verbal encouragement and physiological state ($r(24) = .452, p = .03$) leading to the conclusion that the more one relies on verbal encouragement as a means of building self-efficacy, the greater their ability to face the risk of failure. Conversely, a negative correlation was found between vicarious experience and physiological state ($r(24) = -.421, p = .04$). This would imply that watching the success and failures of others does not build confidence in one's own ability to face the risk of failure; rather, it may have the reverse effect.

These findings are important in light of comments made such as, “It’s a lot less thankless of a job than I thought it would be. You don’t really get a ‘nice job’ and I don’t know if that’s something that I need...but it’s a little different.” An open door and a little verbal encouragement go a long way. As one participant remarked, “A lot of times it’s just verbalizing it, telling somebody. Getting it off my chest and just talking about it. A lot of times after you talk it through you realize that it’s maybe not such a bad thing...I probably could handle that.” Doubtfully a need for just women constructors (men seek validation too), the impact of positive verbal encouragement and affirmation of achievements may be greater for women as they are such a significant minority in the industry.

Influence of others. Most of these women spoke of role models, mentors, or others who have supported them in their careers, having a positive influence on the direction of their careers and their confidence in the construction industry. Role models and significant others were most often reported to be individuals the participant could learn from (i.e., vicarious experience) and significant others were there for emotional support and verbal encouragement. For those participants fortunate enough to have them, mentors, defined as typically senior people in an organization or within a career field who help junior individuals navigate psychosocial and career-related issues (Kram, 1985), were identified as the most valuable resource in their career development and progression. Unfortunately, just a handful of these women had an active mentor and, as consistent with prior research, all of those that did had male mentors.

Although most women can understand the visible organization and learn how it operates, they are not privy, by virtue of their gender and minority status, to the informal

political system that controls the power (Essic, 1999). Mentors help women learn when to be competitive, when to be part of the team, and how to forge strong connections to appropriate sources of power within an organization. They are primary resources in aiding women's understanding of how to cope effectively and advance in male dominated organizations and career fields (Essic, 1999). Prior research has found that for women in non-traditional fields, mentors may serve the important functions of providing information about negotiating the demands associated with having a career and a family and providing information used in making self-efficacy evaluations (Nauta, 1997). All of this shows the need for mentoring to become a priority for construction organizations in supporting the career development of their female employees.

Strategies of Persistence

The general perception of the construction industry among the participants was, as one individual stated, "I definitely see more barriers out in the workforce, especially the more responsibility I get. I see the chauvinism." As regards the role of women in the industry, many challenges were identified but not dwelt upon. Resistance to women in construction was perceived to be within all areas of the industry, from the business and financial to the job site. Prior studies have found the most significant causes of stress for individuals working in the construction industry to be long working hours; insufficient leisure time; paperwork; insufficient family time; travel; architects; poor communication; staff shortages; and imbalances of power and responsibility (Sutherland & Davidson, 1993). The participants in this study identified *all* of these factors as sources of stress, and added interaction with unreliable or unpredictable people, unrealistic expectations, and the monotonous nature of some tasks as the worst part of their jobs.

In light of these challenges, these women are employing a variety of coping and persistence strategies. Consistent with prior research (Astin & Leland, 1999; Dunahoo et al., 1996; Gaskill, 1991), these women spoke primarily of their own abilities and ambitions and the role of self-efficacy traits as means of persistence. Other considerations influencing career development included factors such as flexibility of schedule and number of work hours, level of comfort with company and co-workers, location and moving requirements of the job, and type of work (i.e., construction projects).

Interestingly, while not statistically significant at $p = .141$, there was a .40 and .43 mean score difference (on a 5-point scale) between the polar levels of annual volume of employer with regard to career satisfaction. Findings show a greater degree of career satisfaction for those employed by or heading small companies (4.00) than those with medium firms (3.60) and large firms (3.57). At $d = 1.55$ and 1.61 , respectively, this is a significantly much larger than typical effect size. Similarly, a statistically significant difference was found in career satisfaction among the groups ($p = .002$), with those working for non-commercial companies reporting a higher career satisfaction score (4.00) than their commercial counterparts (3.42). Here, too, the effect size is much larger than typical ($d = -2.25$). A variety of reasons may account for these findings, which this study does not define, but construction organizations may want to take note regardless and look at their internal career development processes for employees.

Profile of Female Constructors

When the delimitations of the study were set with graduation dates from a construction management degree program during a 10 year period between May 1994

and May 2004, the expectation was that this study would have a fairly homogeneous sample of female constructors. In some respects it did, but for such a restricted sample of women in the construction industry (10 years is really such a short period of time), there was an incredible amount of diversity among the participants. This creates both strengths and challenges for the creation of a profile of female constructors.

The women in this study had between two and 24 years (mean 9.1 years) of experience working in the construction industry at the time of the focus groups. Seven had less than five years experience in industry, 12 had between 5-10 years, three had between 11-20 years, and two had more than 20 years experience. As expected, of the 24 participants, 22 had completed a bachelors degree in CM; two has completed a master's degree in CM (both had a non-CM bachelors degree). They work for a variety of construction firms, with a wide-range of corporate volumes, and in an array of job functions. Hours worked per week are consistent with the industry average, but more than most industries, with 20 of the 24 participants working in excess of 40 hours per week. Only two of the women with children reported working 50 hours or more per week. As Table 22 shows, the participants within this study represent a diverse sample of women within the construction industry.

Table 22

Summary of Participants' Professional Demographics (n = 24)

Degree in Construction Management	Frequency
Bachelors degree	22
Master's degree	2
Years of Employment	Frequency
Less than 5 years	7
5-10 years	12
11-20 years	3
More than 20 years	2

Average Hours Worked Weekly	Frequency
Less than 40 hours/week	4
40-49 hours/week	10
50-59 hours/week	7
More than 60 hours/week	3
Employer Type of Work	Frequency
Commercial Builder	12
Construction Manager/Owner's Rep	3
Heavy/Highway/Civil	2
Industrial	1
Residential Builder/Developer	4
Other	2
Employer 2004 Annual Corporate Volume	Frequency
Less than \$49 million	7
\$50 million - \$499 million	10
More than \$500 million	7
Job Titles	Frequency
Owner/Co-Owner	3
Vice President	1
Project Manager	2
Assistant Project Manager	1
Project Engineer	6
Estimator	4
Manager (purchasing, plans, etc.)	3
Safety	1
Contract Administration	1
Cost Engineer	1
Designer	1

Table 23 provides a summary of the personal characteristics of the participants. Ages of participants ranged from 24 to 50 years, with a mean age of 31.6 years. Of the 24 participants, 22 characterized themselves as Caucasian; two identified themselves as Spanish/Hispanic/Latino. Based upon the delimitations and location of the study, these demographic trends were expected. A closer look at the data, however, shows that in a sample of 24 women, all graduating within a ten year period of time, ten of them are 30 years old or younger, ten are between the ages of 31-35, and four are 36-50. As such, three generations are represented, from the Baby Boomers to Generation Xers to Nexters. Green (2005) has defined a distinct set of characteristics for each of these generations, which for the most part, were portrayed by participants. These are:

- Baby Boomer (born 1943-1960): Define themselves through jobs and equate work with self-worth; like to change things and willing to work long hours.
- Generation X (born 1960-1980): Independent; seek connection with managers on an equal footing and are highly comfortable with technology.
- Generation Y or Nexters (born 1980-2000): Technologically savvy, optimistic, and street smart; expect diversity and crave structure.

While the range of ages added depth to the profile, so also did the unexpected aspect of the participants' current marital and family status. While it wasn't surprising that roughly half the participants were married, it was unanticipated that a similar number would have children, especially so many under the age of five (i.e., kindergarten/first grade). Three of the participants were actually in their third trimester of pregnancy at the time of the focus groups. This diversity of personal circumstances and responsibilities added further richness to the profile.

Table 23

Summary of Participants' Personal Demographics

Age	Frequency
Less than 30 years	10
31-35 years	10
More than 36 years	4
Race	Frequency
Caucasian	22
Spanish/Hispanic/Latino	2
Parents Education Level (Mother and Father; n = 48)	Frequency
No diploma	2
High School diploma	20
Associates degree	2
Bachelors degree	14
Master's degree	8
PhD/EdD	1

Socioeconomic Status of Family of Origin	Frequency
Lower-middle class	7
Middle class	13
Upper-middle class	4
Marital Status	Frequency
Never Married/Divorced	10
Married	14
Number of Children (includes current pregnancy)	Frequency
None	14
One	3
Two	7
Age of Children (includes current pregnancy) (n = 10)	Frequency
Less than 5 years	8
6-11 years	1
12-17 years	1
Percent of Household Chores by those Married with Children (n = 9)	Frequency
50%	1
51%-75%	4
More than 76%	4

So what is the profile of a female constructor? Fortunately, the findings of this research show that there is no one profile of a female constructor. It seems as if a woman can enter and succeed in the construction industry regardless of her family background (e.g., socioeconomic status), individual or psychological variables (e.g., excel at mathematics and science), and environmental or sociological variables (e.g., family ties to the industry). She must not come from a family familiar with the construction industry, nor must she share the same skills and interests. She may be single and/or career driven, or she may have a family and/or be seeking a sense of work-life balance. Her goal may be to progress her career as an estimator, or a project manager, or a superintendent, or any other variety of position title. There is no one single profile of a female constructor.

However, there are shared experiences and similarities among women in construction management as this study identified. They share many of the same

personality characteristics, whether innate or learned, such as: responsibility, hardworking, practical, and organized. Yet, many also describe themselves as kind and creative. While some believed themselves to be highly emotional at times, all agreed that the show of emotion was detrimental in their careers and have worked to hide this trait. All participants reported and provided examples of strong self-efficacy, being resilient through internal confidence and the support of others. There was, however, it seemed a shared sense of internal questioning as to each woman's long-term role within the construction industry: Will she be promoted, and to what position? When she is, will she be accepted in this new role? Can she balance the demands of a position (e.g. project manager) with family responsibilities? Can she stay interested and challenged and "up to the fight"? Perhaps the strongest common characteristic in the career development of these women was a mentor, an individual supporting and advocating for them, in their career. This influence cannot be overlooked, especially in light of the rather constant sense of isolation many of these women expressed as a significant minority is every facet of their careers.

Recommendations

The findings of this study indicate many recommendations for academia and industry in the recruitment and retention of female constructors. Many of these recommendations come directly from the female participants in the study; others are finding based upon the breadth of information collected.

Recommendations for Academia

Recruitment. While the number of students enrolled in construction management programs throughout the country is increasing, industry demand for graduates is still

greater than the supply. Yet, women remain a small minority of the student population. College and university construction management programs have a responsibility to try to attract and educate the future leaders of the construction industry. Until a larger number of women are considered and encouraged to enter such programs, the industry will be losing out on future leaders.

Some of the recommendations made to assist colleges and universities in the recruitment of females include:

1. Partner with those already actively engaged in recruiting youth into the construction industry. This may include industry organizations, construction companies, volunteer organizations, and others.
2. Get out into the schools and the community and show youth what the construction industry is and what a degree in construction management provides as a career path.
3. Educate and partner with counselors in local school districts to bring the field of construction as an option to high school schools; support industrial art programs in the schools. Overcome the stereotype that there is just one career path in construction management (i.e., fieldwork) and show the range of options to include business development, estimating, purchasing, project management, and so on. In the words of one participant, “Go beyond shop class and focus on the positives and the ability to choose.” Highlight the many different aspects of the construction industry as viable career paths.
4. Educate and partner with community college advisers and your own college or university advisers (e.g., open option). Many college and university advisers,

much like high schools counselors, are unaware of a degree program in construction management or what the job prospects are within the industry. As one participant said, “Who would have thought you could get a degree in construction management?” Include other majors in introductory construction courses --remember that all but one of the participants in this study transferred into construction management.

5. Broaden thinking to include students beyond those that excel in mathematics and science; diversify skill sets to include, for example, writing, art, and communication. Make classes inclusive of all students from various backgrounds. As one participant said, “Include ‘artsy’ students too as industry is really creative problem solving and they might fit in just fine.”

Retention. Attracting female students to construction management is half the battle for academia. Retaining them through graduation and sending them out into the industry is just as important to the future of the construction industry. Recommendations for the retention of females in academic programs include:

1. Provide an honest preparation for non-technical aspects and challenges of the construction industry. Whether this be the “ass-chewing” class that some participants discussed, or just a chance to elaborate on the interpersonal aspects and challenges of the industry, it is important to realistically and honestly identify common challenges and experiences which may lie before them. Likewise, as one participant said, getting a women’s perspective on the construction industry may also be an enlightening experience for the men

entering the industry as to “this is what they [women] deal with, this is what happens to them”.

2. Develop mentoring program for minority students (e.g., women); help students build support networks before they graduate. Create a Women in Construction student club or partner with another organization of women in construction. Introduce female students to role models in industry; show them that women are succeeding in industry and the range of positions they hold.
3. Have internships or another work experience component of degree program; get students as much “real-life” experience as possible prior to graduation. As there is no substitute for lived experience, these internships are invaluable in building the foundation for future careers. Likewise, structured internships provide guidelines and support which may be helpful for students and industry sponsors, especially if it is the student’s first experience in industry or the sponsors first time hiring a female.

Recommendations for Industry

More recommendations were given by participants regarding the role of industry in the recruitment and retention of women in construction. Admittedly, these recommendations became more complicated, with some calling for a paradigm shift within the construction industry allowing for employers to become more attune to the needs of future employees.

Recruitment. Many of the recommendations for industry regarding recruiting of females were similar to those given for academia. These include:

1. On an individual level, the recommendation was made to get involved with local school districts, community colleges, and universities. Those females working in industry coming back into academia to share knowledge and experiences; show that it's not just men in the industry. Discuss with students the more creative and problem solving aspects of the industry, not just the mathematics and science or the fieldwork. Work at the corporate or association level to support technical-education and industrial arts programs in middle and high schools. Volunteer with organizations actively involved in recruiting females in the construction industry.
2. On a broader industry level, the recommendation was made to broaden the thinking of individuals in industry to help them realize that they are missing a whole sub-segment of really talented employees in their hiring practices (e.g., women). Until current stereotypes are overcome that women don't belong in construction, or those that are in the industry must fill project assistant and accounting positions only, the industry's ability to attract women will be severely limited.
3. Rethink the traditional career path and message industry is selling to young women. Are there other ways for individuals to gain knowledge without years of fieldwork? Rethink the demands of the construction industry. Is it necessary to work the 50-60 hours a week common to most positions? Is it possible to have a successful career in construction and have a family? As one participant said, "To bring them [women] in you need to figure a way to show them that at the end, after all this hard work, there is balance."

Retention. Suggestions by participants for industry regarding the retention of women in industry centered on two themes: a) need for a networking system and b) modification of industry demands to allow for a better work-family balance. The researcher added more recommendations based upon prior research and experience and an overview of this study's findings. Recommendations include:

1. Develop formal mentoring programs for new employees (especially minority) within construction organizations. Encourage senior members of the company to mentor junior members (e.g., new graduates) upon their entry to the industry to help them navigate company policies and expectations as well as larger industry experiences.
2. Develop and encourage participation in support networks. The National Association of Women in Construction (NAWIC) or other such networks which are designed to provide a support system for women in the construction industry as well as provide a means of career networking (a.k.a. career development). Support networks such as these are invaluable in showing that women are doing well in industry and help to off-set the challenges faced (or at least provide a forum to talk them through).
3. Another proven strategy to the career development of employees (men or women) is active and effective company training and career development programs. Make the hiring and career development of employees a priority of senior management. Create a culture within the company that the people employed are the most important factor in the performance and profitability of the organization.

4. Industry needs to become more conducive to having a family (e.g., hours friendly, job sharing, flexibility of schedules). This may include modifying positions so employees can work part-time when their children are very young, or modify positions so employees are not needed to work 50+ hours a week. Be flexible to include working from home on tasks that are applicable. As this study showed, this is the single most critical determinant to the promotion and career development of female constructors.
5. A final recommendation from the findings of this study would be to include diversity training of *all* construction employees; enforce a code of ethics or similar standard for treatment of *all* employees. There is no reason why female constructors should have to endure, on a common basis, any form of harassment. Until the industry takes hold of the culture of harassment and intimidation common to construction jobsites, their ability to recruit and retain employees will be severely limited.

Suggestions for Further Research

There are several areas of further research from which this study can provide a platform. A few of these include:

1. Complete a similar study of male constructors and then do a comparison of results between the two studies. Are their similarities and/or differences among variables of career choice and development? What is the profile of men in construction management? The construction industry has a shortage of all employees which a greater understanding of career choice and development factors may help address.

2. Conduct a comparative study of similar non-traditional fields to investigate for similarities and/or differences in key factors of career choice and development. Investigate reasons why some traditionally male-dominated industries and fields are having better success at recruiting and retaining women than others.
3. Explore further the phenomenon of persistence. Study a similar set of variables (i.e., background, individual, and environmental) of those women who have entered a construction management degree program and then left prior to graduation and/or those who have entered the construction industry after graduation but have since left the industry.
4. Explore in more depth some of the findings of this research (e.g., similarities/differences in the career development of women with and without partners and/or children; similarities/differences in the career development of women with and without mentors; career satisfaction and commitment of women by type and size of employer).

Conclusions

Career choice and development is a complex phenomenon involving a variety of family background, individual and psychological, and environmental and sociological factors. While many theories have been proposed to explain this experience, there is no single set of criteria or developmental pattern which fully explains the process, nor is the process stagnant and unchanging in nature. From this profile of female constructors, one can conclude that the process is a complex, ever-changing relationship of personal goals, characteristics, opportunities, and experiences had throughout life. Figure 5 provides a

model of the key career choice and development factors influencing the success of women in construction management. As shown, much of career decision-making and development evolves from identified factors (e.g., personality, self-efficacy, role models and mentors, personal and professional goals); however, much is situational and an outcome of chance and circumstance.

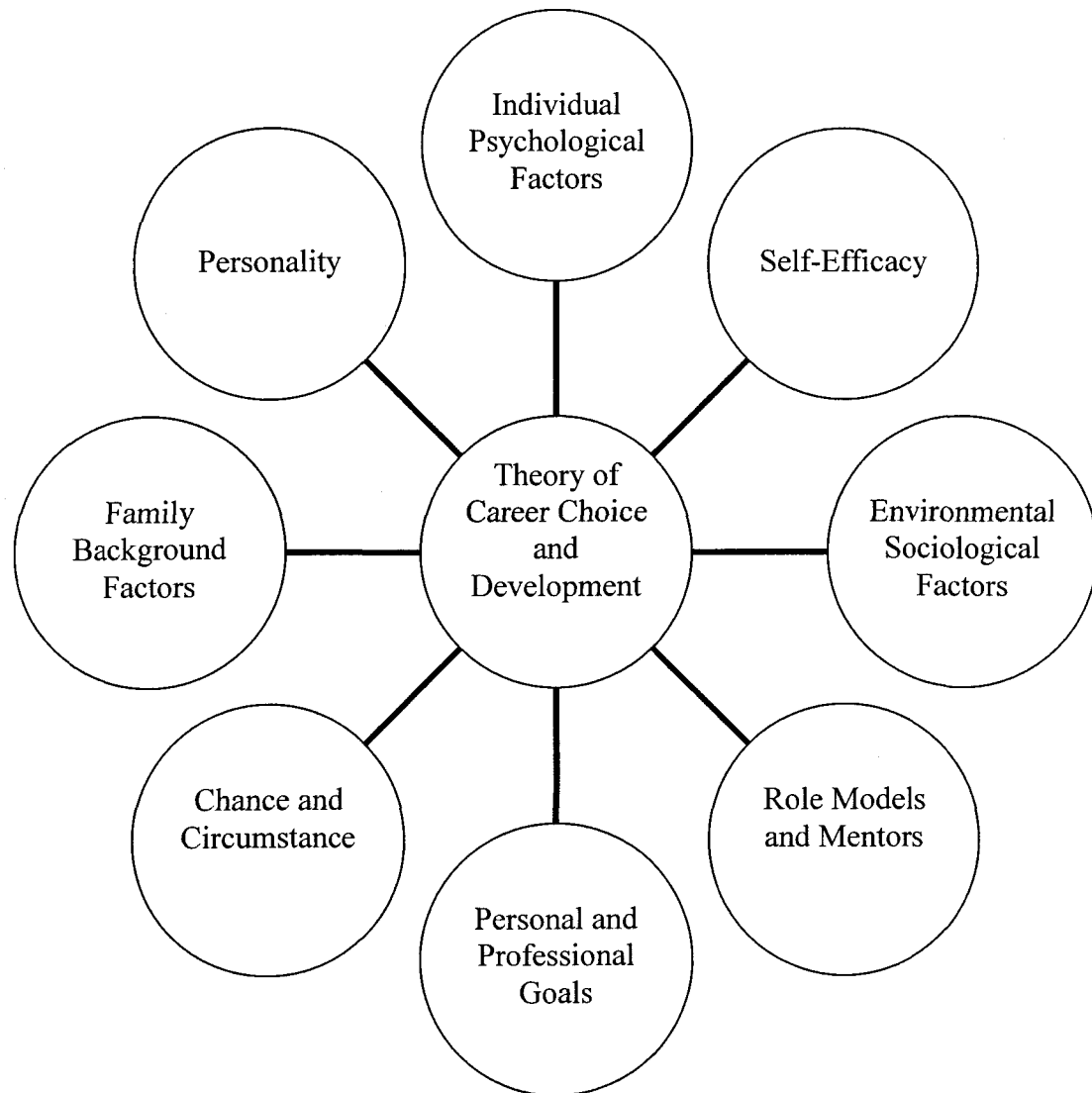


Figure 5. Career choice and development model: Success factors for women in construction management.

Although this study focused on the population of women in construction management, the model developed includes key factors of career choice and development which have been identified in studies of other non-traditional fields. Therefore, there is little reason to believe that this model would not be representative of factors influencing career choice and development of women in other non-traditional career fields. This is especially useful to those engaged in efforts to recruit and retain women in the construction industry as it allows for parallels to other industries which have been more successful in this endeavor.

Of central importance is the need for careful attention to be paid by academic programs and the construction industry to the challenges faced by female constructors. If so much of the talk and effort focused on the recruitment and retention of females into the field of construction management is true, equal attention must be given to correcting areas which have been identified as impeding these efforts. While such a paradigm shift will not be easy for an industry so ingrained in its ways of doing business, it is crucial to its ability to attract, hire, and retain the employees necessary to meet staffing demands. Likewise, as construction is a career field which employs such a great number of individuals, providing a variety of well-paying and interesting job positions, the larger society should demand that it be a viable career option for the “other half” of the population.

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APPENDIX A

THEORIES OF CAREER DEVELOPMENT

Psychologically Based Theories

Theorist (year of publication) ¹	Contributions
Astin (1984)	Socio-psychological
Bandura (1969, 1977, 1986)	Behavior Theory and Therapy
Betz & Fitzgerald (1987)	Self-Efficacy
Betz & Hackett (1981, 1983, 1986)	Self-Efficacy
Bordin (1963, 1984, 1990)	Psychoanalytic/Psychodynamic
Dawis, Lofquist & Associates (1964, 1968, 1969, 1984)	Work Adjustment
Farmer (1978, 1980, 1985, 1997)	Predictor Variables
Fassinger (1985, 1990)	Predictor Variables
Forrest & Mikolaitis (1986)	Relational Identity
Ginzberg (1972, 1984)	Career Choice
Ginzberg, Ginsburg, Axelrad, & Herma (1951)	Career Choice
Gottfredson (1981, 1996, 2002)	Developmental
Holland & Associates (1959, 1973, 1985, 1997)	Vocational Typology
Krumboltz, Mitchell & Associates (1976, 1979, 1984, 1990, 1996)	Social Learning
Lent, Brown, & Hackett (1994, 2002)	Social Cognitive Career Theory
Parsons (1909)	Trait and Factor
Patton & McMahon (1999)	Systems Theory
Peterson, Sampson, Reardon, & Lenz (1991, 2000, 2002)	Cognitive Approach
Roe & Associates (1956, 1969, 1984, 1990)	Occupational Psychology
Savickas (2002, 2003)	Constructivist Theory
Super (1953, 1957, 1980, 1984, 1990)	Life Space/Life Span
Tiedeman & Miller-Tiedeman (1963, 1984, 1990)	Individualistic Perspective
Young, Valach, & Collins (1996, 2002, 2004)	Action Theory

¹ Each publication may not have the same combination of authors as listed; the first author serves as the reference unless superscripted by another name on the list.

Sociologically Based Theories

Theorist (year of publication)	Contributions
Alexander, Eckland, & Griffin (1975)	Status Attainment Theory
Bianchi & Spain (1986)	Structuralist/Dualist Theory--Gender Effects
Bibb & Form (1977)	Structuralist/Dualist Theory
Bielby & Baron (1986)	Structuralist/Dualist Theory--Gender Effects
Blau & Duncan (1967)	Status Attainment Theory
Colclough & Horan (1978, 1983)	Structuralist/Dualist Theory
Duncan, Featherman, & Duncan (1972)	Status Attainment Theory
England & Associates (1981, 1986, 1987, 1988)	Structuralist/Dualist Theory--Gender Effects
Gordon (1972)	Status Attainment Theory
Hauser (1971, 1975, 1976, 1980, 1983)	Status Attainment Theory
Hodson & Kaufman (1982)	Structuralist/Dualist Theory
Jencks & Associates (1972, 1983)	Status Attainment Theory
Kerckhoff (1974, 1993, 1995, 2002)	Structuralist/Dualist Theory
Kohn & Associates (1969, 1973, 1976, 1978, 1981, 1982, 1983)	Work & Personality
Haller (1969, 1970, 1979)	Status Attainment Theory
Parcel & Associates (1983, 1994)	Structuralist/Dualist Theory
Rosenbaum (1976, 1981, 1999)	Structuralist/Dualist Theory
Schneider & Stevenson (1999)	Status Attainment Theory
Sewell & Associates (1957, 1969, 1970, 1975, 1976)	Status Attainment Theory
Treiman & Associates (1975, 1981)	Structuralist/Dualist Theory--Gender Effects
Turner (1962)	Status Attainment Theory

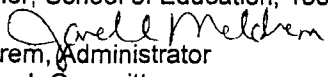
APPENDIX B

HUMAN SUBJECTS APPROVAL

Office of Regulatory Compliance
Office of Vice President for Research
and Information Technology
Fort Collins, CO 80523-2011
(970) 491-1553
FAX: (970) 491-2293

MEMORANDUM

TO: Gene Gloeckner, School of Education, 1588

FROM: Janell A. Meldrem,  Administrator
Human Research Committee

SUBJECT: **PROJECT APPROVAL**

Title: Women in Construction Management: Creating a Theory of Career Choice and Development
Protocol No.: 05-186H
Funding Agency: N/A

DATE: June

The above-referenced project was approved by the Human Research Committee on June 22, 2005 for the period June 22, 2005 to June 16, 2006 with the condition that the attached consent form is signed by the subjects and each subject is given a copy of the form. It is the investigator's responsibility to obtain this consent form from all subjects. *NO changes may be made to this document without first obtaining the approval of the Committee.*

Approval is for a maximum of 50 participants for the focus groups and to complete the survey.

A status report of this project will be required within a 12-month period from the date of approval. Renewal is the Principal Investigator's responsibility, but as a courtesy, you will be sent a reminder approximately two months before the protocol expires. The Principal Investigator will report on the numbers of subjects who have participated this year and project-to-date, about problems encountered, and provide a verifying copy of the consent form or cover letter used. The necessary form (H-101) is available from the Regulatory Compliance web page (see below). Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

It is the responsibility of the investigator to immediately inform the Committee of any serious complications, unexpected risks, or injuries resulting from this research. It is also the investigator's responsibility to notify the Committee of any changes in experimental design, participant population, or consent procedures or documents. This can be done with a memo which completely describes the changes and their consequences (new consent form or cover letter, or altered survey instrument, for example). Students serving as Co-Principal Investigators may not alter projects without first obtaining PI approval. The PI is ultimately responsible for the conduct of the project. Upon completion of the project, an H-101 should be submitted as a close-out report.

This approval is issued under Colorado State University's OHRP Federal Wide Assurance 00000647. If approval did not accompany a proposal when it was submitted to a sponsor, it is the researcher's responsibility to provide the sponsor with the approval notice.

Please direct any questions about the Committee's action on this project to me for routing to the Committee.

Attachment

cc: Jennifer Moore w/attachment

APPENDIX C

INFORMED CONSENT FORM

TITLE OF STUDY:

Women in Construction Management: Creating a Theory of Career Choice and Development

PRINCIPAL INVESTIGATOR:

Gene Gloeckner, Ph.D.
School of Education, Colorado State University
(970) 491-7661; Gene.Gloeckner@ColoState.EDU

CO-PRINCIPAL INVESTIGATOR:

Jeni Moore
Department of Construction Management/School of Education,
Colorado State University
(970) 491-4610; moore@cahs.colostate.edu

WHY AM I BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are invited to participate in this research as an alumnus of a construction management degree program and as a woman currently working as a construction professional.

WHO IS DOING THE STUDY?

This study is in partial fulfillment of the requirements for the degree of Doctor of Philosophy for the Co-Principal Investigator (PI) through the School of Education at Colorado State University. Additionally, the Co-PI is the Coordinator of the Phelps Placement Office within the Department of Construction Management at Colorado State University. The Principal Investigator is the adviser for the study.

WHAT IS THE PURPOSE OF THIS STUDY?

The purpose of this study is to create a theory of women's career choice and development in the context of the construction industry, specifically targeted to those in the professional ranks engaged in the management of construction projects and/or companies. A second, but equally important, component to creating this theory is the development of a profile of women who enter and remain in the construction industry as professionals. From this, we hope to be able to help guide efforts of industry and academia focused on a) recruiting women into construction management degree programs, and b) retaining these women into professional positions in industry.

Page 1 of 4 Participant's initials _____ Date _____

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

Components of the study will include a written questionnaire and a focus group. The written questionnaire will be sent (via e-mail or fax) to you 7-10 days before your scheduled focus group. You are asked to complete and return the written questionnaire to the researchers prior to the focus group. The questionnaire should take about 20-25 minutes to complete. The focus group will be about 90 minutes in duration and be held at either the offices of the Associated General Contractors of Colorado (Denver) or on the Colorado State University campus in the Department of Construction Management's conference room (Fort Collins). Location will be determined by the researchers based upon convenience of the majority of focus group participants.

WHAT WILL I BE ASKED TO DO?

You will be asked to complete and return the written questionnaire prior to the focus group and then participate in a 90 minute focus group discussion related to your experiences as a female in construction education and the construction industry. The focus group will be a moderately structured group interview designed to explore your knowledge and experiences of career choice and development.

ARE THERE REASONS WHY I SHOULD NOT TAKE PART IN THIS STUDY?

The criteria for inclusion in the study include:

- Female;
- Have completed a degree program (i.e., bachelors or master's) in a construction management program between May 1994 and May 2004;
- Have at least one year full-time experience working in the construction industry post-college graduation; and
- Currently hold a professional position in the construction industry.

Aside from these criteria, you should not take part in the study if you cannot physically attend one of the scheduled focus groups.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

There are no known risks to your participation in this study. It is not possible to identify all potential risks in research procedures, but the researchers have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

WILL I BENEFIT FROM TAKING PART IN THIS STUDY?

There is no significant individual benefit to the participant in this study, but from the information you provide we hope to gain knowledge which can positively influence 1) the recruitment of women into the profession of construction management (thereby reducing the participants' minority status) and 2) the environment of construction management academic programs and the industry so as to increase the retention of women who enter construction management as a career. We believe that this will be an eventual benefit to you. Short-term, this study may provide another means of networking with your peers in industry.

Page 2 of 4 Participant's initials _____ Date _____

DO I HAVE TO TAKE PART IN THE STUDY?

Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled.

WHAT WILL IT COST ME TO PARTICIPATE?

There are no costs to your participation in this study. You are asked to provide your own means of travel to and from the focus groups.

WHO WILL SEE THE INFORMATION THAT I GIVE?

We will keep private all research records that identify you, to the extent allowed by law. Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. For example, your name will be kept separate from your research records and these two things will be stored in different places under lock and key. This link list will be destroyed at the conclusion of the study and only the individual code assigned to you (i.e., 1001, 1002) will identify your responses to the written questionnaire or within the focus group.

You should know, however, that there are some circumstances in which we may have to show your information to other people. For example, the law may require us to show your information to a court should you pose a danger to yourself or someone else.

CAN MY TAKING PART IN THE STUDY END EARLY?

You may choose to leave the study at any time. Should you leave the construction profession entirely (this does not include changing positions or employers) during or prior to your focus group you will be removed from the study. Should you leave the industry after the focus group your comments and written questionnaire will remain in the study.

WILL I RECEIVE ANY COMPENSATION FOR TAKING PART IN THIS STUDY?

No, but a light snack and refreshments will be provided during the focus group.

WHAT HAPPENS IF I AM INJURED BECAUSE OF THE RESEARCH?

The Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

WHAT IF I HAVE QUESTIONS?

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the investigator, Jeni Moore at (970) 491-4610. If you have any questions about your rights as a volunteer in this research, contact Celia Walker, Director of Regulatory Compliance, at 970-491-1553. We will give you a copy of this consent form to take with you.

Your signature acknowledges that you have read the information stated and willingly sign this consent form. Your signature also acknowledges that you have received, on the date signed, a copy of this document containing four (4) pages.

Signature of person agreeing to take part in the study

Date

Printed name of person agreeing to take part in the study

Name of person providing information to participant

Date

Signature of Research Staff

Page 4 of 4 Participant's initials _____ Date _____

APPENDIX D

WRITTEN QUESTIONNAIRE

CODE: 1001

Please complete the following questions and, if possible, return prior to our scheduled focus group. If you are not able to return the questionnaire prior to the focus group, please bring it completed with you to our session. Information listed on this sheet will be kept completely confidential and not disclosed during the focus group by the researcher. Thank you.

DEMOGRAPHICS

1. What is your **age**?

2. What is your **race**? *Check all that apply.*

☐	Caucasian	☐	Asian
☐	African American	☐	Pacific Islander
☐	Spanish/Hispanic/Latino	☐	Native American
☐	Other		

3. Which category **best** describes the **type of work** your company or division does?

☐	Architect/Engineer	☐	Industrial Builder
☐	Construction Mgr./Owner's Rep	☐	Residential Builder/Developer
☐	Commercial Builder	☐	Subcontractor
☐	Heavy/Highway/Civil	☐	Vender/Supplier

4. What was your company's **2004 annual corporate volume**? *This would be of entire company, not only your division.*

☐	\$500M or more
☐	\$100M - \$499M
☐	\$99M or less

FAMILY

5. If any, which **family member(s)** was an **influence or role model** in your **choice** of construction management as a major/profession? **How so? Why?**

6. Was there any member of your **family** which **discouraged** your **choice** of construction management as a major/profession? **Who** and **how** so? **Why**?

7. What are the **highest educational levels completed*** and **occupations of your parents** (include step-parents if share(d) residence)? List **primary occupation(s)** of each parent. If parents are retired list primary occupation when in work force. **If they owned a business please state.** Add additional lines if needed.

* Education Level = **No diploma**; **High School** or equivalent; **Associate degree**; **Bachelors degree**; **Masters degree**; **Professional degree** (e.g., MD, DDS, DVM, LLB, JD); or **Doctorate degree** (PhD or EdD)

Mother:

Father:

8. What do you recall the **socioeconomic** status of your family to be while **growing up**?

- ☐ Upper-middle class
☐ Middle class
☐ Lower-middle class

9. What is your **current** status?

- ☐ Never Married/Separated/Divorced/Widowed
☐ Married/Cohabiting

10. What is the **gender** and **current age of each of your children** (include step-children if share(d) residence)? **If no children, check no children.**

#1 (oldest):	#4:
#2:	#5 (youngest):
#3:	☐ No children

11. If **married or cohabitating with children**, what **percentage of household responsibilities** (i.e., housework, childcare, etc.) would you estimate **YOU** do? **If not applicable, check not applicable.**

Percent

☐ Not applicable

EDUCATION

12. **When** (month/year), **where** (name of college/university), and with what **degree(s)** (i.e., AS, BS, MS and name of major) did you **graduate from college**? *Include each degree. * For example: "May 2000, Colorado State University, BS in Construction Management"*

13. If any, beginning with your first year in college, **list all majors** you declared before completing your construction management (CM) degree?

14. What was the most **significant factor** in your choice to declare CM as your major?

15. What was your **cumulative GPA** at graduation (best estimate)? _____

16. Which classes did you **excel in or enjoy most** during your **CM degree program**?

17. Which classes did you **struggle in or like least** during your **CM degree program**?

18. What were your **primary sources of support** (self, peers, family, faculty, advisers, role models/mentors, clergy, etc.) **during your CM degree program**? **How so**?

19. Which classes did you **excel in or enjoy most** during **junior high and high school**?

20. Which classes did you **struggle in or like least** during **junior high and high school**?

21. Was the **junior high or high school(s)** you attended and any of the **school personnel** (teacher, counselor, etc.) **influential or encouraging** of you to get a CM (or non-traditional) degree? If so, **how** so?

22. Were there aspects about the schools or school personnel **discouraging** of your choice to enter a non-traditional degree program? If so, **how** so?

CONSTRUCTION EXPERIENCE

23. In what **positions** and what **calendar years** have you worked in the construction industry? *List each position (including part-time and internships). Begin with current and end with first paid construction job.* Add additional lines if needed.

Position

**Years of
Employment**

**Avg.
Hrs/week**

**Check if
Different
Employer
from Prior**

** For example: "Project Manager, 2003-Present, 50 hrs/week"*

1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		

24. Generally, what were your **reasons for leaving** each employer?

25. If any, which **industry member** was an **influence or role model** in your **choice** of construction management as a major/profession? **How** so?

26. Since you've been in the industry, who has had the most **positive influence** toward your **career development**? **How** so?

27. If any, what **discrepancies** are there between your **personal goals** and **career goals**?

28. What level of **career** (more than job) **satisfaction** do you have?

None Little Some High Very High

--	--	--	--	--

29. What level of **career** (more than job/employer) **commitment** do you have?

None Little Some High Very High

--	--	--	--	--

SELF-EFFICACY

30. Indicate the extent to which you are **confident** in your **ability to successfully demonstrate** the following in your career. *Check only one box in each row.*

Area of Performance	Degree of Confidence				
	None	Little	Some	High	Very High
Job Knowledge	☐	☐	☐	☐	☐
Planning and Organizational Skills	☐	☐	☐	☐	☐
Human Relation Skills	☐	☐	☐	☐	☐
Problem Solving Skills	☐	☐	☐	☐	☐
Communication Skills	☐	☐	☐	☐	☐
Adaptability and Flexibility	☐	☐	☐	☐	☐
Cost Control	☐	☐	☐	☐	☐
Function as Part of Team	☐	☐	☐	☐	☐
Safety	☐	☐	☐	☐	☐
Creativity	☐	☐	☐	☐	☐
Achieve Customer Satisfaction	☐	☐	☐	☐	☐
High Quality of Work and Productivity	☐	☐	☐	☐	☐

31. For the following, rate **how influential** each experience is to your **confidence** in successfully performing a given task or behavior. *Check only one box in each row.*

Experience	Influence to Confidence				
	None	Little	Some	High	Very High
Achievement (i.e., prior successful performance on a similar task)	☐	☐	☐	☐	☐
Vicarious Experience (i.e., successful performance by role models or mentors)	☐	☐	☐	☐	☐
Verbal Persuasion and Encouragement (i.e., being told you "can do it")	☐	☐	☐	☐	☐
Physiological State (i.e., emotionally able to take risk of succeeding/failing at task)	☐	☐	☐	☐	☐

PERSONALITY

32. For **each personality trait**, indicate which **best describes** you as you are typically.
Check only one box in each row.

Description	Very	Moderately	Neither	Moderately	Very	Description
Silent	☐	☐	☐	☐	☐	Talkative
Unkind	☐	☐	☐	☐	☐	Kind
Organized	☐	☐	☐	☐	☐	Disorganized
Relaxed	☐	☐	☐	☐	☐	Tense
Imaginative	☐	☐	☐	☐	☐	Unimaginative
Unassertive	☐	☐	☐	☐	☐	Assertive
Cooperative	☐	☐	☐	☐	☐	Uncooperative
Irresponsible	☐	☐	☐	☐	☐	Responsible
At ease	☐	☐	☐	☐	☐	Nervous
Uncreative	☐	☐	☐	☐	☐	Creative
Adventurous	☐	☐	☐	☐	☐	Unadventurous
Selfish	☐	☐	☐	☐	☐	Unselfish
Impractical	☐	☐	☐	☐	☐	Practical
Unstable	☐	☐	☐	☐	☐	Stable
Uninquisitive	☐	☐	☐	☐	☐	Curious
Unenergetic	☐	☐	☐	☐	☐	Energetic
Distrustful	☐	☐	☐	☐	☐	Trustful
Careless	☐	☐	☐	☐	☐	Thorough
Discontented	☐	☐	☐	☐	☐	Contented
Unreflective	☐	☐	☐	☐	☐	Reflective
Timid	☐	☐	☐	☐	☐	Bold
Stingy	☐	☐	☐	☐	☐	Generous
Lazy	☐	☐	☐	☐	☐	Hardworking
Emotional	☐	☐	☐	☐	☐	Unemotional
Sophisticated	☐	☐	☐	☐	☐	Unsophisticated

33. Which **three or four** of the above traits **best describes** you?

APPENDIX E

FOCUS GROUP QUESTION GUIDE

Check in: Give name tag and Consent Form. Collect Written Questionnaire if not already received. Encourage to have refreshments and a seat at the table.

Welcome--thank. Overview of study. Introductions. Recording equipment and note-taking. Written Questionnaire. Consent Form. Not necessary to go around the table each question, but do want all to have a chance to be heard. Would like to discussion to flow as a conversation, but may also ask each of you at times to start off or add to the discussion. Recording reminders. Questions.

Introductions (10 minutes)

- Excluding names of companies, please **introduce yourselves** and tell the group a little about your **work history**? For instance, how long have you been working in industry and what sorts of positions have you held? What is your current position?

Career Decision Making Process (20 minutes)

A primary purpose of this study is to understand the process women take to make the choice to enter a CM degree program and then, upon graduation, how they make career decisions.

- **When** did you first know you wanted to major in construction management and what was your **perception** of the construction industry and the role of a construction manager at the time?
- **How** did you decide to major in construction management? Did you go through some sort of **process** to make the decision or did it happen more by **chance**?
- Thinking back to the **first CM job** you had following college graduation, what **factors influenced** you to **accept** this position? What aspects of the position, company, location, pay, etc. were important to you?
- Since, what **factors would or have influenced** you to **leave** this company and accept another position? (*promotion, travel, stress, demands/rewards, people, corporate structure, etc.*)
- Briefly what are your **career goals** and what **strategies** are you enacting to meet these goals? (*networking, hard work, etc.*)

Non-traditional Career Choice (20 minutes)

A second purpose of this study is to understand the factors which influence women to major in CM and work in the industry. Much of the written questionnaire was focused on these factors, but I'd like to ask a few questions to elaborate on three broad categories of influence: family, individual, and environmental.

- How do you recall learning about **gender roles** as a child? What were the **messages** you received?
- What aspects of your **family** (members, philosophies on raising children, values, beliefs, expectations, etc.) were **influential or supportive** in your choice of CM as a major and a profession? **How** so?

- If any, what aspects of your **education** (culture and personnel) were **influential or supportive** in your choice of CM as a major and a profession? **How** so?
- Did you have any **role models or mentors** which **influenced or supported** you to get a CM degree and work in industry? **Who** and **how** so?
- What aspects of your **personality** were most **influential** in your choice of CM as a major and a profession? *(give 3 or 4 descriptors of your personality)*
- What factors in your **life situation** (people, experiences, etc.) were **most influential or supportive** of your choice of CM as a major and a profession? Conversely, what factors were the **most challenging and provided barriers** to your decision?

Challenges and Strategies of Career Development (30 minutes)

The final component of this study is to understand what factors (both opportunities and challenges) influence the career development of women in the construction industry.

- What was the **experience** of being a woman in a **CM program** like for you in college (academically, socially, etc.)? As a woman, do you feel the culture or climate of your degree program presented any **barriers or special challenges** relative to your male peers? Do you feel it presented you with any **special opportunities** relative to your male peers?
- Do you feel your **degree program prepared** you (technically, emotionally, socially, etc.) for entrance into industry? **Why not** or **how so**?
- How would you define the **culture** of the construction **industry**? What is the **experience** (positive and negative) of being a woman in the construction **industry** like for you? For those of you with a few years in the industry, what was it like for you when you **first entered**?
- What would you say is the **best and worst** part of your **job**? **Best and worst** part of working in the construction **industry**?
- In what **situations** do you feel the **most confident** in your skills? **The least confident**? From **where** do you derive your **confidence**?
- What **challenges** (time for self, family and friends; work hours and travel; chances for promotion; etc.) do you see before you as you continue your career in the construction industry?
- What is your primary source of **strength** and/or strategy of **persistence** (self, others, experiences, etc.) when faced with **career challenges**?

Recommendations (10 minutes)

- What do you see as the **future** for **women in construction management**?
- What **recommendations** can you make to assist in the successful **recruitment** of girls and women into CM degree programs?
- What **recommendations** can you make to assist in the **training and on-going career development** of women in construction management?
- Is there anything you would like to add to our discussion?