

Nature of adolescent role models on female construction management professionals

by

Katie (Crawford) Loughmiller

B.S., Kansas State University, 2001
M.S., North Dakota State University, 2016

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

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Department of Curriculum and Instruction
College of Education

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Manhattan, Kansas

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Abstract

The underrepresentation of women in the construction management field over the past decades remains a persistent issue. This research addresses the relatively unexplored area of role model relationships established by female construction managers during their formative years and how these connections impact their career choices. The study investigates the influence of relationships formed with adults during adolescence on success in construction management careers, focusing on the Ethic of Care theory. Three key research questions are explored: the identification process of role models, the timing of these connections in participants' adolescent years, and the correlation between these relationships and career choices considering societal and cultural influences. The research methodology employs narrative inquiry, allowing participants to share their experiences through semi-structured interviews. Seven female participants were selected from responses to a questionnaire distributed via the National Association of Women in Construction. The presentation of data from the semi-structured interviews was conducted in two formats. First, the data was presented through the creation of a short story intertwining the stories of the seven interview participants. Second, the data was presented using traditional methods, identifying eight themes, aligned with the research questions. The findings provide insight into the benefits of role-model relationships during adolescence and the lack of exposure to educational and career opportunities in the construction industry during middle and high school.

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Dedication

I dedicate this to the women who blazed a trail before me; my mom, aunts, grandmothers, and friends. As they pass along their stories, they create a quilt of memories.

“Memory is made as a quilt is made. From the whole cloth of time, frayed scraps of sensation are pulled apart and pieced together in a pattern that has a name.” -Kim Stafford

Chapter 1 - Introduction

Background

Somewhere buried in a box is a photo of me when I was probably five or six years old. I am standing on the top rung of ladder poking my head through the rafters of the garage my dad was framing next to our house. This memory is where I think my life in construction began. Although I was a creative and adventurous child, my connection to construction from that point on was mainly playing Legos. Years later, I enrolled in a drafting elective course at my high school and became interested in home design. When it came time to select a future educational path, everyone in my world told me I should be an engineer. I was good at math and science and fit the mold of what society thinks a good engineer looks like. At no point in my higher education exploration did construction come to my attention. I started my college career in general engineering and I wasn't introduced to the concept of a construction management degree until my second semester of college. Whatever I was exposed to that day clicked with me and I was 100% committed to construction as a career path. Later, during my college years and early career, I connected with several role models who helped me find a path in the construction industry. I have often looked back at these events and wondered if there had been someone earlier along my path could have helped me make the connection earlier and helped me navigate the challenges of being a woman in the male-dominated field of construction management.

History of Women in Construction

Women represent 1 in 10 construction industry employees in the United States (U. S. Bureau of Labor Statistics, 2020), but it is only in the past 50 years that the number of women employed in construction has been tracked (Ross, 1978). To understand how women's involvement in construction has evolved, we must look back to the female pioneers of the construction industry.

In the late 19th century, Emily Roebling became one of the first women to successfully manage a large construction project. When her husband, and engineer, Washington Roebling became ill from decompression sickness, she took on the role of project manager for the Brooklyn Bridge in New York City (ASCE, n.d.). At the completion of the bridge in 1883, Abram Hewitt spoke of Roebling's efforts to complete the bridge project as "an everlasting monument to the self-sacrificing devotion of a woman and her capacity for that higher education from which she has been too long disbarred" (ASCE, n.d.). Roebling was a self-taught civil engineer who broke barriers to show women were capable of a traditionally male career.

It was not until nearly 70 years later that another group of women showed society what women were capable of. During World War II, while a substantial portion of the male workforce joined the military, 6 million women joined the workforce, primarily in manufacturing and construction (U.S. Department of the Interior, 2022). These women were known as 'Rosies', a nickname that arose from the song titled "Rosie the Riveter" released in the spring of 1943 by Redd Evans and John Jacob Loeb (*Today in History*, n.d.). The opportunity to work in a non-traditional career provided opportunities for many of these women. Betty Jeanne Boggs recalled her experience working during World War II (Gluck, 1987) and how it changed her thoughts about working in technical fields,

If I had known then, I might have finished engineering, I wouldn't have listened to someone say, "Well, a woman doesn't belong in that," I would have said, "Oh well, the heck with you, I'll go someplace else." I just wouldn't have taken that. And I think I would have designed planes or something like that. (p. 123)

Many women like Boggs had similar experiences and over the course of the war years, many women were given the opportunity to take on skilled and managerial roles (Hirshfield, 1989, p. 481).

After the war ended, many of these opportunities were no longer available to women at the same scale. At this time, the occupational data collected by the U.S. Department of Labor did not list the construction industry as a category of employment for women, so it is unknown how many women remained in the construction industry. In 1950, the Bureau of Women, a division of the Department of Labor, reported 235,544 females were employed as craftswomen (Leopold, 1954, p. 15). This category is not defined in the report, so it is unclear if this is exclusively construction employment or if other types of skilled work were included.

Shortly after the end of World War II, a new organization was started for women who worked in the construction industry, Women in Construction of Fort Worth (National Association of Women in Construction, n.d.). One of the founding members, Doris Efird, felt alone in her career and wanted to connect with more of her female peers. She brought together a group of sixteen women as the first official members in 1953. Two years later, the organization officially became the National Association of Women in Construction (NAWIC). The group's mission at the time of incorporation was "to create a support network for women working in a male-dominated field" (National Association of Women in Construction, n.d.a). Over the past 70 years, the group has continued to grow and support women working in the field of construction and has grown to a membership of 5,400 in 2022 (National Association of Women in Construction, 2022, p. 5).

From the small number of women documented to be in the construction industry in 1950 (Leopold, 1954, p.15), the representation of women grew to 408,000 construction employees in 1970 (Ross, 1978). This represented 1.2% of the construction workforce. During this time, women were starting to enter the management side of the construction industry. Barbara Res, an electrical engineer by education, became the first woman to serve as the project manager on a

skyscraper in 1980 (Wing, 2016). Res has spoken frequently about her experiences as one of the first female construction managers (Wing, 2016),

It's an interesting thing. At that time in the '70s, women were not going into engineering. They weren't going into construction. The president at the time, Jimmy Carter, signed an executive order that said that a certain percentage of the construction jobs on federal sites would be given to women. That was signed. Nobody ever followed it. It was as if it didn't exist. (para. 25).

In addition to the goal of increasing female participation on federal projects, President Carter's administration set a goal of increasing female representation across the construction industry to 6.9% by 1981 (Ross, 1978).

In 1998, NAWIC launched Women in Construction Week (WIC Week), a celebration of women in the construction industry, which is scheduled annually to coincide with International Women's Day, March 8th (National Association of Women in Construction, n.d.b). This is also the year I decided to join the construction industry and pursue an undergraduate degree in Construction Science and Management. There were only two other women in my cohort, which represented 10% of my graduating class. I had always been a tomboy so the idea of working in a male dominated field was not a deterrent for me. During the early years of my career, there were many instances where men assumed I was incompetent or challenged my authority as a project manager, but my strong-willed temperament did not let those situations hold me back. Similar sentiments can be seen in a qualitative research study by Hopkins and McManus (1998), who surveyed 283 women currently in the construction industry. Their survey results showed 70% of the participants disagreed that women were given equal opportunity in the industry as men (Hopkins & McManus, 1998, p. 3). At the same time, 78% of participants indicated they felt there were opportunities for advancement in the construction industry (p. 4). These two data

points show the opposing dynamics the women faced while working in a male dominated field. The necessity as a woman to prove oneself in the construction industry, forces women, like me, to work harder than their male counterparts to find success. Even with these challenges, 97% of participants in Hopkins and McManus' (1998) survey study were supportive of other women choosing construction as a career.

For 12 years I worked in project management on various construction projects. Over time, I carved out a space for myself within the male-dominated culture of construction, but I did not find many women joining me. Throughout those years, I never worked with more than one other woman on a construction project. From my perspective the representation of women was not growing. This point of view is validated by employment data. Between 2013 and 2022, female employment in the construction industry rose from 840,000 to 1,280,000 but maintained the same 1:10 proportional representation (Graham, 2023). This includes tradeswomen, construction managers, and administrative staff. Although many have celebrated passing the 1,000,000 mark, the percentage of women in the industry continues to hover at the 10% mark (Graham, 2023).

Self and Connection for Women in Construction

Understanding why the representation of women in the construction industry has not increased significantly over the past decades is a topic discussed among many of my female and male peers in the construction industry. Loss of self while working in a male-dominated environment is one of the challenges I personally dealt with in my career. Conforming myself to fit the masculine culture of my workplace was critical to advancement. This challenge was identified by Barbara Res in her recollections of her experiences working in the construction industry in the 1970s (Wing, 2016),

Don't let your work define you. You define your work. People that go into construction, all of a sudden, you're put in a box. "This is what you are." It's not true. You can be the girliest girl and still be hauling pipe all day long. Don't let people tell you that you're doing a man's job. That's nonsense. You are a person first; and then a woman... Many women end up dropping out of construction because they start losing their sense of self.

(para. 33)

As women enter the construction field, determining how they fit within the greater culture can be challenging. Tummalapudi et al. (2023) conducted a qualitative interview study of women considering leaving the construction industry. Interviews of 12 tradeswomen working in construction, who in the participant selection process had indicated a previous interest in leaving the construction industry, were conducted. The interviews focused on the topics of male dominant work culture, harassment, employment issues, and improper protective equipment. One of the challenges the women in this study identified was a limited number of role models available to women both while working in the industry and during their adolescent years. This lack of connection with self and others is a concern of women in the construction industry.

The identification of connection as a priority for women in the construction industry is the basis for the selection of Gilligan's (2003) Ethic of Care theory for the theoretical framework of this study. Gilligan posits that women tend to view morality through the lens of care and responsibility towards others, while men tend to view morality through the lens of justice and individual rights (Gilligan, 2003). Ethic of care emphasizes the importance of relationships, empathy, and responsiveness to the needs of others (Belenky et al., 1997; Brown & Gilligan, 1992; Gilligan, 2003 & 2014; Noddings, 1991, 2012, & 2018; Taylor, Gilligan, & Sullivan, 1995). Decision-making must be done with context of the surrounding social, cultural, and historical contexts, which requires a deep understanding of the circumstances and relationships

that shape our experiences. Ethic of care theory highlights the importance of compassion, connection, and community in decision making processes. Applying the ethic of care theoretical framework to this study provides the opportunity to analyze the experiences of women in the construction industry from their viewpoint.

Statement of Research Problem

This research focuses on the role model relationships female construction managers develop in their adolescent years. Representation of women in this industry has not dramatically changed in the past few decades. Understanding how role model relationships relate to future career selection is a research area has not been fully explored. This study explores (a) relationships developed with adults by female construction management professionals during their adolescent years and (b) how those relationships influence success in a construction management career.

Defining a role model is necessary to clarify this research problem. Many definitions of role model exist, including Kemper (1968, p.31) who defines a role model as one who “possesses skills and displays techniques which the actor lacks ... and from whom, by observation and comparison with his own performance the actor can learn.” Another similar type of relationship is that of a mentor. Kanter (1977, pp.181-182) defines a mentor as a person who provided power “(1) by being in a position to fight for the person in question; (2) helping the person bypass the hierarchy, and (3) by providing reflected power”. For the purposes of this study, the role model style relationship was selected and the following definition of a role model was used, “individual who influences achievements, motivation, and goals by acting as behavioral models, representations of the possible, and/or inspirations” (Morgenroth, Ryan, & Peters, 2015, p. 468). This definition was selected due to its alignment with the definitions used in the existing role model research discussed in Chapter 2.

Purpose of the Study

The primary aim of this study is to identify the role model relationships female construction management professionals developed in their adolescent years. In this study, the focus is on types of role model relationships and how they influenced the future careers of the participants. By aiming the focus of this study on the types of relationships, within the framework of the Ethic of Care theory, this study has the potential to contribute important findings to the study of role model relationships for women in construction management.

Research Questions

This qualitative narrative inquiry study explores the experiences female construction management professionals had with role models during their adolescent years. This study will address four research questions.

1. How do the participants describe how they identified a role model?
2. During what period of their adolescence did the participants develop a connection to a role model?
3. In what ways do the participants describe their experiences with a role model in relation to their career choice?
4. How was the participant's experience with a role model influenced by societal or cultural experiences?

Methodology

I chose narrative inquiry as my methodology for my research. Narrative inquiry was selected for this qualitative research study to allow participants to tell their own stories and share their lived experiences. Semi-structured interviews of seven females allowed me to learn about the participants in-depth. Participants were selected from the responses to a questionnaire distributed via email to the membership of the National Association of Women in Construction.

The questionnaire and interview questions are found in Appendix A and Appendix C respectively. A full description of the methodology for this study can be found in Chapter 3.

Definition of Terms

Adolescence – “the phase of life between childhood and adulthood, from ages 10 to 19” (World Health Organization, 2022).

Construction Management - a professional service that provides a project’s owner(s) with effective management of the project’s schedule, cost, quality, safety, scope, and function (*What is Construction Management*, 2021).

Ethic of Care – theoretical framework focused on the moral importance of relationships. It emphasizes the interdependence of people and how relationships influence decision making, focus on the context of situations (Belenky et al., 1997; Brown & Gilligan, 1992; Gilligan, 2003 & 2014; Noddings, 1991, 2012, & 2018; Taylor, Gilligan, & Sullivan, 1995).

Narrative Inquiry - research methodology based in mutual storytelling between researcher and participant. Narrative inquiry “centers the individual as the unit of scrutiny, preserves the voice of the individual through close analysis and presentation of narrative data, and investigates how individuals make meaning of life’s challenges and opportunities” (Josselson & Hammock, 2021, p. 4).

Role Model – “individuals who influence [children’s, adolescents,’ and young adults’] achievements, motivation, and goals by acting as behavioral models, representations of the possible, and/or inspirations” (Morgenroth, Ryan, & Peters, 2015, p. 468).

STEM - a broad term to describe the disciplines of science, technology, engineering, and math. The term also encompasses the “multidisciplinary, interconnected and integrative approach” to solving real world problems (Siekman, 2016, p.3).

Limitations and Delimitations

This study and the subjectivity of the research present several limitations and possibilities. In some cases, an element presents both a limitation and a possibility. When looking specifically at the methodology and methods used in this study, the pool of potential participants were limited to females with construction management related degrees and who are also members of NAWIC. From this pool of potential participants, seven were selected, allowing for a variety of ages and ethnicities to be represented. By limiting the number of participants, the study was able to dedicate more time to interview sessions. Limiting the sample to only seven may have limited the variety of experiences and perspectives collected.

When looking at this study through the lens of my subjectivity, a different group of limitations and possibilities were presented. As a white female, with the privilege of a financially secure childhood, where education was valued, this presented a limitation to my ability to connect with all participants. With my background as a graduate of a construction management program, a previous career in construction management, and my current experience as an educator in a construction management program, my background offered the possibility of a greater understanding of the experiences of the participants and an opportunity to connect personally with the participants.

Significance of this Study

Women's participation in the construction industry has not increased significantly in the past 20 years (U. S. Bureau of Labor Statistics, 2020). This challenge has been the focus for leaders in the construction industry in recent years. Any conference or large meeting I have attended in the past few years includes a conversation about how to recruit more women into the construction industry. Much of the available research, conducted primarily by men, focuses on recruitment and retention of females into the construction industry (Oo, Feng & Teck-Heng,

2019) or construction management educational programs (Bigelow et al., 2015; Bigelow et al., 2016; Carnemolla & Galea, 2021; Oo & Zhang, 2018; Sewalk & Nietfeld, 2013). These studies primarily relied on quantitative methodologies and do not directly ask why or how women decide to pursue a career in construction management. More specifically, who were the individuals in their lives that impacted their decisions?

The significance of this study is in the identification of the influence of role model relationships female construction management professionals develop in their adolescent years. Learning the stories of their experiences, understanding how they chose a career in construction management, and identifying the influence their role models had on their career decisions contributes to the greater body of research related to female participation in the construction industry. The use of narrative inquiry as a methodology provides for a deeper understanding of the stories and experiences shared by the participants. Understanding the nature of role model relationships for female construction management professionals can provide to the leaders in the construction industry knowledge of how to better attract females to construction and a framework for formalized role model or mentoring programs.

Researcher Positionality

When thinking about how I could provide a benefit to society, and more specifically construction education through my research, I often reflected on my own experiences as an undergraduate student and a construction professional. As a white female in a traditionally male-dominated field, I have observed behaviors and attitudes that could present challenges to females entering this field. This viewpoint comes from my own lived experiences from both my undergraduate education in construction management and my 12 years of professional experience as a project manager.

Entering a traditionally male-dominated field for females presents its own unique set of challenges. My research intends to explore if female construction management professionals that made connections to a role model in adolescence has helped them in their current careers. In my adolescence, I did not have a career-related role model to help me make my decision to pursue a non-traditional career, but I did have a mother. She was a strong-willed and determined woman, who spent her life as a science educator, a male-dominated field for her time. She fought quietly at times and loudly at others for the things that were important to her. In turn, her daughter became a mother who is strong-willed and determined, who now has a daughter who has two women to model her life after.

I approach this research with the desire for all women to have some type of role model experience, to have strong role models, either their mothers or others in their lives. By listening to the stories of females in the construction industry, I can provide a glimpse into how other females have successfully navigated this male-dominated field.

Organization of this Study

Chapter 1 includes my introduction, the study's purpose, the research questions, methodology, definition of terms, limitations, and delimitations, the study's significance, positionality, and the study's organization. In Chapter 2, I discuss the relevant literature related to females in construction management, role models in STEM, and the theoretical framework my study is based on, Ethic of Care. Chapter 3 contains a discussion of narrative inquiry as the methodology.

Chapter 2 - Literature Review

Introduction

The purpose of this qualitative narrative inquiry is to identify the impact of a role model on female construction management professionals. Chapter 3 will discuss the process for selecting a diverse group of participants for this study. Before discussing the design of this study in Chapter 3, I will explore the existing literature that informs this research. This chapter addresses two areas of research. First, I present studies directly related to women in construction management, an undeveloped research area. Secondly, I will discuss research from the broader STEM field, specifically focusing on STEM-related role models. Lastly, I present the theoretical framework of my research. Ethic of Care is the primary theory guiding this study.

Women in Construction Management

Females represent a disproportionately small portion of the construction industry, roughly 1 in 10 (U. S. Bureau of Labor Statistics, 2020). Understanding why females choose an education or career in construction management is fundamental to addressing this disparity. The current body of research related to women in construction management is limited and does not directly relate to the role model experiences of females, at any age, about the construction management field. Much of the available research focuses on the recruitment and retention of females into the construction industry (Oo, Feng & Teck-Heng, 2019) or construction management educational programs (Bigelow et al., 2015; Bigelow et al., 2016; Carnemolla & Galea, 2021; Oo & Zhang, 2018; Sewalk & Nietfeld, 2013). Although this research does not directly align with this study, there are aspects of this research that have an influence.

Bigelow et al. (2015) conducted a qualitative study using 90 female students enrolled in construction management degree programs from five universities (p. 181). The participants completed a Likert-scale survey where they rated the influence of sixteen factors (p.181). The

analysis of their data concluded that the two most influential factors for females in selecting a construction management degree program were internships and career opportunities (p. 193). In a follow-up study, Bigelow et al. (2016) expanded on the data previously collected and incorporated a qualitative approach. A select group of participants were invited to participate in follow-up interviews (p. 24). The interviews identified additional factors that influenced the female participants' choice of a construction management degree. The prominent factors that were identified included the community of students, types of classes, internships, innovation, and student organizations (p. 34). The participants in both of these studies were current students enrolled in a construction management program, which may have influenced the factors identified.

The previous study discussed focused on university students in the United States. Carnemolla and Galea (2021) and Oo, Li, and Zhang (2018) focused their research on female construction management students in Australia. In a study by Oo, Li, and Zhang (2018), 19 females, both local and international students at an Australian university participated in semi-structured interviews (p. 3). The findings of this qualitative interview study showed most participants learned about the construction management degree from a family member that had a personal interest in construction (p. 5). Carnemolla and Galea (2021) conducted a qualitative study involving semi-structured interviews of 15 female high school students (p. 825). The interviews were structured around questions related to the participants' decisions around their career goals, influential people in their lives, knowledge of the construction industry, and their interest in the construction industry (p. 826). Themes that were identified from the interviews include a lack of awareness and alignment with construction, concern about the male dominance of the field, and adult influences (p. 828). The participants had a wide range of responses to the

adult influences in their lives, from supportive parents to teachers and counselors dissuading construction as a career option (p. 831).

An alternate approach to analyzing female participation in construction management degrees by Sewalk and Nietfeld (2013) aimed to identify the barriers that exist for females. In their study, an open-ended survey of department heads and program chairs within the Associated Schools of Construction was conducted (p. 243). The survey asked the participants to report on the approaches taken to attract more women. The results of this study did not identify any strong correlations. A slight correlation was found between the number of females in a degree program and the availability of female support groups (p. 249).

Although these studies do not focus on role model experiences, they do speak to some of the factors influencing females in selecting their career in construction. Factors of influence identified by females in these studies include interest in construction careers (Bigelow et al., 2015; Bigelow et al., 2016; Oo, Feng, & Teck-Heng, 2019; Oo & Zhang, 2018), a community within the construction management program (Bigelow et al. 2016), and connection to other women in the program (Sewalk & Nietfeld, 2013) or the greater construction industry (Carnemolla & Galea, 2021). Although current research in the construction management field does not address role model experiences specifically, the larger STEM research community has addressed the experiences of adolescents, males, and females, related to future STEM careers.

Role Models in STEM

How females in their childhood and adolescence are exposed to and interact with role models is a concept I have grappled with for most of my adult life. As I look back on my own experiences, I did not have a strongly identifiable role model that guided me to select a future career in construction management. I had a wide variety of individuals who helped guide the decisions I made, but I have long been curious if that experience is the same for other women

who chose the career path of construction management. The analysis of existing research related to STEM role model exposure is broken down into three areas, methodology, theoretical framework, and conclusions drawn related to connection and relationships. As was discussed in the research problem statement in Chapter 1, the focus of this research is on role model relationships.

Methodology

Existing research related to STEM role model exposure is often targeted to specific age levels; ranging from elementary (Buck, Leslie-Pelecky, & Kirby, 2002), middle school (Betz & Sekaquaptewa, 2012; Gonzalez-Perez, Mateos de Cabo, & Sainz, 2020; Leblebicioglu et al., n.d.), high school (Bamberger, 2014; Gonzalez-Perez, Mateos de Cabo, & Sainz, 2020), through university (Black-Beard et al., 2011; Fuesting & Diekman, 2017; Shin, Levy, & London, 2017; Van Camp, Gilbert, & O'Brien, 2019). The type of role model exposure also varies across the literature. Exposing participants to STEM role models through magazines, books, or videos (Betz & Sekaquaptewa, 2012; Shin, Levy, & London, 2017; Van Camp, Gilbert, & O'Brien, 2019) is one method. More commonly, face-to-face interactions were incorporated into studies of role model experiences (Bamberger, 2014; Blake-Beard, 2011; Buck et al., 2008; Cheryan et al., 2011; Fuesting & Diekman, 2017; Gonzalez-Perez, Mateos de Cabo, & Sainz, 2020; Leblebicioglu et al., n.d.; O'Brien et al., 2019). The remainder of this section will explore the different methodologies applied by the researchers discussed above.

Exposure to a STEM Role Model

One method of collecting data related to role model exposure relies on the use of imagery and stories to expose the participants to a role model. Van Camp, Gilbert, and O'Brien, (2019) conducted a quantitative study of the impact of same-sex role models on college freshmen. The study included 79 female participants (p. 653), who were recruited through flyers handed out on

campus (p. 652). Participants were asked to complete a pre-survey, read a biography of a “successful woman in a STEM career” (p. 655), and complete a post-survey. After reading the biography, the participants were placed in either the “reflective role model condition”, “standard role model condition”, or the “control condition” (p. 656). In the reflective group, the participants were asked to write about how they identified with the woman in the biography. In the standard group, the participants were asked to write a summary paragraph about the woman. The control group did not read the biography but instead were provided a biography of a White woman who enjoyed the outdoors and wrote a paragraph describing what they recalled. Van Camp, Gilbert, and O’Brien’s findings indicated that the women in the reflective group “had weaker explicit stereotypes and stronger implicit women-science associations” (p. 644). The results of the control and standard groups did not show any variation in either explicit or implicit stereotypes of STEM professionals (p. 644). This study used a small sample size to evaluate how a same-gender role model influences stereotypes, other research using a larger sample size reinforces Van Camp, Gilbert, and O’Brien’s (2019) results (Betz & Sekaquaptewa, 2012; Gonzalez-Perez, Mateos de Cabo, & Sainz, 2020; Shin, Levy, & London, 2017).

Shin, Levy, and London (2017, p. 410) hypothesized that exposure to STEM professionals would have a positive impact on sense of belonging in STEM fields. Their quantitative study included 1035 university-level students of both STEM and non-STEM majors, both male and female. The participants were divided into two groups; the role model condition and the control condition (p. 415). Both groups were asked to complete a pre-and post-survey related to the role model exposure designed. The role model group was provided with six biographies to read. The individuals described in the biographies came from a diverse set of backgrounds and career paths within STEM (p. 415). The control group only completed the pre- and post-surveys. The data collected indicated “when students read about a diverse set of

successful STEM professionals who attained their success through hard work, they reported higher interest in STEM and greater perceived identity compatibility between self and STEM “critical constructs related to recruitment and retention” (p. 421). Both Shin, Levy, and London (2017) and Van Camp, Gilbert, and O’Brien, (2019) focused on university-level participants and did not include students in K-12.

Betz and Sekaquaptewa (2012) used similar methods to those previously discussed, with a focus on middle school girls (p. 740). This quantitative study was broken into two parts. In Study 1, 92 sixth-grade girls were asked to report their three favorite subjects in school, read a magazine with interviews of three female college students presented as either feminine or gender-neutral in STEM fields, and then complete a post-survey regarding their impression of the role models presented and their likelihood to take certain high school level courses (p. 741). In Study 2, 45 sixth and seventh-grade girls served as the participants. Instead of the post-survey used in Study 1, the participants were asked to recall specific aspects of the role model, rate their likelihood to “emulate the role models’ success”, and indicate if they agreed with the statement “Do being good at math and being girly go together?” (p. 742). Study 1 results indicated that showing girls feminine STEM role models “made middle school girls feel less capable and interested in math” (p. 743). In Study 2, Betz and Sekaquaptewa (2012) concluded the girls “demotivation was related to the perceived unlikelihood of combining femininity and STEM success” (p. 743). Studies, where female participants were exposed to STEM role models using imagery and biographies, showed mixed results. In the university-level studies, the results indicated a positive impact, but in the middle-school study, the results were the opposite. All of these studies used quantitative methodologies and limited exposure to a role model. This type of methodology may not provide the full story of the impact of STEM role models on females.

Interaction with a STEM Role Model

Multiple studies have used a more personal approach to their research methodology, where the participants have the opportunity to interact face-to-face with the role model. Blake-Beard et al. (2011) conducted a quantitative study of a collegiate online mentoring program. Participants were recruited through an online mentoring program, with 868 women, 142 men, and 3 who did not indicate gender completing a 38-question survey (pp. 629-630). The survey questions related to the participant's experience with being matched to an online mentor. Although this research is not STEM-specific, the responses indicated "having a mentor of one's gender or race was felt to be somewhat important for the success of many of the STEM and business students whom we surveyed, especially the women" (p. 637). The participants' responses also indicated "those who had a mentor of their gender or race reported receiving more help" (p. 637). The authors discussed other possible factors influencing the survey responses:

Race and gender may be indicators of shared background experiences, but experiences of women or ethnic minorities, and their personality characteristics, are sufficiently varied such that we should not assume individuals will be more empathetic just because they are of the same gender or race as each other. (p. 638)

Similar to the studies of university females previously discussed, the researchers concluded a positive influence related to the role model interaction for females.

Cheryan et al. (2011, p. 656) conducted a study to determine if STEM stereotypes associated with masculinity hinder women's ability to anticipate success. This quantitative study focused on female students in a university-level computer science program. Upper-level, computer science students were paired as role models to incoming non-computer science students. The participants and the role models in this study included both males and females, with a total of 22 females and 19 males. Each participant was grouped with an upper-level student and provided a questionnaire for the participant to ask of the upper-level student. The

questionnaire asked gender stereotype questions related to computer science and the upper-level students provided pre-determined responses. After the interaction, the participants completed a questionnaire in which they were asked to recall the responses. The analysis of responses indicated the female participants “anticipated lower success in computer science” after interacting with a stereotypical role model compared to a non-stereotypical role model. A second study of the same methodology was conducted with 88 participants, but the analysis was conducted for both males and females. The results indicated “men’s success beliefs were not affected by exposure to stereotypical role models” (p. 660). The researchers concluded stereotypes have a greater impact on women and create “a lower potential for success in the field” (p. 660). Stereotypes may have an impact on females’ success, but other aspects must also be evaluated.

Fuesting and Diekman (2017) conducted a quantitative study related to communally-oriented individuals, those who prioritize “working or helping others” (p. 163), selected out of STEM programs. They posit “STEM fields are especially stereotyped as fulfilling fewer communal goals than other careers” (p. 163). A mixed-gender group of 149 participants was exposed to four STEM careers and six communal behaviors. They were asked to rate how challenging those behaviors would be in each STEM career field and were asked “how challenging do you think it would be to find a role model” (p. 166) in each career field. The participant responses indicated identifying role models who represent communal behaviors would be more challenging in STEM fields than in other fields (p. 167). From this data, three studies were developed to further explore communal role models. Study 3 focused primarily on how role models express communal behavior. A group of 323 students, including 141 males and 182 females, with a distribution of ethnicity similar to the general population were recruited for the study. Participants responded to a list of role model behaviors and traits in conjunction with

two prompts, one focused on admiration and the second focused on the admiration of individuals in STEM fields (pp. 171-172). The results of the study found females indicated a higher level of importance of communal behaviors in role models than men did (p. 172). Independent of gender, individuals who self-identified as communally-oriented valued communal behaviors in role models more than those who did not self-identify (p. 173). University-level studies have shown that gender, race, stereotypes, and community influence how females connect with role models. Studies related to K-12 experiences must also be considered.

Bamberger (2014, p. 549) researched the influence of exposure to engineers on the perceptions, capabilities, and future career choices of ninth-grade girls in an Israeli Jewish private school. The girls were divided into two groups, where one group visited a high-tech company and participated in a program that allowed the students to meet with female scientists and engineers over two visits (p. 551). The mixed methods analysis of the activity was conducted using pre- and post-surveys, observations, and focus groups (p. 553). Bamberger found the experience of interacting with female role models did not encourage the pursuit of a STEM career. The girls indicated they were “frightened,” “believed they cannot deal with STEM,” and were less likely to choose a STEM major (p. 557). Bamberger proposed this result may be impacted by four factors, the cognitive gap, the age difference, the length of the relationship, and the cultural aspect of the school associated with the study (pp. 558-559). Further research provides some perspective on the potential impact of these factors.

A quantitative study of 304 girls between the ages of 12 and 16 by Gonzalez-Perez, Mateos de Cabo, and Sainz (2020), relied on the Using Inspiring Girls Foundation programming as the source of role model experiences. In this study, the participants were introduced to three female STEM role models from diverse backgrounds. The role models were brought into the schools to share their STEM careers and professional experiences (p. 6). After the session, the

participants were asked to complete two questionnaires, one week following, and one month following the session. The results presented by the authors indicated a significant increase in enjoyment, importance, and expectations of success for the participants (p. 15). The questionnaire responses also indicated the sessions “contributed to decreasing the effect of gender-role stereotypes” (p. 15). The participants also perceived the skills of teamwork and communication as requirements for success in STEM (p. 16). The results of this study varied significantly from the Bamberger study. Unfortunately, it is difficult to determine if this was directly related to any of the factors Bamberger proposed.

In another study of middle school girls, O’Brien et al. (2017), conducted a field experiment where middle school girls participated in a one-day science event. During the event, 175 girls from the New Orleans area were exposed to multiple female role models through three science workshops. After the workshops, half the participants were asked to write about their favorite workshop leader and half were asked to write about their favorite friend. A quantitative analysis was done using pre- and post-surveys. The surveys focused on identifying role models and measuring the “sense of fit in science” (p. 303). The results of the surveys indicated the participants asked to write about a role model “tended to have higher levels of role model identification” (p. 305). For that same group a “significant increase in sense of fit in science” was noted. This study addressed an aspect of role model impact not seen in the previous research discussed, i.e., the influence of writing about an experience. There was a conscious recognition of the role model experience made through writing. Writing is not the only mechanism that can be used to reinforce experiences.

Leblegiciolgu et al. (2011), applied the Draw A Scientist Test (DAST) (Chambers, 1983) as a mechanism for communicating how students perceived scientists. This qualitative study was structured around a ten-day science camp experience in Turkey. During the camp, 24 sixth- and

seventh-grade students, both male and female, participated in a variety of informal and formal sessions with scientists (p. 161). On the first day, the students were asked to draw a scientist. The following day, the students met with a group of scientists to discuss their drawings and then meet with three scientists from diverse backgrounds (p. 162). The students were then asked to draw a scientist on the last day of camp and participate in a short semi-structured interview about their drawings (p. 163). The analysis was completed on both the DAST drawings and the interviews. Although this study focused primarily on the appearance of scientists, the results did show a significant change in how many students identified a female scientist in their second DAST drawing (p. 171). This study did not specifically address role models, but like the original Draw a Scientist Test (Chambers, 1983), highlights the perceptions that exist regarding gender and race in science careers.

A mixed methods study, conducted by Buck, Leslie-Pelecky, and Kirby (2002) analyzed how elementary students respond to images of scientists. For six months, a group of 24 fourth and fifth-grade students from diverse sets of backgrounds and genders, spent 45 minutes each week interacting with three female scientists (p. 2). The interactions included four visits where the scientists led physical science activities and exposure to science careers through a one-hour video presentation. The analysis of this study was a combination of pre-and post-project questionnaires, interviews of the participants, and observations during the science activities (pp. 3-4). The results of the data collected showed that students were unable to identify the women as scientists and alternatively identified them as visiting teachers. The authors found the students made this conclusion based on responses from students that “the visiting women scientists did look and act like their teachers” (p. 7). This study shows that the type of experience students have with role models may impact how they interpret the purpose of the role model.

Of the research studies discussed, a majority of the studies use quantitative methods or a mixed-methods approach. The mixed-methods studies use short interview sessions and observations as the qualitative component. None of the studies discussed involved a narrative inquiry methodology. In addition to the type of methodology, the theoretical framework identified in existing research should be explored.

Theoretical Frameworks

The majority of research reviewed for this study did not identify a theoretical framework related to the research conducted. In the few studies where a theoretical framework was identified, the most common was expectant value theory (Cheryan et al., 2011; Gonzalez-Perez, Mateos de Cabo, and Sainz, 2020; Shin, Levy & London, 2016). Constructivist gender theory (Olofsdotter & Randevag, 2016), critical feminist theory (Beck et al., 2022), and socio-cultural theory (Bamberger, 2014) were also identified within the research review. Understanding how the theories applied in the existing research provides context to the conclusions of each study.

Expectancy Value Theory

Multiple studies applied expectant value theory (Vroom, 1964), which proposes motivation for a behavior or action is determined by expectancy and value. Eccles et al. (1983) expanded this concept in their expectancy-value theory to postulate “achievement-related choices can be predicted by the expectations a person has of succeeding, as well as subjective task values” (p. 2). Both Shin, Levy, and London (2016) and Cheryan et al. (2011) incorporated this theory into their studies. Cheryan et al. (2011) hypothesized that exposure to stereotypical role models in STEM could impact the participants “feeling like they can succeed in STEM” (p. 657). The presumption of challenges associated with being in a nontraditional field would influence the choices females made related to their future success in a STEM field. Shin, Levy, and London (2016) selected expectancy-value theory as their framework due to its focus on

psychosocial factors and how they are “believed to promote or sustain STEM engagement” (p. 410). In their study, the researchers were attempting to identify what factors influence a student’s “interest and desire to pursue STEM” (p. 411), including stereotypes about STEM careers and professions, lack of natural talent, and inclusivity (p. 412). Expanding on the expectancy-value theory, Gonzalez-Perez, Mateos de Cabo, and Sainz (2020) incorporated gender schema theory (Martin & Halverson, 1981), which proposes observing people in their gender-congruent roles reinforces gender-congruent aspirations. By combining these two theories, the researchers thought to identify how gender specifically impacts the “achievement-related choices” (p. 2) within Eccles et al.s’ original expectancy-value theory. Understanding how the existing presumptions and stereotypes exist within society impact the choices females make regarding pursuing STEM-related careers is a valuable component of analyzing the impact role models can have on female adolescents. Developing on the idea of gendered stereotypes in STEM, other gender-based theories have been applied to role model research.

Constructionist Gender Theory

Olofsdotter and Randevag (2016) developed their study around constructionist gender theory (West & Zimmerman, 1987), in which gender is understood as something is done in relation to others’ actions rather than something that inherently is. This theory was chosen to assist the researchers in explaining how women adjust to male norms (p. 147). Olofsdotter and Randevag (2016) studied how women interact in a male-dominated work environment. Although this study does not directly tie to role models, it illuminates one of the challenges females face in male-dominated fields, like the construction industry. The authors note,

as a woman, she is an outsider in relation to the informal power networks that are apparent in the management of the project. This position limits her possibilities

concerning performing her work, and therefore, she must constantly make plans and determine how to maneuver in this masculine territory. (p. 147)

In the study, the success of the females interviewed brings to light the challenges of being female in a male-centered world. The women were forced to “balance between doing masculinity well and finding ways to do it differently” (p. 148). The idea that women need to be more masculine and conform to the patriarchal system is another aspect that has been incorporated in role model research.

Critical Feminist Theory

In a review of existing literature related to STEM mentoring programs, Beck, et al. (2021) based their analysis around critical feminist theory. Critical feminist theory, as Rhode (1990) proposes, is a need to “describe the world in ways that correspond to women’s experience and that identify the fundamental social transformations necessary for full equality between the sexes” (p. 619). Approaching an analysis of mentoring programs in STEM fields, predominantly occupied by men from this lens allows for a deeper discussion. In their review of existing literature, Beck (2021) found overall “women’s experiences in STEM fields are enhanced when they have strong mentors and facilitators to support their work” (p. 179). Within their findings, evidence identified institutional structure programs as less successful experiences for females (p. 179). In evaluating institutional programs from a critical feminist lens, we can see the standard model, designed by men, does not meet the needs of women. Women found greater success with mentors when there was “intentionality” (p. 179) within the mentor relationship. Critical feminist theory is not the only gender-based theory in which research in the area of role models can be framed.

Socio-Cultural Theory

Bamberger's (2014) study was designed around socio-cultural theory (Vygotsky, 1978), which proposes gender stereotypes develop from the gendered division of labor in society. In this study, the participants were selected from an all-female, Jewish modern-orthodox, secondary school in Israel. This theory was selected due to the unique cultural context of the population studied. In this case, nationality, gender, and religious values were incorporated. Bamberger strived to find if the cultural ideals within this specific community could impact the girls' "perceptions of women scientists" (p. 550). Socio-cultural theory claims "social interactions and cultural symbols provide essential opportunities for constructing meaning" (p. 550). Unfortunately, the results of this study showed the role model experience did not increase the participants' perceptions, which could be due to the lack of cultural and community connection between the girls and the role models.

Connection

Although a specific theory was not always identified within the research reviewed, their discussion commonly addressed one specific topic—connection or relationship. Fuesting and Diekman (2017) skirted the topic of connection in their analysis of communal behaviors, and how community impacts an individual's interest in STEM fields. Their findings are that communal and relational behaviors identified in role models can "foster belonging and involvement" (p. 173). Similarly, in a study by Betz and Sekaquaptewa (2012), where there was no face-to-face interaction for the participants, interest in STEM careers declined, reinforcing the idea of a connection between the participant and the role model being more impactful than learning about a role model. This idea of connection or relationships having an impact on the role model experience was identified explicitly in several of the studies discussed in this section. O'Brien et al. (2017) concluded females who were asked to write about their experiences with the STEM role models had a higher "sense of fit in science" (p. 306) than those who did not

write about their experiences. Diversity of experience and how it relates to the relationships formed with role models was found in research conducted by Blake-Beard et al. (2011), where they identified “deep-level diversity becomes more important” in the success of a role model relationship. Bamberger’s (2014) research, socio-cultural theory as a framework comes closest to evaluating the success of a role model experience based on relationship. Buck et al. (2008) summarize Bamberger’s research most eloquently, “a role model cannot be created when only observed or presented a few times in a girl’s life. However, not every child has a caring relationship with a scientist, and such a relationship cannot be designed” (p. 558). The conclusions by the researchers discussed lacked a specific focus on the area of connection and relationship in role model experiences. Additionally, research related to females in the construction management field (Bigelow et al., 2015; Bigelow et al., 2016; Carnemolla & Galea, 2021; Oo, Feng & Teck-Heng, 2019; Oo & Zhang, 2018; Sewalk & Nietfeld, 2013) does not address role models, mentoring, or relationships between women. This apparent gap in research in the area of connection and relationship between role models and adolescents has influenced how I approach this research study and reinforces the selection of Gilligan’s (1990, 1993, 2003) Ethic of Care as the theoretical framework.

Ethic of Care Theory

The Ethic of Care Theory began with Gilligan’s work as a research assistant with Kohlberg (Kohlberg & Hersh, 1977) related to moral developmental stages. Throughout her time working with Kohlberg, Gilligan (2003) developed several critiques of his work. Gilligan felt Kohlberg’s research was framed specifically around maleness. By only including male participants in his study, Gilligan argued Kohlberg assumed moral development is a male characteristic (p. 18).

Gilligan (2003) went on to expand on Kohlberg's theory to create the feminist theory of the ethic of care (p. 20). In her book, *In A Different Voice*, Gilligan presents the results from three different studies: the college student study, the abortion decision study, and the rights and responsibilities study. In the college student study, interviews of 25 college seniors, who had taken a sophomore moral and political choice course were conducted. An additional 16 women were selected, drawn from the group of students who had dropped the course. The participants were interviewed as college seniors and then interviewed again five years later. The interviews focused on oral development in the early adult years (2003, p. 2). The abortion decision study involved interviewing 24 women from diverse backgrounds who were in their first trimester of pregnancy and were considering abortion. The women were interviewed in the first trimester and again one year later. The interviews focused on the relationship between "experience and thought and the role of conflict in development" (2003, p. 3). The third study, the rights and responsibilities study, involved interviewing males and females at nine ages across the life cycle, ranging from six to 60. The participant group included 144 individuals, equally distributed by age and gender. The interviews asked participants about "self and morality, experiences of moral conflict and choice, and judgments of hypothetical moral dilemmas" (2003, p. 3).

Gilligan's (2003) research aimed to provide a "clearer representation of women's development" and "women's identity formation" (p. 3). By revisiting Kohlberg's research, in conjunction with her own, she identified the positionality of the researcher had impacted the research itself (p. 29). By excluding females from both the researcher and the participant perspective, the resulting data was presented from a solely male perspective. Gilligan saw the results of Kohlberg's data as an opportunity to observe how females respond to moral dilemmas. In Gilligan's (2003) view,

The internalization of the gender binary and hierarchy marks the psyche's induction into a patriarchal order. When you hear a gender binary – being a man means not being a woman or like a woman (and vice versa) – and encounter a gender hierarchy that privileges the masculine (reason and self) over the feminine (emotions and relationships), you know you are in patriarchy, whatever it may be called. Organized around gender and privileging the voices of fathers, patriarchy is at odds with democracy, which rests on a presumption of equal voice or equality. (p. 94)

By understanding individuals have differing viewpoints, Gilligan used her research into the experiences of young women to show how relationships guided their response to morality questions. Listening to the stories of lived experiences provided Gilligan with the opportunity to frame the conversation of morality around relationships and connections. Gilligan's research posited listening as a researcher and allowing the research participant to guide the conversation, a deeper understanding was found. The voice she gave to these individuals allowed for the recognition "that even within a culture, there are voices that resist culture, and although they may be hushed or hidden at the margins, these voices may hold the power to transform the conversation" (Gilligan, 2014, p. 101).

Gilligan's qualitative research into the experiences of young women dealing with the challenges of making real-life decisions about abortion was used to develop the three stages of the ethic of care (Gilligan, 2003, p. 74). In the first stage, Preconventional morality, the individual is focused on survival and care for self. Think of this as the time when a toddler is unwilling to share something with another child. Everything in the individual's world is held on to for survival. To move to the second stage, the individual must transition from survival to a focus on responsibility. In the second stage, Conventional morality, the individual is focused on the care of others and acts selflessly. In this time, the individual is focused primarily on self-

sacrifice for the good of others. Before moving on to the final stage, the individual must transition through a period of tension, where they no longer are focused solely on the care of others, but the importance of self-care also. In the last stage, Postconventional morality, the individual can embrace a balance of care for self and care for others.

Gilligan posits “these transformations arise out of recognition of the paradoxical interdependence of self and society, which then overrides the false simplicity of formal reason and replaces it with a more encompassing form of judgment” (Gilligan, 2003, p. 97). The ethic of care theory provides a framework for how we can act in a caring manner in the human world. It is not grounded in philosophical or hypothetical analysis, but in the importance of the “cost of not paying attention, not listening, being absent rather than present, not responding with integrity and respect” (p. 103). Gilligan’s work (1990, 1993, 2003) shows when women establish a deep, meaningful connection with others and are able to listen to the lived experiences of others, they can fully see themselves in the world.

From Gilligan’s (1990, 1993, 2003) initial Ethic of Care theory has grown a body of research, which expands upon the development stages to address how relationships, connections, voice, and knowing affect women (Belenky et al., 1997; Brown & Gilligan, 1992; Gilligan, 2003 & 2014; Noddings, 1991, 2012, & 2018; Taylor, Gilligan, & Sullivan, 1995). The remainder of this chapter, will discuss how the extension of research beyond Gilligan’s original Ethic of Care relates to lived experiences of adolescent females.

Relationships and Connection

Care, as described by Gilligan (2003), is based in relation to others. When moral decisions are made outside the bonds between individuals, tensions arise (p. 132). Many women experience the world and the associated conflicts by “anchoring the self in a world of relationships and giving rise to activities of care” (p. 132). In Gilligan’s view, women see the

world as a series of relationships rather than individuals standing alone, focusing on “human connection rather than through systems of rules” (p. 29). Rather than a focus on the individual, the relationships are collective. This is a contrast to Kohlberg’s (Kohlberg & Hersh, 1997) individualist and male-centric approach to moral development, where the individuals assume roles and enter into “reciprocal relationships” (p. 57). Kohlberg views relationship as transactional and not as a mutual connection.

Helle (1991) defines relationship as “a sense of knowing oneself and others through a process of mutual relational interaction” (p. 62) and views it as a way of being a part of a community with its own “unique existence” (p. 62). Noddings and Witherell (1991, pp. 168-169) explored the idea of relationship in school and found girls did not see relationships as separate from their day-to-day experience, whereas the boys in her study identified distinct separation from relationship and emotion, and their daily activities. Understanding the definition of relationship is critical to understanding how relationship affects us. Noddings and Witherells’ (1991) position is women are not dependent or independent within relationships, but have a desire

to be in relationship with others and, again, to comprehend the other; wanting to understand the other’s feelings, wanting to contribute to the other; wanting the nature of the relationship to be one in which the other person(s) is engaged in this way. (p. 21)

The experience of creating a true relationship, as they propose, can allow us to “learn some things about how to live and invent our lives, that lessons can lead us to a more moral and compassionate life” (p. 94).

For most women, this exploration into deep, meaningful relationship begins with our mothers and as we grow, we develop more relationships with the older women in our lives (Taylor, Gilligan, & Sullivan, 1995, pp. 139-140). This type of relationship remains constant

across race and ethnicity. Their research found the relationships girls form are based on “mutual interest and respect,” where both the girl and the woman are interested in each other’s conversation (p. 140).

Connection Between Girls and Women

The connection and relationship between girls and adult women in their lives have been the focus of many Ethic of Care researchers (Belenky et al., 1997; Brown & Gilligan, 1992; Gilligan, 2003 & 2014; Taylor, Gilligan, & Sullivan, 1995). During adolescence, girls are at a turning point between childhood and adulthood. Gilligan (1990, p. 14) found by age fifteen, a majority of girls identified their most powerful learning experiences outside of school. As girls are experiencing the world at this age, establishing relationships with adult women can provide an opportunity for them to “speak openly rather than trying to be a good or bad girl” (Brown & Gilligan, 1992, p. 219). For the women in these relationships, their voices can become “more radical – quicker to spot false voices and also to differentiate between real and idealized relationships” (p. 219). The experience of both girls and women in these relationships holds “the potential for societal and cultural change” (p. 232).

This relationship between girls on the verge of adolescence and the adult women in their lives is more profoundly represented in the lives of non-white women. The cultural history of Black and Latino communities shows a stronger emphasis on connections between young girls and their “othermothers,” as Hill Collins (1991) describes them. In her theoretical research, Hill Collins posits these women who are not their mothers, but are typically a part of Black communities, show us a different perspective on how relationships develop. In Latino families, where gender roles still adhere to traditional Latino culture, including the belief “women are morally and spiritually superior to men” (Taylor, Gilligan, & Sullivan, 1995, p. 61), creates unique challenges for girls in their adolescence. Having a woman from their extended family to

connect with in times where American culture and Latino culture are in opposition is beneficial. The need for relationship in minority cultures has more dimensions than just feminism. Black and brown girls and women are also grappling with the added layer of racism in society. Minority women historically have not been seen just as women, in the way white women are perceived, but also forced into “subservient and second-class roles” (Bing & Reid, 1996, p. 183).

As we look beyond the extended family as a source of connection between girls and women, educators can, by nature of access, fill this need. Relationships between girls and their female teachers can be challenging. Brown and Gilligan (1992) noted the “wish on the part of both girls and women for more authentic relationships” (p. 231) from both girls and their teachers. Developing authenticity in relationships, particularly between female teachers and their female students, while being difficult at times, provides an opportunity for female adolescents to form meaningful connections beyond their family.

Connection in Education

For many girls in middle and high school, the opportunity to develop a meaningful relationship with adult women is within their school experience. For this type of relationship to be successful, female educators must create an environment that encourages the deeper conversations required for a true relationship.

Noddings’ (2012) theoretical research on how to create caring relationships in the classroom focuses on listening and creating a caring climate within the school. Her research concludes that a “carer” (teacher) must be attentive, attend to their students, listen, respond, and reflect on the experiences in the classroom. The “cared-for” (student) must acknowledge receipt of care for the care relationship to be beneficial (p. 772). Noddings further discusses the difference between a character of care and care ethics for educators. A character of care is that of virtue, of doing good, but not necessarily establishing relationships. A care-ethic educator

requires the establishment of relationships with their students through listening, trust, and open-mindedness (p. 774). Successful relationship-building with students requires educators to have the willingness to share and reflect openly (Noddings, 1984, p. 121). The holistic view of education presented by Noddings demands humanity be set at the forefront of learning, that school cannot only “train intelligence” (p. 172) but allow students to become fully human.

For women, this is a fine line to walk in the educational system. Those on the outside of these relationships may view a female teacher as soft or focusing more on taking care of her students than on the learning process (Belenky et al., 1997, p. 213). Belenky et al. (1997) take this one step further and propose “so long as teachers hid the imperfect processes of their thinking, allowing their students to glimpse only the polished products, students will remain convinced that only Einstein -or a professor- could think up a theory” (p. 215). By providing students with models of reasoning through their observations of the instructor, students can learn reasoning. These relationships show us the value of connection with women and can be applied to other aspects of education, including career exploration. Taylor, Gilligan, and Sullivan’s (1995) research posits “opportunities for connection with women who work in many different industries” (p. 199) can be more beneficial than simply providing career counseling within the school.

As girls are moving through adolescence, they are weighing their desire for autonomy, independence, and autonomy with their values and integrity (Lyons, 1990, p. 57). The struggle for girls in adolescence is in knowing when to be silent and when to speak out. Adolescence is a time of significant change, understanding how one fits into the greater society and knowing oneself at this stage can be challenging. Understanding how women and girls come to know themselves and their world is a key aspect of the relationships they develop.

Women's Way of Knowing

Belenky et al. (1997) reflect on the work of Gilligan through research involving a broad demographic of women to define what knowing is for women at different points in their lives. Their study involved multiple interviews with 135 women, focusing on the women's lived experiences (p. 11). A majority (90) of the women were actively enrolled in university or young alumni, and the remaining 45 women were selected from family agencies focused on parenting (p.12). The analysis of their interview study was conducted using blind coding and organized by the works of Perry, Kohlberg, and Gilligan (1997, p. 14). The group interviewed women about their self-image, moral challenges, relationships, education, and goals for the future. This research resulted in the development of six epistemologies, ranging from basic to complex thought. The first epistemology is silence (p. 24). Silence encompasses women who have no voice and often are powerless. Received knowledge, or listening to the voices of others, is the second epistemology. Belenky et al. (1997) summarize received knowledge as "received knowers can be very open to taking in what others have to offer, and they have little confidence in their own ability to speak" (p. 37).

The third epistemology is subjective knowledge or the inner voice. Subjective knowledge can be described as the awareness of "the existence of inner resources for knowing and valuing" (Belenky et al., p. 54). In the research study, the majority of women interviewed fell into this category. Their stories revealed women situated in this epistemology had encountered a "crisis of trust in male authority in their daily lives, coupled with some confirmatory experience that they, too, could know something for sure, that women from these backgrounds could take steps to change their fate" (p. 58). Subjective knowledge, or quest for self, is the fourth epistemology presented. Women experiencing subjective knowledge sensed "the enormity of the steps they have taken" (p. 80) and their personal relationships feel unstable. These women have been

moved to action and are committed to continuing their journey of personal development. The fifth epistemology is procedural knowledge or separate and connected knowing. Separate knowing is the act of refusing to act as a traditional female and embracing the role of the traditional male (p. 104). Connected knowers seek to understand different ideas and points of view and focus primarily on context and the value of experience (p. 15). In a follow-up study, Knight, Elfenbein, and Martin (1997) conducted a quantitative study to identify if separate and connected knowing were gendered. Females in the study scored higher in connected knowing than males, while males scored higher on separate knowing (p. 411). The authors suggest for women, “listening to others and knowing through and about others, is perhaps used more frequently” (p. 411) and differentiates them from men.

The last epistemology, constructed knowledge or integrating the voices is characterized as recognition of the interconnectedness of knowledge, knowing, and the knower (p. 137). For women in this stage,

simple questions are as rare as simple answers. Constructivists can take, and often insist upon taking, a position outside a particular context or frame of reference and look back on “who” is asking the question, “why” the question is asked at all, and “how” answers are arrived at. They no longer dutifully try to come up with answers when questions are asked. (p. 139)

The epistemologies of women’s ways of knowing can be used to recognize how women have complex pasts that impact their ability to move through society and how knowledge can allow for the nurturing of relationships and connections.

Women’s Voice

Women’s voices are described as feminine because often they are filled with “emotions and relationship” and are “seen as limiting their capacity for rationality” (Gilligan, 2014, p. 89).

Gilligan proposes this is not the reality, i.e., women's voices sound different because they join emotion and self with relationships. In terms of the development of knowing among adolescent girls, Taylor, Gilligan and Sullivan (1995) states girls,

live in a territory between voice and silence. If they continue to speak from their experience, they may find out that their voice is out of relationship, too loud, and off-key. If they remain silent, they are in immediate danger of disappearing. (p. 202)

To truly listen to girls requires adults to take the time to listen to their experiences and understand their growth requires them to "challenge adults' own beliefs" (p. 192). Creating a space for girls to voice their opinions that the outside world silences provides an opportunity to "support the strengths, intelligence, resilience, and knowledge" (p. 203) of girls who feel marginalized by society. Brown and Gilligan (1992) summarize the value of voice poetically,

Voice is central to our way of knowing – our channel of connection, a pathway that brings the inner psychic world of feelings and thoughts out into the open air relationship where it can be heard by oneself and by other people...Voice is inherently relational – one does not require a mirror to hear oneself – yet the sounds of one's voice change in resonance depending on the relational acoustics: whether one is heard or not heard, how one is responded to (by oneself and by other people). (p. 20)

Power of Silence

For all the discussion of voice, in the form of speaking, voice can also take on the form of silence. Silence is complicated, i.e., it can be perceived as passive or aggressive. We must take the time to evaluate silence, as Goldberger (1996) suggests, asking "Under what conditions and situations does a person fall silent? Is silence chosen or imposed?" (p. 343). Goldberger (1996) discusses cultural stories passed down through generations of women in different cultures. One of the themes they identify stems from an understanding of the context in which silence and

speech are used. Women can be silenced in oppressive ways, but also through choice. Goldberger proposes that women who fall into the epistemology of silence by choice, actually represent acquiring or constructed knowledge (p. 346). Women of Color often use silences purposefully. Hurtado's (1996) theoretical research posits, "many women of Color use silence with a specific goal in mind and return to their own safe communities to share what they have learned and to verify the accuracy of their observations" (p. 382). This form of reconnaissance allows for the survival of the women and their families. For Women of Color, "silence is a powerful weapon" (p. 382). Hurtado proposes this intentional silence within oppression serves as a sixth epistemology of knowing, *subjugated knowledge*, "knowledge that is temporarily suspended or subjugated to resist structures of oppression and to create interstices of rebellion and potential revolution" (p. 386). Women of Color are working hard to balance these "tactical judgments" (p. 387) as they use their own knowing to survive in society. This expectation can be seen as a choice, but a choice that is wrapped in the layers of history and society that are not kind to women, particularly Women of Color. Women are constantly making choices, but when are those choices their own and when are they forced upon them from outside?

Choice

A component of understanding women's voices is understanding when and where they have choice. For adolescent and young adult women, the concept of choice can have lifelong implications. In the research conducted at the Laurel School in Cleveland, Brown and Gilligan (1990), interviewed 100 girls enrolled in the private day school over the course of four years (1986-1990) (p. 5). This study, in combination with an earlier study at the Emma Willard School (Gilligan, Lyons, & Hanmer, 1990) shows how critical understanding of how females develop in adolescence and how deep, connected relationships with women influence their lives. At this critical point in their lives, adolescent females are faced with difficult choices. The choices

adolescent and young adult women grapple with impact their futures, as wives, mothers, and professionals. The girls of the Emma Willard School (Mendelsohn, 1990) shared their desires to be “responsible, outgoing, mature, independent, understanding, enthusiastic, self-confident” (p. 236) and also understanding that as women, they would have greater challenges achieving this as adults. This did not diminish their desire to pursue college or challenging careers. The girls were looking at careers that would “enable them to do interesting work” (p. 238). In the end, Mendelsohn (1990) noted from their interviews, “that these girls do not see themselves as needing to be rescued from the responsibility of making choices about the future” (p. 242). As choice becomes intertwined with caring and knowing, perhaps, what adolescent females need most is to form deep, connected relationships with adult women who have lived these same experiences and can walk with them through these challenging choices.

Criticisms

For all the research conducted on the development of women, criticisms are being made. In “An Ethic of Care: Feminist and Interdisciplinary Perspectives” edited by Larrabee (1993) a collection of essays critically analyzes Gilligan’s (2003) Ethic of Care Theory. Two perspectives criticizing Gilligan are included in the collection of essays. Tronto (1993, p. 241) proposes that moral development should not be a binary of male versus female and that care should not be assigned only to females. They argue it is a dangerous position for feminists to assert gender is the only component that impacts the development of an ethic of care. Instead, we should “demoralize the genders and discuss justice and care on their own” (Tronto, 1993, p. 241). A second criticism presented comes from Greeno and Maccoby (1993). In their discussion, they question whether only interviewing women, as Gilligan’s (2003, 1990, 1993) studies are structured, provides an accurate analysis of the difference between men and women. They propose, “simply

quoting how some women feel is not enough proof” (p.197) and question if what Gilligan proposes is “distinctly female, or simply human” (p. 197).

Criticisms of Gilligan’s (2003) Ethic of Care are not limited to researchers outside of Gilligan’s circle. Bing and Reid (1996) provide criticism in a collection of essays edited by Goldberger et al. (1996). The focus of their criticism is on gender, ethnicity, and class (p. 185). The original studies conducted by Gilligan (1990, 2003) and Belenky et al. (1986) used primarily white females. This did not start with these researchers but reaches back to the beginnings of psychological research (p. 180). The authors posit this narrow focus does not allow for the depth of experience seen by a diverse group of women, and “we have little to no understanding of the differences that may exist among poor women or women of varying ethnic backgrounds” (p. 186). Bing and Reid express this type of research must “recognize by the ‘universal’ experiences of women and the ‘unique’ experiences of women” (p. 196). By limiting the participants in research to primarily white women, the breadth of experience is omitted. In this study, to address this criticism, women from diverse backgrounds, ethnicities, and life experiences will be included.

Contribution of this Study

The primary aim of this study is to identify role model relationships female construction management professionals developed in their childhood and adolescent years. To date, most studies on role model experiences with a focus on construction management, engineering, or STEM-focused primarily on the success rate of female students continuing to pursue higher education (Betz & Sekaquaptewa, 2012; Blake-Beard et al., 2011; Cheryan et al., 2011; Shin; Levy, & London 2017). Another cluster of studies was primarily based on short-duration exposure to role models and did not thoroughly evaluate the impact of deeper relationships with

the role model (Bamberger, 2014; Betz & Sekaquaptewa, 2012; Blake-Beard et al. 2011; Fuesting & Diekman, 2017; O'Brien et al., 2017)

Beyond the area of role model research exists a body of research focused on the retention and recruitment of female students to construction management undergraduate programs (Bigelow et al., 2015; Bigelow et al., 2016; Carnemolla & Galea, 2021; Oo, Feng & Teck-Heng, 2019; Oo & Zhang, 2018; Sewalk & Nietfeld, 2013). The identification of community (Bigelow et al. 2016) and connection (Sewalk & Nietfeld, 2013) as influential in female students' decision to pursue a degree in construction management could result from positive female role model experiences before attending university. It should be noted, that of the lead researchers on the studies discussed here, three of the five are male and that research faculty across construction management programs in the U.S. are primarily male. The lack of female voice in this research area is prominent.

In this study, the concepts of community and connection identified in the recruitment and retention research related to female construction management students are brought together with the existing body of research on role model experiences. By aiming the focus of this study on the types of relationships female construction management professionals developed with role models in their adolescence, within the framework of the Ethic of Care theory (Gilligan, 2003), this study sought to contribute important findings to the study of role model relationships.

Summary

Chapter 2 provided a review of research literature on role model experiences, the theoretical framework for this study, criticisms of the theoretical framework, and the contribution this study will make to the field. This includes the identification of previous studies specifically focused on STEM role modeling and studies related to females in the construction management field. Chapter 2 connects this research to the theoretical framework, Gilligan's (2003) Ethic of

Care, Belenky et al.'s (1996) work related to Women's Way of Knowing, and Noddings' (1984) research connecting care to education. The synthesis of this research will inform the narrative inquiry methodology presented in Chapter 3.

Chapter 3 - Methodology

Introduction

This qualitative narrative inquiry study was designed to explore the adolescent role model experiences of seven female construction management professionals. Data collection methods included semi-structured interviews, observational data, and field journal notes. The data was analyzed and interpreted through a Feminist Ethic of Care framework. The exploration of the types and significance of role model relationships provided an opportunity to learn how these relationships impact the future careers of female construction management professionals.

Chapter 3 includes the following sections: suitability of qualitative design, purpose of the research, research questions, research design of the study, data collection, data analysis, and trustworthiness.

Suitability of Qualitative Design

Qualitative research was selected for this study due to the desire to explore and understand “the meaning individuals or groups ascribe” (Creswell, 2009, p. 22) to the challenges in their lives. Because qualitative research “locates the observer in the world” (Creswell, 2013, p. 15) there is an opportunity to interpret the stories of participants from their personal perspective and not that of the researcher. Qualitative research can be classified into different methods. Creswell (2018) identifies five categories: narrative, phenomenology, grounded theory, ethnography, and case study. Each of these types of qualitative research has its own methodology and types of data collected (Polkinghorne, 2005). For most researchers, a set procedure includes an introduction, questions, methods of data collection, and analysis (Creswell, 2013).

Qualitative researchers “emphasize the construction or discovery of concepts” and “examine the data for common themes and ideas” (Polkinghorne, 1995, p. 10). Rather than collecting data from survey responses, qualitative research allows participants to share their lives

and learn their stories. The data, collected through the stories of participants, capture the nuances and complexities of people's experiences. These stories can provide rich insight into how people make sense of their experiences and how they understand their own lives. The memories collected by qualitative researchers, through the words of the participants "might best be viewed as a kaleidoscope, with continuity in its elements but change in their arrangement and in the dominance of certain elements at different times" (Josselson & Lieblich, 2009, p. 665).

The structure of qualitative research can be found in its lack of structure. Although there is no singular set of rules that qualitative researchers can use for all methods of research, Denzin and Lincoln (2011) define qualitative research here:

Qualitative research is a situation activity that locates the observer in the world.

Qualitative research consists of a set of interpretative, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them. (p. 3)

With regard to this study, a qualitative approach was selected to allow the participants the opportunity to tell their stories, share their experiences as adolescents, and find the meaning of the role model relationships they experienced during this time in their lives. Asking participants to look into their past and share their memories of adolescence, as when they "embark on the identity project and are first able to construe their lives as full-fledge narratives" (McAdams, 2001, p. 117) provides an opportunity to understand how those experiences impacted their future.

Purpose of the Study

The primary aim of this study was to identify the role model relationships female construction management professionals developed in their adolescent years. In this study, the focus was on types of role model relationships and how they influenced the future careers of the participants. By aiming the focus of this study on the types of relationships, within the framework of the Ethic of Care theory, this study may add important findings to the study of role model relationships for women in construction management.

Research Questions

This qualitative narrative inquiry study explores the experiences female construction management professionals had with role models during their adolescent years. This study addresses four research questions.

1. How do the participants describe how they identified a role model?
2. During what period of their adolescence did the participants develop a connection to a role model?
3. In what ways do the participants describe their experiences with a role model in relation to their career choice?
4. How was the participant's experience with a role model influenced by societal or cultural experiences?

Research Design of the Study and Rationale

Narrative inquiry was selected for the qualitative method of this study, utilizing interviews, observational data, and field journaling for data collection. This selection was based on narrative inquiry not being “intended to be generalizable to populations, but rather highlights the particularities and process of experience” (Josselson & Hammock, 2021, p. 10). Because the

population included in the study is a minority group within a predominantly white, male workforce, narrative inquiry provides the opportunity for the stories of these individuals to be heard. Below is a brief overview of narrative inquiry, its suitability for this study, and its connection to Ethic of Care theory. Following the overview, participant selection and research site are discussed.

Narrative inquiry as a qualitative research method provides the opportunity for the researcher to gain insight from the stories of the participants. Poole (2020) identifies one of the strengths of narrative inquiry is its “flexibility” (p. 115). Narrative inquiry can be combined with other qualitative methods, including conversation, field notes, personal artifacts, and researcher journaling (p. 115). Thomas (2012) explains, “narrative is one of our most fundamental ways of making meaning from experience. It provides a structure for ordering, through emplotment, seemingly disparate events in our lives” (p. 209). To learn about participants in an in-depth manner and share their stories about their experiences with their role model in their adolescence is why narrative inquiry is best suited for this study.

Narrative inquiry methodology and specifically narrative analysis, where the narratives are collected from various forms of data, including interviews, observations, or artifacts, is the most suitable methodology for this study. The analysis of narrative research data requires the researcher “to extract, frame, and conceptualize meaning” (Josselson & Lieblich, 2009, p. 662). This process leads to identification of themes and how those themes are embedded in the data as a whole (p. 662). Hendry (2007) refers to this process of sharing one’s narrative as “a spiritual act” (p.496) and it is the role of the researcher to preserve their stories in the narrative analysis.

Understanding how to create a narrative story from the data collected is a complicated process. Forming the data collected from interviews or observational data into a narrative requires a synthesis of events or stories into an explanation of “how and why a particular

outcome came about” (Polkinghorne, 1995, p. 16). The complexity of this process requires planning and organization to accurately represent the individual participants, their experiences, and the answer of “how and why a particular outcome came about” (p. 19).

Qualitative research has many ties to the theoretical framework of Ethic of Care. Much of the research in the field of Ethic of Care is based in narrative inquiry (Belenky et al., 1997; Brown & Gilligan, 1992; Gilligan, 2003 & 2014; Noddings, 1991, 2012, & 2018; Taylor, Gilligan, & Sullivan, 1995). Because relationships and connection are the foundations of the Ethic of Care theory, using a narrative inquiry methodology is a simple connection to make. In order to conduct a successful narrative inquiry study, the researcher must develop a rapport with the interviewee. Andrews (2012) found that “the sense that people’s abilities to think and talk about the events, as well as the overall meaning, in their lives are most developed when they are on their own-or rather on their own with me, the researcher” (pp. 5-6). This is only possible when a trusting relationship has been established between the researcher and the participant. Clandinin (2000) proposes the researcher needs to create a level of intimacy with their interviewees, to gain “some measure of connection” (p. 77) in order for the full stories of their lives to be shared. Caine et al. (2019) argue for the necessity of Ethic of Care within narrative inquiry. Their position is that all narrative inquiry

must begin from a position of caring for potential participants. An ethic of care continues to be lived with participants through an inquiry, but in an inquiry relationship, an ethic of care is not enough. It is necessary to begin the relational work of narrative inquiry from an ethic of care as it is impossible to work ... until there is some kind of nascent understanding of the other. (p. 268)

The melding of theory and methodology is fundamental to understanding the stories gathered in this narrative inquiry study.

Participant Selection

The selection of participants was done using a questionnaire that had been distributed to members of the National Association of Women in Construction (NAWIC). The distribution to the NAWIC membership was coordinated through the NAWIC membership coordinator, who distributed the questionnaire via the NAWIC listserv. This group was selected for the distribution of the questionnaire because it is the largest organization focused on women in construction (About NAWIC, n.d.). The questionnaire included questions to provide information necessary for identifying a diverse group of interview participants. The results from the questionnaire were also included in the analysis done for this study. Within the questionnaire, which had been distributed using Qualtrics survey software, the following information were requested: age, ethnicity, race, gender, type of employment, confirmation of construction management-related higher education, their parents' highest level of education, their perceived socio-economic status in adolescence, whether they had had a role model they could self-identify from adolescence, whether their role model was related to the construction industry, and whether they would be interested in participating in a follow-up interview. Informed consent was provided at the beginning of the questionnaire, and personal data was only collected if they had indicated they were interested in a follow-up interview. A copy of the participant selection questionnaire is included in Appendix A.

Ethnicity, race, and economic background was included in the questionnaire to select a diverse participant pool for the interview. In the initial development of this study, the intention had been to focus the interview pool on recent graduates from the university at which I have been working. In the research into existing role model studies and the ethic of care theory, the need for a more diverse participant pool had been identified as a necessity. Goldberger (1996) had noted in their research:

The claim by researchers of difficulties in access to ethnic minority or working-class communities had resulted in samples of convenience. As a result, white middle-class researchers had tended to stick with white middle-class informants, who had been closest at hand and certainly more familiar to them. Furthermore, even when researchers had turned their attention to the study of different groups, rather than letting the 'others' speak for themselves, they had tended to assume the platform of 'expert' as if the outsider's 'objective' knowledge had been privileged over the insider's 'subjective' knowledge. (p. 391)

With this in mind, the 51 responses were narrowed to a selection of seven female participants, with three non-white participants, from a variety of ages and geographic locations was made. The selected participants were invited to participate in a scheduled interview, with follow-up interviews.

Research Site

All interviews for this study were conducted virtually using the Zoom video conferencing software. Due to the potential distance between the participants and the researcher and a desire to maintain consistency, all interviews were conducted in this manner regardless of the location of the participant. The interviews were recorded using the recording function within the Zoom software. This included video and audio recordings, and the rough transcript created by the software. Additionally, the artificial intelligence software, Parrot.AI was used as a secondary transcript service. Both transcripts were compared to the original recording to create the official transcript of each interview.

Data Collection

Data collection for this narrative inquiry study was done using semi-structured interviews, observational data, and a field journal. The interviews consisted of an initial 90-

minute interview and a follow-up 45-minute interview. Observational data was collected during the interview and documented using the observation checklist found in Appendix B. The field journal consisted of research notes taken throughout the research process, including before and after each interview, and during the data analysis process. The use of multiple sources of data allowed the researcher to triangulate the data and provide trustworthiness to the research (Creswell, 2018, p. 43). The data collection procedure included data and participant protection, timeline, interviews, observational data, field journal, and role of the researcher.

Data and Participant Protection

Prior to conducting this study, Institutional Review Board approval to conduct this research was obtained. All information gathered from the participant selection questionnaire was collected anonymously. The interview participants' were asked to provide a pseudonym to protect their identity. All participants selected their own first name as their pseudonym. Interview participants were recorded in both audio and video formats. These files and transcription files were stored on a password-protected flash drive. A copy of the files were also maintained on an external hard drive in a locked cabinet at the of residence of the primary investigator. Only the primary investigator in this study has access to the files.

Interviews

After IRB approval was received, the participant selection questionnaire was distributed. From the responses received, 7 participants were selected. Due to the variety of locations from which potential participants were selected, all interviews were conducted using Zoom video conferencing. The length of interviews varied in length. The initial interview with each participant ranged from 75 to 90 minutes and the follow-up interviews ranged from 45 to 60 minutes. Participants were asked to share their lived experiences as professionals in the construction industry and their experiences as adolescents. The interviews were semi-structured

using the question list provided in Appendix C, with additional questions emerging during the interview to provide further context to the responses. The questions developed for the interviews were designed to allow the development of conversation (Clandinin & Connelly, 2000, p. 110). This style of interview allows the researcher to focus on “how events are remembered, connected to one another, and understood in relation to a person’s life course” (Josselson & Hammock, 2021, p. 7). By capturing these “small stories” (Josselson & Hammock, 2021, p. 72) from conversation, the research can better identify the self in the interviewee. The interview questions were provided to the participants in advance of the interview. The interview protocol is included in Appendix D and includes information about informed consent, participant checks, and the interview process. Before their interviews, the participants were asked to complete the informed consent form in Appendix E.

Each interview was recorded using Zoom video conferencing software. All recordings were transcribed, and each participant was provided with a copy of the transcript to perform a check for accuracy. The participants were given the opportunity to remove any information, make corrections, or make additional comments related to the transcript.

Observational Data

Although the interviews were video recorded, observational notes during the interviews were compiled. These notes allowed the researcher to capture the body language, environmental factors, and allow for the creation of the participant’s environment (Polkinghorne, 1995). In addition to the notes taken during the interview session, additional notes were taken regarding each video-recorded interview during the transcription process.

Field Journal

Outside of the formal interview sessions, I recorded thoughts, questions, and ideas in a field journal (Josselson & Hammock 2021, p. 23). The recording of my perspective on this study

allowed me to trace my “developing understanding” (p. 24) of the interview data collected. Documenting these thoughts and ideas may provide significance to what may appear to be nothingness at the time of the interviews (Clandinin & Connelly, 2000, p. 104). This third method of collecting data adds creditability and trustworthiness to my data.

Role of the Researcher

As a qualitative researcher who understands the value of hearing a person’s lived experiences is greater than the data collected from a survey, I worked to establish a trusting, respectful, and engaging relationship with participants (Poole, 2020, p. 115). This approach ties directly to Gilligan’s (2003) Ethic of Care theory, which focuses on how relationships and connections are integral to the moral development of women. Caine et al. (2019) evaluated how the Ethic of Care can be applied in narrative inquiry research. In their research, the “intentions were to establish relationships of trust” (p. 273) and “attend to their lives, to listen to their...stories and to respond in positive ways” (p. 273). For this study, I have the unique position of being of a similar background to the participants. This allowed me to build a rapport in the interviews and understand the perspective that each participant brings to the interview.

Beyond the development of relationships, the power dynamics in the interviews need to be addressed. The women in this study work in a male-dominated field where often the power dynamics are working against them. Creswell (2013, p. 48) states that the researcher “empower individuals to share their stories, hear their voices, and minimize the power relationships that often exist between a researcher and the participants” (Creswell, 2013, p. 48). By having the interviews conducted by a woman, instead of a man, particularly in my case, a woman who has worked in the same profession as the participants, this power imbalance can be minimized.

Data Analysis

Once the interviews were transcribed, I collected them with the observational data from the interviews and my field journal and began to read everything before beginning the formal analysis. To thoroughly review all of the data collected, I used a process developed by Brown and Gilligan (1992). Their data analysis process was developed within their interview study of the students at the Emma Willard School and was done under the framework of Ethic of Care. The interview analysis was structured around four questions:

- (1) Who is speaking?
- (2) In what body?
- (3) Telling what story about relationship – from whose perspective or from what vantage point?
- (4) In what societal and cultural framework? (p. 21)

This approach of analyzing interviews through the “distinct voice, a new voice – a voice worth listening to” (p. 21) creates a framework that places the interviewee’s voice at the center of the story. These questions were further developed into a “listener’s guide” (p. 25), in which the researchers listened to the interviewees through multiple readings of the interview transcripts while listening to the original recordings. In the first listening of the interviews, the focus was on “the plot” (p. 27), the events, and the people involved. The second, listening to the participant’s own “self” (p. 27) was the intent. By listening in this manner, they were able to include the individual’s voice in their analysis. These two steps come together in what Brown and Gilligan refer to as a “relational method” (p. 28). This allowed them to “listen for and against conventions of relationship within a society and culture are rooted psychologically in the experiences of men” (p. 29). Two additional listenings of each transcript were included. In these listenings, the focus was on “how they experience themselves in the relational landscape of human life” (p. 29). This

method of analysis suggests a way to “understand how those not heard as full human beings within such a system exist and resist, how they create and maintain their humanity” (p. 30). For this study, I used this three listenings process.

From the three listenings, the data was organized and assigned codes (Creswell, 2018, p. 45). The coding was completed in a “holistic” (Poole, 2020, p. 118) manner that allowed for themes to emerge without compartmentalizing the data. By taking this approach, I allowed for the participant stories to remain the focus (Thomas, 2012, p. 213). Throughout the analysis and coding process, I compared the transcript data with both my observational data and field journal to ensure that no context was lost in the coding and there was consistency of analysis.

Trustworthiness

Lon (2013) explains to achieve trustworthiness in narrative studies “it must also achieve verisimilitude; it must ‘ring true,’ it must have believability” (pp. 9-10). The audience must find commonality between the data presented and their own experiences. In addition to this aspect, trustworthiness is “marked by transparency regarding the process of sorting, choosing, and organizing the data” (Tracy, 2010, p. 841). Trustworthiness of the data in this study is addressed through credibility, transferability, dependability, and confirmability. Each area is described in turn below.

Credibility

Credibility, which parallels the internal validity criterion in quantitative research, is found when the participant and the researcher agree on the meaning of their experiences and their representation. For this study, I used participant checks to confirm the accuracy of all transcripts and observational data. Researchers must be transparent in our approaches and allow participants to provide feedback. Thomas (2012) expresses concern over this approach to credibility, “while theoretically this may appear an ideal way of increasing claims of validity, many participants

may not have the time, indeed the interest, to provide feedback” (p. 216). In this study, I addressed this issue by providing the transcripts for review and the observational data collected during the interview. It is important to know that the stories shared by the participants belong to them and credibility is established by empowering the participants to review my interpretations alongside their words.

Transferability

Transferability in qualitative research parallels the traditional quantitative criterion of external validity. Transferability is validated through the ability of future researchers to accurately replicate the study based on the information provided (Lincoln & Guba, 1985). For this study, transferability was met through the description of methodology, participant selection, data collection, and data analysis methods.

Dependability

Dependability parallels the quantitative criterion of reliability and is demonstrated through “rich rigor” (Tracy, 2020, p. 841). Tracy expands upon the concept of rich rigor by proposing the following questions be addressed to confirm the level of rigor or dependability:

Are there enough data to support significant claims?

Did the researcher spend enough time to gather interesting and significant data?

Is the context or sample appropriate given the goals of the study?

Did the researcher use appropriate procedures in terms of field note style, interviewing practices, and analysis procedures? (p. 841)

In this study, these questions are addressed through the participant selection process and the methodology proposed. The participant selection process ensured that a diverse group of participants was selected that meet the overarching criteria of this study. The methodology

proposed demonstrates the amount of time spent with each participant and the process to be used for data collection and analysis.

Confirmability

Confirmability, which parallels the quantitative criterion of objectivity, ensures all interpretations or assumptions can be connected back to the original data. In this study, confirmability was achieved through the use of a field journal. The field journal includes internal discussions regarding the choice of participant, revisions to the research question, revisions to the interview questions, the data collection process, interim interpretations of the data, and self-reflection. Lincoln and Guba (1985, p. 319) refer to the process of field journaling as an audit trail, which provides documentation of the thoughts and experiences of the researcher while in the research process. The self-reflection portion of the field journal may hold a level of confirmability. Connolly (2007) states “we must ‘give permission’ to researchers to confess – without fear of judgment by their peers – their own emotional reactions to the narratives that they gather” (p. 452). In this study, my own personal connection to the types of stories collected created some of these emotional reactions and the field journal provided an avenue for documenting those thoughts.

Summary

This study used a qualitative narrative inquiry research design. A Feminist Ethic of Care framework was the lens through which the data was analyzed and interpreted. The triangulation of data and participant feedback ensures the trustworthiness of the research. Data analysis was conducted using a three-step process to identify emerging themes and patterns, through the Ethic of Care lens.

Chapter 4 - Narrative Analysis of Findings

Introduction

The following is a short story representation of the stories collected during the interviews of the seven participants. Although creative liberties were taken in the presentation, the core of the story is based on the experiences shared by the interview participants.

Time Capsule

Three 9th-grade girls are whispering at their lockers. A rumor is circulating the Roebling High School that there is a time capsule buried on campus. Roebling is a large school, with over 900 students, but the rumor moves quickly. Everyone is talking about it by the end of day. The girls, who have been friends, and neighbors for years, head out to find Anna's dad, their ride home. He is late picking them up, so they sit on the curb and continue their discussion about the time capsule.

"I heard from Asher during lunch that it was buried under the gym floor" shared Stella.

"It can't be there, if it was buried during the construction of the new wing, it would have to be in the new section of the school" states Anna.

"But if it's under the school, who would anyone ever find it? If it was buried during the construction, it has to be in the courtyard" ponders Rosie.

Several years ago, a new addition had been added to Roebling High School. The addition included classrooms for a new STEM program, including spaces for robotics, construction, architectural drafting, and computer programming. Because of the new addition, a courtyard was created that students could use during lunch.

The girls continue to brainstorm ideas of where it could be hidden but keep returning to the idea that the time capsule was buried in the courtyard. This was the only area of the construction project where someone could easily dig up a time capsule.

“I bet it is buried in one of the planters. That would be an easy place to hide a time capsule” shares Rosie.

As they hop in Anna’s dad’s car, Stella questions, “What could be in it? Who buried it? We have to figure this out!”

The next morning before school, they decide to walk through the courtyard on their way to their first-period class. As they turn the corner to enter the courtyard, they head to the two large planter areas in the courtyard. As they walk, they notice one of the shrubs has died in the farthest planter. The girls continue into their class, making plans to come back over the weekend to further investigate.

On Saturday morning, the girls meet up to make a plan.

“If we are going to do this, we have to get started, I have tennis lessons this afternoon” states Stella. Stella recently started playing tennis and her parents agreed to private lessons only if she never skips. “If I miss my lesson, I will never hear the end of it.

Anna adds, “I’m free all day, but I have my cousin’s quinceanera tonight, so I need to make sure we are back in time to get ready.”

“I have to be back by lunchtime. It’s technically my dad’s weekend, but he had to work late last night, so he is picking me up after lunch to spend the rest of the weekend with him” shares Rosie.

“What are we going to tell our parents?” asks Anna.

“We do have that big social studies project due next week, we could just tell them we are going to the library to work on it, the library IS across the street from school” conspires Stella.

The girls agree and run home to tell their parents their plans for the morning and grab their bikes. Stella also grabs her dad’s camp shovel from the garage and shoves it into her backpack.

“I can’t wait to be able to drive. Riding our bikes everywhere is such a pain” complains Anna as the girls jump on their bikes and head to school.

The girls stash their bikes behind the school and head to the courtyard. On their way, Stella and Rosie grow hesitant about the plan.

“What if we get caught?” exclaims Stella.

Anna replies, “It will be fine. We have to figure this out!”

The girls enter the courtyard and approach the planter with the dead bush. Stella unfolds the camp shovel and begins poking the ground. After a few attempts, the girls hear a “ting” and look up at each other.

“There! We found it!” shouted Rosie grabbing the shovel from Stella and frantically starting to remove the dirt. In a matter of moments, the top of a metal ammo box is uncovered, with the words “Roebbling High School Time Capsule, 2015” written on the top. The girls continue to dig around the box until they can work it loose from the ground.

“Should we open it now?” questions Stella.

The girls think for a moment and Rosie suggests, “Why don’t we take it back to my old tree fort and open it there? My mom is at my brother’s soccer game, so no one will be around. That way no one will catch us at school with the box.” The girls carry the time capsule back to their bikes, tie it to the back of Anna’s bike, and head home.

The girls throw their bikes down in Rosie’s driveway and run to her backyard. Once in the tree fort, they open the box and find a pile of letters. Disappointment is on all their faces.

Anna sighs, “It’s just a bunch of letters, I was hoping it would be something more exciting.”

Stella comments, “What if something is exciting in the letters? I think we should open them, maybe there are more clues, or instructions to find something else.”

Letter from Tessa

Stella opens the first letter and begins to read aloud.

Dear Roebling High School Girls:

My name is Tessa and I was the person who came up with the idea for this time capsule. During the construction of the addition to Roebling High School, I served as the project manager on the project. Before completing the work in the courtyard area, I had the idea to bury a time capsule for future generations to discover. This time capsule is filled with letters from other women who graduated from Roebling and are now my friends, peers, and mentors.

When I was a student, I struggled to figure out what I wanted to do after I graduated. I was fortunate to have teachers and family members who were very supportive of me, but I wasn't confident in what I should do for college or a career. Because I was good at math and science, I was encouraged to pursue engineering. After starting college, I realized, that I was more interested in construction management than engineering and changed my major.

As I look back on my time at Roebling High, I wish that I had the opportunity to learn about the different career opportunities that exist in the construction industry. I hope these letters I have collected for this time capsule will help future generations of girls see the opportunities available in the construction industry and the amazing women who made it their career. Enjoy reading the stories and advice these women have to share and I hope you can pass along your experiences to others.

Sincerely, Tessa

“Wow, I can’t believe she took the time to create this time capsule! Should we keep reading the letters?” commented Rosie.

“Absolutely!” shouted Anna and Stella.

Letter from Ashley

Anna picked up the next letter and began to read.

Dear Roebling High Students,

My name is Ashley and I was a student like you in the 1990s. I had a pretty normal high school experience. I played sports and hung out with my friends. My family wasn't rich, but we weren't poor. When I was graduating from high school, I didn't really know what I wanted to do, but I knew my family wanted me to go to college. I wish I would have had a grown-up in my life that could have helped me figure out what I wanted to do when I grew up. When I was 19 my mom died and I really struggled. Although I had supportive people around me, particularly from my church, I didn't have the one person I had relied on my whole life. It wasn't until I was older, and met my husband, that I found someone who would support me in my career path. I finished my psychology degree and somehow ended up working in construction management. My husband encouraged me to get my master's degree in project management and now I work as a project manager for a construction firm.

When I was your age, working in construction management never crossed my mind. I spent many years going to school and working in jobs that I did not enjoy. I wish that more opportunities existed for high school students to learn about the variety of careers available in the construction industry. My job focuses so much on dealing with people and I don't think most students realize that aspect of construction. My nieces are about your age, and I am always encouraging them to explore different opportunities to learn about different careers.

My hope for you and future students of Roebling is that you can find someone who supports your goals. If you can't find that person in your family, find someone in your school or community who is supportive of whatever you aspire to do or be in the world.

-Ashley

“Ashley sounds like a fun person, who has done some pretty amazing things in her life”, said Anna.

Letter from Tara

Rosie grabs the next letter and begins to read.

Dear Roebling High Young Women,

My name is Tara and I was a graduate of Roebling High School in the late 80s. One of my favorite things about high school was being in the marching band. Back then, our marching band was very competitive. We traveled to away football games and marching band competitions. Being part of the band is where I learned to be disciplined and work in a team. It's also where I met some of my best friends. I lived with just my mom because my parents divorced when I was really young. She was a very progressive person. I don't think they even publish M Magazine anymore, but copies were always lying around our house.

When I was your age, I fell in love with Architecture. Starting in middle school, I watched the historical home restoration shows on PBS and spent my free time sketching house designs. I was fortunate that Roebling had some great classes related to architecture. I took classes in blueprint reading, drafting, and electrical. After high school, I went to school to be an architect. Unfortunately, I learned in college that architecture wasn't exactly what I wanted to do, so after college, I started working in construction management. I didn't know until then that construction management was even a career field. It was perfect for me, and just this year I took the brave leap to start my own construction management consulting business. I love being a part of the construction industry and enjoy seeing the amazing buildings that I am a part of.

As you are thinking about your future after high school, my one suggestion to you is to follow your interests. Take advantage of the classes, clubs, camps, or other opportunities that are related to your interests. You may not figure out exactly what your career is to be, but you

will be on your way to narrowing your career choices. I know high school is challenging, but I have faith that you and future Roebling High graduates will do amazing things.

Sincerely, Tara

“I am jealous she figured out what she wanted to do when she graduated so early” commented Anna, “I may never figure out what I want to be when I grow up.”

Stella replied, “Maybe you already have and you just weren’t thinking about the things you love to do as possible jobs?”

Letter from Riki

“I wonder what this next person will talk about?” Stella said as she picked up the next letter and began reading.

Dear Roebling High Girls,

High school was a long time ago for me, so I hope I can share with you some valuable advice. I grew up in a time when the opportunities for girls were not great. I remember my step-mom’s suggestion I get a job in the Civil Service because it would be a stable job and allow me to focus on getting married and starting a family. The Civil Service seemed boring to me. What I wanted to do was work in theater and movie production. My dad was a projectionist for a movie production company; back when you needed someone to switch out the movie reels at the movie theater. I had watched my dad’s coworkers building the amazing sets used in movies and thought that would be a fun job to have. When I talked to my dad about it, he discouraged me. I wasn’t as stubborn then as I am now and didn’t fight back. My advice to you now and in the future is to be stubborn, be assertive, and don’t take shit from anyone!

The discouragement about working in movie and theater production led me to community college after high school and a series of jobs I didn’t love, until I started working in construction. Once I found construction, I went back to school twice! And I did it when I was

much older. I finished my associate's in construction technology just before I turned 30. A decade later I finished my bachelor's degree in business. All through that time of going to school, I continued to work for construction companies. One of the most important things that happened to me during that time was joining the National Association of Women in Construction. Through NAWIC, I was able to get more construction training and meet some of the most phenomenal women I have ever met. Those women were my mentors and role models.

As you go out in the world after graduation, find your people. Connect with a mentor or role model and as you grow older, return that favor by mentoring and role modeling others. And always remember that if there is something you want to do, you can do it!

-Riki

“O. M. G. Riki is a wild woman,” a shocked Anna said. “She seems a lot like my grandma,” Stella noted. “And it seems like every letter is better than the last, should we keep reading?”

“Absolutely,” chirped Rosie.

Letter from Amy

Rosie grabbed the next letter and began to read.

Dear RHS young women,

My name is Amy and I graduated from RHS not that many years ago. Tessa and I knew each other in school, so I was excited when she asked me to include a letter in the time capsule. Have you ever been on a road trip with your family and looked up and there is a beautiful building in front of you? That is how I fell in love with buildings. My family is Vietnamese and my parents moved here before I was born. They came here for a better life and to provide their children with the best opportunities available to them. They had expectations of high achievement for their children. Sometimes that was rough

and other times it was nice to know they would support us in every way they could. In school, I played sports and was good at math and science. Because I knew I liked buildings, I started looking at architecture schools and learned about architectural engineering. I went to college and while studying architectural engineering, I realized that I really enjoyed the construction of buildings more than the design. In my junior year, I was fortunate to have an academic advisor that helped me adjust my goals. I still graduated in architectural engineering, but I found a job where I could use my degree and still work in construction management. I love what I do, even though my family doesn't understand why I have an engineering degree, but I'm not an engineer.

My advice to you is to be flexible. Sometimes you never know where the choices you make in life will take you. There were times when I questioned my decisions, but in the end, I found a career that I love.

Sincerely, Amy

“My mom told me once, that I shouldn't worry about picking a major in college, that having a degree is sometimes all you need. It's cool to see that Amy found a job in something related to her degree and didn't have to start school all over again,” shared Anna.

Letter from Marissa

“We only have a couple of letters left, should we keep going” asked Stella.

“For sure,” commented Anna as she opened the next letter.

Dear Roebling High Students,

My name is Marissa and I graduated from Roebling High in 2018 and college in 2023, so I'm not sure how much advice about the future I can share. My family immigrated to the U.S. when I was going into the 6th grade. We lived in Mexico before that, but it wasn't a great place to be, so we left. Coming to the U.S. was challenging. I didn't know much English and that made

going to a new school even harder. My parents moved us because they wanted their children to have the opportunity to get an education. When I was deciding where to go to school after graduation, I didn't have a lot of money and my family couldn't help much. I decided to go to community college first to save money. Then I transferred to a four-year school and earned my degree in construction management. I didn't initially plan on a career in construction. My dad and many of my family members worked in construction, so all I knew about construction, was being a laborer or a carpenter. Now I realize there is more to the construction industry. Now that I have graduated, I am working as an estimator for a construction company. My biggest hope is that I can help create more opportunities for Hispanics to be successful in all areas of the construction industry.

My advice to you as you are deciding what to do after you graduate is to find someone you feel comfortable talking to. Someone you can share your life problems with, that can help you navigate becoming an adult.

-Marissa

"I never thought about how challenging moving to another country could be. I would love to learn more about her life," shared Anna.

Letter from Karli

"It's our last letter. I wonder what..." Anna is interrupted as Stella reaches across her to grab the last letter.

"Let's find out!" Stella shouts.

Dear Roebling High School Ladies,

My name is Karli and I was at RHS during the 1990s. I was a tomboy, who loved to hang out at the skate park with my brother and my friends. I was really good at math and science, so much so that I almost went to MIT. My family was excited about the opportunity and my

grandmother even volunteered to move to Boston with me. Ultimately, I decided to stay closer to home and went to school to get my mechanical engineering degree. I didn't really know what I was going to do with a mechanical engineering degree when I started college, but everyone told me I would be great at it because I was good at math and science.

This summer I bought my first company! I am the owner of a mechanical construction firm and it is one of the scariest and most exciting things I have ever done. When I was your age, I never dreamed this would be what my career would turn out to be, but I wouldn't change it for anything. I don't think I would have been able to tackle owning my own company without support from other women in the construction industry. The relationships I have developed over the years have been the support I needed.

My advice to you is to know that you don't always need a cheerleader. Sometimes you just need someone to take you seriously. To understand what you are going through and to just be there, to believe in you. Good luck as you become the amazing future leaders, I know RHS graduates to be.

Sincerely, Karli

"This was so much fun. I really wish we could meet these ladies in person," said Rosie.

"What should we do now?" asked Stella.

"I think we should take it back to school and leave it for someone else to find in the future." Suggested Anna.

"Great idea!" shouted Rosie.

The girls grab the time capsule and head back to school. On the way, they chat about the letters. Stella shares, "I know we still have lots of high school remaining, but now I want to learn more about working in construction."

“My mom’s best friend works in construction. I will ask her the next time she visits.”

Anna says.

As the girls continue back to the school, they continue to chat, excited to learn about this possibility. They enter the courtyard and Rosie stops, “Wouldn’t it be awesome to come back here when we are old and share with students how we made an impact as women in construction!”

Chapter 5 - Traditional Presentation of Findings

In Chapter 4, the interview data were presented in a storytelling format I created by using excerpts from the participants' interview transcripts. This chapter details the traditional presentation of the data based on the research questions and emergent themes. The six sections of the chapter include (a) descriptive data and an introduction to the research questions and emergent themes, (b) results for the first research question and its theme, (c) results for the second research question and its theme, (d) results for the third research question and its themes, and (e) results for the fourth research questions and its themes, and (f) results for the overarching theme.

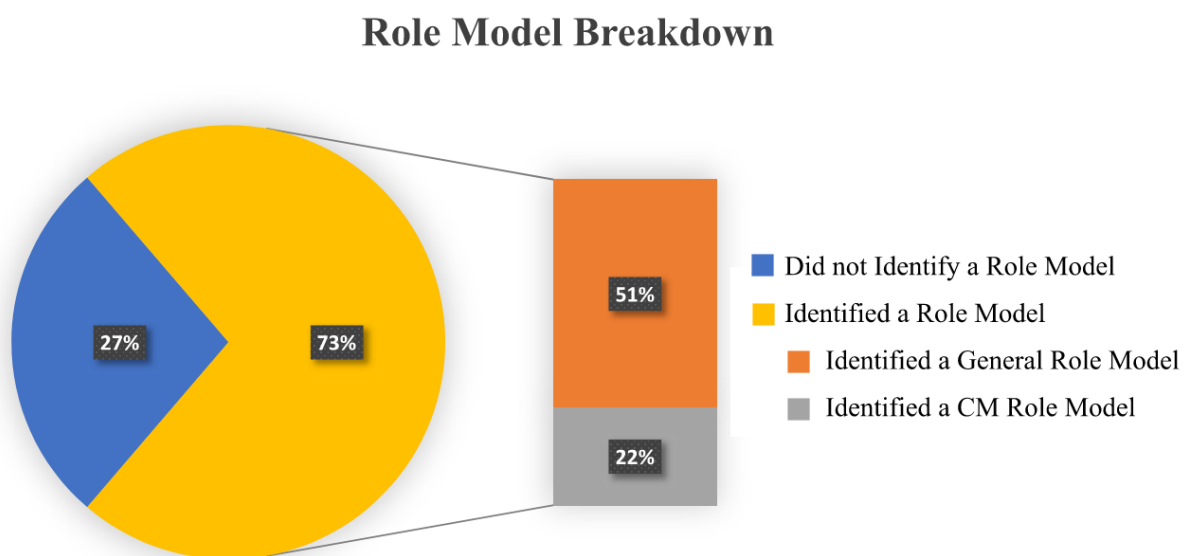
Findings

This study explored the role model relationships through the questionnaire, found in Appendix B, which yielded responses from 51 participants with advanced degrees in construction-related fields and actively working in the construction industry. From that group, 23 individuals agreed to participate in the interview portion of this study. Of that group, nine individuals were selected based on their diverse responses to the questionnaire. Seven of the nine selected ultimately agreed to participate in interviews. The questionnaire responses provided an overall representation of the role model relationships experienced by the participants, whereas the interviews provided the lived experiences and reflective viewpoints. Overall, the construction industry will be able to use both sets of data to reflect on the experiences of adolescent females with role models, specifically related to the construction industry. This chapter includes (a) a discussion of the questionnaire responses, (b) descriptive data from the interview participants, and (c) an introduction to the research questions with emergent themes.

Questionnaire Responses

The results of the interview participant questionnaire resulted in 41 of the 51 participants identifying a role model during their adolescent years. Of those who identified a role model, only 22% (11 participants) identified a role model that was specific to their future career in construction management, as shown in **Error! Reference source not found..**

Figure 1 Role Model Experience



Role Model Experience by Ethnicity

Of the respondents, 90.2% (46 participants) identified as white, 5.9% (3 participants) identified as mixed race/other, 2.0% (1 participant) responded as Asian, and 2.0% (1 participant) identified as Native American. This closely represents the construction industry as a whole. In 2020, the U.S. Bureau of Labor Statistics (2020) reported 78.5% of construction management professionals were White, 2.7% Asian, 2.5% Black, and 14.3% Hispanic.

Of the responses to the questionnaire, 84.8% of those who identified as white indicated they had a role model experience during their adolescent years. 100% of Native American,

33.3% of Mixed Race, and 0% of Asian participants identified a role model experience. A breakdown of the responses by ethnicity can be found in **Error! Reference source not found..** Additionally, when looking at how respondents clarified their role model experiences, None of the Native American and mixed-race participants identified a construction management (CM) specific role model. Of the White participants, 25.6% identified a construction management-specific role model.

Table 1 Role Model Experience by Ethnicity

Ethnicity	Did not identify a role model	Identified a role model	Identified a CM-focused mentor
Native American	0	1	0
Asian	1	0	0
Other/Mixed Race	2	1	0
White	7	39	11
Total	10	41	11

Role Model Experience by Age

The age of the questionnaire participants was broken down into six, 10-year brackets and included individuals recently leaving adolescence through retirement, as shown in **Error! Reference source not found..** The distribution of ages ranged from a low of 7.8% for the 65+ age bracket to the 25-34 age bracket representing 29.4% of the responses. Throughout all the age brackets the identification of a role model during adolescent years ranged from 66.7% to 90%, with the highest reported rates among the younger age brackets of 18-24 (83.3%), 25-34 (80%), 35-44 (85.7%), and 45-54 (90%). For the construction management-focused mentors, the participants were consistently lower across all age brackets, with a low of 0% in the 34-44 age bracket and a high of 41.7% in the 24-34 age bracket.

Table 2 Role Model Experience by Age

Age	Did not identify a role model	Identified a role model	Identified a CM-focused mentor
18-24	1	5	1
25-34	3	12	5
35-44	1	6	0
45-54	1	9	3
55-64	3	6	1
65+	1	3	1
Total	10	41	11

Role Model Experience by Socioeconomics

For the question, “In your adolescent years, how would you describe your family’s economic status?”, the questionnaire participants were given the following options, far below average, somewhat below average, average, somewhat above average, and far above average, as shown in **Error! Reference source not found..** Of the questionnaire participants, 5.8% reported a far below average socio-economic status during adolescence, 19.6% reported somewhat below average, 49% reported average, 21.6% reported somewhat above average, and 5.8% reported far above average. It is important to note no financial data was collected. The responses gathered were based on how the participants perceived their socio-economic status during their adolescence.

In comparing socio-economic status to role model identification, 100% of the questionnaire participants who reported a far below average status, identified a role model, 50% of the somewhat below average status, 96% of the average status, 72.7% of the somewhat above average status, and 66.7% of the far above average status.

Table 3 Role Model Experience by Socioeconomics

Socio/Economic	Did not identify a role model	Identified a role model	Identified a CM-focused mentor
Far Below Average	0	2	1
Somewhat Below Average	5	5	1
Average	1	24	5
Somewhat Above Average	3	8	4
Far Above Average	1	2	0
Total	10	41	11

Role Model Experience by Parent Education

For the question, “What is the highest level of education one or both of your parents achieved?”, the questionnaire participants were given the following options, less than high school, high school, 2 years of college, 4 years of college, professional degree, and doctoral degree, as shown in **Error! Reference source not found..** Of the questionnaire participants, 1 3.7% reported their parent(s) as having less than a high school education, 19.6% as having a high school education, 23.5% as having two years of college, 25.5% as having four years of college, 13.7% as having a professional degree, and 3.9% as having a doctoral degree.

In comparing socio-economic status to role model identification, 71.% of the questionnaire participants who reported their parent(s) as having less than a high school education, identified a role model, 70% of participants’ parents having a high school education, 83.3% of participants’ parents having two years of college, 92.3% of participants’ parents having four years of college, 85.7% of participants’ parents having professional degrees, and 50% of participants’ parents having doctoral degrees.

Table 4 Role Model Experience by Parent Highest Level of Education

Family Education	Did not identify a role model	Identified a role model	Identified a CM-focused mentor
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Less than High School	2	5	2
High School	3	7	2
2 years college	2	10	4
4 years college	1	12	0
Professional degree	1	6	3
PhD	1	1	0
Total	10	41	11

Interview Participant Descriptions

Of the 51 participants in the questionnaire, 23 responded they would be willing to be interviewed regarding their experiences or lack of experience with role models in their adolescent years. Of those 23 questionnaire participants, nine were selected to be interviewed and seven responded to follow-up correspondence and participated in the interviews. These individuals were identified based on their responses to the demographic questions in the questionnaire shown in **Error! Reference source not found.** The seven participants represent a cross-section of age, ethnicity, socio-economics, and parental education.

Table 5 Interview Participant Questionnaire Responses

Name	How old are you?	Which race or ethnicity best describes you?	In your adolescent years, how would you describe your family's economic status?	What is the highest level of education one or both of your parents achieved?
Riki	65+ years old	Other	Average	High school graduate
Tara	45-54 years old	White	Average	4-year degree
Karli	45-54 years old	White	Somewhat below average	High school graduate
Ashley	35-44 years old	White	Average	4-year degree
Amy	25-34 years old	Asian	Somewhat below average	High school graduate
Tessa	25-34 years old	White	Average	Professional degree
Marissa	18-24 years old	Other	Somewhat above average	Less than high school

During the interview process, additional demographic information was gathered to provide a more detailed representation of each participant, as shown in **Error! Reference source not found.** The additional information provides more context to the questionnaire responses and further emphasizes the diversity of the interview participants selected.

Table 6 Interview Participants Additional Demographic Information

Name	Decade of Adolescence	Adolescent Hometown	Ethnicity	Family Description	College Degrees	Current Career	Role Models Identified in Interviews
Riki	1970s	Orlando, Florida	Japanese (mother)/White (father)	Divorced parents, brother, lived with grandmother	AA Construction Technology, BS Business Management	Owner of Construction Consulting Firm	grandmother
Tara	1980s	Dayton, Ohio	White	Divorced parents, older sister/brother, younger half-brother	BS Architecture, MS Construction Management	Owner of Consulting Firm	high school band teacher
Karli	Late 1980s/early 1990s	Bellevue, Nebraska	White	2-parent household, 2 younger siblings (brother/sister)	BS Mechanical Engineering	Owner of Mechanical Subcontracting Firm	high school math teacher, parents, grandmother
Ashley	1990s	Midland, Texas	White	2 parent household, 1 younger sister	BS Psychology, MS Construction Management	Project Manager for a Commercial Contractor	church members, grandmother as a child
Amy	Early 2010s	Wichita, Kansas	Vietnamese, parents immigrated	2 parent household, 2 older sisters	BS Architectural Engineering	Project Engineer for a Mechanical Firm	sisters, college professor
Tessa	Early 2010s	Spring Hill, Kansas	White	2 parent household, 1 younger sister	BS Construction Management	Project Controls for Construction Management Firm	high school teacher, college professor
Marissa	Late 2010s	Dodge City, Kansas	Hispanic, moved to US @ 10.	2 parent household 1 younger brother	BS Construction Management	Estimator for a General Contractor	parents, high school teacher, college professor

Research Questions and Themes

This qualitative narrative inquiry study explored the role model relationships formed in adolescence of female construction management professionals. Specifically, the study explored the following research questions and emerging themes:

1. How do the participants describe how they identified a role model?
 - a. Theme: Casual connections

2. During what period of their adolescence did the participants develop a connection to a role model?
 - a. Theme: High school was the most influential time for role model exposure
3. In what ways do the participants describe their experiences with a role model in relation to their career choice?
 - a. Theme: High school role models provided life advice
 - b. Theme: College role models provided career advice.
4. How was the participant's experience with a role model influenced by societal or cultural experiences?
 - a. Theme: Participants from immigrant families identified societal and cultural influences
 - b. Theme: Gendered career or college advice was observed to be generational
5. Overarching Theme: Minimal exposure or connection to the construction industry in adolescence

Each research question and its connected themes are discussed, highlighting specific examples from the participant stories. In addition to the stories included in the short story shared in Chapter 4, additional participant stories are included as they align to the research questions and related themes.

While analyzing the data for this study, the lens of Feminist Ethic of Care, and specifically the epistemology of the Women's Way of Knowing (Belenky et al., 1997) gave context for researching the reasons the participants did (or did not) identify a role model in their adolescent years. Through this lens, the voices of the participants come through in their stories of adolescents and finding their way in the world. Those stories are told through the following themes: (a) casual connections; (b) high school was the most influential time for role model

exposure; (c) high school role models provided life advice; (d) college role models provided career advice; (e) Participants from immigrant families identified societal and cultural influences; (f) gendered career or college advice was observed to be; and (g) minimal exposure or connection to the construction industry in adolescence. These findings are described below.

Research Question 1: How do the participants describe how they identified a role model?

Theme: Casual connection

Throughout the interviews with participants, a strong role model connection was not immediately identified. For six of the seven participants, a role model was revealed through follow-up questions, and not in the initial discussion about role models in adolescence. This casual relationship with the memories of role models can be seen through the words of several participants. The types of role model relationships revealed in the interviews included parents, grandparents, teachers, older siblings, and other adults in the participants' lives.

The identification of parents or grandparents as role models was predominant for one participant in particular. Karli shared her relationship with her parents are role models, “My parents, both of them, I mean, just neither of my parents went to college, but they are both just smart, hard-working, kind people.” Additionally, she identified her grandmother as a strong role model in her life. Karli connected with her grandmother as a role model because she was supportive of her opportunities after high school. She expanded on this thread,

if I was going to MIT my grandmother was gonna have to move to Boston with me and we would be able to go that way. We would be okay, the two of us together.

The identification of family as role models also extended to older siblings. In the case of Amy, a first-generation Vietnamese, her sisters navigated the world of high school first and provided a role model relationship throughout her school years. Amy recalls,

it was my older sisters. so, my oldest sister..., she's three grades above me. But so, I had her and then had my second older sister who's a grade below that one. But, they definitely kind of like, navigated all that.

Marissa, a first-generation U.S. citizen, reflected on the role model experience she had with her parents, who navigated coming to the United States so their children could have a better life,

so, the main reason why we moved here was because where we lived in Mexico, crime is terrible. Yeah, females have a curfew like 3 p.m. We can't be out. And my dad, that was his biggest push for my brother and I, he's like, I don't have any money so all I can do is help you pay for your school. And he's like, and that's all I would do for you guys. Like we move here, to U.S., and have a better education and it's way more valuable than anywhere else. And that was the biggest push for my parents, were very like, determined that we're not gonna push you if you don't want to, but we'll support you if you do.

Marissa stated one of her goals in life is to be able to support her parents financially in the future because of everything they sacrificed for her and her brother to come to the U.S.

Several participants identified teachers as role models in their lives. Tessa, Marissa, and Tara all focused their role model discussion in part on high school teachers. Tessa connected with her Civics teacher,

Actually, now that you say that, there was one teacher in high school and so she, her name was Miss Bowen and I had her in the 10th grade for civics and, but she was also like an assistant debate coach, which I did debate in my freshman year. She went to K-State and so while I kind of decided on my own to go to K State, she was somebody that I could kind of like bounce stuff off of because she really wasn't that much older than me.

And so, I could kind of like run stuff by her and I felt like I was making a good choice because she approved of my choice.

Although Tessa's teacher was able to guide her through academic decisions, Tara connected with the structure and discipline of her band teacher,

So, I really learned that discipline, I think from being in that [band] and all my friends were. And I think that's kind of what I remember, sort of the biggest influence when I was in school was just being a band. And, you know, you had to be at practice, you had to stand at attention, you had to memorize your music and, you know, learn the routine.

In the case of Marissa, her teacher role model was just someone willing to listen and help her navigate the world, she recalls,

she was a teacher and she, she tried to help me as much as she could and she was cauc, she's Caucasian. So, she didn't know any Spanish but she, like, knew how hard I was struggling but she was still trying to help.

The role model connections identified also extend to the greater community. After the death of her mom who she identified as her first role model, Ashley found support and guidance from members of her church community. Although she did not identify a specific individual, she looked up to this group as role models. Ashley shared a connection to people from church,

I never, I never, never really confided in just one person. It would be, I want to talk about this with how to handle it with this person, but maybe I'm having a boy problem and I want to talk about somebody with that problem. I'm having a friend issue. It would be with somebody else, but there was no one person that I went to with everything.

For one participant, Riki, the identification of her grandmother was immediate in the interview. Riki stated,

my grandmother would have been my, my ultimate role model for being just, the kind person to work hard to care about others.

Riki's parents divorced when she was young and her dad moved their family in with her grandmother, who served as a role model and mother figure throughout her adolescence.

Although all the interview participants were able to identify a role model, the strength of that relationship varied. In the next section, covering Research Question 2, the theme will discuss when role model relationships are developed during adolescence.

Research Question 2: During what period of their adolescence did the participants develop a connection to a role model?

Theme: High school was the most influential time for role model exposure

For the majority of interview participants, the role model relationships that were identified occurred during their high school years. Several of the participants specifically identified role models related to their high school education, in the form of educators. Many of the educator role models discussed by participants focused on the academic success participants had in their adolescent years. Karli's math teacher opened her eyes to the possibilities of a career in engineering, based on her proficiencies in math and science. She noted,

If it wasn't for that math teacher who said that to me, I mean, I, I would not have just ended up on this path somehow. So, so even though it wasn't a formal mentorship, I, I think that, I think that yes, those are in important because somebody's gotta be planting those seeds for people.

In some cases, the role model relationship was focused on the transition to college. In the case of Tessa, she recalled,

I did have a teacher; I had her my sophomore year. And so then by the time I got to junior and senior year when I decided that I was going to K-State, like I wasn't in her class

anymore, but I'd go back in and talk to her and run stuff by her about college and what it was like.

For two interview participants, the educator they connected with was a music teacher. The leadership styles of those individuals were what drew Tara and Ashley to their music teachers. Tara specifically recalled being drawn to the discipline of being a part of her school band, and the guidance from her band teacher. In recalling her experiences with her band teacher, Tara stated,

So, I really learned that discipline, I think from being in that and all my friends were. And I think that's kind of what I remember, sort of the biggest influence when I was in school was just being a band. And, you know, you had to be at practice, you had to stand at attention, you had to memorize your music and, you know, learn the routine.

In addition to the connection to educators in high school, Amy also connected to her older siblings. As an immigrant family, Amy relied on her older sisters to help her navigate school and life. She noted,

and examples like my sisters for sure to just, you know, put me on the right path in some direction wherever that leads, you know, as long as it leads somewhere, but at least they put me in that initial path.

Having a role model near her age who had just experienced high school and college provided a template for success. In the next section, covering Research Question 3, the themes will discuss the types of role model relationships developed in adolescence.

Research Question 3: In what ways do the participants describe their experiences with a role model in relation to their career choice?

Theme: High school role models provided life advice

From the role models participants identified during the high school years; the most common connection point was life advice. This included generalized advice related to adolescence, navigating life after high school, and making decisions about college or other further education. As discussed in the previous theme, Tessa described how her role model teacher was able to help her navigate her college decisions and answer questions to help her prepare for that transition.

Two of the interview participants had significant events that occurred during their adolescence that impacted them. Ashley's mom died just after high school and she relied on the role models she identified from her church to help her through that difficult time in her life. In Marissa's case, she went through a personal traumatic event during her senior year of high school and did not have someone in her life she could go to. In looking back at that time in her life, she noted how having a strong female role model would have benefited her,

Definitely a strong female exposure, I went through a traumatic event when I was younger, and I needed someone strong along my side.

The sharing of experiences with role models providing life advice aligns with the questionnaire results discussed previously in this chapter.

Theme: College role models provided career advice

Three of the interview participants identified role models during their college years. For this group of role models, the connection point was focused on career advice. It should be noted that these three interview participants were my former students. Additionally, they all initially pursued a college education in an engineering field and Tessa and Marissa changed their major

to construction management after starting college. Amy completed her architectural engineering degree but opted to pursue a career in construction management. For all three, these decisions were directly impacted by their connection with a faculty member who served as a role model to them. Marissa shared her experiences with her academic advisor,

Well, we, I used to look up to her quite a bit. because obviously I don't have anyone to look up to like her and I thought ArchE was like my thing. And she was very much pushing that I should change into construction science because I wasn't making it through some of those classes. And she's like, and in the long run you'll be better off in construction science. So, it took me a while to like, actually understand that, and to like, change my mind be like, ok, well, you're just not pushing majors because you want me to change majors. So, she pushed me and then I was like, you know what, this is like a really good vibe and now that I'm in here, it's actually way better in my opinion because there's a lot of Hispanics in this industry and I wanna help them, I, I've been in their shoes that I better understanding than anything that's going on and I wanna be a change for them. And so now, and when I realized that in construction, there's a lot more Hispanics and you can have a lot more impact on them and help them.

As a first-generation Hispanic student at university, Marissa needed a role model. Through her interactions with her academic advisor, she was able to identify how she could make a real impact on the construction industry in a way that was not apparent to her previously.

Amy was another first-generation college student. She realized late in her college career that a traditional career in engineering might not be the best fit for her. In her words,

I was freaking out like senior year like, or yeah, my last semester I was like, shit, what am I gonna do? But I don't know, I think it's definitely more so of my experience. And then just realizing because like talking to Julia, Julia is probably like, if I had to choose a

mentor or role model, Julia would have been one. But like, I don't know, just talking it through with people, like, OK, I have an engineering degree. It makes sense to go engineering, get my, you know, license and all that or I can go straight to, straight to construction and do that. And so, I don't know, I guess, I mean, so I still didn't know what I wanna do. And like, but at that moment at that time, like, graduating, I knew construction, like Southland was the right road.

In Amy's situation, the role model provided the validation she needed to decide her future career direction. For those participants who were able to make role model connections during their late adolescent years, primarily associated with their college experience, the role models were able to help them navigate career decisions.

Research Question 4: How was the participant's experience with a role model influenced by societal or cultural experiences?

Theme: Participants from immigrant families identified societal influences

Of the interview participants, three came from immigrant families. Two of these participants, Marissa and Amy, shared how their experience being part of first-generation families influenced their adolescence and in part their role model relationships. One of the major impacts during this time in their lives was related to cultural differences in their school and community, and the challenges of not being a native English speaker.

Marissa's family immigrated to the United States from Mexico when she was entering middle school. The adjustments to life in the U.S. were a challenge. Marissa shared,

And when we moved here, it was completely different, the culture, the food, the weather, the people, the weather was the worst thing ever. We went from a 90 80 degree weather to like, 100 and something degrees weather and the winter was like forties probably. And then here you get, like, the teens so you and negatives, it was the worst thing. But it was

really, really hard. That, that was really hard. We go back and think about it and we're like, wow, we can't even believe that we made it.

In addition to her challenges with adjusting to overall life in the U.S., middle school was an especially challenging time. Marissa noted the greatest challenge had to do with her lack of English language skills,

I think middle school was just horrible for everyone because it's like you're finding yourself out and everything is hard, you know. I was bullied a lot when I was in middle school mostly for my accent and not knowing any English because, I was, I moved here and then I went to sixth grade, and then from there you transition to seventh grade, which is a completely different school. That was really hard. I struggled a lot. I cried so many times not wanting to be here anymore and everything.

Existing as an adolescent in a new country also was challenging for her family. Building a community was important to her parents, as Marissa shares,

We didn't know anyone. And so, my mom, we couldn't afford to have just been out working. So, then my mom started working right away and then she also didn't know anyone at work. So, then it was like everyone was new and everything was so new. But time by time, like she ended up finding females that were also like, yeah, we just moved here and we're also struggling with the same thing. So, like, and now like those people have like kids that are my age too and we're all friends and we all like know each other.

Things did start to get better for her during her high school years. Marissa was able to connect with peers through sports. As she shares,

But it got better once I got into high school. Because I started joining sports running, running was like my thing and it got a lot better. I made friends that to this day I talked to

some of them, not all of them, obviously. But yeah, it was a lot better. I have friends in sports helped a lot to take out like all the stuff that you have going on in your mind.

For Marissa, the transition to the U.S. happened during her adolescent years; for Amy, her family moved to the U.S. before she was born, so the cultural challenges were different.

Amy's parents immigrated to the U.S. from Vietnam before she and her siblings were born. Their family immigrated to an established Vietnamese community. Amy noted the influence her parents and their Vietnamese culture had on her education and interactions in the community,

But comparably for Kansas, it was quite a bit of Vietnamese immigrants. And so, I guess community-wise, my parents, they wanted us to have a good education just because they never had it. And so, they, you know, worked hard to get us through Catholic school. So, like grade school, middle school, high school is all Catholic school. So, they put us through that and yeah, I guess a lot of my relatives are still in Wichita as well. So, we had family and friends nearby.

The decision to attend Catholic school was influenced by her parents' desire for their children to have every opportunity for success. This aspect was discussed at multiple points by Amy in her interview and is best summarized by her thoughts,

So, you know, my parents being Asian who have their stereotypical Asians, right? They push us just because, you know, the opportunity. So, it's always like that pressure from them to like go to college, you know, get an education, get a job after.

One aspect of her experience as an immigrant that differed from Marissa was a disconnect from her Vietnamese heritage. Because she was exposed to U.S. culture from birth, English was more predominantly spoken in her life. Amy shared her thoughts on the Vietnamese language,

I wish I was better at speaking my parents' language, right? Like I, I know enough to get through, you know, like some conversations but I can't read or write. I can only speak.

And so that was probably one thing where it's like, ok, you know, we spoke more English at school and then coming home should speak more Vietnamese but definitely spoke more English, especially to my, like my siblings.

Another area where her Vietnamese heritage impacted her adolescence was related to food. She shared her embarrassment about bringing traditional Vietnamese food to school events,

Fortunately, you know, we usually got school lunches. But like just even like, oh what do you wanna bring, like, for a field trip? Like, we wouldn't bring, like, something weird, you know, like some Vietnamese dish.

The experiences of Marissa and Amy show how the influence of culture impacted their adolescent experiences. Both women also identified a strong role model in their lives during that time.

Theme: Gendered career or college advice was observed to be generational.

The interview participants in this study ranged in age from mid-20s to mid-60s. In asking them about their experiences both in a male-dominated career and their experiences in adolescence, the participants from older generations identified advice from adults that was focused around traditional gender stereotypes. For Amy, Marissa, and Tessa, who all experienced adolescence in the 21st century, traditional gender role advice was not experienced.

For the remaining participants, varying levels of gendered advice was identified.

In the case of Ashley and Tara, the advice was provided in a filtered manner. Ashley's experience was in being sheltered. Her family and to an extent her teachers did not share with her the opportunities that would have been perceived as male careers. In her experience,

It was partly the standard of the nineties where you have to go to college to be able to do anything. The option of a trade school or not going to school and figuring it out was not an option that was ever presented to me. I saw other people doing it, but to me that was not an option to me because it was nothing I was ever taught.

She did not recognize until later in life a variety of career opportunities existed. In the end, it was the support of her husband who encouraged her to pursue a career in construction.

Riki, who experienced adolescence in the 1960s, shared the most overt gendered advice. Her dad was active in the theater and movie production industry. He did not feel that was an appropriate career for a girl. She shared,

I mentioned that my dad was in the, in the theatrical union and in high school, I was very active in our drama club, not as an actor on stage or anything like that, but I loved working stage crew. I liked working in the electrical and lighting and, and even makeup and, you know, costuming and all that kind of stuff. I loved doing all of that kind of stuff. And I mentioned at one point to my dad, I says, hey, I think this is what I wanna do. I, you know, I, I wanna go to New York work on Broadway and on stage crew and he discouraged me. He was like, no, you really don't want to do it. It's very competitive, you know, you, you, that's just you, you're not gonna make a lot of money, blah, blah, blah, blah. And so, I just went with it, you know, like, OK, all right, I won't do that. I think that had I had the encouragement to do whatever I wanted to do. In a way, I think I would have gotten to what I wanted to do quicker.

When asked if she thought her dad was opposed to a career in the theater because she was a girl, she noted,

I think it was mostly because I was a girl. It's not something that I think he would have said directly but just with some of the, you know, some of the things that he was saying it

was, you know, yes, it's, it's competitive but it's like it's competitive but even more so because I'm a girl, you know, he just kind of left off the everything after the ellipsis. So, you know, I truly believe it, it was more because of that than anything else because my brother was doing the same thing at, at the, at the time that I was doing that, my brother was also in the union and doing the same work. And my father didn't have any problem with that. In fact, he was encouraging him to do it.

The discouragement to pursue a career in a male-dominated field was also seen in Riki's stepmother. Even in adulthood, her step-mother was encouraging her to leave construction and find a more appropriate job,

Well, even, especially my stepmother, even after, you know, I started school and was working for the general contracting company. she was still saying, you know, you really should take that civil service exam. You know, I'm in my thirties and she's telling me the same thing. I'm like, yeah, I don't think that's ever gonna happen, you know. So, it, I, I think it's just, it was that generation.

The challenges some of the participants experienced in their adolescence influenced their career paths, and the experiences they shared delayed their connection to the construction industry as a career.

Overarching Theme: Minimal exposure or connection to the construction industry in adolescence

Throughout the process of interviewing the participants, they all described how they did not either know or desire a career in the construction industry during their adolescent years. Several participants, were guided toward engineering primarily due to their high math and science proficiency and changed their path either during college or immediately after college graduation. For the remainder, the construction industry became a career opportunity much later in life. Engineering was the recommended career option for Karli, Tessa, Marissa, and Amy.

Karli recalled this experience,

And I remember my math teacher said to me, which I was very good at math and he said, man, have you ever considered being a mechanical engineer, which I had never even heard of, but that like stuck with me and then people keep asking what you're gonna do. And I just kept answering that.

Karli took her education in mechanical engineering and began a career after college working for a mechanical subcontractor.

Similar experiences were identified by Tessa and Amy. Both made the switch to construction during their college years. Tessa recalls the moment she realized construction might be right for her,

It was my like intro to engineering course, freshman year actually. And we had a Friday seminar and every week they'd bring in like the department heads and they present to us and whatever Ray said, I was like, that's it. I'm in.

For Amy, the connection to the construction industry was through her love of buildings, “just going to cities like Chicago, New York. Just seeing all those, you know, the downtown area

with all tall buildings.” This connection led her to a degree in architectural engineering and a career post-graduation in construction management.

Positive exposure to the construction industry was only strongly identified by Tara. She had the opportunity to take career and technical education (CTE) courses in drafting and electrical installation during high school. Although this experience did not guide her to a career in construction management, she did choose to pursue a career in architecture. She shares this experience,

I took a couple of drafting classes. I took blueprint reading and I took electricity. So, I was the only girl or only one of maybe two girls in the classes. But, you know, one thing which, you know, every time I read stuff about, you know, women in the industry, my teachers for the classes I took in high school related to, you know, construction never told me I couldn't be an architect.

On the flip-side, a more negative exposure to the construction industry was identified by Marissa. Her dad and other family members worked as construction laborers. She shared that in her college years,

I always thought that like, it's cool to be in construction, but like, I feel like Hispanics can't also be at the top, you know, so I wanted to be the change for that.

The opportunity to impact the Hispanic community was not identified during her adolescence, but during her college internship experiences.

All participants expressed a regret that they did not have exposure to the construction industry in their adolescence that would have helped make their entry into a career in construction management easier.

Summary

This chapter provided a traditional presentation of the findings, following the previous chapter providing an analysis of the findings through a short story I wrote using excerpts from the participants' interview transcripts. In addition to descriptive data of the participants, this chapter described the emergent themes and subthemes associated with the research questions including:

1. How do the participants describe how they identified a role model?
 - a. Theme: Casual connections
2. During what period of their adolescence did the participants develop a connection to a role model?
 - a. Theme: High school was the most influential time for role model exposure
3. In what ways do the participants describe their experiences with a role model in relation to their career choice?
 - a. Theme: High school role models provided life advice
 - b. Theme: College role models provided career advice.
4. How was the participant's experience with a role model influenced by societal or cultural experiences?
 - a. Theme: Participants from immigrant families identified societal and cultural influences
 - b. Theme: Gendered career or college advice was observed to be generational
5. Overarching Theme: Minimal exposure or connection to the construction industry in adolescence

Chapter 6 includes analysis, interpretation, and discussion of the findings for each of the research questions and emergent themes. In addition, the chapter includes the conclusion, implications, and recommendations for practice and future research.

Chapter 6 - Discussion of Findings

The previous two chapters provided the findings of this study; Chapter 4 presented the findings in the form of a short story and Chapter 5 provided the traditional presentation of data, including the emergent themes for each of the research questions. This chapter discusses the analysis of the findings, connected to the research questions and themes, as well as the conclusion and recommendations. The chapter is organized into eight sections; (1) a discussion of the first research question and its theme, (2) a discussion of the second research question and its theme, (3) a discussion of the third research question and its themes, (4) discussion of the fourth research question and its themes, (5) discussion of the overarching theme, (6) conclusions, (7) recommendations for practice, and (8) recommendations for future research.

Focused on the adolescent role model relationships of female construction management professionals, this study focused on the role model relationships identified by female construction management professionals during their adolescent years, through the following research questions:

1. How do the participants describe how they identified a role model?
2. During what period of their adolescence did the participants develop a connection to a role model?
3. In what ways do the participants describe their experiences with a role model in relation to their career choice?
4. How was the participant's experience with a role model influenced by societal or cultural experiences?

The discussion of the themes associated with the research questions is accomplished through the lens of the theoretical framework of this study, Ethic of Care.

Research Question 1: How do the participants describe how they identified a role model?

Theme: Casual Connection

The participants who did not have an immediate response to the question of who was their role model during their adolescence shows that those connections were casual and not as dominant in their lives. This phenomenon is interesting knowing that the participants were all aware the main topic of the interviews was role model experiences. Additionally, they were able to schedule their interviews at their convenience. The lack of a strong connection, even with advanced knowledge of the topic, reinforced the casual connection the participants held with a role model. The importance of strong relationships is the basis of the ethic of care. In Gilligan's work (1990, 1993, 2003), we are shown how women can fully see themselves in the world when they have deep, meaningful connections with other women. Beyond this general interpretation of the ethic of care, Taylor, Gilligan, and Sullivan (1995) elaborate that

the relationship need not be an intimate or confiding relationships, although those are the ones that are mentioned most frequently. What is essential is mutual interest and respect, in which the woman is 'into my conversation...interested in it,' and in which girls feel respected and acknowledged, like 'a person on my own'. (p.139)

This lack of memorable connection in adolescence may be explained by a lack of mutual interest and respect. This undeveloped connection may explain the emergence of the overarching theme (discussed later in this chapter) of minimal exposure or connection to the construction industry in adolescence. Due to the lack of a deep and meaningful connection with a strong female in their adolescence, the participants may have struggled to determine their career passions.

Another explanation for the lack of memorable connection may be related to the types of opportunities female adolescents have to connect with a professional as a role model. Existing

research related to role models of adolescents has focused on either exposure through imagery or stories (Betz & Sekaquaptewa, 2012; Shin, Levy, & London, 2017; Van Camp, Gilbert, & O'Brien, 2019) or short duration face-to-face interactions (Bamberger, 2014; Blake-Beard, 2011; Buck et al., 2008; Cheryan et al., 2011; Fuesting & Diekman, 2017; Gonzalez-Perez, Mateos de Cabo, & Sainz, 2020; Leblebicioglu et al., n.d.; O'Brien et al., 2019). The lack of opportunity to form strong role model relationships can be explained by a combination of a lack of opportunity and an absence of interest or respect by the adult when an opportunity is presented.

Research Question 2: During what period of their adolescence did the participants develop a connection to a role model?

Theme: High school was the most influential time for role model exposure

The participants who did identify a role model made this distinction as someone in their high school years. Identification of high school as the most influential time for a role model can be tied to this being a time of change. Gilligan (2003) stated,

Life transitions that invariably engage these experiences can be expected to involve women in a distinctive way. And because women's sense of integrity appears to be entwined with an ethic of care, so that to see themselves as women is to see themselves in a relationship of connection, the major transitions in women's lives would seem to involve changes in the understanding and activities of care. (p. 171)

Understanding the need for connection is directly tied to the transitions in life, may explain the timing of these role model connections the participants developed.

This transition is also a transition away from our mothers. Taylor, Gilligan, & Sullivan (1995) note that during this time, girls are looking for connection with "the type I wish my mother could be" and "know what things go on in school" (p. 140). This explanation of the

connections females develop during high school shows why this is a very influential time for role model exposure.

Research Question 3: In what ways do the participants describe their experiences with a role model in relation to their career choice?

Theme: High school role models provided life advice

The identification of high school role models providing life advice is not surprising, as many of the individuals identified by the participants were teachers, they interacted with during high school. Teachers are the adults that adolescents spend the most time with outside of their families and are often most familiar with post-secondary career and education options. Noddings (2012a, p.774) notes the importance of care-ethic educators establishing relationships with their students through listening and open-mindedness. In furtherance of this concept, Belenky et al. (1997) note from their experiences in college,

What these women needed and what the clinic provides, perhaps more clearly, consistently, and sincerely than any other institution we sampled, was confirmation that they could be trusted to know and to learn. Given confirmation, they felt they could “just do anything.” Lacking it, as one woman said, they were “crippled” and “just can’t function.” Most of the women we interviewed made it clear that they did not wish to be told merely that they had the capacity or the potential to become knowledgeable or wise. They needed to know that they already knew something (although by no means everything), that there was something good inside them. (p. 195)

The reinforcement the participants received from their teacher role models empowered them to continue to pursue their goals, and in several cases pursue an education or career path that they were not aware was available to them.

High school is a time when everything is changing and feels unknown. The focus on general life advice from the participants in the study can be tied to the changes the participants were experiencing in their high school lives. Taylor, Gilligan, & Sullivan (1995) expand on this experience,

Connecting with girls in a meaningful way means meeting with girls at the edge of their knowing, being willing to stay with their questions and knowledge about race, culture, class, bodies, sexuality, pleasure, and danger, and joining with them to develop and sustain their critical perspective toward conventions and their own survival strategies. (p. 141)

Looking back at my own high school experience, the need for a role model to help guide young women through the challenges of adolescence was more critical than finding someone to answer my questions about a future career. This same sentiment was voiced by several of the participants of this study.

Theme: College role models provided career advice

The participants who identified role models during their late adolescence and college years indicated that the relationships were focused on career advice. For those participants, they were able to voice their concerns about the future and take action from the advice provided by their role models. This aligns with Belenky, et al.'s (1992, p.79) fourth epistemology, subjective knowledge. Subjective knowledge is the stage where women can acknowledge "the enormity of the steps they have taken" (p.80), are moved to action, and are committed to their journey of personal development. The participants were able to see what choices their future holds and connect with a role model who would be able to help guide them through those choices.

The need for career advice during college was also identified by Shin, Levy, and London (2017). In their study of university students in STEM programs, where students were exposed to

a variety of STEM professionals from diverse backgrounds, participants indicated increased “STEM interest and identity among undergraduate students” (p. 425). Although this study did not directly relate to the construction management field of study, it does highlight the importance of role models in cementing career choices in college-aged students.

These types of role model relationships allow young females to see themselves as capable of addressing the challenges ahead of them as females in the construction industry. Mendelsohn (1990, pp. 236-238) identified this same phenomenon in her research with the Emma Willard School. The girls understood the challenges women face in their careers, but that did not diminish their desire to pursue challenging careers. Mendelsohn expands on this concept in relationship to college experiences,

Some women found the confirmation they needed in these colleges, Faith, for example, said that although she had always done well in school, no one had ever told her that she was intelligent until she came to college. There, Faith said, “people say, ‘Well you know, you’re a pretty smart person.’ If people say that to you enough you have to figure that they know at least a little of what they’re talking about. (p. 237)

In my experience advising undergraduate students in construction management, I have found that many female students seek out female faculty as role models or mentors. For many of them, we are the first professionals in the industry that they have interacted with. Providing advice and support to those students, in my experience, has increased their confidence in their abilities and expanded their horizons as to what career opportunities exist in the construction industry.

Research Question 4: How was the participant's experience with a role model influenced by societal or cultural experiences?

Theme: Participants from immigrant families identified societal influences

The two participants who shared their experiences as immigrants during adolescence identified societal influences that impacted their middle and high school years. Taylor, Gilligan, and Sullivan (1995, pp. 61-63) also observed this type of impact in their study of Latin American girls. These girls faced challenges in navigating both the traditional values of their culture and the culture of school. Taylor, Gilligan, and Sullivan best described this challenge as ‘intrapsychic or interpersonal stress according to the degree to which a girl or woman tries to adhere to strict traditional values while at the same time adopting new and conflicting values” (p. 63).

As was observed in the experiences of both Marissa and Amy, the pressures to assimilate to U.S. culture in school were in opposition to the traditional culture they were experiencing at home. The added challenge of learning a new culture and/or language can limit the opportunities to connect with an adult role model, particularly adults outside their family. This desire to assimilate can be seen in Bamberger’s (2014) research, which used socio-cultural theory as a framework. Bamberger’s approach focused on the cultural ideals of the study’s participants and how cultural ideals within a community could impact perceptions (p. 550).

The pressure to assimilate into a new culture at school, while maintaining the family's culture at home must be a challenging situation for any adolescent. Although neither of the participants indicated a lack of diverse adults in their lives, one can assume that the opportunity to find an adult role model to whom they could personally relate is a greater challenge than a white student would experience.

Theme: Gendered career or college advice was observed to be generational

The participants in this study represent a range of ages from early 20s to late 60s. Of the participants who experienced adolescence in the 1960s and 1970s, more gendered career and college advice was observed. This is not surprising when looking back at the events of that time. Gilligan's research into the ethic of care began out of frustration with the male-centered research of Kohlberg in the late 1970s (Kohlberg & Hersh, 1977). In the United States, between 1920 and 1972 multiple attempts to pass an Equal Rights Amendment (ERA) were attempted (Suk, 2021, p. 823). It wasn't until 1972 that the movement grew to a level of common discourse among the public. It was during this time, that several of the participants were experiencing adolescence, so it is no wonder that their families were not overtly supportive of careers in traditionally male fields.

If we look at the timeline of research into the Ethic of Care and related fields of study, many of the lead researchers did not publish their findings until after this generation of participants was well into adulthood. Noddings and Witherell's (1991) contributions to Ethic of Care in the field of education were not published until the 1980s. Belenky et al.'s (1997) research into the Women's Way of Knowing was not published until the 1990s. Additionally, the research discussed in Chapter 2 related to females in construction management (Bigelow et al., 2015; Bigelow et al., 2016; Carnemolla & Galea, 2021; Oo, Feng & Teck-Heng, 2019; Oo & Zhang, 2018; Sewalk & Nietfield, 2013) was not published until the 2010s. This research focus did not gain traction until the participants who reported gendered advice were well into adulthood.

As the perception about non-traditional careers, and particularly STEM careers has shifted over time, more and more young women are encouraged to pursue these types of opportunities. In 1970, only 8% of STEM fields were occupied by women and by 2019 that value had risen to 27% (Martinez & Christnacht, 2021). As previously discussed in Chapter 1,

the percentage of women in the construction industry has only reached 10% (U. S. Bureau of Labor Statistics, 2020). Although the younger participants in this study did not identify any gendered advice from adults in their lives, representation of women in the construction industry remains below overall STEM representation.

Overarching Theme: Minimal exposure or connection to the construction industry in adolescence

Throughout the process of interviewing the participants of this study, one strong theme emerged. All of the participants reflected on the absence of a strong connection to the construction industry during adolescence and a desire to provide that connection to future generations. Taylor, Gilligan, and Sullivan (1995) identified this same desire in their research,

The kind of intervention this suggests is not simply more career counseling or more career days in school, however beneficial these may be. It also suggests ongoing opportunities for connection with women who work in many different industries, in jobs that do not require a college education as well as those that do. Learning from the experience of women with working-class and poor backgrounds, including those who have continued their education beyond high school or have entered professions dominated by the middle class, would also be invaluable. (p. 199)

Not showing young women that they can be a part of careers that are traditionally dominated by men only perpetuates the problem of increasing participation by women in these fields. As previously discussed in Chapter 2, after more than 50 years of applying the Draw a Scientist Test (DAST) to school-aged children (Chambers, 1983) students still struggle to identify women as scientists. In 2016, only 58% of girls in DAST studies identified a female scientist (*50 Years of Children Drawing Scientists*, n.d.).

The representation of women as role models in the construction industry is challenged by the small portion of the industry these women represent. This puts a greater demand for time on women interested in interacting with youth. As discussed in Chapter 2, the majority of current research into female involvement in the construction industry has been conducted by men, which places that research outside of the lens of the female perspective (Bigelow et al., 2015; Bigelow et al., 2016; Carnemolla & Galea, 2021; Oo, Feng & Teck-Heng, 2019; Oo & Zhang, 2018; Sewalk & Nietfield, 2013).

While attending the National Association of Women in Construction Annual Conference in August 2023, I attended a workforce development panel. The panel was a group of individuals directly involved in the development of new construction workers. The panel was one white woman, one Black woman, and two Black men. They were all leaders in the field of workforce development and provided a broad perspective on the challenges of recruiting workers for construction careers. During the discussion, panelist Cornel Johnson, Director of Diversity, Equity & Inclusion at the Center for Energy Workforce Development, talked about the unspoken network of brothers, uncles, and dads, nicknamed BUDs. I had never heard of this term, but in his explanation, it is the idea that who someone knows is as important as what someone knows. Johnson suggested that the women working in construction fields need to create their own network, SAMs – sisters, aunts, and mothers. While I agree that this is a great idea in theory, when the quantity of SAMs is one-tenth that of the BUDs, it is a challenging task to take on and emphasizes the need for more opportunities for construction career exposure during adolescence.

Ethic of Care within Narrative Inquiry

Throughout the process of interviewing the participants of this study, I used the Listening Guide method of interpretive analysis developed by Brown and Gilligan (1992). This listening method allowed me to approach the interview process in a manner that created an environment

where the participants felt comfortable sharing their stories. Taylor, Gilligan, and Sullivan (1995) used the Listening Guide in their research and found that,

Listening to girls speaking, we also listen for the unspoken – places where there is no voice or where girls may have silenced their experience or have simply not been heard – either in the interview itself or later, in the course of interpreting the interview. (p.14)

Of the participants selected for this study, some were known to me as acquaintances in the construction industry and as former students. For those individuals, the development of a care relationship in the interviews was not challenging. So much so, that one participant felt comfortable sharing a significant life event that impacted her life path after high school. While sharing her story, she was able to express that although it was a difficult experience at the time, she was comfortable sharing details and the impact with me. Taylor, Gilligan, and Sullivan (1995) identified similar experiences where,

the individual has the opportunity to consider what happened, what she thought, felt, and did, and how things turned out. Authoring, furthermore, is enabled and encouraged by just such a reflective consideration of one's experience in the process of narrating a story of moral conflict, because to claim authority and assume responsibility one must be fully aware of the consequences of one's thoughts, feelings, and actions. (p. 9)

Although the participant was able to claim authority of her story, I struggled with whether that story should be included in this study. I ultimately decided that the impact of the story was not significant enough to include the details, which could pose harm to the participant if made public.

Another aspect of the narrative inquiry method used in this study that relates to Ethic of Care is the opportunity to allow the participants to share their voice in relation to their experiences in adolescence. Tappan and Brown (1991) emphasize the importance of storytelling

as “giving meaning to our life experiences, whether as mundane as going to the grocery store or as momentous as a moral crisis that changes our lives forever” (p. 177). For many of the participants, I was able to see through their mannerisms and willingness to share, that having the opportunity to share their stories was an important way to give back to future generations of young women entering the construction industry. The experience, as described by Witherell (1991) provided an “integration of value, purpose, and meaning, where value represents the value we attach to the present, purpose entails our sense of future possibility and aspirations, and meaning is our memory and interpretation of the past” (p. 92). The hope for the future and willingness to connect with future generations came through in each of the interviews.

Conclusion

Recommendations for Practice

The recommendations gleaned from this study fall into two categories, recommendations for educators and recommendations for construction professionals. These recommendations are shaped by the words of the participants of this study. In each interview, the participants provided feedback on how their personal experiences during adolescence could have been impacted by stronger role models. They also shared their desire to be a part of the solution.

Recommendations for Educators

Throughout the interviews for this study, the participants openly shared their desires for a strong role model in their adolescence and how that connection would have influenced the timeline of their career path. From those comments, two recommendations for educators were identified, listening and connecting to the construction industry.

The first recommendation, listening, is simultaneously easy and difficult. Multiple participants indicated the need for someone to confide in during the difficult years of adolescence. Amy shared a need for “someone I could confide in and get advice. It would have

been nice to have someone to talk to”. This desire for support, for someone to listen to their dreams and not dismiss them was also identified by Riki,

I think about those moments when my parents were saying no, you can't do that and ultimately, I proved them wrong. You know, I don't want a, a child, a 15-year-old child to feel like they have to prove their parents wrong. They just need to know that they can be whatever they want to be, do whatever they want to do.

The themes of this study identified that many of the relationships female adolescents develop are with the adults they are regularly in connection with. School is the one place where adolescents spend the majority of their time, so creating an environment within the school that allows students to connect with adults in a safe, positive manner is valuable. Gilligan (2014), stated, “Active listening means asking, how might I call forth a voice that is held in silence” (p. 104). As educators, we can take this simple, but challenging, step to connect with our female students.

The second recommendation, connecting to the construction industry, comes after the listening has been established. Many existing programs provide education to young people about the construction industry. These include the ACE (Architecture, Construction, Engineering) Mentor program (ACE Mentor Program, n.d.), where students are connected to a mentor from the construction industry, the NAWIC Education Foundation K-12 programs (NEF, n.d.), which provide educational programs that can be implemented by educators or construction professionals in the classroom, or any of the multitude of corporate and non-profit programs that exist in communities across the U.S. A list of national and Kansas/Missouri programs can be found in Appendix F. The participants in this study shared their connection to these different programs and the joy they experienced from connecting with female students. Tara shared that she volunteers with the ACE Mentor Program (ACE Mentor Program, n.d.) and Camp NAWIC

(NAWIC Kansas City, n.d.). She reflected that those types of experiences would have been beneficial when she was taking drafting classes in high school,

I wish I would have had this as a kid just to understand, you know, all that was out there.

Because we never had anybody come into our drafting classes to talk to us. No professionals, which is kind of a shame.

For educators to successfully implement these recommendations, they need the support of construction industry professionals, particularly female professionals.

Recommendations for Construction Professionals

Throughout the construction industry, many different programs for providing mentors or educational programs to adolescents exist. The challenge lies in connecting those programs to schools. To address this challenge and the themes identified in this study, I propose two recommendations specifically for the construction industry: consolidation of resources, and engaging more female professionals.

The first recommendation is to develop a centralized internet resource to consolidate all of the many construction education and mentoring programs that already exist. For an industry that relies heavily on networking, the implementation of these types of programs is disjointed. Each industry organization has developed its program targeted towards adolescents, focusing on different aspects. For educators to connect with these programs requires the educator to either already know about the program or for a construction professional to connect with the school directly. By creating a centralized website, educators can easily identify the programs that are available in their area.

The second recommendation is to engage more female construction professionals in these education programs. For several of the participants of this study, their experience with educational programs or mentoring programs in adolescence resulted in exposure to only male

professionals. Tara participated in an Architectural Institute of America (AIA) mentoring program and was partnered with a male architect, but in reflecting on her experience felt it would have been a better fit if she had a female mentor. The desire to be involved in these programs as construction professionals was noted by multiple participants of this study. Tessa's firm organizes a competition for K-12 students where the students are challenged to solve real-world problems (Burns & McDonnell, n.d.). She enjoyed her experience in the program and stated, "I loved helping out with that and I, wanted to be involved in the outreach that we do." In my personal experience, the desire to help females in the construction industry is not lacking. In some cases, the challenge is that these programs have champions and those individuals may not reach out to others within their organization or firm to participate. Expanding who is involved in these programs will allow students to see the diversity within the construction industry.

Recommendations for Future Research

There are several recommendations for future research associated with this study. The first recommendation is to expand the scope of this study to include tradeswomen, engineers, and architects. This would allow for a more holistic view of the representation and perspectives of women in the construction industry, not just those whose career focuses on construction management.

The second recommendation is to develop a more detailed questionnaire based on the interview responses collected in this study to determine if the themes identified are predominant across the construction industry. This additional data, in conjunction with the expansion of the participant population, can provide more depth to the data collected in this study.

The third recommendation is related to existing educational programs provided by the construction industry. The recommendation is to develop a pre-test and post-test questionnaire to be administered in conjunction with the existing education programs. Existing research

discussed in Chapter 2 related to exposure to the construction industry used a pre-test and post-test methodology, but this methodology has not been applied to the programs identified in Appendix F.

The fourth recommendation is to develop a longitudinal study of female students who participate in construction education programs (Appendix F) to identify the influence of mentoring on their career selection. Much of the existing research discussed in Chapter 2 relies on the immediate post-activity responses from students. By creating a longitudinal study that tracks these female students through their post-high school experience and into their careers, we can better understand the long-term influence that mentoring or role models have on adolescent females.

Summary

This study focused on the role model relationships female construction management professionals developed in their adolescent years. Specifically, the study explored (a) how role model relationships were described, (b) when during adolescence connections to a role model were developed, (c) how role model relationships influenced career choices, and (d) how role model experiences were influenced by societal or cultural experiences. Ethic of Care framework (Gilligan, 2003) provided the lens through which the narrative inquiry analysis of interview and observational data were analyzed and interpreted.

The analysis resulted in seven different themes emerging; the first theme showed that most role model relationships were casual connections; the second theme identified that high school was the most influential time for role model exposure; the third theme discussed the importance of life advice was during high school; the fourth theme discussed the importance of career advice during high school; the fifth theme discussed the societal influences experienced by immigrant families; the sixth theme discussed the generational impact of receiving gendered

career advice; and the seventh theme addressed minimal exposure to the construction industry during adolescence.

Understanding the stories of construction management professionals during their adolescence is a key part of expanding the participation of females in the construction industry. The sharing of more stories, like those collected in this study, creates an opportunity for more engagement between adolescent females and construction industry role models.

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Appendix A - Participant Selection Questionnaire

Questions to be included in the Participant selection questionnaire and the Qualtrics logic are listed below.

1. Have you completed a degree in Construction Management, Construction Science, Construction Engineering or related fields? (multiple choice)
2. What U.S. state do you primarily work in? (drop down selection)
3. Which race or ethnicity best describes you? (multiple choice)
4. How old are you? (multiple choice)
5. In your adolescent years, how would you describe your family's economic status?
6. What is the highest level of education one or both of your parents achieved?
7. Do you have a role model that you recall from your adolescent years (age 10-19?) (YES/NO)
8. Did your role model influence your decision to pursue a career in construction management? (YES/NO)
9. Would you be willing to be interviewed regarding your experiences with role models in your adolescent years? (YES/NO)
 - a. If answering YES to the previous question, the following questions will be asked:
 - i. Provide the informed consent wording and request consent.
 - ii. What is your first/last name?
 - iii. How would you like to be contacted about scheduling an interview?
(Call/Text/Email)
 - iv. Please provide your contact information.
 - b. If answering NO to the previous question, no additional questions will be asked.

10. At the completion of the questionnaire, the respondents will be provided with the following information:

Thank you for your participation in this research on the influence of role models on female construction management professionals in their adolescent years. Your participation was important in identifying common themes among female construction management professionals and their role model experiences. The results of this study will be published in the form of a dissertation report at a date to be determined. Your participation will remain confidential. If you have any additional questions regarding this research, please contact Katie Loughmiller (loughmil@ksu.edu or 785-477-2732).

Appendix B - Observation Checklist

Participant Name: _____

Date/Time of Interview: _____

Location of Participant: _____

Description of the participant's environment:

Description of the participant's behavior and mannerisms during the interview.

Appendix C - Interview Questions

List of semi-structured interview questions. More questions will be added as the interview is conducted.

Initial Interview Questions

1. What is your current career?
 - a. Describe your day-to-day responsibilities
2. How did you decide to pursue a career in construction management?
3. Where did you go to college or further education?
 - a. What was that experience like?
 - b. What relationships within the construction management program did you develop?
4. Where did you grow up?
 - a. Share about your family/community
 - b. Share about your middle/high school experiences
5. Who in your life was a role model(s) in middle/high school?
 - a. How did you first meet or interact with this person?
 - b. How did this person influence your educational decisions?
 - c. How did this person influence your career decisions?
 - d. What is an example of an event/experience related to that role model that you remember?
6. If no specific role model identified:
 - a. Who was a significant influence on your life in middle/high school?
 - b. How did you first meet or interact with this person(s)?
 - c. How did this person influence your educational decisions?

- d. How did this person influence your career decisions?
 - e. What is an example of an event/experience related to that role model that you remember?
7. If no significant adult influence:
- a. How did you navigate your middle/high school experience?
 - b. What influenced your educational decisions?
 - c. What influenced your career decisions?
 - d. What event/experience most impacted your educational or career decisions?
8. Women's way of knowing:
- a. During this time did you feel powerless?
 - b. During this time did you listen to the voices of others?
 - c. During this time did you feel you had an inner voice guiding you?
 - d. During this time did you reflect on yourself?
 - e. During this time did you find yourself adopting traditional male traits?
 - f. During this time did you have a deep understanding of the value of your life experiences?

Follow-up Interview Questions

Remembering back to our previous interview

1. What additional people, if any, do you recall who influenced your educational decisions?
2. What additional people, if any, do you recall who influenced your career decisions?
3. What additional events or experiences, if any, do you recall related to the role models previously shared?

Revised Questions:

- How did your mom or dad influence your educational or career decisions?
- How did your grandmothers or grandfathers influence your educational or career decisions?
- How did your aunts/uncles or older cousins influence your educational or career decisions?
- How did your older siblings influence your educational or career decisions?
- Did you have any “other mothers” in your life? How did they influence your educational or career decisions?
- What type of formalized mentoring would you have wanted as an adolescent?
 - Career specific?
 - Strong female exposure?

Appendix D - Interview Protocol

Prior to the Interview

Prior to the first interview, the participants will be briefed on the following:

1. The purpose of the research
 - a. The primary aim of this study is to identify the role model relationships female construction management professionals developed in their adolescent years.
2. The procedures of the research
 - a. Sources and methods of data collection
 - i. Interview as the primary source of data collection
 1. Interview will be recorded using Zoom (audio and video).
 - ii. Observation data from notes during the interview.
 1. I will be taking hand notes during the interview.
 - iii. Notes from field journal taken after completion of the interview.
 - b. Participant checking
 - i. Participants will have the opportunity to review transcripts, make additions, and/or changes to ensure their meaning, information, and data are accurate.
3. The risks (if there are any) and benefits of the research
 - a. Risks
 - i. No risks anticipated to the participant.
 - b. Benefits
 - i. No direct benefits but your participation will further enhance the impact of the study on adolescent role model relationships of female construction management professionals

4. Participation is voluntary, and the participant may choose to withdraw from the research at any time without repercussion.
5. Procedures used to identify and protect confidentiality
 - a. No direct attribution of information to the participant
 - b. Pseudonyms will be used for all participants
6. Signing the consent form
 - a. Both researcher and participant will sign the informed consent
 - b. Electronic copies will be provided to both the researcher and participant

Prior to Follow-up Interview

1. The purpose of the research
 - a. Insert here
2. The procedures of the research
 - a. Sources and methods of data collection
 - i. Interview as the primary source of data collection
 1. Interview will be recorded using Zoom (audio and video).
 - ii. Observation data from notes during the interview.
 1. I will be taking hand notes during the interview.
 - iii. Notes from field journal taken after completion of the interview.
 - b. Participant checking
 - i. Participants will have the opportunity to review transcripts, make additions, and/or changes to ensure their meaning, information, and data are accurate.
3. The risks (if there are any) and benefits of the research
 - a. Risks

- i. No risks anticipated to the participant.
- b. Benefits
 - i. No direct benefits but your participation will further enhance the impact of the study on adolescent role model relationships of female construction management professionals
- 4. Participation is voluntary, and the participant may choose to withdraw from the research at any time without repercussion.
- 5. Procedures used to identify and protect confidentiality
 - a. No direct attribution of information to the participant
 - b. Pseudonyms will be used for all participants

Conclusion of Interviews

At the conclusion of each interview:

- 1. Thank participant
 - a. Debriefing statement, which includes contact information

Thank you for your participation in this research on the influence of role models on female construction management professionals in their adolescent years. After the completion of this interview you, as a participant, will be provided with a copy of the interview transcript for your review. You will be provided the opportunity to respond with any clarifications or changes to the transcripts. Your participation was important in identifying common themes among female construction management professionals and their role model experiences. The results of this study will be published in the form of a dissertation report at a date to be determined. Your participation will remain confidential. If you have any

additional questions regarding this research, please contact Katie Loughmiller (loughmil@ksu.edu or 785-477-2732).

2. Explain the participant checking process and discuss the timeline
3. Following the conclusion of the recorded interview, record information
 - a. Record field journal notes
 - b. Record additional observation notes as needed
4. Listen to the participant's interview

Appendix E - Informed Consent

KANSAS STATE UNIVERSITY

INFORMED CONSENT

PROJECT TITLE: Nature of adolescent role models on female construction management professionals

PROJECT APPROVAL DATE/ EXPIRATION DATE: TBD

LENGTH OF STUDY: 90 minutes (first interview), 60 minutes, (follow-up interview)

PRINCIPAL INVESTIGATOR/CO-INVESTIGATOR(S): Katie Loughmiller (Co-PI) and Dr. Kay Ann Taylor (PI)

CONTACT DETAILS FOR PROBLEMS/QUESTIONS: Katie Loughmiller
loughmil@ksu.edu

IRB CHAIR CONTACT INFORMATION: *For the subject should he/she have questions or wish to discuss any aspect of the research with an official of the university or the IRB. These are:* Lisa Rubin, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224; Brad Woods, Associate Vice President for Research Compliance, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.

PROJECT SPONSOR: None

PURPOSE OF THE RESEARCH: The primary aim of this study is to identify the role model relationships female construction management professionals developed in their adolescent years.

PROCEDURES OR METHODS TO BE USED: Participant interviews will be face-to-face, using Zoom video conferencing, lasting about 90 minutes for the initial interview. The follow-up interviews will be approximately 60 minutes. These interviews will be recorded using Zoom video conferencing. Additionally, there will be observational notes taken during the interviews.

ALTERNATIVE PROCEDURES OR TREATMENTS, IF ANY, THAT MIGHT BE ADVANTAGEOUS TO SUBJECT: N/A

RISKS OR DISCOMFORTS ANTICIPATED: We do not anticipate participation would result in any risks or discomfort.

BENEFITS ANTICIPATED: There may be no direct benefits to you as a participant. We anticipate your participation in this study will further enhance the impact of the study on adolescent role model relationships of female construction management professionals.

EXTENT OF CONFIDENTIALITY: None of the information you share with us will be attributed to you directly as all participants will be given a pseudonym. Identifiable information

will be removed and the information provided may be used for future research studies or distributed to another investigator for future research studies.

IS COMPENSATION OR MEDICAL TREATMENT AVAILABLE IF INJURY OCCURS: *N/A*

PARENTAL APPROVAL FOR MINORS: *N/A*

Terms of participation: I understand this project is research, and that my participation is voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

PARTICIPANT NAME: _____

PARTICIPANT SIGNATURE: _____

WITNESS TO SIGNATURE (researcher/CO-PI): _____

Appendix F - Construction Education Resources

Below is a list of National and Kansas/Missouri area construction education resources and programs. This list is comprised of resources either revealed during participant interviews or within the literature review for this study. Programs similar to the ones identified from Kansas and Missouri exist in communities across the United States but were not included in this appendix.

ACE Mentor Program: Architecture, Construction, Engineering

- Website: <https://www.acementor.org/>
- The free after-school program connects high school students with experts in the architecture, construction, and engineering career fields (ACE Mentor Program, n.d.).
- The program reaches 1500 schools and over 10,000 students annually (ACE Mentor Program, n.d.).

Architecture & Construction (CTE Career Cluster)

- Website: <https://www.ksde.org/Agency/Division-of-Learning-Services/Career-Standards-and-Assessment-Services/Content-Area-A-E/Architecture-Construction-CTE-Career-Cluster>
- State of Kansas Education Department curriculum standards for high schools providing an Architecture and Construction Pathway.

Associated General Contractors (AGC) - Build-up Programs – State Level Programs (Kansas program described below)

- Website: <https://buildupks.com/>

- A program connecting Kansas high school students to trade school, community college, and 4-year college programs focused on the construction industry (Build Up Kansas, n.d.).
- The program provides financial support for skilled trade instructors in high schools across the state of Kansas (Build Up Kansas, n.d.).

Burns & McDonnell Battle of the Brains

- Website: <https://www.botbkc.com/>
- A K-12 STEM competition hosted by Burns & McDonnell. Students compete to earn grants for their school's STEM education programs by creating exhibit concepts for Science City in Kansas City, MO (Burns & McDonnell, n.d.).
- Over 30,000 students from 55 different school districts have participated in the program (Burns & McDonnell, n.d.).

Camp NAWIC – Construction Camp for High School Girls

- Website: <http://www.kcnawic.org/camp-nawic.html>
- A free hands-on summer day camp where girls learn basic skills of carpentry, welding, and electrical wiring. Camp includes a field trip, demonstrations, and interactions with construction industry professionals (NAWIC Kansas City, n.d.)

Construction Industry Education Foundation (CIEF)

- Website: <https://www.cie.foundation/high-school-programs.html>
- High school programs connecting students to the construction industry (CIEF, n.d.)
- CREATE Mentoring Program connects students to construction industry professionals through a simulated real-world project (CIEF, n.d.).
- CREATE Summer Camp provides a six-day camp for students interested in careers in construction, engineering, and architecture (CIEF, n.d.).

- Design Build Competition is a team-based competition where students design and construct a small structure based on the competition criteria (CIEF, n.d.).

Kansas State University/U.S.D. 383 Summer STEM / Virtual STEAM Camps

- Website: www.k-state.edu/stem-career-education
- Summer camp opportunities for grades 5-8 focused on a variety of STEM/STEAM related topics.
- STEAM Virtual camps are available to students across the U.S. STEM topics vary by summer and cover a variety of STEM fields related to degrees offered at Kansas State University (College of Education, 2022).
- In-person summer day camps for students in the Manhattan, KS area. Construction industry specific sessions include tree house architecture, drafting, and tiny house design. Sessions are co-taught with U.S.D. 383 teachers and Kansas State University faculty (U.S.D. 383, n.d.)

National Association of Women in Construction Educational Foundation (NEF)

- Website: <https://nef-edu.org/>
- Provide educational opportunities to promote the construction industry (NEF, n.d.)
- Five self-paced certification courses covering construction management topics designed for adults pursuing a career in construction management (NEF, 2023).
- The Block Kids building competition for K-6 students. The program reached over 2,400 students in 48 cities across the U.S. Students are challenged to create something construction-related using building blocks and other materials (NEF, 2023).
- The Design Drafting competition for middle and high school students. The program provides a design problem for students who are asked to create design documents for (NEF, 2023).

National Center for Construction Education and Research (NCCER)

- Website: <https://www.nccer.org/>
- A not-for-profit foundation that supports craft training for the construction industry (NCCER, n.d.).
- Includes over 2,500 instructors providing over 23 million training modules in 2022 (NCCER, 2022).

National Institute for Construction Excellence – Kansas City

- Website: www.nice-kc.com
- Provide a variety of educational programs for high school students and educators related to the construction industry (NICE Kansas City, n.d.).
- The iBuild Showcase is an annual exposition for the Kansas City area to connect students to the construction industry through contractors, architects, engineers, and post-secondary education programs (NICE Kansas City, n.d.).
- The Institute for Shaping the Built Environment (ISBE) is a middle school curriculum that introduces students to sustainable design and construction and includes a design-build competition that is presented at the iBuild Showcase (NICE Kansas City, n.d.).