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A MULTICASE STUDY OF THE IMPACT OF PERCEIVED GENDER ROLES ON
THE CAREER DECISIONS OF WOMEN IN SCIENCE-RELATED CAREERS

by

Stephen Frank Hren

A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF EDUCATION

in

Education

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2012

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ABSTRACT

A Multicase Study of the Impact of Perceived Gender Roles on the Career
Decisions of Women in Science-Related Careers

by

Stephen Frank Hren, Doctor of Education

Utah State University, 2012

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The purpose of this study was to determine how perceived gender roles developed throughout childhood and early adulthood impacted the career decisions of women in science-related career fields. An additional purpose was to determine if my experiences as I analyzed the data and the propositions discovered in the study would become a transformative agent for me. A multicase framework was utilized so that within and between case analyses could be achieved. Four women who showed early promise in science were chosen as the case study participants.

The relationship of gender roles to the career decisions made by the four cases were arbitrated through three areas: (a) supports, which came from parents, immediate family members, spouses, teachers, mentors, and collaborators; (b) opportunities, which were separated into family experiences and opportunities, school and community opportunities, and postsecondary/current opportunities; and (c) postmodern feminism,

which was the lens that grounded this study and fit well with the lives of the cases. As seen through a postmodern feminist lens, the cases' social class, their lived experiences tied to their opportunities and supports, and the culture of growing up in a small rural community helped them develop personas for the professions they chose even where those professions did not necessarily follow from the early promise shown for a science-related career. In addition, as related to my transformation as a male researcher, being a male conducting research in a realm most often shared by women, I was able to gain greater empathy and understanding of what it takes for women to be successful in a career and at the same time maintain a fruitful family life.

(293 pages)

PUBLIC ABSTRACT

A Multicase Study of the Impact of Perceived Gender Roles on the Career
Decisions of Women in Science-Related Careers

by

Stephen Frank Hren, Doctor of Education

Utah State University, 2012

This study was done to determine how the perception of gender roles developed throughout childhood and early adulthood affected the career decisions of women who showed early promise in science. In addition, this study was done to determine if my experiences as a researcher would have any impact on me personally. Four women were chosen as case study participants, providing for comparison within and across cases.

Gender roles were found to relate to the career decisions made by the four cases in three ways: (a) support from family members, teachers, mentors, and collaborators; (b) opportunities within the family, school and community, and postsecondary venues; and (c) by respecting the diversity among the four women in this study which allowed for their voices and life experiences to be shared. The women's social class, experiences in life that were tied to their opportunities and supports, and the culture of growing up in a small rural community helped them develop identities for the professions they chose. This was true even where those professions did not necessarily follow from the early promise shown for a science related career. In addition, as a male conducting research in a subject area most often studied by women, I was able to gain greater empathy and understanding of what it takes for women to be successful in a career and at the same time maintain a fruitful family life.

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To my dear spouse, Deb, you are an inspiration to me on a daily basis. Your ability to be so involved in our community, your work, and especially with our family is remarkable to me. You are my role model for work ethic and desire to do one's best in all situations. Thank you! To my children, Taylor, Stephen (CJ), Christopher, Rhiannon, and Nicholas, thank you for putting up with me during this long process and listening to me every time I would say that I will be finished soon. I hope that I am a role model for being a life-long learner and that you all will be the same.

To my brother and sisters, I am finally finished. Thank you for always supporting me throughout my life. You all are near and dear to my heart. The experiences we shared growing up have made us who we are today.

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Stephen Frank Hren

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CHAPTER I

INTRODUCTION

Problem

Increasing numbers of women are gaining undergraduate and graduate degrees in many science-related career fields as compared to men (National Center for Education Statistics [NCES], 2004). Coupled with this trend, attitudes toward traditional gender roles are beginning to change in relation to work and home influences (Buck, Leslie-Pelenky, Lu, Plano-Clark, & Creswell, 2006; Kaufman, 2005). However, in a more recent newspaper article, Boss (2007) discussed the timely issue of gender roles. Even though gender roles are changing in today's society, it seems that many women are still yearning to have a spouse at home who will take equal responsibility for domestic tasks and provide emotional support for them in their chosen careers. According to this article, many women still have to do the bulk of domestic tasks even though they are working full time in their careers outside of the home. Advancement in their careers was thought to be negatively impacted due to the added stress of domestic responsibilities and lack of emotional support from their significant others. The contents of this article were supported by a study by Park, Smith, and Correll (2008). In this study, 631 participants responded to two different scenarios related to job and family/private life. Statistical correlations were performed on the survey results. According to the findings, women and men perceived that both genders who worked more hours in their career field had higher job competence and lower warmth ratings. However, women were still expected to assume more of the child care responsibilities as work hours increased as compared to

men working similar hours.

Studies have been conducted that addressed, in part gender and gender role influences on women in science fields as well as in science-related academia. In a study conducted by Tindall (2006) that looked at the factors in the life histories of women in academia in science and engineering that influenced their success, it was suggested that most of the female study subjects did not perceive any negative influence in regard to gender or gender roles and their success in school or as engineering professionals. Tindall suggested that further study in this area, especially in terms of replication of these findings in other science-related careers should be conducted. In a contrasting study, Koehl (2005) believed that gender and gender roles can still have a negative influence on women's success in science academia and science-related professions. The study utilized the oral histories of seven women in science, technology, engineering and math. Themes emerged in relation to family life, education, and experience with science. Koehl suggested that further study be conducted in regard to gender and gender roles to determine the impact on women in science, in academia and other science career related professions. In a study conducted by Carlone and Johnson (2007), in addition to gender and gender role influences on women's pursuit of science-related careers, the race and ethnic backgrounds of women have an effect as well. According to Carlone and Johnson, often professors do not understand women's backgrounds, especially those from racially and ethnically diverse cultures. These misunderstandings affect the type of identity women form in relation to science-related fields and directly impact their future careers in the sciences. Carlone and Johnson suggested using their findings to further investigate

the dynamics involved in women's formation of science identities. Perhaps, women from other backgrounds, such as those who have grown up in a rural setting, may have experiences that impacted their identity formation in the sciences as well.

When addressing the issue of gender roles, a study conducted by Settles, Cortina, Stewart, and Malley (2007) suggested that women in science-related fields reported greater job satisfaction if they had a voice and believed they were being heard in the workplace or academic setting. These researchers suggested that women gained a stronger voice if they were mentored by other women as compared to being mentored by men. They went on to suggest that further research should be conducted to determine why being mentored by men resulted in women feeling less empowered. However, there was no indication for gender preference of the researchers for these future studies. It may be possible for men to gain greater empathy than they currently have for women's feelings of success and career maintenance in science-related fields and academia if more men conducted some of the research in this realm. The old adage of "walking in someone else's shoes" to better understand their circumstances may be warranted in this situation.

In an experimental study conducted by Diekmann and Goodfriend (2006), the perceptions of gender roles in relation to career choices of women were studied. The findings of the study suggested that women were accepted by society more than men if their roles changed in relation to their career path. For example, if women were in a more traditional male dominated career such as law, it was acceptable for them to become more competitive and aggressive as compared to a man in a more female dominated career field. If men were to become more communal and nurturing, it was not as

acceptable or valued. The researchers concluded by suggesting that for new gender roles to be valued and societal change to result, counter stereotypical gender roles need to be accepted. In the case of this study, a male researcher investigating a topic usually studied by women researchers could be viewed as another example of a counter stereotypical role.

Purpose

The purpose of this comparative case study will be to determine how four women's perceptions of gender roles affected their decision-making processes in regard to their respective careers. As a male researcher, my attempt to understand women's perceptions of gender roles through this proposed investigation may add a different perspective to much of the existing research on this topic and perhaps may be a transformative process for me as a male researcher as well.

Research Questions

1. In what ways do perceived gender roles, developed throughout childhood and early adulthood, impact women's career decisions?
2. How will the analysis of data and the propositions discovered in this study lead to transformation in the researcher?

Operational Definition of Terms

The following terms and their operational definitions will be useful to better

understand the purpose of this study and literature review topics.

Postmodern feminist lens as it related to science-related career fields and the four cases' experiences in this study. Viewing science-related career fields through the lived experiences of the four cases in order to develop an understanding of how their backgrounds influenced their decisions and life paths in a manner not stereotypical of traditional gender feminism. For a detailed analysis of a postmodern feminist lens in science, the reader is directed to the Literature review section.

Gender roles as they related to science-related career fields and the four cases' experiences in this study. Societal and familial expectations on the relationship between the cases' perceived roles as contributing members in society and how these perceptions affect the daily routines in their related career field and family lives. Discussion of gender roles as they relate to science-related career fields will be discussed in more depth in the Literature review section.

Personal identity development as it related to the four case studies working in their current vocational fields and my journey as a male researcher in a field most often studied by females. The familial, sociocultural, educational, and economic status influences that impacted the way in which the four cases developed the identity of an individual that works in their chosen career path and how my identity was influenced by the propositions developed from this study. Discussions of these major influences on identity development can be found in the Literature Review section.

CHAPTER II

LITERATURE REVIEW

The career paths pursued by individuals are influenced by a number of factors. These factors often include historical, sociological, and personal influences that can have a general affect across all career domains. However, these influences can have manifestations in specific fields and for specific types of individuals. In this review of literature, I will explore the pertinent historical, sociological, and personal influences as they relate to choices made by women who show early promise (i.e., during high school) for careers in science or science-related fields.

Historical factors will be represented through an investigation of the history of science education for girls in the United States. Having an understanding of this historical view is important as a means to frame my study.

Sociological factors will be understood through an explanation of gender role influences on identity development of women in science and the workplace. Among these factors are the influences of the socioeconomic and racial/ethnic backgrounds of families. Along with these backgrounds, factors related to their experiences in school through college and graduate levels have much to do with the identity women develop.

Personal perspectives will be investigated through feminist literature—postmodern feminism, in particular. The lens through which one experiences the world strongly influences how one develops a sense of identity as an individual and also as a member of a particular career group, such as women in science-related field. In turn, women's lived experiences, socioeconomic backgrounds, culture, and race/ethnic

background influences that lens. Postmodern feminism embraces the cyclic nature of this lens and experience and is the theoretical framework that grounded this study.

Postmodern feminism will be explored in this review of literature.

Finally, this review will provide a brief exploration of the literature on the qualitative methodology used and how that methodology can serve a transformative function for the researcher. When choosing a methodology for research, the study question or questions should, of course, determine which method will answer the question(s) most effectively. As was the case in this study, if one wants to gain specific information about an individual or group of individuals, empirical or quantitative methods will not work as effectively as qualitative methods. Often in empirical scientific studies, the impersonal objective nature of data collection will not allow for individuals to share specific or intimate details that would answer the study questions in more depth. The researcher must also gain a different level of rapport with the study participants in order to obtain more intimate details necessary to answer the study questions. This level of rapport is usually not necessary or achieved when conducting quantitative research. Therefore, the participants in qualitative studies can share their lived experiences more completely than when quantitative methods are utilized alone. Having a different level of rapport with the study participants allows for the researcher to reflect upon their own connections with the research and how their lived experiences have influenced them as an individual. In many instances, the self-reflection undertaken by the researcher becomes transformative for the researcher as well.

History of Science Education for Girls in the United States as Influenced by Gender Roles

Male dominance in science and science-related fields is not a new development. It can be argued that the study of science and science-related research has been a male-centered endeavor for centuries. Harding (1991), for instance, specifically contends that science has been a white European male centered (androcentric) endeavor for centuries. She posited that science had been and continues to be driven by elite white males with Western European lineage. This was one of the main reasons why women in general, women of color, and women from developing countries—labeled “others” (p. 268) by Harding—have not been successful in becoming part of the scientific community.

Nonetheless, early in our country’s history, boys studied the classics and Latin to gain entry into college so they could serve in leadership roles in society. Initially girls were offered the chance to study geography, considered a science course at the time. This served the needs of society by fostering personal improvement and supporting nationalistic fervor—especially as westward expansion fulfilled the promise of Manifest Destiny. Further girls would become better conversationalists for their husbands and more competent teachers for their children. Women were to function as a support for their husbands and children (Tolley, 2003).

This ushered in an era of science education for girls. Geography became the precursor to other science subjects such as nature study or life sciences. It was believed that by studying nature, women would become closer to God and therefore, be better spouses and mothers. By the mid-1800s, the focus by women’s academies and schools of

science on nature study made women, according to Tolley (2003), the first nature study advocates and experts. Scholastic experience in nature study and life sciences eventually led to the study of physics, zoology, physical geology, and botany for girls, while boys continued to study the classics. In both cases it was primarily the wealthy elite who received these opportunities.

Courses of study such as home economics were thought to be necessary for the increasing numbers of female students from lower classes entering school because most of these girls would become housewives or domestic laborers, not individuals who were college bound (Tolley, 2003). However, even home economics had its birth in the study of science by women. Lippincott (2003) chronicled the research conducted by Massachusetts Institute of Technology scientist Ellen Swallow Richards. During the late 1800s through the turn of the twentieth century, Richards created the New England Kitchen, a research laboratory where she conducted experiments in nutrition. Trained in the field of chemistry, Richards developed scientific studies dealing with ways to cook various foods in order to gain the best nutritional value from them.

However, society's leaders (i.e., men) controlled the curricular content based on what was deemed proper given the gender roles in society. Girls were to become housewives, teachers for their children, and supporters of their spouses. Boys, in contrast, were to work outside of the home and gain professions or other means of work to support their families and be the leaders in society. Thus, men were in control of their own destiny as well as the roles women were to take in society (Tolley, 2003). Therefore, although women did more study in science-related fields than men early in our country's

history, Harding's (1991) thesis about science as androcentric still holds.

According to Tolley (2003), the pendulum began to swing the other direction (i.e., toward men pursuing more science and women pursuing less) during the turn of the previous century. Women, with suffrage and their fight for equality with men, wanted to gain college degrees. In order for this to happen, they also needed a classical education. Women's academies began to drop nature study and offer the courses necessary for college entry. Men determined, particularly with the demands of the Industrial Revolution that more job opportunities were developing in the science fields. As boys and girls from all social classes entered school and continued their educations through high school, boys took more science, math, and technology courses, while girls began to focus more on Latin and the classics. This was why we see the switch during the early part of the previous century to women being associated with the study of the classics and men in the sciences. Remnants of this switch in focus (i.e., the study of science and technical fields undertaken by men and of classics and Latin undertaken by women) are present still in educational settings today.

Men's domination of science fields is seen as well in higher education during the time period of World Wars I and II. Male organizations developed what would become ostracizing agents for women in the sciences. For example the National Research Council, which funded scientific research; Phi Delta Kappa, which focused on science education at the college level; and the National Association of Research in Science Teaching, which funded research specific to science education, maintained a focus of scientific research and technical fields as being male endeavors. Male-dominated

perspectives in science education did little to support the inclusion of women in fields of science. This backlash, according to Tolley (2003), negatively affected the views of men toward women studying science and pursuing related careers. Further, after World War II, many women freely gave up their technical science-related jobs to men returning from the war. Many women believed that it was their duty to relinquish these jobs while others who wanted to stay were fired and men hired in their place.

However, in this same time frame, even with a male hierarchy in place women contributed greatly to cutting edge research, particularly in the life sciences. For example, from the 1930s through the 1970s, the *Drosophila* fruit fly was utilized in the early stages of genetic research, because the number of chromosomes this life form contains is small and could be studied more easily. Many women contributed to the research in the *Drosophila* laboratories across the country. Dietrich and Tambasco (2007) argued that even though women's contributions in these labs were not widely publicized, the impact of women researchers in this field of biology should not be overlooked.

In contrast, Post World War II ushered in an era of physical science research and the focus on technical fields such as engineering. A study by Griggs (2001) of the 150-year history of the American Society of Civil Engineers chronicled many of the influential engineers in the United States. Amazingly, no women were highlighted, suggesting, perhaps, that women did not make any major contributions to the civil engineering field during this time frame.

Along with World War II and the Cold War that followed in the 1950s, a renewed interest in science and technology took over in the United States. Terzian (2008), in an

historical review, discussed how a weekly radio show was utilized to emphasize our country's need to focus on science education for all Americans. The show aired from 1942-1958. During the program, high school age girls and boys, who were chosen through a national science talent search organization and considered among our nation's best in the science classrooms, were interviewed about their main science interest and what they had been researching. During this time, it was thought there were two main reasons to study science. The first reason was related to our national defense and focused on building strong military technologies and weaponry. The second reason was to improve the quality of life for all Americans and bolstering our economy in the Post World War II era. It was thought that all Americans should have a general understanding of the science fields. This general understanding was to come in the form of science courses that were to be called "fusion courses" (p. 310). Having general science knowledge would lead to support from the populous for future research in the science fields thus helping create a vibrant economy for the nation. Interestingly, this national focus on science education came before the former Soviet Union's launch of Sputnik.

A variety of science-related topics were discussed during the radio program each week. Among those interviewed was a girl from New York City in 1942. She discussed how Uranium 235 could be used, in the near future, for the development of weapons and also for domestic purposes. However, according to Terzian (2008), when girls were interviewed, "gender related colloquialisms" (p. 323) were utilized by the radio hosts that made reference to cooking and other domestic duties in relation to their science studies. It was noted that no such colloquialisms were used when interviewing the boys on the

program suggesting that traditional gender roles for girls and boys were being reinforced even though the focus was supposed to be on the science research each student had conducted.

While the Cold War era loomed over our nation in the 1950s and 1960s, another movement was underway. The civil rights movement, that can be argued had its origins on African American college campuses prior to World War II (Hutcheson, Gasman, & Sanders-McMurtry, 2011), was taking hold throughout our nation and, in particular, the southern states and other urban centers. In an historical review, Evans (2009) chronicled what was deemed the “international 1968” (p. 331). According to Evans, during 1968, civil rights activism took on a global perspective. Across the globe, unrest in the cities’ streets and on college campuses was taking place regarding the lack of personal rights afforded to racial minority groups or those individuals from lower socioeconomic classes. It was noted by Evans that most of the leaders of these protests were men. Often, these men were from families of the social elite. According to Evans, these men were rebelling against the status quo of the institutions developed by their fathers.

Women were also active participants during the civil rights movement; however, they were taking on roles subservient to the men in leadership. Evans (2009) discussed how women wanted to be afforded the same status as the men, but they were relegated to more traditional supportive roles. During this time, many women realized that they would have to develop a separate movement that focused on the lack of rights afforded women, thus building upon the suffrage movement that eventually led to the passage of the 19th Amendment in 1920 when women were first given the right to vote (Scholastic, Inc.,

2007). According to Evans, many of the men in leadership roles during the civil rights movement created yet another system that lacked focus relating to the plight of women in our country and worldwide. Thus, supporting Tolley's (2003) and Harding's (1991) stance that men, especially the social elite, were in control of women's roles in society.

Coming out of the civil rights movement in the late 1960s, a renewed focus on women's rights, specifically in relation to their education ensued in the 1970s. In a review of Title IX, Kennedy (2010) discussed how this landmark piece of legislation, though focused on equal rights for women and girls to play sports along with men and boys, also paved the way for equal access in other areas of academia. For example, through the 1970s to the present, research has been conducted in the realm of increasing and maintaining the number of women and women of color in the areas of science, technology, engineering, and math (STEM).

This brief history has demonstrated how certain political, economic, and social movements have impacted the views held for the roles girls and women play in society and how this has influenced choices they make in science education. The basic thesis that emerges is, as initially contended by Harding (1991) but in the context of the history provided primarily by Tolley (2003), that science education has historically been available to women but has also been centered on the needs of society as perceived by men. Eventually, a shift occurred in which opportunities for women in science essentially disappeared. Only recently have men and women joined together to begin the development of a true equal opportunity for both.

Gender Role Influences on Identity Development of Women in Science and the Workplace

The influences of gender roles on the identity development of women in science and the workplace have many facets. Gender role expectations were discussed at length in the historical overview that preceded this section. Other influences include socioeconomic, racial/ethnic, and geographic regional backgrounds. Along with these backgrounds, factors related to their experiences in school through college and graduate levels have much to do with the identity women develop. In addition, the experiences women have as they begin their careers in the workplace contribute to their identity development as well. The opportunities and supports afforded women at the various stages of their lives need to be conducive for a positive identity regarding science to develop and be maintained. Without a positive identity, the chances for women to pursue and maintain a career related to the sciences are greatly reduced.

Social Class and Racial/Ethnic Background

With regard to social class and racial/ethnic background, women from white middle class families who want to pursue science as a career will have an advantage over minority women who come from a lower economic family. The advantage is similar to that for men from white middle class backgrounds. To illustrate this, Chinn (1999) conducted a qualitative study about barriers to minority women pursuing engineering professions. Four female engineers from Polynesian and Filipino ethnicity shared their personal narratives. Chinn concluded that women from similar ethnicities as her study

participants were less likely provided with the cultural capital of the middle class.

Labeling this cultural capital “a social/capital social network perspective” (p. 623), Chinn indicated that this network includes middle class contacts, language, knowledge, skills, attitudes, and behaviors that help shape a woman’s identity. As a result, the roles afforded to women in this social/capital social network are more conducive for them to gain an education with a science focus compared with other individuals from the middle class.

Even though the women in Chinn’s study are from ethnic backgrounds often grouped with Asian ethnicities, the Polynesian/Filipino subgroup are not well represented in the science fields contrary to what is often the case with the Asian group as a whole. According to Chinn, the women in her study had supports from family members while growing up that helped them gain access to the social network of the middle class. By gaining access to this network, the four women were able to successfully navigate through an education system focused on the middle class.

In a qualitative study utilizing ethnographic interview techniques, Carlone and Johnson (2007) studied 15 women from African American, African, Latina, Native American, and Asian American ethnicities who were successful at navigating the middle class educational network to develop science-related careers. This study extended the work of Chinn (1999) and focused on the separation of race and ethnic background. According to Carlone and Johnson, race is determined by what one looks like and is interpreted by the observer upon first association. In comparison, ethnicity is more than the physical look of an individual and incorporates the values and culture within their group. The race and ethnic backgrounds of the women in their study influenced how they

formed an identity of a scientist. Moreover, the way the participants were able to perform science-related tasks, gain knowledge or competence in science fields, and gain recognition from others as being competent in their field of science were all interwoven in the formation of their identity. As a result, the researchers determined that three science identities were developed among their study participants depending upon the interaction of the aforementioned factors. The three identities were that of research scientist, altruistic scientist, or a disrupted scientist identity.

According to Carlone and Johnson (2007), those participants who developed a research science identity were able to successfully perform tasks, gain knowledge and be recognized for their successes in a laboratory setting. These women wanted to or became research scientists and all were working towards or finished PhDs in research related science fields. Being recognized as a research scientist by professors, mentors, and others in research science was a key factor for these women to form the research scientist identity, according to Carlone and Johnson. The participants who developed the research scientist identity embraced the predominant white male culture of being a scientist as discussed in Harding (1991), Tolley (2003) and Ong, Wright, Espinosa, and Orfield (2011).

For those study participants who formed an altruistic science identity, focusing on the humanitarian side of science was most influential in the formation of their identity. These participants were all in the health science-related areas. It was noted by Carlone and Johnson (2007) that the women with the altruistic identities were usually not recognized for their skills in the pure science areas in contrast with those participants who

formed a research scientist identity. They were able to form a different perspective regarding the culture of science. Their focus was more on helping humanity and the environment rather than the accepted cultural norms of science.

The study participants, who formed disrupted scientist identities, at some point in their quest to become a scientist or pursue a science-related career, were discouraged to continue. Often this discouragement was connected to the culture of their ethnic background. For example, one of the Native American participants was told to major in a nonscience area because she would not perform dissections of various animals. This belief was especially strong for this participant because she was pregnant at the time. In her culture, it was believed that harm could come to her baby if she performed dissection or the unwarranted dismembering of an animal.

In a meta-analysis of the past 40 years of studies related to women, specifically women of color, and their experiences preparing for STEM careers, Ong and colleagues (2011) described how cultural beliefs, as just described, are often misinterpreted by professors or others in science-related fields. Many professors assume there is a lack of interest on the part of the students in regard to pursuing degrees in science because the professors do not understand the cultural related issues within the various ethnicities. Even with such discouragement, the participants with disrupted scientist identities still obtained degrees in science-related fields. Most work in health related fields such as pharmacy. They developed their identities by focusing on their love of science, perseverance in the face of negative feedback, their own competence and ability to perform science-related tasks and less on recognition from others.

Some contend that issues of race/ethnicity are often confounded with issues of class as suggested by Carlone and Johnson (2007). However, according to Chinn (1999), racial stereotyping by the educational institutions, specifically within engineering vocations, has negative impacts on women entering that profession. Johnson (2007), in a qualitative study addressing the experiences of African American, Asian, and Native American women who were pursuing science-related careers or who dropped out of a science pathway, contends that even though her participants were able to enter the middle class educational network as discussed in Chinn, they had difficulty maintaining their path to a science-related career. Johnson suggested that placing the blame on being ill prepared in science or lack of interest as reasons for the struggles of her participants was incorrect. Instead, the way science is taught from a white male science culture was far more impacting. According to Johnson, professors in science courses did not understand the cultural backgrounds of her study participants and this negatively impacted their success. This was a similar finding as discussed by Ong and colleagues (2011).

Chinn (1999) has suggested, as a first level solution, that positive familial influences and science educators who understand minority women and their cultures are important in encouraging the identity formation necessary to counteract the negative influences that keep women from entering science-related careers. The literature on science educators is discussed in a later section. Here I discuss positive familial influences.

The participants in Chinn's (1999) study had at least one parent who understood the need for their daughters to navigate and assimilate into the network of the white

middle class. By doing so, the participants were afforded the advantages enjoyed by others in this network as described previously. In one case, the father of one of the participants went against some of the cultural values of his ethnic background, but realized this was necessary to help his daughter succeed in the white middle class educational network. In this case, the mother of the participant held to more traditional cultural beliefs and had less of an influence on her daughter regarding pursuing a path to become an engineer.

In a quantitative study utilizing data from surveys, Bhanot and Jovanovic (2009) studied the links between parental attitudes and beliefs and their children's achievement beliefs in the sciences. The study group included equal numbers of girls and boys in grades 5-8 with the majority from grade 6. Eighty one percent of the study participants were from white ethnicities with intact two-parent families. The rest of the study group was made up of 3% Asian American, 4% Latino/Latina, and 12% other ethnic minorities.

The study was conducted by utilizing a pre and post survey, one at the beginning of the school year and one at the end. Using analysis of covariance to analyze the relationships between parental attitude and utility beliefs regarding science and the effect on their child's beliefs and utility about science, the researchers concluded that the mothers of the participants had a positive effect on their daughters and a negative effect on their sons. Interestingly, mothers interacted more with sons who struggled in science to help them and less with sons who excelled in science. The opposite was true for daughters. The mothers interacted more with daughters who excelled in science and less with daughters who struggled. Even with these patterns, the researchers concluded that

mothers had a positive effect on their daughters' beliefs about their science abilities and the utility of science as a career goal and a negative effect on their sons' beliefs about their science abilities and the utility of science as a career goal. In comparison, according to Bhanot and Jovanovic (2009), fathers' behaviors had less impact on either their daughters' or sons' beliefs in their own achievement successes in science. However, fathers had a positive influence on their daughters' and sons' utility of science as a career possibility.

In another quantitative survey based study, Scott and Mallinckrodt (2005) used correlational analysis to determine the effect of parental emotional support on the self-efficacy daughters developed in regard to pursuing careers in engineering, the physical sciences, and biology. The participants in the study were selected from 79 female students who were in a special science program funded by the National Science Foundation. This program focused on girls' science achievement while in high school. Each participant was given a survey to determine the connection between the parental emotional support they received while growing up and their choice of career path in college. Of the 79 surveyed, 41 completed and returned the survey. The findings of the study suggested that fathers had more positive impact on the self-efficacy of their daughters in regard to pursuing a science-related career as undergraduate students as compared to their mothers. Interestingly, the researchers suggested that daughters who had fathers who were more overprotective or had given emotional support conditionally, meaning they would give of themselves emotionally if their daughters performed a certain task or achieved something of merit, were negatively impacted. These findings

somewhat contradict Bhanot and Jovanovic's (2009) findings where at an earlier age, mothers appeared to have a more positive impact on their daughters' attitudes towards science. The findings of these two studies suggest that both mothers and fathers have the potential to positively affect their daughters' pursuit of a science-related career. However, it appears that fathers have a more positive effect later in their daughters' lives when they enter college.

Geographic Regional Background

Another important cultural dimension that influences women's understanding of their roles and identity in society is the geographic region in which they are raised. Geographic region is especially important when one's location results in isolation, such as might be the case in urban centers or rural areas. The literature most germane to the present study addresses the isolation that occurs in rural areas. While the literature is not always specific to women, it clearly has implications for women's identity formation as scientists.

According to Bouck (2004), 40% of the students served in our country's schools live in rural settings. Growing up in a rural area will affect the quality of education afforded to those who live in such areas. There are several mitigating factors regarding the quality of education one receives in a rural setting. Among these factors are: lack of financial resources, families living in poverty, teacher preparation related to teaching in rural schools, student preparation for success at the larger prestigious universities, and understanding the rural way of life. In a review of literature related to the quality of education in rural settings, Bouck discussed how lack of funding and the higher numbers

of families living in poverty in rural areas impacted the quality of education afforded students. The lack of funding often associated with rural schools impacts the course offerings in rural districts. Bouck discussed how the curricula are often less diverse and fewer college preparatory courses are found in rural settings. Clearly, this impacts both young men and women in their opportunity to learn in science-related fields.

In a quantitative study that utilized descriptive statistics to analyze the advanced placement (AP) offerings in rural school districts in Texas, Klopfenstein (2004) studied the number of AP courses offered and the demographics of those enrolled in these courses. According to Klopfenstein, fewer AP courses were offered in rural settings as compared to either suburban or urban districts. Even with federal funding to support the creation of more AP offerings and to entice more minority students to attend AP courses by waiving fees for the AP exams, Klopfenstein discovered that the demographics of the courses did not change significantly from past years. For example, AP courses such as physics mostly contained Caucasian males. The lack of female presence in these courses was not discussed by Klopfenstein. However, he contended that waiving of fees for minority students did little to increase their desire to take AP courses. Klopfenstein believed the lower numbers were mainly due to lack of preparation to take the courses and not financially based. This clearly contradicts Johnson's (2007) contention that placing the blame on being ill prepared in science or lack of interest as reasons for the struggles of her participants was incorrect.

Along with fewer course offerings, especially college preparatory courses such as AP classes in rural settings, Bouck (2004) also contended that families that struggle

financially have less time to devote and focus on their children's education. These families have fewer resources to help their children succeed academically and many of the parents have a high school level education or less. Thus, the parents' life experiences do not include a focus on education or how education can help change the future for the lives of their children.

Along with financial constraints and high poverty levels of families associated with many rural school districts, the retention of highly qualified teachers in rural areas is another roadblock that districts face. In a descriptive qualitative study that utilized interviews to gain information regarding mid-continental states' colleges and universities teacher preparation programs, Barley and Brigham (2008) wanted to determine the quality of preparation prospective educators received for teaching in rural school districts. According to Barley and Brigham, five areas needed to be addressed: offering the ability for prospective teachers to gain endorsements or certifications to teach in several subject areas, actively pursuing prospective teachers who live in rural areas because they already know and understand the cultural *morés* of their communities, actively seeking student teaching positions in rural schools, offering continued professional development via online courses or other modes of distance learning for those educators already teaching in rural areas in order for them to meet the standards for being highly qualified under No Child Left Behind legislation, and offering courses regarding the cultural *morés* of rural communities, especially for those prospective teachers who have not spent much time in rural settings.

After conducting the research, Barley and Brigham (2008) discovered that many

of the teacher preparation programs of the colleges and universities in their study had two or three components suggested to better prepare prospective educators. However, it was rare for a teacher preparation program to have all five components. Often, the researchers contended that this was due to the location of the college or university. For example, some of their study schools were near rural communities so the need for distance learning, seeking rural candidates, or finding rural schools for student teaching placement were something that happened naturally without making it a focal point.

While Barley and Brigham (2008) discussed reasons why the lack of educator preparation to teach in rural settings will often negatively impact the quality of education students receive while in high school, Guiffrida (2008) discussed reasons why rural students often fail to finish their degrees at the larger more prestigious universities. In a review of literature over the past 30 years, Guiffrida discovered that rural students gain college degrees at about the same rate as their counterparts from the suburban and urban settings, but they tend to graduate from smaller colleges closer to their home towns. When looking at the rate of college graduation among rural students at the larger more prestigious universities, the rate was much less as compared to those students coming from suburban/urban settings. Guiffrida discovered several reasons for this pattern. Students from rural areas often struggle with the diversity of the large university setting. Many rural communities are homogenous in their racial and ethnic make-up and rural students have difficulty fitting in with the ethnic and racially diverse populations often associated with larger universities. Coupled with this trend, the larger number of students at a university creates a more competitive environment. Students from rural areas who are

accustomed to being involved in a wide variety of activities such as sports, music, and student government find themselves having difficulty being involved at the same level when they enter the university setting. With the increased number of students at the university, rural students find it difficult to deal with the large lecture hall style courses as well. The overall large size and impersonal nature of the university setting is counter to the many cultures associated with rural areas. Guiffrida found that rural students will often leave the larger universities before their first semester is completed. However, rural students were more likely to transfer to a smaller college or go to a technical school to complete their education as compared to students from urban settings who left the university mid-semester. The students from the urban areas often did not return to higher education.

In order to help students from rural areas better prepare for college, especially larger universities, Guiffrida (2008) made several suggestions. One of the main suggestions was for high school counselors to paint a clear picture of what the experience of going to a university would be like for their students. For example, setting up times for students to go to university campuses and experience life during the school year while classes are still in session would be more beneficial than only going to freshman orientation in the summer when the majority of university students are no longer present. In addition, having parents, influential teachers, and counselors truly listen to students' expectations and desires regarding college would better support students and help steer them to a college that better fits their needs and desires. Often, these influential adults pressure students to go to the larger universities when they would thrive better in a

smaller college or vocational setting. Lastly, students who have excelled in many arenas in rural school settings often are the individuals who drop out early from the larger universities because they cannot deal well with no longer being involved at the same level. According to Guiffrida, helping these students understand that they will most likely have to find other avenues to become involved in the university setting would help them better prepare to be successful in their new environments.

While Barley and Brigham (2008) lauded the components teacher preparation programs should contain to better develop educators for rural settings and Guiffrida (2008) discussed better ways to prepare rural students for success in larger university settings, in an essay regarding the importance of education reform in rural areas, Howley (2009) argued by having rural students conform to our nation's focus on being a leader in the global economy was ineffective and counter to maintaining the ideals of rural America. In essence, Howley argued by having rural education focus on preparing students for being successful in "Corporate America" (p. 2), we were destroying what was left of the cultural *morés* of rural communities. Instead, rural educators should be preparing students to help rural communities grow and prosper by utilizing the culture of their community as the guiding principle. In this way, the *morés* of their communities would remain intact. According to Howley, without this refocus, the best and brightest individuals will continue to leave their rural settings for more urban and suburban communities where they can be more successful in helping our country compete in the global economy. Howley believed this exodus continues to further erode the ideals of rural America. With this erosion of the rural ways of life, much of what our country was

based upon from its beginning, will be lost. Howley's contention is particularly germane regarding women's pursuit of science because as Tolley (2003) discussed in our country's history, women were allowed and encouraged to study science fields. However, men were in control of which fields they were to pursue. Some of the past *morés*, of rural areas as discussed by Howley, may be a roadblock to women's further pursuit of science, especially if the women come from rural areas where traditional gender roles are entrenched as part of the culture.

School-Related Experience

As girls move through their years in school, teachers need to be aware that they have a responsibility to help all girls form identities that will facilitate their pursuit of science and science-related careers. Ways to facilitate positive identity formation include: consciousness of the role of schools in socializing girls for their role in society and for science-compatible gender role expectations; the use of gender inclusive strategies in teaching, and being aware of relational dynamics within the family setting that educators can capitalize on while teaching.

Precollege Experience

As discussed previously, Tolley (2003) illuminated the historical trends related to science education for girls in our country. Tolley argued that the needs of our society through time, as envisioned by men, had much to do with the types of science courses open to girls. Schooling was utilized to help socialize girls for their roles in society. With the civil rights movement during the 1950s-1960s and the passage of Title IX, a renewed

focus regarding equal opportunities for girls and women ensued. School districts and individual schools have looked more critically at their role as socializing agents for society. For example, in a qualitative study that utilized interview and archival data, Ashcraft (2004) chronicled a 6-month debate a Colorado school district had regarding part of their strategic plan's diversity policy. The debate surrounded using the words "valuing" as opposed to "respecting" (p. 686) diversity in their schools. One of the categories utilized in the district's definition of diversity was gender, which would be a link to the tenets of Title IX. During school district board meetings, several community members argued that the term valuing was more focused and set a stronger stance as compared to utilizing respect in regard to diversity. In the end, the school board voted to use the word valuing in regard to the school districts' belief about diversity.

In a related essay, Oder (2005) discussed the role schools play in maintaining cohesion in our society. Democratic ideals are fostered and maintained via our nations' schools according to Oder. Promoting a nation with educated citizenry, regardless of their gender, ethnic background, or socioeconomic station, is a focal point for our schools. Without this focus, our country and the ideals in which it was founded are in jeopardy. However, Oder explained that the socioeconomic elite are continually advocating for their children to be tracked so their educational needs are better met. By allowing the social elite to track their students, our schools will negatively impact the cohesion in our society. The cohesion in society, as discussed by Oder, is particularly germane to women, especially those from racially and ethnically diverse backgrounds. Thus, Oder explained, our nations' schools are in an ongoing struggle to maintain cohesion in society.

With school districts and schools focusing more on how to include all members of their school community and meet their needs, in recent years girls have become a focal point in relation to increasing opportunities and developing ways for girls to take more courses related to science, technology, engineering, and math (STEM) in the hope that more girls would follow this educational path to related careers as adults. Ways to increase the number of girls in STEM courses include: researching STEM course selection patterns from middle to high school as discussed in Rudasill and Calahan (2010), advising/counseling girls to improve the likelihood they will take STEM courses throughout middle and high school as discussed in Guiffida (2008), ways to improve the use of gender inclusive strategies in teaching STEM courses as discussed in Tindall and Hamil (2004), and looking at family dynamics as a mitigating factor in girls' pursuit of STEM courses as discussed in Scott and Mallinckrodt (2005) and Bhanot and Jovanovic (2009).

In a study conducted by Rudasill and Calahan (2010), the course taking patterns of academically advanced girls and boys from 5th through 12th grades were compared in relation to math, science, and humanities courses. For this study, humanities included the social sciences and English courses. Fifty-nine percent of the participants were girls. Of the study participants, the majority were from Caucasian, two-parent homes. Regression analysis was conducted on the questionnaire data received from the 447 students selected for the study. Interestingly, no differences were discovered in self-perception of abilities between the girls and boys in regard to math and science courses. However, boys did feel their abilities were lacking in the humanities. Even with high perceptions of abilities in

math and science and similar tests scores compared to the boys in these areas, the girls in this study planned to take or took fewer math and science courses than boys as they moved through their schooling. Rudasill and Calahan believed this was due more to societies' socialization of girls to pursue traditional female occupations such as nursing and teaching. In contrast, boys traditionally pursue occupations related to engineering, the physical sciences, and computer technologies. Even with girls who are advanced academically, these traditional roles are still mitigating factors and influence their choices to pursue math and science courses which could lead to occupations that are currently male-dominated. Rudasill and Calahan's findings continue to support the historical context as previously discussed in Tolley (2003) and Harding (1991).

To counteract this trend, Rudasill and Calahan (2010) suggested that parents, influential teachers—(especially science/math teachers)—and counselors support girls to pursue what interests them rather than what society deems appropriate for women. As discussed in Guiffrida (2008), it is important to truly listen to what interests girls. Often, girls are interested in occupations related to engineering, the physical sciences, and computer technologies. It is imperative for girls to be guided to take related science and math courses that better prepare them to follow an academic path that supports reaching these occupational goals.

In a longitudinal 7-year study, Kerr and Kurpius (2004) studied the effects of an intervention program in science and math designed to increase the likelihood that at-risk girls ages 11-20 would persist in their desire to pursue a degree and future occupation in a science or math-related field. The study participants were deemed at-risk due to their

socioeconomic conditions, minority status, and engagement in behaviors such as drug/alcohol use or early promiscuity. Of the 500 + participants, 33% were Caucasian, 28% were Hispanic, 22% were Native American, 11% were African American, 4% were Asian American, and 5% other. The participants were from urban, suburban, rural, and reservation schools.

During this 7-year study, the girls participated in the Talented At-Risk Girls: Encouragement and Training for Sophomores (TARGETS) program. Components of the program included: a values inventory designed to determine the participants' levels of self-esteem and self-efficacy towards their education, guided imagery of what the perfect workday would look like in the future, completion of a career inventory and personality test, a group discussion of barriers to attaining a degree and occupation related to science or math, goal setting, and in-service for teachers, counselors, and administrators to better prepare them to support and guide girls towards an education that would result in obtaining occupations related to science or math. Pre and post questionnaires were utilized to determine the impact of the program through time. Analysis of variance was utilized as a means to compare the before and after results.

According to Kerr and Kurpius (2004), the study results showed that the majority of the girls improved their self-efficacy with regard to science and math related courses. In turn, the participants researched possible occupations related to science and math to a greater extent prior to being involved in the program. Kerr and Kurpius noted that an individual's behaviors are precursors to their action. It was the researchers' contention that the TARGETS program had a positive impact on the girls' future goals in relation to

their education and obtaining a career in a field related to science or math.

In a meta-analysis of studies related to how science teachers can change their classrooms to be more gender inclusive and help boost girls' desire to take more science/math courses and eventually pursue science or math related careers, Tindall and Hamil (2004) shared several key elements to create such an environment. Among the practices discussed by Tindall and Hamil, the establishment of norms for participation and development of an equitable management style were precursors to other strategies. Having students consistently raise their hands prior to speaking helps improve girls' ability to respond more equitably with boys. Monitoring who is chosen to respond to make sure everyone in the room has a chance to be involved is also important. In this way one or two individuals will not be allowed to dominate the discussion.

According to Tindall and Hamil (2004), accommodating other learning styles is important as well. Often, science is taught from a Eurocentric white male perspective as discussed by Harding (1991), and this pedagogy excludes the ways in which many girls would better embrace science. Making humanitarian connections to science will connect more girls with the subject matter. This is especially important for girls when they are in physical science courses that are usually concept and process driven. Moving away from conceptually driven processes and making connections to real world examples will help improve the quality of instruction. In addition, science classrooms should be environments that promote a community atmosphere where girls and boys share equally in the endeavors of science. For example, when conducting a lab activity, girls should share in all activities and not be bystanders taking notes. In this way, girls' self-efficacy

for science will be improved. Female role models, such as notable women scientists, should be utilized as examples to further demonstrate to girls that active involvement in science can lead to future careers as well. According to Tindall and Hamil (2004), having female science teachers who share their stories regarding how they chose a science path to teaching would also be beneficial. At the end of their study, Tindall and Hamil noted that utilizing gender inclusive strategies to teach science focuses on best practice teaching techniques. These techniques not only help girls succeed, they help boys succeed as well.

In a related experimental study with 158 eleven- to fourteen-year-old girls, Weisgram and Bigler (2007) looked at the influence of gender discrimination and gender roles in science as they related to girls' attitudes and interest in science. The findings of the study suggested that if girls were taught about the influences of gender discrimination and gender roles in science, their perceptions and attitudes towards science improved as compared to those who were not presented this information. However, the results also suggested that interest in pursuing science in college or as a career were not improved. According to Weisgram and Bigler, this may have been because the impact of the information was only short term and not enough to sustain lasting attitudinal change among the participants. This finding supports the Kerr and Kurpius (2004) study where they suggested that a program such as TARGETS needs to be implemented over a period of several years for girls to maintain positive attitudinal change towards science and math courses which would lead to taking science/math courses in college and eventually obtaining careers related to these fields.

In addition to implementation of gender inclusive strategies and teaching girls

about gender discrimination and gender roles in science, other avenues have been explored to improve the quality of science/math education girls receive as well as boost their self-efficacy for these subjects in order to propel them into science/math course work in college and eventually careers related to these fields. Creating single sex classes in science and math has been studied to determine if girls-only courses are beneficial over coeducational courses.

In a mixed method longitudinal study, Parker and Rennie (2002) compared single sex girls' and boys' science classes with co-educational science classes to determine the ease of implementing gender inclusive strategies. According to Parker and Rennie, classroom management was an important factor as the all girls' classes were more easily managed from a behavioral standpoint as compared to the all boys' classes or co-educational classes. In turn, gender inclusive strategies were more readily implemented in the all girls' classes. In contrast, it was noted that the all boys' classes were more conducive to focusing on areas of weakness for boys, such as communication. In addition, Parker and Rennie indicated that teachers became more aware of gender inclusive strategies and how to implement them in the traditional co-educational setting even though the teachers admitted the implementation of these strategies was more difficult in either an all boys' class or co-educational setting. Teachers realized that utilizing gender inclusive strategies, regardless of the classroom make-up, supported what is considered best practices in teaching. This was a similar finding as discussed in Tindall and Hamil (2004).

In another study related to the use of single sex classes, Monhardt, Tillotson, and

Veronesi (1999) utilized a naturalistic, multi-case study design to determine the effects on girls' self-efficacy and involvement in science. The findings suggested that having single-sex classes would be beneficial for girls during their precollege experience for similar reasons as discussed in Parker and Rennie (2002), thus helping them continue on a science path. However, as these women entered college and science-related career fields; this was no longer the case as other factors related to family responsibilities had more impact on their career paths.

In a more recent study, Shapka (2009) utilized longitudinal data to determine the impact of all girls' classes on their achievement and self-efficacy in math and science. A multi-cohort, multi-occasion design was utilized. Girls in grades 9, 10, and 11 who had achieved a 70% or better in their previous math and science courses were eligible for the study. Questionnaire data were collected at three time intervals: at the end of the first year, the end of high school, and 1-3 years into college. Hierarchical linear modeling techniques were utilized to estimate the math/science achievement and self-efficacy growth curves through time. Analyses of variance were utilized to determine the influence of parents' education levels and expectations for their children in math and science. A control group of students in a traditional coeducation setting was utilized for a comparison. In regard to the analyses completed dealing with parental influences, of those participants who entered and completed the study, most of the parents had a higher education level than control students' parents and the students were higher achievers as compared to those who did not complete the study. However, both the all girls' classes and the control group had similar results, so it was determined that these co-variables did

not impact the validity of the overall findings of the study.

The overall findings of the study showed that girls from the all girls' classes had a more linear growth curve through time in relation to math/science achievement as compared to the control group, suggesting that being in the all-girls setting had a positive influence on achievement. However, this was not the case in regard to self-efficacy or competence. The growth curves through time showed a similar pattern with the all girls' classes and control groups. Shapka (2009) suggested that this was due to girls not knowing where they stood in relation to their peers when they enter transition phases in their schooling. For example, competence levels dropped when entering high school and then again when entering college.

Beyond creating a classroom which includes gender inclusive strategies, developing programs similar to TARGETS, teaching girls about gender discrimination and gender roles in science, and the possibility of having all girls' classes to improve the achievement and self-efficacy of girls in science and math, understanding family influences and dynamics is important during the precollege years as well. Having an understanding of girls' family situations will help teachers and administrators best support the girls as well as create a partnership with the family.

In an article reviewing a statewide initiative in New Hampshire, Muscott and colleagues (2008) discussed how schools are reaching out to the families in their communities to develop partnerships that will help students succeed academically and behaviorally. This program focuses on developing school wide positive behavioral supports that will help students become better holistically. At the heart of this program is

creating partnerships with the families in order to bring them into the schools on all levels. Understanding that family dynamics have changed, Muscott and colleagues discussed the need for teachers and administrators to learn about the ethnic backgrounds and cultures of the families whom they serve in their schools. Often, social class and language become barriers to the creation of these partnerships. By understanding these differences, teachers and administrators can best reach out and support students and their families. In doing so, partnerships can be more readily developed to help sustain student growth behaviorally and academically through time.

In a related study, de la Piedra, Munter, and Girón (2006) shared the findings of their longitudinal case study dealing with pre-service teacher training at the University of Texas at El Paso (UTEP). Interview data were utilized to describe the transformations that were made by students as they moved through the education program and became teachers in K-12 schools serving high numbers of recent immigrant students from Mexico. Similar to the focus of the program discussed by Muscott and colleagues (2008), the student teachers in the UTEP program developed an understanding of the family structure and dynamics of the Hispanic people they would eventually teach. Through research projects, these future teachers reached out and developed relationships with these families. With the creation of these relationships, these preservice teachers realized that many of their stereotypes related to these families were changed and a new paradigm set in place. In both of the examples just described, the focus was on developing partnerships with all students and their families. However, building partnerships with and understanding families' dynamics are particularly germane to girls in relation to their

education in STEM courses because misunderstandings exist in relation to girls and science as described earlier by Tolley (2003), Harding (1991), and Carlone and Johnson (2007). With the formation of new partnerships, a new paradigm could be set in place in relation to girls' education in STEM as well.

In a related study conducted by Basu and Barton (2007), the development of a sustained interest in science was explored utilizing a critical ethnography methodology. This study looked at the concept of *funds of knowledge* as it related to success in science. The assertions made in this study focused on relationships. Specifically, the relationships between peers, teachers, and family members were the focus. One example described the relationship between a female student and her mother. The student described her mother as a positive role model. The mother's influence helped the girl develop a sense of identity that influenced her to excel in a science setting. Basu and Barton suggested that teachers and administrators need to be cognizant of the relationships girls develop between family members, peers, and teachers as they were the key to developing the *funds of knowledge*. According to Basu and Barton, building partnerships with the individuals who have an influence in girls' lives will be important in supporting them in a school setting, especially in regard to taking science courses and excelling in science. This is a similar finding as described in de la Piedra and colleagues (2006) regarding developing partnerships with family members and other influential individuals in girls' lives.

As girls transition from high school to college, continued supports are necessary for them to successfully navigate through the myriad of science/math courses necessary

for them to be prepared for a possible career related to a science field. Ongoing support from professors and parents, who help guide and inspire these girls will be key for them to maintain a path to a career in science.

Undergraduate Experience

During college, when exploring science as a career becomes reality, the support and encouragement of college professors is critical. Providing opportunities that will help women understand what it will be like to be a scientist in their chosen fields and allowing them to use their capabilities are key elements for identity formation. For example, Fox, Sonnert, and Nikiforova (2011) utilized *t* tests to analyze survey data from 48 universities that have programs specifically designed to recruit and retain women in science and engineering in their respective colleges. The survey questions focused on the quality of the programs in regard to having components affecting positive changes for the individual as well as positive structural changes for the institutions.

After analyzing the data, Fox and colleagues (2011) discovered that self-confidence and efficacy in regard to pursuing a degree in science or engineering was the most impactful from the individual level. In comparison, creating a classroom climate conducive for women to succeed coupled with mentoring by professors of undergraduate women in science and engineering were found to be most impactful structurally for the institutions. Interestingly, the results of the study suggested that the implementation of the programs did not match the needs of the most impactful areas of the individual/structural components. For example, programmatic components at most of the colleges of science and engineering addressed the development of the social climate for

the women more readily than the classroom climate or mentoring which would have a more direct link to the self-confidence and efficacy levels for the women. Moreover, outcomes from the programs were most often reported to mid-level administrators, department chairs and deans of the science/engineering colleges rather than the provosts of the universities. It was posited by Fox and colleagues that the science and engineering colleges/departments most often held traditional gender beliefs as previously discussed in Tolley (2003), Harding (1991), and Carlone and Johnson (2007) regarding who should become scientists and engineers. These beliefs are difficult to transcend when trying to implement programs in which the most impactful areas are readily addressed. It is much easier to address other social needs of the individual rather than the institutional hierarchy.

Even though there was a mismatch with the most impactful needs to improve women's pursuit of science and engineering degrees and the actual implementation of programs, Fox and colleagues (2011) believed it was a positive step forward that the universities were able to identify areas that needed to be addressed and were working towards the changes required. To address the changes, the researchers suggested that the science and engineering departments provide training for their professors regarding the development of a classroom climate that is more conducive for improved self-confidence and efficacy of women in their courses as well as create time for mentoring. These suggestions are supported by the findings as previously discussed in Ong and colleagues (2011). Their study illuminated the misunderstanding many science professors have regarding how women function and learn in their courses, especially women of from

racially and ethnically diverse backgrounds. Providing training for professors regarding the issues described above would be a positive move forward.

According to Fox and colleagues (2011), creating classrooms in which gender inclusive strategies, similar to those implemented at the high school levels as discussed previously in Tindall and Hamil (2004), would be conducive to changing the climate in the undergraduate science and engineering classrooms. In turn, the self-confidence and efficacy for women would be improved and the institutional hierarchy changed for the better. For example, role play has been successfully utilized at the undergraduate level to create a learning situation in which information is discussed in a context where concepts become more real to the students involved.

In a qualitative study Maddrell (2007) utilized student feedback regarding the use of role play to better understand the historical plight of women who were associated with the Royal Geographical Society at the turn of the previous century. According to Maddrell, the students involved in the role play were better able to understand the plight of women during this time in a more real life context as compared to listening to traditional lectures about the topic. The women and men in the class were able to work together creating a classroom climate with more of a community atmosphere. This instructional strategy would be particularly suited to learn about the historical plight of women as they have been associated with science/engineering and science research through time.

Along with creating a classroom climate that is more conducive for women in science courses at the undergraduate level, Fox and colleagues (2011) suggested that

mentoring by professors was a key element for helping retain women in science-related programs as well. In a qualitative study in which pre-and postsurvey data were utilized to determine the effectiveness of a mentoring program designed to better meet the needs of individuals pursuing science-related fields, Wai-Ling Packard (2003) discussed the merits of composite mentoring. The main idea behind composite mentoring is that more than one person can better meet the needs of an individual student. This is in contrast with traditional mentoring models where the student is paired with one individual who is to help guide and support them through their undergraduate experience. The post survey results suggested that women, especially, benefited from having more than one mentor. For example, male mentors may not have the same experience when it comes to balancing family responsibilities with work and school as compared to female mentors. Therefore, female mentors are better able to share their experiences and support women while they pursue their degrees than male mentors. In a related study, Downing, Crosby, and Blake-Beard (2005) utilized survey data and conducted analyses of variance to determine if female mentors are more effective working with female protégés pursuing science-related degrees as compared to male mentors. The findings of this study suggested that female protégés often named males as being most helpful in regard to helping them navigate through their undergraduate experience in science. Males were better able to serve as guides, sponsors, and role models in the day-to-day functioning of a student in science. This is in contrast to the findings of Wai-Ling Packard (2003). However, Downing and colleagues cited gender stereotypes in science as a possible mitigating factor. For example, fewer women obtain influential positions on faculties in

science departments, which would reduce the number of female mentors available to female protégés.

In addition to having more than one mentor, the selection process for matching mentor and protégé is more dynamic in the composite mentoring model. The protégé is not the passive recipient of a mentor as assigned by a department chair. Instead, the protégé actively seeks out mentors who will meet their needs and act as role models. In another study where positive professor and student relationships coupled with strong mentoring were key components of a program in a southeastern university for women in science, engineering, and math, Kahveci, Southerland, and Gilmer (2007) conducted a quantitative study using pre-and postsurvey data to determine the effectiveness of the program. Three groups participated in the study, women in The Program for Women in Science, Engineering, and Mathematics (PWISEM), women in an honors science-related program, and men in an honors science-related program. All three groups were high achieving and held beliefs that they would eventually work in a science, engineering, or math. Utilizing analysis of variance to compare the survey results, the researchers determined that women involved in PWISEM maintained their degree direction more often than women or men not involved in PWISEM. Kahveci and colleagues suggested that both women and men would benefit from being involved in programs similar to PWISEM. By being involved in similar programs, more women and men would obtain degrees in science-related fields which would lead to greater numbers pursuing professions in science, engineering and math.

Coupled with the support from mentors, programs designed to support women

while pursuing science-related degrees, and developing classroom climates and instructional strategies that are more supportive of women, parents continue to be necessary supports for women as they navigate through their undergraduate college experience. As discussed previously in Scott and Mallinckrodt (2005), parents continue to be influential in their daughters' success in science-related fields as they work to obtain their degrees. The findings of the study suggested that the relationship between fathers and their daughters is particularly important. However, if fathers showed love and support conditionally, meaning they supported their daughters when they performed well or acted appropriately, the women in the study had negative feelings regarding their fathers' support. Therefore, it is important for fathers of daughters to be aware of the influence they have, especially during the early years of college. A positive father/daughter relationship maybe a key to the continued success of women in college as they pursue a degree related to science.

In a related study, Gibbson, Woodside, Hannon, Sweeney, and Davison (2011) utilized a phenomenological qualitative method to share the stories of 17 participants regarding their lived experiences with school and work. All of the participants came from a family where both parents had no formal education beyond high school. Of the 17 participants, 11 of them were women. Ten of the 11 women were Caucasian and one was African American. The age of the participants ranged from those in their 20s to those in their 50s. Gibbson and colleagues suggested that often the women in this study were not encouraged by their parents to obtain an undergraduate degree or to go to college at any level. According to some of the female participants, their parents deemed going to

college as a male endeavor, not female. This created a barrier for the women in the study who pursued an undergraduate degree and later graduate work in their fields. This attitude is particularly germane to women pursuing science degrees as similar gender stereotypes are often held by parents in regard to science as a career being more suited to men. Gibson and colleagues suggested that influential teachers, counselors, and other adults in these women's lives should act as mentors and support women who come from families who hold these beliefs, especially those from families whose parents lack post high school education experiences. As previously described, having more than one adult acting as a mentor fits with Wai-Ling Packard's (2003) discussion of composite mentoring. By having multiple individuals acting as supports, more women would have the chance to be successful in their undergraduate experience, especially those pursuing degrees in STEM fields where traditional gender roles are often prevalent.

Coupled with parental supports for women while they pursue undergraduate degrees in science-related fields, preparing women from rural areas to be successful in the larger university setting is also a mitigating factor for retention in undergraduate studies. As discussed previously, Guiffida (2008) suggested ways to support students from rural areas. Among the ways was for counselors to provide experiences for students that paint an accurate picture of life at the larger universities. By doing this, the students will have a better chance to navigate through their undergraduate experiences. In contrast, Howley (2009) contended that by not maintaining the *morés* of rural communities, our nation runs the risk of losing what our country was based upon because the best and brightest leave never to return. Howley contended that this further erodes the quality of

life in rural settings. Of course, conflicting advice such as this could leave those who would support women from rural areas wondering what to do. Therefore, it behooves those in education to counsel girls in a manner that does not stifle their growth and at the same time help them understand the cultural morés that they have grown up with and how they can best prepare for a possible science-related career.

Graduate Experience

As women continue their career path and enter graduate programs in STEM fields, support and mentoring by professors and other individuals continue to be important for their continued success. However, at this time, other factors such as balancing family and career/educational responsibilities become critical to their retention in graduate programs and eventually gaining positions in academia as full professors or obtaining positions in STEM fields outside of academia.

In an ethnographic study, Sallee (2011) utilized interviews and participant observation over a six month period to determine how the social hierarchy of an Aerospace and Mechanical Engineering Department at a large research intensive university affected the graduate students' experiences in the program. The majority of the graduate students in the department were male. Fourteen graduate students participated in the study with 12 being male and 2 female. The gender breakdown of the study group was similar to the overall make-up of the department.

According to Sallee (2011), competition between graduate students was welcomed and even encouraged by the professors in the department. Often, professors would complain about the graduate students when the professors believed the competitive

atmosphere was less than desirable. There was a distinct hierarchy in place where graduate students were expected to put in long hours, as much as 60-70 hours per week, in the lab conducting research for the professors. While working the long hours in the lab, the competitive nature in the students was cultivated. The professors believed that this was the best way for the graduate students to prepare for being future professors in academia or scientists in the private sector. Paradoxically, once the graduate students completed their degrees and achieved the level of professor, they earned the right to not have to put in these extremely long hours. It was expected that the graduate students would conduct research for their professors.

In addition, Sallee (2011) suggested that professors acted as mentors in order to maintain the established norms of the department. This is in contrast to Wai-Ling Packard's (2003) discussion of composite mentoring where the protégés actively sought out mentors who would meet their individual needs and the relationship developed was one of collaboration. The hierarchy in the Aerospace and Mechanical Engineering Department at this university reinforced science as being a competitive androcentric endeavor as posited by Harding (1991) and supported by Tolley's (2003) historical context. According to Sallee, students, especially the female students, often struggled with the atmosphere and expectations within the department.

In a related study, Fox (2001) utilized a mixed method design and sent out a national survey to 5,000 students in the fields of chemistry, computer science, electrical engineering, microbiology, and physics which dealt with barriers to personal identity development in the sciences due to the male hierarchical setting that exists. This study

suggested that women felt less accepted while working in collaborative groups that included men and were less likely to feel that they could speak or that their views would be taken seriously. According to Fox, the hierarchical system needed to be changed in order for women to feel that their contributions would be accepted equally with their male peers. This would enable women to conduct research, publish their findings, and be cited by others as much as their male peers have for years.

Along with the male hierarchy that is in place in many STEM graduate programs, other factors such as family responsibilities are often cited as problematic for the success of women in these programs. Sallee (2011) suggested that the women as well as some of the men who participated in the ethnographic study felt pressure to put in long hours in the lab conducting research at the expense of their familial relationships. The long hours spent in research were not conducive to maintaining positive family relationships. According to Sallee, when the participants chose family over research, the professors were not sympathetic and believed the research and graduate program should come first. Often, these beliefs have perpetuated through time.

In another study, Monhardt and colleagues (1999) utilized a naturalistic, multi-case study design to determine the effect of family responsibilities on the success of women in science-related fields. The findings suggested that if a female scientist chose family first during the developmental stages of their careers and minimized time spent at work, this became a barrier to advancement. According to Monhardt and colleagues, if science-related careers are to continue to be attractive to women, changes in regard to job demands that allowed women to advance in their careers while still being able to meet

family obligations will be necessary. Programs that allow for the flexibility posited by Monhardt and colleagues do exist.

In an exploratory case study conducted by Buck and colleagues (2006), eight women in a nontraditional graduate fellowship program in STEM fields were interviewed. Of these eight women, four were married with children, three were not married, and one was a single mother. Even though the fellowship was not designed specifically for women, the focus on creating their own identities of being a scientist that were in contrast to the typical image, working with science/math teachers and their students in K-8 classrooms to develop relationships that fostered a passion for these subjects instead of acting as teaching assistants for their professors, and focusing on the balance between their home lives and becoming a scientist, the nontraditional fellowship attracted mostly women. At the time of this study, 80% of the participants were female. According to Buck and colleagues, these women believed it was important for them to strike a balance with their personal lives and their work as graduate students. Without achieving this balance, these women believed it would be difficult for them to continue in their programs. However, these women believed they were not as connected to their graduate departments. This disconnect was attributed mainly to spending time in the public schools instead of acting as graduate assistants within their departments. Due to the disconnect, problems with developing rapport with their professors, especially those professors who held more traditional values as described by Sallee (2011) resulted. When the fellowships were concluded, the women believed the benefits of working with the public schools and having time to reflect on striking a balance between home

responsibilities and their programs outweighed the negative aspects. Buck and colleagues concluded that the nontraditional graduate fellowship program was conducive for helping students, especially women, maintain their course to completing their degrees more readily than being a member of traditional graduate programs. The researchers added that follow up studies should be done to determine the long term effect of this program.

The experiences and supports women receive throughout their lives have a direct impact regarding who they become as adults and the career paths they follow. In the previous sections of this literature review, I have discussed the historical context, socioeconomic, familial, gender roles, cultural and racial/ethnic backgrounds, and educational related experiences which help shape the identity of women and their path to science-related careers. The combination of all these factors influences the lens in which women view their circumstances. The following section will explore postmodern feminism as it relates to women's pursuit of science-related careers. Postmodern feminism is the lens that grounds my study.

Post-Modern Feminism and Its Relationship to Science Education and Related Careers for Women

Just as the identity of women and the cultural capital afforded to them are influenced by their socioeconomic class and race/ethnicity, as described earlier in this literature review, the lived experiences and the lens through which women view the world are influenced by these factors as well. Thus, Rosser (2005) described how women cannot be viewed from one universal feminist lens. Instead, one must take into account

the culture, socioeconomic class, and race/ethnicity of women to better understand how these factors affected their lived experiences and shaped the lens through which they view the world. Furthermore, as women experience the different time periods in their lives, these factors become cyclic in nature. For example, women from white middle class America will have a different lived experience as compared to women from Sub-Saharan Africa. Even women from middle class America who live in the larger cities will have different lived experiences as compared to women who live in the rural areas. This contention is supported by Howley (2009), especially in regard to the difference in cultural *morés* of rural America as compared to the values held by corporate America in the larger cities. The diversity of experiences as influenced by the factors just described are the main tenets of postmodern feminism. Therefore, in an article dealing with educational policy reform, Wallin (2001), defined postmodern feminism as “the lens that appreciates and systematically upholds the value of multiple voices and perspectives, and respects diversity” (p. 39).

Through a postmodern feminist lens, a better understanding of how to affect positive change for women as they pursue their education in the sciences and continue on to science-related careers can be achieved. These changes need to be made at all levels in the educational process as the lens supported through postmodern feminism is an ongoing look at the experiences of women throughout their lives and not an endpoint to be achieved. For example, in a study conducted by Capobianco (2007), three high school science teachers conducted action research to transform their practice. These three teachers engaged in a self-analysis of their practice and joined eight other science

teachers to discuss the nature of science, science teaching, and science education to better serve diverse student groups. The focus of these discussions centered around an examination of their teaching pedagogies in order to determine how well they were utilizing female friendly and/or feminist pedagogical techniques in their classrooms. According to Capobianco, the teachers in the study discovered that a wide variety of techniques were necessary to achieve a female-friendly environment. Among the techniques suggested by the findings of this study were allowing female students to create their own inquiry based questions that enabled them to make connections to their own lived experiences. This constructivist technique was viewed as a positive reinforcement of feminist pedagogies, those specifically related to postmodern feminist tenets.

The collaborative nature of the action research methodology used by the teachers was also viewed as a positive technique for feminist pedagogies and was informed by the past experiences of practicing science teachers. When a constructivist framework and the lived experiences of women are utilized in order to make meaning in a new situation, this aligns well with the highest level of identity formation and women's ways of knowing as described by Belenky, Clinchy, Goldberger, and Tarule (1986).

In a related study, Chetcuti (2009) utilized interview data to determine the gender inclusive strategies utilized in their classrooms by 14 secondary science teachers in a Masters of Education in Science program. The 14 teachers in the study came from a wide variety of school settings. The settings included: an all-boys public school, an all-girls public school, an all-girls private school, an all-boys private school, an all-girls church

school, an all-boys church school, and coeducational public schools. According to Chetcuti, the teachers indicated that having knowledge of the cultural background, lived experiences, and prior knowledge related to science concepts for individual students was helpful in order to develop appropriate lessons, assignments, and formative as well as summative assessments for their classes. In this way, the learning needs of each student would be better served. This aligns well with a postmodern feminist lens as individuals, especially women, cannot be viewed as having one universal lived experience. Therefore, a single approach to teaching science concepts will not work with all learners. However, Chetcuti pointed out that the information regarding how these educators approached teaching science was acquired through interviews only. It is quite possible that what the teachers say they do and what actually occurs in their classrooms may not match entirely.

Even as women complete science-related degrees and pursue science-related careers, the need for an understanding of women's lived experiences and the factors affecting the lens in which they view the world is important for those in leadership or supervisory roles to support the maintenance of these positions. For example, in an essay dealing with feminist ideologies related to the work setting, Roy (2004) explained how she eventually moved from a doctoral level research position in molecular biology to being the resident scientist in the Women's Study Department at her college. She found it difficult to bring her feminist ideals into the laboratory setting. She explained how these settings needed to change in order to reflect women's ways of gaining knowledge as these ideals are often different from the status quo in many science laboratories. This contention is supported by Sallee (2011) in regard to the atmosphere in the laboratory

setting in the aerospace engineering department. The male hierarchy, competitive focus, and the long hours expected for students to engage in research for their professors are not conducive to having an awareness of the lived experiences of the students, especially the female students who are in the program. As a result, individuals, such as Roy, often leave their positions in the sciences and move to other positions in which the lens which grounds their beliefs is more compatible.

As supported by Rosser (2005), postmodern feminism speaks to the need for those in leadership or supervisory roles, at all levels, to understand that the lived experiences as informed by gender, race/ethnicity, socioeconomic background, and culture all influence the lens in which one views the world. In turn, having this knowledge will help leaders become the mentors necessary for women to succeed in science-related degree fields and future careers in the sciences. Making changes in teaching pedagogy and expectations related to science careers that reflect this understanding will be a positive step for women's pursuit and maintenance of careers in science-related fields, especially those that have been dominated by men in the past.

In the last section of this literature review, I look at how the use of qualitative methodologies can become transformative for the researcher as they reflect upon their own study and relationships with the study participants. Part of the approach to qualitative research, as described in Creswell (1998), is for the researcher to become part of the study in a collaborative framework in order to form relationships with the study participants. These relationships would allow the researcher to gain a transformation along with the analysis of the data.

Qualitative Methodologies Serving as a Transformative

Agent for the Researcher

In an article dealing with the role reflexivity plays in qualitative research, specifically related to case study, Watt (2007) described how numerous readings of her research journal helped transform her as a researcher and reshape her identity. After completing her first qualitative study that dealt with the personal journey of a family who home schooled their children, Watt chose to read through her research journal as a means for greater self-reflection regarding the processes involved in case study. For example, Watt homeschooled her children and was well acquainted with her study participants. She used her research journal as a means to develop trustworthiness in her study. By being open and sharing her thoughts about her relationship with the study participants, it would be easier to disclose possible bias to the readers of the research. Through reflection in her journal, she was able to better sort out the connections with the study participants and openly disclose these relationships in the narrative of the research document.

According to Watt (2007), it became clear that maintaining a research journal was the key element in transforming her into a better qualitative researcher and helping shape her future identity as an individual. After several readings of passages in the journal, Watt was able to refine all aspects of qualitative research from defining the research questions, developing better interviewing techniques and other forms of data collection, becoming more adept at recognizing categories and themes as they emerge from the data during analysis, and using reflexive journaling as a vehicle for maintaining balance between being a researcher and ongoing family responsibilities. Watt maintained that the role of

reflexivity in qualitative research would not be as powerful if the researcher did not use the narrative writing in a research journal as their guide. As a result, the possible transformations in the researcher would not be as readily achieved.

Often, the researchers are transformed as a direct result of their experiences with the study participants. In a qualitative study where the researcher was a member of the same racial and ethnic group as the study participants, Ngunjiri (2007) described her personal transformation as a researcher and individual. Ngunjiri, a graduate student in the United States, chose to go back to Kenya, Africa, where she was raised. In her research regarding the role women leaders played in their culture, Ngunjiri wanted to give an authentic voice to these women. According to Ngunjiri, most of the research she found while conducting her study reinforced stereotypes of these women. Ngunjiri wanted their authentic voices to be heard.

An important aspect of Ngunjiri's (2007) culture is the oral tradition of passing down the cultural *morés* from one generation to the next. Much of the oral history and tradition is passed through the women leaders in their communities. Ngunjiri quickly realized for her to be accepted as a researcher with these groups of women leaders, she would simultaneously be taking on the role of learner as well as researcher. After completing the research, Ngunjiri had a personal transformation related to being a leader in her culture as well. Ngunjiri realized that she could no longer be a researcher in academia alone. In addition, she had the responsibility to utilize her status in academia to further the cultural awareness and ideals so strongly espoused by the participants in her study.

In another case study example where the relationship with the study participants had a transforming effect on the researchers, Gould and Nelson (2005) described how difficult it was for them as researchers to describe the day-to-day struggles of their participants who either had or were currently experiencing breast cancer. The researchers had difficulty making sure the voices of the cancer patients were being heard and at the same time having an empathy level that adequately supported the participants. Being female as well, the researchers never experienced breast cancer nor had they dealt with a close family member or friend who fought this disease. The researchers believed that this separation made it more challenging to adequately present the propositions developed in the study. However, Gould and Nelson maintained that they gained a level of empathy that would not have been possible without having developed the close relationship with the study participants. By the end of the study, the researchers learned as much about themselves as they did about the study participants in regard to dealing with having or survived breast cancer. For Gould and Nelson, it became difficult to discern who benefited more from the relationships forged through the study, the participants or they as the researchers.

One of the hallmarks of qualitative methodologies, case study in particular, is the relationships forged between the researcher and the study participants as described by Creswell (1998). These relationships allow for the rich details of individuals' lives to be heard and expressed. The depth of understanding and meaning derived from qualitative research can, in many instances, become a transforming agent for the researcher as well. This transformation may come through the rigor of the research process as described by

Watt (2007) or through the self-reflection about the researchers' relationships with the study participants as described by Ngunjiri (2007) and Gould and Nelson (2005).

Summary

In this review of literature, I provided a brief historical context of the role science education played in shaping the identity of girls and women in the United States in relation to their opportunities in science and science-related fields. The basic thesis that emerged was, as initially contended by Harding (1991) but in the context of the history provided primarily by Tolley (2003) that science education has historically been available to women but has also been centered on the needs of society as perceived by men. Next I explored how socioeconomic class, race and ethnicity coupled with regional and geographic backgrounds of women further influenced the identity they develop in relation to science and science-related careers. The cultural capital provided the white middle class, as discussed by Chinn (1999), was critical for women to obtain and embrace if they are to successfully navigate through science courses and eventually work in science-related fields. This is especially true if women are from racially and ethnically diverse backgrounds or from geographically isolated areas as described by Bouck (2004), Howley (2009), Guiffida (2008), and Barley and Brigham (2008).

In the next sections, I discussed the importance of family supports. I noted that the role mothers and fathers play in their daughter's lives is critical. As discussed in Bhanot and Jovanovic (2009) and Scott and Mallinckrodt (2009), mothers tend to have a greater influence when women are young and fathers when women are in their late high school

and early college years. However, if fathers' relationships with their daughters were conditional, meaning they would show support only when their daughters performed well or acted in a way that pleased their fathers, then this had a negative influence according to Scott and Mallinckrodt.

In conjunction with support from family members, I discussed experiences women have in school during their formative years, through college and into graduate school, and how those help shape their identities as well. The course taking patterns as described by Rudasill and Calahan (2010) suggested that even though girls demonstrate performance levels in math and science similar to boys, they still tend to take fewer math and science-related courses as they move through school. According to Rudasill and Calahan, they believed this was due to the socialization of girls in our society to fill traditional gender roles. Programs such as TARGETS described by Kerr and Kurpius (2004) have been developed to counteract the socialization of girls in our society coupled with those girls who have at risk tendencies but also show promise in the sciences and math related fields. While in college, programs such as PWISEM as studied by Kahveci and colleagues (2007), showed promise in maintaining the focus for women who were already in science and math related degree fields.

Along with programs to help support girls and women as they pursue science and math related course work and eventual careers in these fields, teachers and professors need to be aware of gender inclusive teaching strategies as described by Tindall and Hamil (2004). In addition, professors need to be aware of their biases as they teach and mentor women, especially those from racially and ethnically diverse backgrounds as

suggested by the studies of Carlone and Johnson (2007), Ong and colleagues (2011), and Johnson (2007). According to Carlone and Johnson, depending upon how professors mentor and interact with their female students in the science fields, they may form three identities as a scientist or leave the science areas to pursue an entirely different path. The three identities as described by Carlone and Johnson are: research scientist, altruistic scientist, and disrupted scientist. Depending upon which identity is developed by the student, this helps determine which science-related field will be chosen.

All of the areas covered in this literature review are tied directly to the lived experiences women have as they navigate through their lives on the path to obtaining a science-related career. These experiences help shape who they become at any given time in their lives. These experiences are influenced by their socioeconomic background, geographic location, race/ethnic background, and culture in which they live. The theoretical lens that grounded my study and was discussed in this literature review is postmodern feminism. As discussed in Rosser (2005), one cannot view women as having one universal lived experience and ground their beliefs in one form of feminism. Postmodern feminism speaks to the diversity of lived experiences of women and how this diversity needs to be taken into account when interacting with and helping women succeed along their path to a career. This is especially true if this career path includes the sciences and those science areas traditionally dominated by men.

Finally, I explored how using qualitative methodologies, case study in particular, can become a transformative agent for the researcher. The relationships developed between the researcher and study participants become dynamic. Often, this collaborative

relationship, as described by Creswell (1998), leads to new insights and becomes a change agent for the researcher. These changes can be directly related to becoming a better researcher as described by Watt (2007) or more personal as described by Ngunjiri (2007) or Gould and Nelson (2005).

CHAPTER III

FRAMEWORK AND METHODOLOGY

This section addresses the following areas: (a) research framework, (b) case selection, (c) data collection, (d) data analysis, and (e) trustworthiness.

Research Framework

In this study, the main questions that drove the data collection were:

1. In what ways do perceived gender roles, developed throughout childhood and early adulthood, impact women's career decisions?
2. How will the analysis of data and the propositions discovered in this study lead to transformation in the researcher?

As a male researcher studying perceptions of gender roles as viewed through a postmodern feminist lens, I believed that it was important to have justification for conducting a study in an area that could possibly be interpreted as being *out-of-bounds* for a male because a male may not be able to represent the subject matter appropriately.

As Diekman and Goodfriend (2006) suggested, counter stereotypical roles need to be accepted by society if positive change is to occur in regard to gender roles. Being a male researcher dealing with a topic usually dealt with by women would be an example of a counter stereotypical role. I believe that if men are to be more accepting of and advocate for women in science-related fields, we must *walk in their shoes* as closely as possible. What better way than to conduct research in a realm most often undertaken by women? The material that follows will describe the overall framework of my study.

As discussed in Yin (2003), case studies are utilized to answer how or why questions with greater depth. The framework or design utilized in the case study will depend upon the depth required to answer the questions. Will the questions require a description of an event or individual or a more in depth cause and effect explanation? For example, if a single case is utilized for the framework, the propositions developed from the analysis of the data are difficult to confirm. Consequently, the transferability of the propositions is reduced. In contrast, a multi-case framework allows for within case analysis and comparison of data between cases. The researcher can look for replication of data which strengthen the propositions and improve transferability. In this study, a multi-case framework was utilized. This framework allowed for an in depth explanation regarding the impact of perceived gender roles and lived experiences of the study cases on their career decisions. Four former female students of mine, who showed promise in science while they were in high school, were the cases utilized. The four cases were bound in time and place (Creswell, 1998). For example all four participants grew up in the same southeastern Utah community and attended the same high school over the span of nine years. The data collection for the study occurred over a 10-month period from November of 2008 to September of 2009.

In addition, qualitative research and case study in particular allows the researcher to be more reflective and connected to the study. As discussed in Creswell (1998), due to the connection often developed between the researcher and the individuals in the case, the researcher may become part of the study. For example, through the use of researcher journals and connections developed with their study participants, Watt (2007), Ngunjiri

(2007), and Gould and Nelson (2004), shared how their abilities as qualitative researchers and personal lives transformed through their experiences while conducting their studies. The personal transformation I went through as a researcher and individual was addressed in my study. The second main question that was addressed in my study dealt with the reflexivity of the researcher as it relates to possible transformations, personally and professionally.

As discussed in Yin (2003), six sources of evidence are often utilized as forms of data collection while conducting case studies. Due to the physical distance of the cases from me and time constraints, I was not able to travel to their locations. The ability to use a variety of sources was reduced. As a result, two sources of evidence were utilized for this study. Interviews and archival evidence were the sources utilized. In the following section, I will discuss the criteria for the selection of the participants and how the criteria were applied.

Case Selection

Purposeful sampling as described by Creswell (1998) was utilized to select the four cases. With purposeful sampling, criteria are set as a guide for selecting cases who will best serve to answer the study questions and support the framework and methodology of a study. The following criteria were utilized to guide the sampling for the case selections: (a) all of the cases included in the study needed to be women, (b) all of the cases needed to have shown promise in science, (c) all of the cases, with the exception of one which was to be utilized as a negative case for possible alternative explanations to

emerge, needed to be actively involved in a career related to science, (d) of the three cases who were involved in a science-related career, one needed to be involved in a pure science field that is still male dominated, (e) all of the cases needed to have grown up in a rural setting, (f) all of the cases needed to have commonalities growing up as well and differences, and (g) due to time constraints and location of the researcher the cases needed to be convenient and amenable to having interviews conducted via phone and communication through e-mail. With these criteria set for selection of the cases, it was difficult to find participants that fit all of the parameters. In the end, four cases were selected who fit the criteria.

In terms of common typologies utilized in purposeful sampling for this study, the cases were convenient choices that had commonalities as well as variation that fit well with the study questions. All four cases were former female science students of mine and are successful in their career choices. Because I have had occasional contact since high school with each participant, entrée was easily obtained. All four cases were eager to be part of this study. They were selected because three are now working in science-related careers and the fourth chose a different career path even though she initially wanted to become a medical doctor.

All four cases went to the same high school in a small rural community located in southeastern Utah. This community is different from many similarly sized communities in the state and has an eclectic make-up in terms of its residents, more similar to what might be expected in a larger city rather than a rural, remote community. This is due in part to an economy that is highly dependent on tourism. In addition, in contrast to most

rural Utah communities, membership in The Church of Jesus Christ of Latter-day Saints makes up about 45% of the population. This is a much smaller percentage than would normally be expected. Moreover, at varying times of the year, the community make-up consists of people from all over the world who mainly come to participate in various forms of outdoor recreation. Over the years, many visitors have decided to stay, creating an eclectic mix of residents.

More than 35% of the high school student population qualifies for reduced or free lunch. Eighty-three percent of the student population is Caucasian, 10% is Latino/Latina, and 7% is Native American. All four cases in this study are Caucasian and graduated from the high school within a 9-year period spanning from 1992 to 2001. Two of the cases are active in The Church of Jesus Christ of Latter-day Saints and the other two have no strong connection to a church group. This is an important point of comparison within each case and between cases due to the possible influence this religion might have in regard to gender roles and career choice.

In regard to the cases' occupations, one is a veterinarian. Veterinary medicine was once a male dominated field, but as of 2010, females now outnumber males in this profession (*Journal of the Veterinary Medical Association* [JAVMA], 2010). Another case is a practicing registered nurse, a traditionally female-dominated field that only recently is attracting more males. Both of these cases work in applied science professions. The third science career related case is a research assistant in a college located in Colorado. She works in the field of hydro-geochemistry. The hydro-geochemist is working in a pure science field that is dominated by male scientists. The

fourth case is working as a lawyer. The lawyer was utilized as the negative case which allowed for alternative or rival explanations to emerge from the data analysis.

During high school, all four cases were recognized as outstanding students, being nominated for Sterling Scholar honors by our local high school during their senior year. The Sterling Scholar competition is a statewide program where students compete in various academic areas, science being one of these areas. However, it must be noted that an air of subjectivity surrounds the selection process. Students who have aptitude in various subject areas, but may not have *teacher pleasing* behaviors will most likely not be selected as participants. The participants were chosen based upon their success in the science area throughout high school. Grades, application of science concepts in terms of field study, internships, and awards received, and achievement on the ACT test in the science category were all taken into account in the selection process. The potential for following a science-related career path after high school, as determined by the interviews during the competition, is a factor in the judging of the final competition as well. The competition is separated into regions and the eventual winners, if they choose to stay in state for college, are typically offered varying levels of scholarship funding. While all four cases in this study showed promise during high school in the area of science, three of them, the lawyer, the veterinarian, and the nurse were chosen as Sterling Scholars in the science category, while the one case now working in a male-dominated, pure science field was not chosen as a recipient in the science category. Instead, she was chosen as the representative in the foreign language Sterling Scholar category for our high school. The nurse and lawyer eventually took first place in the regional competition in the science

category. They remained in state and utilized their scholarships at their respective universities. The veterinarian eventually went out of state to pursue her education. The hydro-geochemist did not pursue science until after she began her college career. As with the veterinarian, she pursued her college education outside of the state.

Data Collection Procedures

As stated previously, two case study data collection methods were employed in this research: interviews and artifacts. These will be discussed in turn.

Interviews

Open-ended and more focused interviews (see Appendix A) with the four cases, as described by Yin (2003), were utilized as the main source of evidence. Prior to the first interviews, each participant was sent an informed consent form (see Appendix B) that was signed and returned to me. Once the form was returned, an initial interview was scheduled at a time and place convenient to the case. Three of initial interviews were conducted in person because the cases were visiting their parents. Nancy's and Susan's interviews took place at their parents' home. Maggie's interview took place at the home of her in-laws. These homes are located in the rural community where the four cases grew up and went to school. The initial interview as well as the second interview with the veterinarian was conducted via a video feed over the Internet and telephone because she lived on the southeast coast of the United States, which made it cost and time prohibitive to conduct an in person interview.

Electronic recordings of the first interviews were taken for later transcription

utilizing oral transcription computer software, Dragon Naturally Speaking.[®] The electronic recordings were transcribed verbatim. A handwritten notebook was also maintained during the interviews to help determine the course of questioning for the second round of interviews by using notations written during the interviews and to aid in the analysis phase of the study. The cases received completed transcriptions of the first interviews so they could verify that their views were being represented accurately or suggest edits that would clarify or add to their responses. Hard copies as well as electronic files of the original and edited transcription data were stored by me. The member checked transcription data of the first interviews were utilized in the analysis phase of the study. Utilizing member checked transcripts was the best way to ensure the authentic voices of each case was accurately represented.

During the initial interviews, the main study questions were both open ended and structured. However, I was hesitant to move away from the protocol that I set for the first interviews. I was not sure how much I should probe and extend on the initial questions or wait until the first transcription and beginning analysis. I was concerned that moving away from my initial interview protocol would possibly impact the external validity of the study by introducing personal bias during the interview. Due to my former relationship with the four cases, I was their science teacher when they were in high school, I had to filter the previous knowledge I had of them as students in order to allow for their voices to be heard. With input from my auditor, I was able to maintain the proper focus on the study protocol which helped mitigate my previous relationships with the cases. Due to the previous relationship I had with the cases, there was also a hierarchy

of power. In the initial interviews, I had the perception that they were viewing me through a student-teacher lens while I was viewing them through a researcher-participant lens. The level of relationship had changed, however, because each of the cases had accomplished much in regard to their education and status in their careers. I sometimes had feelings of inferiority because the cases had accomplished much in a relatively short period of time in regard to their education and careers, while I had taken a much longer period of time to advance in mine.

After beginning the analysis of the initial member checked transcriptions and looking at notes that I had taken during the first interviews, the second round questions were created (see Appendix C). The second round questions helped the cases answer more openly, which led to a richer understanding of their lived experiences and how they negotiated the equity in their personal relationships, especially with their spouses. This led to new avenues of inquiry as discussed in Yin (2003). Further, these new avenues led to conducting interviews with parents, spouses, and mentors of the cases. These snowball interviews, as discussed in Creswell (1998), included the mother, father, and spouse of the lawyer; the mother, spouse and mentor for the veterinarian; the father, spouse, and mentor of the nurse; and the mother and spouse of the geochemist. The interviews with the parents of the cases and mentor of the nurse were face-to-face interviews as they all live in the same community as I do. The interviews with the spouses of the participants and mentor of the veterinarian were all conducted via telephone due to the distance from my location. All of the second rounds of interviews with the four cases were conducted via telephone due to the distance from the researcher's location as well. As with the

initial interviews with the four cases, the follow-up interviews with the study cases, interviews with parents, spouses, and mentors were recorded and transcribed. Copies of the second round of interviews with the four cases and interviews with spouses and mentors were sent back to them to be member checked. The member checked transcripts were utilized for analysis in the same manner as the initial interviews from the four cases.

Artifacts

Archival evidence (see Appendix D) in the form of personal records and memorabilia was also utilized. These records were in the form of college transcripts, letters of recommendation, photographs, examples of college work, recognition for test scores achieved, and narratives from Sterling Scholar portfolios.

Permission was granted by the study cases to utilize these forms of data when applicable. However, cases were given latitude to keep more personal records private, and the lawyer eventually chose not to send any archival evidence. The purpose of these forms of evidence was to validate and reinforce information obtained in the interviews. However, the utilization of the cases' archival evidence, like other historical documents, ran the risk of selection bias by the cases or by me as the researcher. Using an external auditor to verify the inclusion of the selected documents helped mitigate the possible bias. These archival records and documents were sent to me electronically as PDF files or given to me when I had the face to face interviews with the cases or their parents.

Data Analysis

By utilizing a postmodern feminist lens to ground my study, I analyzed the cases'

lived experiences from a variety of perspectives. Even though the four cases in this study grew up in the same southeastern Utah community and were products of the same school system, they had varying life experiences and influences that affected their views. These experiences added a unique cultural perspective in contrast to if they had grown up in a more urban setting. In addition, each case's experiences influenced the choices they made in regard to her educational path and eventual career. After the completion of the analysis of the sources of evidence, the theoretical propositions developed from the study fit well with a postmodern feminist lens.

Yin (2003) described three over-arching principles in analyzing case study data. These include: (a) relying on theoretical propositions, (b) entertaining rival explanations, and (c) developing a case study description. To address these three principles, a flow chart was utilized throughout data analysis as visual heuristic that clarified the theoretical propositions that were emerging from the data. For example, an earlier version of the flowchart (see Appendix E) was used to show the relationship between the study questions, categories and subcategories as they began to emerge from the analysis of the sources of evidence. It later became apparent that this flow chart was overly hierarchical and linear. This seemed inconsistent with the feminist lens used in posing the research questions in the first place and with the evidence within the data. As the evidence mounted, the flowchart was changed to reflect what was being learned in the analysis (see Appendix F). Instead of a linear progression from gender roles to propositions, a more cyclic picture emerged. Gender roles became part of the cycle and not the main determinant of the propositions. True to the cyclic relationships eventually included in

the flowchart, while data from the transcripts and artifacts influenced the construction, the visual flow chart was also helpful in organizing the common vocabulary and phrases for coding and identifying common themes. Propositions were made relating back to the purpose of the study and how well it fit into a postmodern feminist lens.

With the beginning of the initial analyses of each case study data, the first peer debriefing and auditing sessions occurred. In the beginning of the study, I utilized separate individuals, one as a peer debriefer and the other as auditor. However, as the data collection and analysis moved forward, the feedback from the peer debriefer diminished because she was too busy with her own dissertation, career, and family responsibilities. At this point, the auditor took on the dual role as debriefer and auditor. With the utilization of a nonexample case, negative analysis, and input from the debriefer/auditor rival explanations began to emerge and inform the propositions of the study. Instead of a focus on gender roles as initially intended at the beginning of the study, the propositions that emerged from the analysis became more robust and encompassing. The analysis of the data was ongoing. I did not wait until the end of the study to begin the coding and categorizing of the data. This was a form of constant comparative analysis as described by Creswell (1998).

Following from the general principles, the specific steps that were undertaken to analyze the sources of evidence will provide a clear picture of the process utilized in the study. After each interview, the digital audio recorder was utilized to play back the conversation. During this time, I repeated the words verbatim through the dictation software using my laptop computer. As a result, an electronic copy of the transcript was

developed. The transcribing phase became the second interaction with the transcript data as the actual interviews were the first. Hard copies of the transcripts were then kept in a binder and electronic copies were sent to the cases for member checking. When the member checked transcriptions were returned, I began the next phase of the analysis which was to read through the hard copy of the member checked transcripts and circle key words and phrases in the text and make marginal notes to help me begin developing categories of the data. I did not wait to receive all member checked transcripts before beginning this phase of the analysis. I would work on this phase as soon as I received a member checked transcript from a case or snow-ball interview. In this way, I kept the data in the forefront of my mind, and this became a form of constant comparative analysis as I was able to develop categories from the data as they emerged.

Each member checked transcript was labeled with the case name, number of interview if applicable, date of the interview, and location on the digital recorder. In addition, each line in the transcript was labeled with a number and each page numbered on the bottom for reference purposes later in the analysis (see Figure 1).

After the initial phase of the analysis was completed with the hard copies of the raw data transcripts, an electronic table was produced utilizing the member checked transcripts with marginal notes. This electronic version was separated into two columns. The column on the left contained the question from the interview followed by the section of the member checked transcript that pertained to the question. The transcript was highlighted in yellow where it related to the annotated notes in the hard copy margins. The creation of the raw data table was the third time I interacted with the data during the

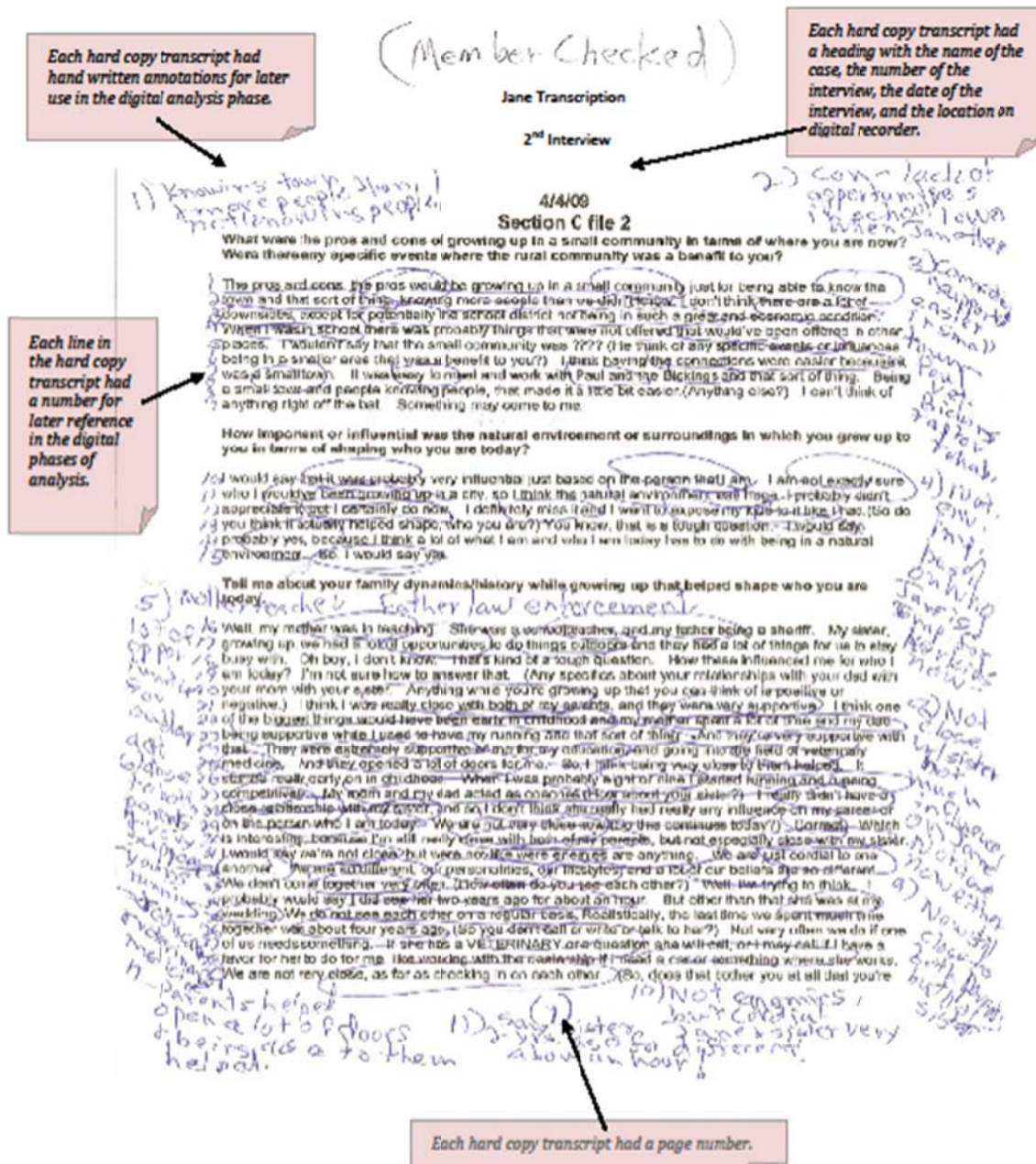


Figure 1. Example of member checked transcript used in analysis.

analysis phase. Again, I was able to be immersed in the information which helped constantly compare the data as it came back to me. The column on the right contained information from the original marginal notes from the hard copies as well as possible new

1. What were the pros and cons of growing up in a small community in terms of where you are now? Were there any specific events where the rural community was a benefit to you?

The pros and cons, the pros of growing up in a small community is that you know the town and the people and there are more people than you would have in a larger town. There are a lot of downsides, except for the school district not being in such a great and economic condition. When I was in school there was probably things that were not offered that would've been offered in other places. I wouldn't say that the small community was 2222 (He think of any specific events that were connected to the small town that was a benefit to me. Paul and the Dickings and that sort of thing. Being a small town and people knowing people, that made it a little bit easier. (Anything else?) I can't think of anything right off the bat. Something may come to me.

The left column has a numbered Question from the interview.

The highlighted areas in the left column relate to annotations in the right column.

The right column has explanations for the abbreviations.

Jane believes that knowing more people than not knowing was a positive in a small town. This made it easier to meet and work with the veterinarian and the raptor rehabilitators. However, the school district was not in the best financial shape at the time and she believes this limited the offerings that would have been available at a larger or more affluent school. (Personal Identity Development, Feminist Lens) (Ja2, p. 1 lines 1-5, 6-8)

Annotations from the raw data transcripts aligned with operational definitions.

Figure 2. Annotations of raw data aligned with operational definitions.

subcategories. The right side of the table contained sections of the transcripts that supported the categories and subcategories as well as references to supporting artifact data if applicable. At this point, all the transcripts were being utilized from the cases as well as the snow ball interview data. During the development of the categories and subcategories, I was immersed in the data for a fourth time by reading and rereading the transcripts. Different color fonts were utilized for an easy visual to denote the sources of the interview data. Black fonts were utilized for the case study interview data, blue fonts were utilized for the parent interview data, green fonts were utilized for spouse interview data, and orange fonts were utilized for mentor/advisor interview data. The same abbreviation system to denote location in the original hard copy transcripts was utilized throughout the analysis tables (see Figure 3).

The artifact data were utilized as a form of triangulation, which improved the internal validity of the study as well as the development of additional categories. Three additional categories emerged that were supported by the artifact data. Predictors of future vocation, teaching/helping others, and perseverance and drive were additional categories. Figure 4 illustrates the connection between the category table from the transcripts, the category table developed for the artifact data, and an example of the actual artifacts.

In the last phase of the analysis, the category and subcategory table was utilized to inform the propositions developed from the interview and archival data. The propositions were developed after having been immersed in the data for a fifth time. A new summary table of propositions was created with a synopsis of the propositions under each

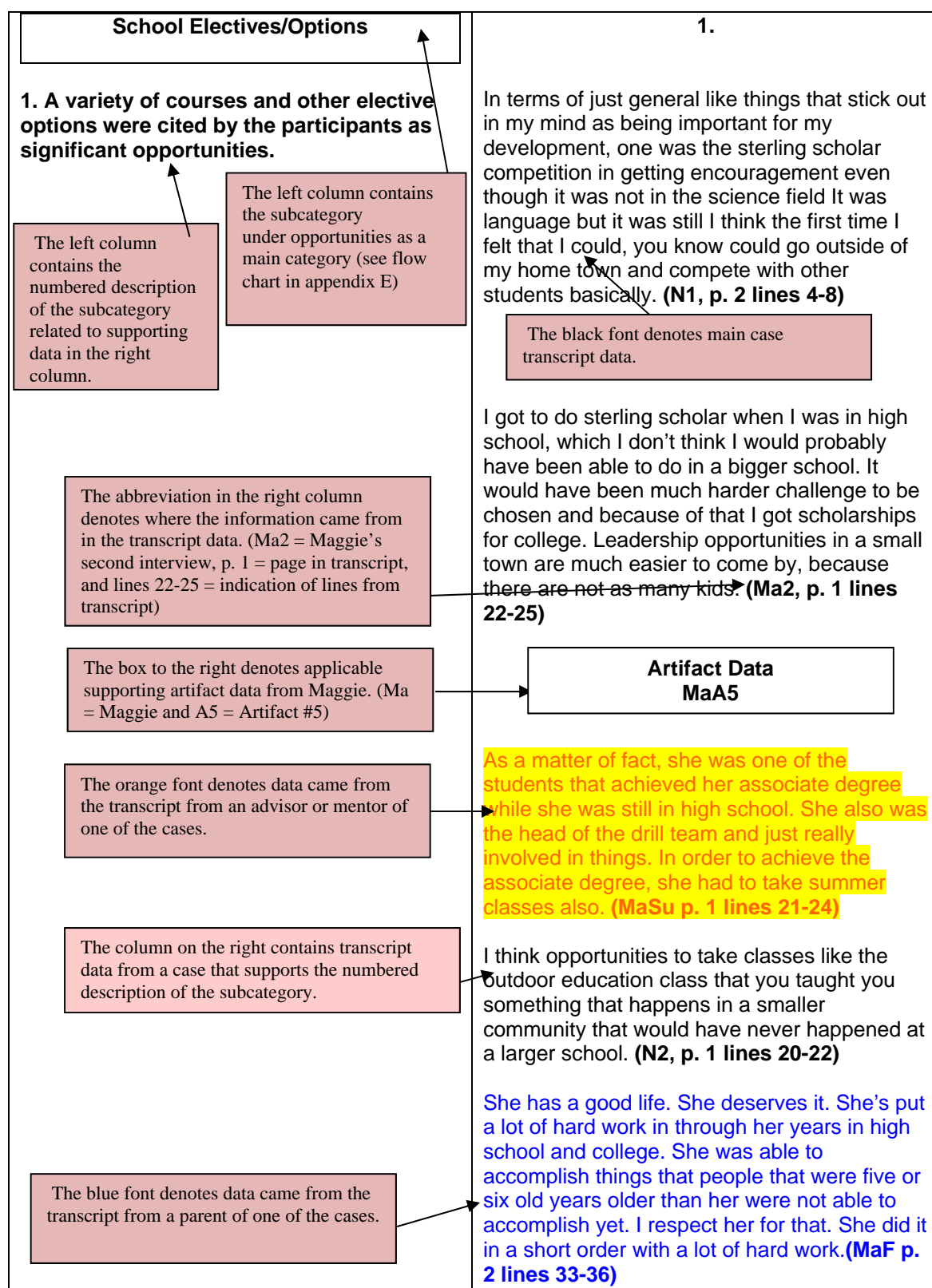


Figure 3. Emerging categories and subcategories utilizing all transcript data.

(4a) Transcripts

<p>3. Teachers and advisors were key supports for these four women while growing up.</p> <p>The right column denotes transcript data that supports the subcategory description.</p> <p>The box in the right column denotes the artifact data that supports the case's transcript data, which in turn supports the subcategory description.</p>	<p>3. Black Type = Participants Blue Type = Parents Green Type = Spouses Orange Type = Other Snow Ball Interviews</p> <p>Well, obviously like my teachers in high school, that were great teachers, you, Mr. Carter, he was a math teacher but he did science in middle school, both of you were great. (Ma1, p. 2 lines 25-27)</p> <p>Sarah Underwood , she was the upward bound adviser. I don't know if she still works there or not, but she was great! I loved her! She always got my college classes organized. She always helped me get everything I needed for that and she always would encourage me to do what I wanted with my career path. She would say, "if you want to be a stay at home mom that's what you should be, or if you want to be a rocket scientist, that's what you should be. You know, don't do anything that someone else thinks you should do." She was just really great at saying where ever your life takes you, be proud of it and just do what you want to do with your life. She would also say, "It doesn't matter where anyone in your family goes or where they were, you need to create your own life for yourself." That always helped. (Ma1, p. 4 lines 3-12)</p> <p>You helped me a ton in science. You always encouraged me to do Sterling Scholar. In fact I am sure that you nominated me for the competition. I feel like that's why I got an academic scholarship from the University of Utah, my Sterling Scholar. I was encouraged a lot by you to do science. (Ma1, p. 4 lines 20-23, 25)</p> <p>Artifact Data MaA3, MaA4</p>
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(Figure 4 continues)

Figure 4. Sequence of connections from the category table to an artifact example.

(4b) Artifact Category Table

Participants	Predictors of Future Vocation	Teaching/Helping Others	Perseverance/Drive
Susan	Susan chose not to send artifact data.	Susan chose not to send artifact data.	Susan chose not to send artifact data.
Nancy	NA5, NA6, NA7, NA10, NA11	NA1, NA2, NA3, NA4, NA9,	NA8, NA10
Jane	JaA1		
Maggie	MaA1, MaA3, MaA4, MaA5, JuA6	MaA4	MaA1, MaA2, MaA3, MaA4, MaA6

(4c) Letter of recommendation

To whom it may concern:

It is a pleasure to write a letter of recommendation for [redacted] is an outstanding student who exemplifies all the important qualities one would look for in a student. She is highly successful in all areas of school and a responsible community member.


[redacted] is a dedicated student who not only maintains an excellent grade point average, but also challenges herself by taking the most advanced academic courses offered to her. As a junior she filled her schedule with college classes in pursuit of her Associates Degree which she will achieve at the end of her high school senior year. She has challenged herself to take advantage of the opportunities and get the best education she can while in high school.


Although academics are very important to [redacted], she has many other interests and is actively involved in activities at school and in the community. She has been a member of the Drill Team for all four years and is presently serving as the team President. Her leadership qualities and abilities are demonstrated through the many different clubs, organizations, and student body positions she has held during her high school years. Some of which are, sophomore class President, Pep Club Fund-Raising Officer, Upward Bound Secretary, Hobby Ambassador, Youth Court Judge, and Track Captain. Her example of self-discipline and commitment to excellence also influences others to work to their ability. This, along with her ability to work with adults and maintain the high regard of her peers makes her a capable leader.

[redacted] is a mature and independent person who is highly motivated to achieve personal success. She knows, however, that to be personally successful one must also be a contributing member of the community. She has been involved in a church organization with youth groups and has been a great role model for many of the younger children. Teaching dance and gymnastics to young people has been a very rewarding task for [redacted] as well as teaching kindergarten and preschoolers.

[redacted] consistently demonstrates responsibility, leadership and dedication. She is of high moral character and integrity. I recommend her without reservation.

Sincerely,


Upward Bound Counselor

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applicable heading. The four main proposition headings developed were: main supports, opportunities, postmodern feminist lens, and researcher. Under each main heading, subheadings were created. The headings under main supports were: parent/family members, teachers/mentors/collaborators, and spouses. The headings under opportunities were: early opportunities/experiences, school elective/options, and postsecondary/current. The headings under postmodern feminist lens were: social class, lived experiences, and nationality/culture as applicable to living in a rural community and developing a scientist persona or identity. The headings under researcher were: researcher reflective journal, spouse related comments, and study participant related comments. Under each of these subheadings, applicable comments that supported the proposition sections from the category and subcategory table analyses were placed in the proposition table. This was the culmination of the analysis of the data. Figure 5 illustrates examples from the proposition summary table.

Along with data analysis, the ability to generalize or transfer the findings from this study to similar cases or situations will be improved based upon the trustworthiness of the data from this study. The last section will deal with the steps that were taken in this study to improve internal and external validity which in turn strengthens the trustworthiness and the transferability of the findings.

Trustworthiness

To establish trustworthiness for the data and findings of the research, I employed five methods: (a) triangulation, (b) member checking, (c) researcher journal, (d) peer

Case Study Propositions Summary			
The synopses of propositions were written under each main heading.		The top of the table contained the four main proposition headings.	
Supports	Opportunities	Post-modern Feminist Lens	Researcher
<p>Throughout their stages of life, these four participants had strong support from parents and/or family members. All the participants were strong willed, independent, and relationship oriented. Parents/family members helped guide and nurture these individuals' personalities.</p> <p>Teachers/Mentors/Collaborators helped support these individuals at various time in their lives as well. Each participant had a very supportive spouse in relation to home responsibilities and work.</p> <p>Even though the negative case study participant grew up in a family with traditional gender roles as compared to the other three, nontraditional roles were supported. The other three participants were exposed to nontraditional gender roles as they related to home and work responsibilities. Two of the participants sited their religious affiliation as being influential in their decision making processes.</p> <p>These supports and exposure helped them develop their personalities as they related to career and home responsibilities. It was imperative that these four participants had consistent and ongoing support from all these entities, especially their families and spouses, in order for them to maintain their current career status and nurture their family lives.</p>	<p>Along with the supports provided these participants throughout their lives, all of them had a variety of opportunities and experiences that helped shape their personalities and guide them in their pursuit of careers and family. In many instances, these experiences were not positive. However, these experiences were influential in these participants' lives in regard to developing perseverance, independence, and a drive to succeed. In addition, many of these opportunities and experiences did not always fit into traditional gender roles, but rather exposed these participants to a broader perspective for these roles.</p>	<p>The lived experiences of these four women greatly influenced who they became as adults. In addition, with the culture of growing up in a small rural community and being educated in the same schools throughout their lives, this affected the opportunities and experiences afforded to them. All four participants were very independent and did not want to be placed into a category of being considered a "stereotypical feminist." Instead, they took more of a holistic view of what it meant to be female. Their views regarding feminism fit well with the Post-modern Feminist perspective in which the lived experiences, cultural and social class backgrounds of an individual sets the stage for who they become as an adult. Therefore to place women into a narrow view of feminism is incorrect. These perspectives aligned well with how the participants of this study lived and developed their current personas in their careers as well as gender roles in relationships.</p>	<p>Very little research in the realm of this study has been conducted by male researchers. For women to be supported in their various career choices, especially in the area of science-related fields, it is imperative that more research be conducted by males for true understanding and empathy to be achieved. The old adage of "walking in someone else's shoes" in order to gain a true perspective is appropriate in this case. Along with this perspective, it is important for the researcher to be reflective in order to determine how they have been changed or influenced by the research. This is similar to Gould and Nelson's (2005) participatory qualitative study regarding their personal transformations as researchers when they dealt with a study of breast cancer patients in marginalized groups and Ngunjiri's (2007) study where she was transformed as a researcher and individual after studying the leadership roles of women in Kenya, Africa.</p> <p>As a male researcher, I was raised in a family with traditional gender roles. Throughout the course of this study, I have kept a reflective journal. In this journal, my path of self-discovery was documented. With qualitative research, the researcher can no longer be the objective observer but rather a more active participant.</p>

(Figure 5 continues)

Figure 5. Example from proposition table.

These are the first sub-headings under the main headings.		These are examples from the transcripts that supported the subheadings.	
Parents/Family Members	Early Opportunities/Experiences	Social Class	Researcher Reflective Journal
<p>Oh, my parents. Umm. Always encouraging me, teaching me how to get the things that I want, like work for it. That was really big in getting where I am. (S1, p. 2 lines 25-26)</p> <p>Oh, My mom took us fossil hunting when we were little. We went to a lot of rock and mineral shows in town. (N1, p. 1 lines 22-23)</p> <p>Okay, I do remember that and much of the encouragement came from my parents. They were very supportive in general, and especially science. (Ja1, p. 1 lines 23-24)</p>	<p>I played with my siblings a lot. We were our own entertainment. Umm we would go hiking or what we thought was hiking up through the neighborhood. Umm. ride bikes being with the animals here. When I was really little I would ride horses. Umm, play a lot in the swimming pool, just Marco polo things like that. We did not do a lot of board games, of course me and my sister played a lot of imaginary games. We would make up on the spot (laughing). Umm. Umm, like house where we would just pretend all of this. (S1, p. 1 lines 20-25)</p>	<p>When I chose a college, He encouraged it and was just excited I wanted to go to college. Any parent, I think should be excited that a child wants to go to college and do something. (Ma1, p. 2 lines 22-24)</p> <p>She was just really great at saying where ever your life takes you, be proud of it and just do what you want to do with your life. She would also say, "It doesn't matter where anyone in your family goes or where they were, you need to create your own life for yourself." (Maggie speaking about her Upward Bound Advisor. Ma1, p. 4 lines 9-12)</p>	<p>11/20/08—General Beginnings It will be interesting to hear what the participants have to say in regard to the initial interview questions. As a husband for almost 16 years, I have prided myself in sharing the family responsibilities that have traditionally been a wife's role. However, I am open to determine if my perceptions of my role are accurate. I may not be as aware as I perceive.</p> <p>12/1/08—Following the first two initial interviews, I interviewed Susan and Nancy 11/29/08. It was interesting to hear how these two women answered the questions. It was apparent to me that, at times, they were trying to give "correct" answers. It was difficult not to lead them in anyway and allow them to answer freely. This is imperative to reduce bias in the question and answer sessions. It must be their answers and they cannot be swayed by my presence or prompting. I feel that I did a good job in these initial interviews. I need to talk with Becky to determine how specific I can be with my follow up interview questions.</p>

debriefing, and (e) audit. Implementation for each of these will be described in the material that follows.

Utilizing case interviews, snowball interviews with parents, spouses, mentors/advisors, and archival records added to the validity of the study. These sources of evidence offered a form of triangulation as described by Creswell (1998) and Yin (2003). It was necessary to utilize these sources of evidence in order to reduce threats to

internal validity. Triangulation allowed for confirming or disconfirming evidence for the initial coding and categorizing of data as well as proposition development. Refer to the highlighted sections in Figures 3 and 4 for an example of triangulation between the transcript data from Maggie, her high school academic advisor, and the letter of recommendation from Maggie's advisor. In addition, the use of Susan's case as a nonexample allowed for better triangulation of the data and the possibility of rival explanations to emerge. The ability to confirm emerging themes became stronger with the comparison to the nonexample. Internal validity was also improved by exploring why this participant did not choose to follow a career path related to science even though she initially showed interest and aptitude for a career in a science-related field.

Along with the use of triangulation as a means to improve trustworthiness in my study, member checking was employed as well. After each transcription of interview data was completed, I sent an electronic copy of the transcript via e-mail to the person interviewed. Using electronic copies allowed for easier editing and revising as compared to using hard copies. Those interviewed had a chance to edit or revise the transcript to better reflect what they wanted to say or add additional information that they had forgotten to mention during the interview. Copies of the original and member-checked transcripts were kept in a three-ring notebook for analysis. There were times when the individual interviewed indicated they did not want to make any changes to the transcript. When this was the case, the original transcript was utilized in the analysis phase. However, if changes were made, the member checked transcripts were utilized for analysis. Refer to Figure 1 for an example of the first page of a member checked

transcript that was used in the analysis phase of my study.

Following along the lines of feminist inquiry as discussed in Creswell (1998), I, as the researcher, was a collaborative participant in this study due to my unique relationship with all of the participants. In order to improve trustworthiness and transparency I maintained a researcher journal.

The researcher journal was utilized as a self-reflection regarding the study protocol and analysis. The writings also became an introspection regarding some of my life's challenges related to work and family during the data collection and analysis phase of this study. As discussed in Chacko (2004), being reflective as a researcher is imperative in qualitative research in order for relationships between the researcher and participants and researcher to his or her self to be developed and more fully understood. Each journal entry was separated into two sub-headings. The first section of each entry dealt with my personal feelings, emotions, and issues that I was confronting related to work, home, and the study in general. The second section dealt specifically with the study protocol and methodological issues (see Figure 6).

The researcher journal gave me a way to check myself and remember some of the nuances that may have occurred during the data collection and analysis phases. Keeping track of all of the data was a daunting task. My researcher journal helped me keep organized. The journaling process became a form of personal member checking as I became part of the study as well. Where applicable, selected entries from my journal were utilized in the development of propositions for the study (see Figure 5).

1/7/09 – Maggie returned her revised transcription
Personal Thoughts:

Maggie returned her revised transcription of our interview. I saved it to my files and will read through it tonight. She will also give me some copies of her Sterling Scholar portfolio that she feels are pertinent to why she chose a science-related career. This was her suggestion and since being a Sterling Scholar was part of the purposeful sampling, I feel this is a good artifact. I still need to touch base with Dr. Monhardt and get some advice as to how to proceed with the analysis and what her opinion is in regard to my progress and if it is going at a pace to be ready for defense by the end of the summer or early next fall.

I have been thinking of my connection in terms of a postmodern feminist lens as it relates to cultural background, etc. I find myself feeling a connection to the study participants in regard to feeling that their work habits more so than their intelligence has helped them get to where they are today. Is this a societal thing for women? Coming from an immigrant background, I have often thought of myself as inferior to many professionals. I want to honor my ancestors for their decisions to come to this country and I feel that I am fulfilling some of their dreams and aspirations, however I feel that I have achieved what I have in regard to academic and professional success through my hard work and dedication and not from my intelligence. Is there a correlation between my life's path and that of my study participants?

Methodology:

I will have to take a closer look at the matrix used in the audit trail described in the Nursing research article regarding audit trails. I plan on using a similar format and possibly connect it to my working definitions and questions. I will then refine it to reflect the categories and themes that result from the analysis of the interviews.

Figure 6. Example from my researcher journal showing self-reflection and method focus.

Another method I employed to improve trustworthiness in my study was to utilize a peer debriefer as a check for my journal entries and to give me feedback during the various stages of data collection and analysis. The utilization of a peer debriefer helped improve the external validity of my study. I chose one of my cohort members in my doctoral program as my peer debriefer because she was able to give me insight into how my perceptions as a male researcher were meshing with the postmodern feminist lens that I defined for this study. In talking with her about being my peer debriefer, she was excited when I thought of her and was eager to help in any capacity necessary. Having finished the same courses in the doctoral program, she was familiar with qualitative study

and case study in particular. She was very interested in my case studies as her own dissertation was quantitative, and she was very much interested in qualitative study when we took the courses related to this methodology. I gave her a copy of my research proposal so she could get an over-view of my study. The proposal gave her a good perspective on what my study entailed so she was better able to give me a more thorough critique as I began data collection and as she read my journal entries (see Figure 7).

The last method I employed to improve the external validity and the overall trustworthiness of my study was to utilize an external auditor during the data collection

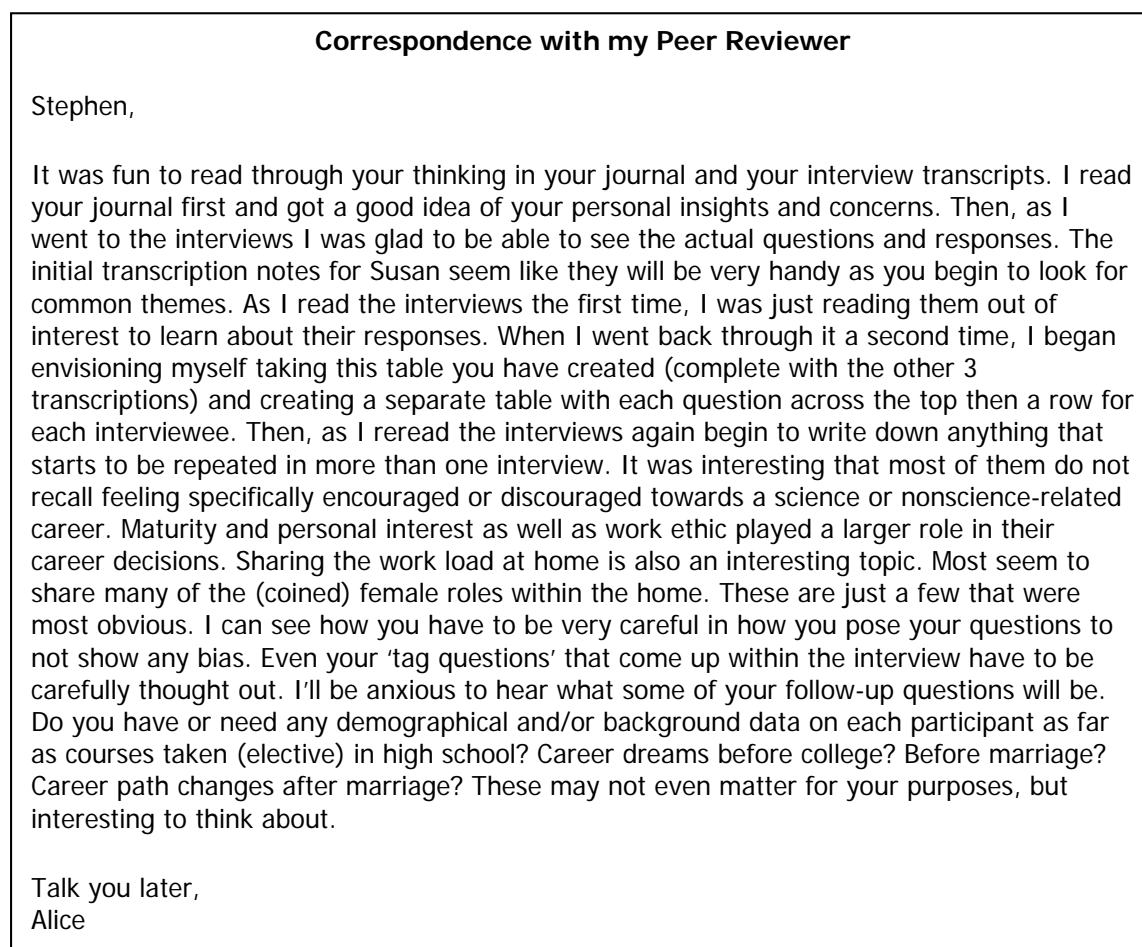


Figure 7. Correspondence with peer debriefer.

and analysis phase. The auditor had expertise in qualitative research and case study in particular. The auditor was able to follow the phases of the research from beginning to end and gave feedback to improve the rigor and trustworthiness of the study. As my peer debriefer became overwhelmed with her work, family, and her own dissertation, my auditor began to fill both an auditor and peer debriefing role (see Figure 8).

At the end of the data collection and analysis phase of my study, the auditor provided an attestation which improved the trustworthiness and reduced threats to external validity (see Appendix G).

Having utilized triangulation, member checking, my researcher journal, a peer debriefer, and external auditor, both internal and external validity were improved in my study. Hence, the trustworthiness and transferability/generalizability of the propositions discovered through the data analysis were improved as well.

Dr. Killeen's feedback

6/4/09

Hi Stephen,

It sounds as though the second round was able to yield some interesting "below the surface" information. It may lead you to further inquiry as now you are getting to the true picture of how these women see themselves, and how they have extrapolated the early school experiences to have influenced their professional and life positions. What is fascinating to me is how you are discovering the commonalities across the subjects, which is the basis for phenomenological study.

As I recall, you are using a cross comparative approach to the data analysis. If so, you might want to consider the use of sub categories in your emergent categories. For example, if you were to break 'supports' down into retrospective views of early supports, post secondary educational supports, and current professional supports, you would be able to draw a line between the various phases of professional (i.e., self-image/efficacy) development to hypothesize either turning points or key decisions. Similarly, were you to break down opportunities into early exposure, school electives/options, and post secondary choices, a pattern inter and intra dependently could emerge. Naturally, the backdrop for understanding these changes would come from the post-modern feminist literature. Anyway, just a thought. I do concur that those are viable categories for which you should have data to triangulate/support the rationale for your categorization.

In terms of the gender roles connections you might find that gender did not play an appreciable part in the directions these women chose to go. It may be the case that the sheer possibilities and/or the expectations set by their parents had more to do with professional/science pursuit than the subjects' own considerations of the issue of gender.

I really like the triangulation or added trustworthiness aspect of interviewing the individuals who came up in the participant interviews. This would become an integral part of your study because in a sense this is a form of member-checking the reliability of the interpretations you have regarding the stated information from the participants. Have you considered interviewing their parents or community/church leaders for clues to ambition, drive, work ethic, aspirations, vision whilst they were young?

All subjects were Sterling Scholars?! Is this a factor of a small school? Is it related to counselors helping steer students in this direction? Could it be related to the sheer motivation of scholarships? Or, is there a culture in your High School that engenders academic excellence and a sense of "going for it." My point is that these are independent of the both the gender issues of the participants, and their personal agendas. Is it more plausible to be a Sterling Scholar or runner up in a school population that is much smaller than a 4A or 5A school (i.e., the relative criteria is less stringent)?

Figure 8. Feedback and guidance given by the auditor.

CHAPTER IV

CASE STUDY PROFILES

In this chapter, I introduce the four cases who participated in this study. Each case's profile adds to the thick description which is necessary to gain better insight into the lives of the cases. Having the knowledge of each case's profile will allow for a more thorough understanding of the results for this study.

Nancy

Nancy was raised in the same southeastern Utah rural community as the other cases in the study. Growing up, Nancy had an independent spirit and always looked at the good in people around her. Her mother described Nancy by saying:

She looks beyond boundaries and is accepting of everyone, regardless of race, religion, social economic background. She's just very very accepting of everyone, all people! She is very goal oriented. When she sets a goal for herself, she achieves it. She says she will do something, she will do it! She has a beautiful aura about her, just beautiful aura, a beautiful spirit! (D. Smith, personal communication, July 3, 2009)

Nancy is the oldest child in her family. She has one younger sister. Growing up, both of her parents worked, sometimes two jobs. Her mother has worked for the county government in the District Attorney's office and most recently as the Director of the Juvenile Justice Center. Her father has been the city Chief of Police for several years and her stepfather has been a highway patrolman for many years. Due to her parents' busy schedules, Nancy had the responsibility to make sure her younger sister was taken care of, especially after school. She made sure that her younger sister got home from school

safely, finished chores, and completed homework before her parents came home. Nancy accepted this role and enjoyed being the older sister. She and her sister have always had a good relationship from the time they were young. Nancy still feels she has the same role with her sister today. Her sister will often call her for advice about situations that occur in her life. Looking back on her role with her sister, Nancy realizes that this helped develop a sense of independence and responsibility at a young age.

While growing up, Nancy remembers playing with neighborhood kids along with her sister. They would often “play house” and Nancy would usually choose the role of being a banker. Her perception of a banker in their small community was one of being successful and in charge of several people. Nancy liked being the “boss.” Along with playing with neighborhood kids, Nancy liked to play board games such as Yahtzee™ and card games like Rummy with her family. She remembers being, and still is, a voracious reader as well.

Nancy fondly recalls days riding bikes and exploring the surrounding areas in her rural community. She liked the freedom to go where she wanted in her town because she and her family viewed it as a safe place for kids to be able to explore on their own. As Nancy grew older, this exploration of her surroundings led her to seeking solace in the desert environment in which her community resides. Nancy views this outdoor setting as having much to do with who she became as an adult. Nancy remarked:

I don’t think I realized it until I moved east and then came back. (Laughing) I think for me when I need to blow off steam, or reduce stress. I always try to get outside away from everybody. I think this was part of growing up, where I did. That’s also one of the benefits of being in a small town is that I was able to get away from everybody pretty quickly. In the city, you really do not have that option. The openness of being in the desert is important. I’ve always felt attached

to that and even the reading that I do for fun. I like authors like Terry Tempest Williams, people who write about the desert environment. I certainly think it's a part of who I am. (Nancy, personal communication, April 6, 2009)

As a child, Nancy would bring back rocks from her adventures or spend time in her driveway looking at and selecting different types and shapes of rocks. Her mother teases her today about how she liked rocks as a child even though she was adamant she was not going into the sciences as she went through high school and began college. Nancy's mother would take her to a rock and mineral show that was an annual event in her community and take her fossil hunting in the desert as well. Nancy's undergraduate major was eventually to become Geology.

While growing up, Nancy had to deal with situations that were not always positive. According to Nancy, these events made her even more independent in mind and spirit. When she was 14 years old, she found out that her father was actually not her biological father. During this time her mother and father were also having difficulties in their relationship. These difficulties led to the family going through a divorce by the time Nancy was 15 years old. Nancy recalled:

The father that I grew up with was not my biological father, but I didn't find out about that until I was about 14 or 15. Then, my parents got divorced when I was like 15. Certainly there are things about that event in our family that helped shape me, but I do not think I can express that into words. I could see it coming. I was old enough to understand what was going on. I had already had my first boyfriend and broken up, and so I could certainly see it coming and my mom told me pretty early before they started the divorce proceedings. She told me before she told my sister. It was a lot harder on my sister than it was on me. In that situation too, I tried to make sure she was okay through all of that. So, I think I have always felt somewhat responsible for her and trying to make sure that she was safe and that she was okay. (Nancy, personal communication, April 6, 2009)

After the divorce, Nancy and her sister split time between their mother and father. Nancy

had a difficult time with this situation as she did not want to create a feeling of loyalty to one parent or the other. However, after trying to maintain a strong relationship with her father, she realized that he did not reciprocate as readily. Nancy described their relationship as one of “more of a convenience” and she is okay with this. She mentioned that her sister would like to have family get-togethers that surround birthday parties and other events, but their father does not see these events in the same way. This is troubling to Nancy’s sister, but Nancy resigns herself to the idea that this is just who their father is as an individual. Nancy spends more time with her mother and stepfather when she is in town. She calls her mother as often as three times per week. This is not much different than when she was growing up because her mother was the main one who raised Nancy and her sister. Her mother recalled taking family vacations and their father would rarely come along, even when the girls were young.

About the time Nancy was 18 years old, her biological father tried to make contact with her. She did not make any effort to reciprocate as she felt that he did not make any attempt the first years of her life to make contact, so why should she try at this point. Nancy has not had time, until more recently, to begin to process what impact these events had on her as an individual. She cannot readily put into words how she feels about this time in her life. She realizes that she will need to deal with this time in her life in more depth at some point and she is beginning to think about these past events more often as she begins her career and the current phase of her life. However, looking back on her adolescent years, Nancy feels that her experiences dealing with divorce and paternal relationships made her more independent and driven to achieve her goals. These events

are “just what life dealt her.” Nancy views her life as similar to many of her peers while growing up in regard to her family situation.

Besides the support from her mother while growing up, Nancy also talked about the positive influences of living in the rural community. The high school was small enough that a rapport could be developed with all teachers. Nancy talked about her Spanish teacher as being a very positive influence on her while in high school. She eventually became the Sterling Scholar in Foreign Language for the high school. Nancy credits much of this to her teacher’s positive support and influence. Looking back on the Sterling Scholar competition, Nancy recalled:

One thing that sticks out in my mind as being important for my development was the Sterling Scholar competition in getting encouragement even though it was not in the science field. It was language. The competition was still, I think, the first time I felt that I could go outside of my rural community and compete with other students! (Nancy, personal communication, November 29, 2008)

There were other unique opportunities according to Nancy. An outdoor education course that was taught by me was an option for students in her high school. This course utilized outdoor activities like backpacking in the local desert canyons and rock climbing to help students learn about themselves as individuals and how to work in a group to achieve goals. Nancy believed that this course would not have been offered in an urban/suburban based school.

However, Nancy also discussed the downside to growing up in her rural setting. She viewed the lack of diversity among her peers as being negative. She felt that she had to change herself to fit in and that there were few like-minded peers. Nancy recalled:

I think some of the negative things were there were a lack of opportunities in terms of having people with similar interests or similar goals or at least that’s the

way I felt. That's what I feel now in that it was sort of hard to find a group of people that were similar to me and my interests and people to hang out with. I just felt like I ended up molding myself to fit as opposed to just finding people that I naturally fit with.

I certainly had a real sense that being smart was not cool. So I don't think there was a group like that to hang out with. When I talk to the people I hang out with now about their experiences growing up, they were members of knowledge bowl teams and had friends that they may still keep in touch with. Many of them went on to college and onto graduate school. They had these kinds of goals and aspirations all the way through school. They had friends that had similar goals and similar interests. So I don't think I could characterize completely a group that I would have liked to have hung around with, but I certainly didn't fit with a lot of the people. (Nancy, personal communication, April 6, 2009)

Along with the lack of diversity among her peers, Nancy also felt that, even though there were unique opportunities at her high school, there was also a lack of opportunities as well. There were few advanced placement courses to take and no co-curricular activities such as quiz bowls to participate in. Due to the size of the community, there were few cultural attractions to attend such as different types of museums.

While growing up, there was never a question that Nancy would further her education beyond high school. Having experienced divorce and being independent herself, Nancy's mother was determined to make sure her daughters were independent as adults as well. According to Nancy's mother, the main avenue to gain this independence was through education.

As her senior year drew to a close, Nancy chose to apply and was accepted to a small college on the western slope of Colorado. Being true to her childhood dreams, Nancy wanted to pursue a degree in business and finance. As she began to take courses related to business, she quickly realized that she did not like these courses and was not sure that she wanted to continue along this educational path. Realizing how much she

enjoyed being outside, she looked into forestry. However, the college she was attending did not have degrees related to this vocation. While home during winter break her first year of college, Nancy was contemplating what courses to take the spring semester prior to transferring to a college or university where she could pursue forestry. She had a discussion with her mother and stepfather. Her stepfather talked about having taken a course in the Geology of the Colorado Plateau. He recalled being very interested in the topics explored in this course. Nancy also remembered taking a geology course through the college extension while she was in high school. As a result of having had these conversations, Nancy decided to take a course in Geology for the spring semester. While taking this course, Nancy realized that she thoroughly loved this field of study. She decided to change her major to Geology and continue her undergraduate education at the same college.

Having changed her major to Geology, Nancy had some “catching up” to do. During her second year of college, she took a class load of 21 hours one semester to stay on track to graduate with a bachelor of science degree in geology. As Nancy continued on her degree path, some of her chemistry and geology professors realized that Nancy had the potential to pursue a graduate degree in the sciences, specifically related to geology. They supported and encouraged her to continue her studies at the graduate level.

Along with the encouragement and support from her professors, Nancy worked on an honors thesis project that afforded her the opportunity to work with master’s degree candidates and Ph.D. students from the University of Colorado in Boulder. This project was field based. Nancy also had the opportunity to present the findings of her honors

thesis project at the Geological Society of America meeting. These experiences gave her insight into academia and scientific field research. While working with the graduate students from the University of Colorado, Nancy realized that she could pursue a similar educational path. Due to these experiences as an undergraduate student, she chose to pursue an academic path instead of going into industry as a geologist.

After graduating with honors with a BS degree in geology, Nancy continued on her academic path. She was accepted to a prestigious college along the Front Range of Colorado and she began work on a master's degree in Geochemistry. She worked diligently and completed her degree in 2 years. Nancy maintained a 4.0 GPA, which, at this college, is an impressive accomplishment.

Her professors continued to support and encourage her to complete a Ph.D. in a related field. During this time, her mother was not in a position to help her pay for school, but was always there as moral and emotional support. Her mother maintained that Nancy deserved all the accolades for her accomplishments. It was due to her independent drive to succeed that she was able to achieve her goals. Nancy was accepted to Penn State University in the fall of 2003 to begin her doctoral studies. She had never been this far away from home, but had no qualms about moving back east to work on her Ph.D.

Nancy chose to focus her doctoral studies on Hydro-geochemistry. At that time and when she graduated four years later, Nancy was one of only four or five women in the world with a focus in hydro-geochemistry.

During her doctoral studies, Nancy had the opportunity to teach undergraduate students. She related this about teaching:

I think there is a short-term gratification for myself and teaching. You get to see people develop and to see them grow. You get to see the moments where the light bulb comes on, and they understand something. I would like to think that by teaching I'm making a difference for the greater good. Teaching a future generation of kids, not just teaching them science, and hopefully teaching them the skills that they can transfer to life in general, like problem-solving skills. (Nancy, personal communication, April 6, 2009)

As Nancy completed her doctoral studies, she had opportunities to work in the field to conduct research for her doctoral thesis and continue the development of collegial networks while working in national laboratories. She had already begun this networking while an undergraduate when she worked with the Masters and Ph.D. students from the University of Colorado and presented her honors thesis at the Geological Society's National Convention years before. It was during these opportunities that Nancy realized the value of collegial networks and how much these factored into being a research scientist in academia.

During this time period, Nancy had opportunities to work with geologists in the field as well. Most of these geologists were male and working in the oil or mineral extraction industries. While interacting with these men, Nancy experienced negative reactions because she was a woman working in an industry that was male dominated.

Nancy related this in regard to these experiences:

There are certain people who I choose not to collaborate with, because of the way they interact with women. I see it less in people who have Ph.D.s than I do in geologists who work for oil companies. There are a number of geologists who have worked for oil companies for quite some time, who have this opinion that women just can't hack it. They seem generally surprised when they meet a female scientist that's smart and does their job well. They are generally surprised. (Nancy, personal communication, April 6, 2009)

These experiences solidified in Nancy's mind that she wanted to pursue a career as a

research scientist in academia.

With this focus on her advanced education, she remembered having a discussion with her mother about relationships. Her mother quipped about Nancy needing a “house husband.” Most of Nancy’s friends’ relationships were ones in which there was mutual sharing of household duties. This type of relationship was one that fit with Nancy’s vocational pursuits and independent nature. During her doctoral studies, Nancy met and began dating her future spouse. He was finishing his master’s degree in geology and was about to begin his doctoral studies as well. They were married when Nancy was about halfway through her doctoral program. About the same time that Nancy was completing her doctoral degree, her spouse decided that his doctoral program was not a good fit for him. He had worked as an intern for a geological firm while working on his advanced degrees. He obtained a job with this company and after discussing the opportunity to move back west to work with this company, Nancy and her spouse chose to move to the Denver area so he could take this job opportunity. This worked out well for them as they would both be closer to home, and Nancy had the opportunity to apply for a postdoctoral position with the University of Wyoming. She was able to work from their home in Denver part of the week and then travel to the U of W for a couple of days per week. Nancy felt that this was a win-win situation for them.

Most recently, after the completion of her postdoctoral position at the U of W, Nancy accepted a research associate position at the same college where she obtained her master’s degree. Nancy is now on the road to becoming a full professor in her field of science.

Throughout her graduate level work, her mother and stepfather continued to be supportive of all of Nancy's endeavors. They are proud of her accomplishments and her mother is still quick to point out that Nancy deserves all the credit for her success as a scientist and academician. While finishing her doctoral degree and up to the present time, Nancy points to the support given her by her spouse. He shares in all household chores. In particular, when it comes to cooking, cleaning, and shopping, these tasks are shared equally. Nancy's spouse did point out that she is less tolerant of laundry piling up around the house, so she does the laundry more often than he. However, he was quick to point out that the laundry is not her responsibility but rather due to her tolerance level she takes on that duty. Nancy's spouse grew up in a household where he witnessed the sharing of household tasks. He feels that this is the way a relationship should work and he tries to share as equally as possible in all the household tasks.

Not only does Nancy's spouse share in the household tasks, but due to having a similar background in science, he also helps Nancy to edit her proposals for grants and papers for publication. Nancy was also quick to point out that he helps her when she is having difficulty with a collaborator on a project. He will help her be more diplomatic with her e-mail conversations, for example.

In regard to being a support, Nancy also described herself as being a Christian and that she tries to utilize these principles in her decision making, especially in regard to her relationships with people. She has a very good friend whom she talked about as being helpful as a moral compass when it comes to dealing with people as well. Nancy mentioned growing up Catholic but now has been going to the Lutheran church when she

attends.

In the future, Nancy and her spouse plan to have a family. However, Nancy was quick to relate that she feels that women are at a disadvantage when it comes to gaining tenure or advancing in their careers. She knows that, from a biological standpoint, women have to carry the child for nine months and then nurture the child in its early years. This is time away from achieving one's goals, academically and career related. Men do not have this time, especially the nine months to contend with as a hindrance to their careers. At this point, having a family is a timing issue for Nancy and her spouse. Nancy laughed and quipped that this was a "loaded question" for her at this time.

When it comes to the topic of women in science, Nancy does not feel personally impacted as a woman. She does not feel she was ever discouraged from pursuing a career in science, especially since she did not specifically choose the science fields until she was in college. She feels that the college atmosphere is much more conducive and supportive of women for pursuing degrees in science fields. However, even though she does not feel personally impacted because she is a woman, she does see issues with women advancing in the science fields in general, so she does participate in the Women in Science and Engineering (WISE) programs. She has been actively teaching workshops at their summer camps and acts as a mentor. She believes girls should be mentored and encouraged to become what they want to in life, in science-related careers or otherwise. She believes that boys need this encouragement as well. When discussing the topic of being a mentor, Nancy does not necessarily believe that she should automatically be a mentor for girls. According to Nancy, being a mentor depends more upon the

personalities of the individuals involved. She tries to be a positive role model at all times because one never knows when someone is looking at her as a role model, female or male. She does not want those individuals to have a negative experience when they are around her.

As Nancy continues to advance in her career, she believes that she is continuing to develop a scientist's persona. When it comes to being a scientist, Nancy likes to focus on the "bigger" picture. This is why she collaborates on research projects. This is the main reason why developing collegial networks is so important to her. Nancy realizes that she cannot be an expert in all aspects of a question being answered, so she seeks out other scientists who have specialties in areas that will build upon the data in order to answer a question more fully. She prefers to work in the field, so it is not as exact as experimental scientists who can control variables in a laboratory setting. When it comes to collaboration, Nancy does not observe women scientists as being naturally more collaborative. Instead, she believes it depends upon what kind of research an individual is focusing upon. If scientists prefer looking at a holistic picture of an event, then they will seek out collaborators due to the scope of their project. If a scientist is interested in one aspect of a problem or question, they will often work individually.

When asked about how feminism fits into her persona as an individual and scientist, Nancy made these remarks:

I think that I see all of my friends, all of my female friends that I view as being strong women. I know there's the classic image of bra burning and that kind of stuff. You know, the crazy (laughing), outraged women. But if somebody asked me what a feminist is I would collectively take the personality aspects of all the women I know who are strong, capable women and put that together. I would then make one person out of that image. (I interject a question: So, do you see yourself

as a feminist?) Yes, I think so. However, I don't think you have to be a female either. A feminist is just someone who wants to see women succeed in what they do and my spouse and I just had a conversation about this. Since I participate with women in science and engineering. We were sort of discussing the merits of programs like that and whether in some respects are we bringing attention to a gender bias that we're trying to get rid of. So, if you don't think you need women in science and engineering, then why do you still do it? If you're striving for a community where everybody is equal, and then you wouldn't need that kind of a program. But we still have that kind of program. It's hard to erase that bias in people's minds. And I think that the word feminist is kind of like the women in science and engineering, the word feminist should be phased out, eventually. Hopefully we will get to a society where there is no difference between anybody and their desire for women to succeed or their view of whether women are capable of succeeding or not. The word feminist to me, I hope that it gets phased out, eventually. We will not have to call someone a feminist. If someone is not a feminist, are they opposed to seeing women succeed? So I kind of view it as a negative. Everybody to me is a feminist, unless you're opposed to having women succeed and then you wouldn't be called a feminist. (Nancy, personal communication, April 6, 2009)

For Nancy, to be a feminist is to be supportive of women in all that they do. According to Nancy, feminism is a collection of personas that are characterized as being strong and independent individuals who strive to be successful. However, she believes that, in the future, the term *feminist* should not be needed any longer as women will be viewed as being capable as men. There will exist an equality that is accepted in all aspects of society. Programs like WISE will no longer be needed.

Jane

Jane was raised in the same southeastern Utah rural community as the other case studies. Growing up, Jane had an independent spirit and drive to succeed. Jane's mother described her when she related the following:

Pride! Perseverance! She was a pretty persistent child, always pushing the limits. She was always pushing the envelope. When she was 10 years old, she ran the

Colorado Marathon after totally training according to a book for months.
(J. Doe, personal communication, July 3, 2009)

While Jane was growing up, both her parents worked outside of the home. Her father was a deputy sheriff for the county, and her mother was a teacher at the local high school. Jane has one other sibling, who according to Jane, has a completely different personality, so they were not very close while growing up. Even to this day, they rarely have contact with each other unless there is a specific reason. For example, if her sister has a question related to veterinary medicine, she will call Jane. Because they are so different, Jane is comfortable with their relationship and does not feel the need to change it.

Jane developed a passion for running by the age of 10. Her mother described how Jane trained for the Colorado marathon. She and Jane would get up at 4:00 a.m. and her mother would ride a bike alongside Jane while she ran 8-10 miles prior to the beginning of school. Jane continued to run competitively until the end of her freshman year of high school. Along with the passion for running, she pursued other outdoor activities like riding bikes, riding horses, and rock climbing during her high school years. In fact, Jane talked about rock climbing in much the same way as she described what running meant to her when she was younger. She quickly became an accomplished climber, scaling several difficult routes in the surrounding area. She also enjoyed other traditional childhood activities like playing dress up with her mother's clothes and applying makeup.

Jane's mother described her as having a passion for animals from the time she could walk. The family has numerous photos and framed pictures with Jane holding or carrying around one family pet or another. Jane's Mom related this story:

She was always picking up animals. When she was in the sixth grade, she ended

up actually having to stand in a corner with her nose to the wall because she brought six baby squirrels into this one teacher's room. She had to feed them every hour and that was her punishment. She never complained about what her punishment was. She would do anything anyway. (J. Doe, personal communication, July 3, 2009)

Living in the small rural community allowed Jane and her family to know many of the people in the town. By knowing so many individuals in the community, Jane's mother set up the most influential opportunity for Jane for her pursue her interest in veterinary medicine. When Jane was about 12 years old, her mother was at cocktail party at which she met a local veterinarian. Jane's mother mentioned that she had a daughter who wanted to become a veterinarian. He told Jane's mother to bring her to his office as he would be happy to meet her.

After meeting the veterinarian, Jane began to go to the veterinarian's office after school and on weekends. She became immersed in all aspects of being a veterinarian. At this early age, Jane worked as a receptionist, assisted in surgeries, worked on a university bear study in the local mountain range with the veterinarian, and assisted the doctor when he would go to the local raptor rehabilitator's office to work on injured birds. The veterinarian had this to say about Jane:

She had super interest in veterinary medicine. She was really an intelligent kid. I pushed her to try to get into veterinary school. Of course, she did very well with that. I've tried to maintain contact with her over the years and watched her career. She had an incredible work ethic. She could actually do reception and tech work better than anyone else I had working for me at the time (laughing)! (Banister, personal communication, July 16, 2009)

When Jane recalled these experiences, she was quick to say that her relationship with this veterinarian was the most influential aspect of her pursuing a career in veterinary medicine.

Not all of Jane's childhood experiences were filled with impressive feats of running or assisting the local veterinarian with various surgeries. Jane recalled the largest hurdle she had to overcome when she was young, struggling to learn how to read. In fact, Jane realized later in elementary school that she had a form of dyslexia. She was unable to read until she reached the fifth grade, making her feel self-conscious. In early elementary school, when comparing herself to her peers, Jane believed she was inadequate, that something was wrong with her, or that she was dumb. This discouraged her from her goal of becoming a veterinarian. However, with support from her special education teacher and her fourth grade teacher in particular, Jane was able overcome her reading deficits and self-esteem issues. Her mother worked diligently with her at home as well.

As Jane continued through school, she cited various teachers, including me as being influential in her journey to become a veterinarian. Jane feels that her elementary and secondary teachers were more influential than her college professors. However, some of her professors wrote letters of recommendation for her to get into veterinary school.

Jane loved growing up in her small rural community. She believed the opportunities that she had would not have been possible if she were to have grown up in a more urban setting. The only down side was that she believed the school district was not in a very good financial state when she was in school. Due to this financial state there were fewer course offerings, she believed, as compared to a more affluent or larger school.

Jane was accepted to Colorado State University as an undergraduate student. Her

goal the entire time, as an undergraduate, was to do well and finish her Bachelor's Degree with her sights set on being accepted to their veterinary school. When thinking back to when she struggled to learn how to read, Jane was proud to say that her reading ability was not a hindrance to her while in college. Jane remarked:

I was very embarrassed that I wasn't keeping up with the other kids in the classroom and so that was really a drive for me to not be singled out as one of the quote unquote dummy kids. That was probably good for me to go through. I realized at an early age, if I set my mind to do something, I could really accomplish anything. That set a foundation for me later on, just accomplishing goals I wanted to pursue. (Jane, personal communication, April 4, 2009)

I am a very slow reader. I do have really good comprehension, but I think it was always a mental thing in the back of my mind, thinking that you know, I couldn't read, but I went forward and didn't have any problems in college. I did very well! (Jane, personal communication, December 13, 2008)

As an undergraduate student, Jane worked independently most of the time. She did not recall ever studying in a group setting. She worked while completing her Bachelor's Degree and did not have much time for study groups. Jane did not mention any noteworthy experiences while an undergraduate. Her experience was viewed more as the next step on the road to becoming a veterinarian.

Continuing on her path to become a veterinarian, Jane was accepted to Colorado State University's Veterinary School. While in veterinary school, Jane did study in a group setting for the first couple of years before she began her clinical rotations. The study group was made up of two women and two men, including Jane. She studied with this group on a consistent basis. The entire group did well with its studies, and everyone did their part. Jane described the group as being very intelligent and focused on doing well. Jane thought, at the time she was in veterinary school, that the percentages of

women to men in veterinary school were about 85% female to 15% male. Jane remarked that she remembered looking up similar statistics when she was first interested in becoming a veterinarian when she was very young. At that time, the percentages were reversed.

Jane's parents continued to support her in a variety of ways while she was attending veterinary school. Her mother was a major support for her as she took on extra jobs in addition to her teaching duties at the local high school. Jane's mother did not eat lunch at the school and saved the money that she would have spent to send to Jane. She also washed dishes in the evenings for a restaurant near their home and watched vacation homes in the area for individuals while the homes were not in use by the owners. With her mother's support, Jane was able to finish her veterinary medical degree debt free, not a common occurrence. Any loans that Jane were to take out would be for her future practice.

Near the end of veterinary school, Jane had the opportunity to travel to Africa. While there, she was able to utilize her veterinary skills and work with some of the indigenous animals. This was a valuable experience for Jane. Jane's mother accompanied her on the trip. This trip was in part, a way to thank her mother for all that she had done for her while she was in veterinary school. Jane graduated near the top in her class and was ready to begin her practice.

After graduating from veterinary school, Jane chose to become part of an established veterinary practice in Florida. Jane described her typical work week.

One day a week I perform surgical procedures in the morning and then in the afternoons, I have medicine workups. I will typically perform anywhere from 3-7

surgeries in a four hour period in the morning followed by a short lunch break, then see appointments. The rest of the week I see appointments for 8-10 hours a day. These appointments can be anything from performing annual physical examinations, vaccinations, to examining sick dogs and cats and doing workups (blood-work, radiographs, and ultrasounds) to figure out what medical problems they might have. This could mean bringing them to a hospital or potentially to refer their case to specialized care. (Jane, personal communication, December 13, 2008)

Jane loves being a veterinarian and is living out her childhood dream. She describes how many individuals make a very good living, but do not like what they do for work. Jane believes she is very lucky in that she makes a very good living and is able to fulfill her passion at the same time. She also likes the respect that she receives because of what she does. Jane believes that being a veterinarian is an honorable and compassionate profession and people respect that she works with animals. Jane remarked, “I feel I get a different level of respect because of my level of education and because of my profession as compared to someone who was just called Mom.”

Jane continues to receive support while working as a veterinarian. She talked about one of her colleagues in the practice. He has been a veterinarian for over 40 years, and Jane looks to him for his years of experience. At the same time, he looks to her for newer techniques and information because of her more recent experiences in school. They travel together to conferences and often discuss the information gained while there. Jane and he will often converse about different patients and the various diagnoses that each have developed. Along with her colleague, Jane subscribes to an online veterinary information network that allows her to ask questions and have dialogue with a variety of veterinarians and specialists around the country. This is especially helpful when she is having difficulty diagnosing a particular case.

During the first 2 of years of her practice in Florida, Jane met her future spouse while at a friend's wedding back west. Soon after they met, Jane's future spouse moved to Florida, and they were married soon afterward. Both Jane and her spouse wanted to begin their family, so within the first 3 years of marriage, they had two children. They have two girls, ages 2 and 4. Having started a family along with her veterinary practice has created a very busy schedule for Jane and her spouse. Fortunately, Jane's spouse is very supportive and dedicated to their family and to Jane's career. Jane remarked:

Probably the biggest support is my family support. Specifically, my husband to be so supportive. It can be stressful. It can be long hours. It could be going in on my days off, and without his support, I would have a hard time doing it or being successful. He is very supportive of the work that I do. He also has taken his own career and put that on hold to make sure mine is going where I would want it to be, especially while our kids are so young! (Jane, personal communication, April 4, 2009)

Jane's spouse grew up on a family farm in Nebraska where he eventually graduated from a small high school with 19 other students. He went to a state college and earned a degree in health, physical education, and recreation. Someday, he would like to become a teacher and coach. At this time, he described himself as a soccer dad. Jane's spouse has a part time job taking care of the greens at a local golf course. He gets up early in the morning and takes care of the greens and then goes back home in time for Jane to go to work. He then takes care of their daughters and other household duties while Jane is at work.

When asked to describe Jane, her spouse was quick to say that she was intelligent and had a good heart. People are quickly at ease when they are around Jane. She is an easy person to talk to. Their marriage is one of partnership. When thinking about their

relationship, her spouse was quick to share:

She is my partner, my friend, my confidant. Whenever we make a decision, we talk about it first. So, I think about her as a partner first and then a mother. She takes great pride in that. She does a great job at it. As far as I think about her, I always think about her first as a wife and mother to my daughters and then a doctor. (Strong, personal communication, August 16, 2009)

Jane's spouse added that he was also very proud of her in the job that she does as a veterinarian. He has no contention for the role that he is playing as it is what is best for their girls as they are being raised by them and not someone from a day care facility. Being a soccer dad has allowed Jane to develop a focus on her career as well.

When discussing women in science and veterinary medicine in particular, Jane did not hesitate to say that she believes gender does not matter in relationship to the quality and ability of the individual doctor or scientist. However, she did say that there still is a pay differential with women being paid less than men for the same level position. She also believed those women who are trying to have families or those who already do have a more difficult time cultivating their careers in veterinary medicine. She discussed knowing some women who dropped out of the profession while their children were young. Jane considers herself fortunate that she has the support from her spouse that has enabled her to move forward and build her professional career and at the same time be a mother and wife. Jane would like to, in the future, cut back on her hours so she could spend more time with their daughters and allow her spouse to pursue his career. However, she does not plan on ever completely stopping her practice.

As a way to give back, Jane has mentored a couple of younger children. She has mentored a young girl about the same age that she was when she was first mentored by

the veterinarian where she grew up. Jane has mentored a young boy as well. Jane believes that mentoring girls or boys at a young age is critical as she reflects on her own life's path to becoming a veterinarian. When she reflected upon those early years, she believed her perseverance and the stubborn, tenacious attitude she developed from her experiences with the difficulty in learning to read coupled with her focus on running were critical to her development as an individual. She attributes her success as a veterinarian to these personal qualities rather than to her innate intelligence. The development of these types of attributes in those whom she mentors is very important to Jane.

The continual support that Jane received from her parents has always been a source of strength for Jane. She appreciates all that was done for her, especially the sacrifices her mother made in order for her to achieve all that she has throughout her life. In part, Jane pushed herself to achieve what she has as a way to say thank you to her parents. She has always wanted them to be proud of her. To this day, Jane has kept a list of things that she has wanted to accomplish. She has been able to mark most of the items off of her list.

When asked about the spiritual or religious side of her life, Jane added that her family did not attend any particular religious organization while growing up. She did not believe that her personal spirituality had much of an influence on her life or the decisions that she has made in relationship to her career or family.

When Jane thinks of the word feminism, she made the following remarks, "It's usually an angry white female. I guess I support women in the workplace and in their field. I wouldn't say that I would consider myself a feminist." (Jane, personal

communication, April 4, 2009)

Interestingly, Jane's spouse had much more to say about feminism. He remarked:

A feminist is someone that is a short haired female giving a speech about women's rights. This is a very stereotypical image. To be totally honest with you, this is the image that comes to my mind. There are a lot of males out there that have more feminine characteristics than females. They feel that they can carry the torch of feminism as well as any female out there. I have to look at the modern term of feminism, a second or third definition. The first definition would be a basic political answer, fighting for women's rights. There are other definitions like being a support for their career field, a doctoral field or a Ph.D. field. So, I guess I would be a feminist if that were part of my definition. As far as feminists go, I really think the 1% of the group gets the really bad press. The largest percent of the group are doing really good work. They're looking out for the best interests of all parties involved, not just women in general. So, my stereotypical image probably only covers about 1% of that group, but that is what gets the press and is all over the newspapers, magazines, and media outlets. (Strong, personal communication, August 16, 2009)

When discussing his view regarding Jane being a feminist, Jane's spouse said,

"No, I would just consider her as being very independent. She's very similar to me. We are both very independent and we do not try to fall into any stereotypes. We just do what we think is right for our family."

For Jane and her spouse, it is important for them to support each other in all that they do. At this point, Jane is establishing her career as a veterinarian and her spouse is taking on the daily responsibilities for their two daughters. They are both making decisions that are in the best interest of their family and Jane's career at this point in time.

Maggie

Maggie grew up in the same southeastern Utah rural community as with the rest of the cases in this study. Maggie is an intelligent, dedicated, and goal oriented individual

who has accomplished much in her life. She is the youngest of the four cases in the study.

Her father had this to say about Maggie.

She is very smart, a good thinker, helpful, and hard-working! She is a very sweet lady. The times I got to enjoy with her while she was in high school participating in drill team and her other school activities were memorable. I was lucky because I was able to travel with her and watch. When she was younger, she liked to ride bikes, swim, and play baseball and soccer (laughing). She liked to dance. She was very involved in dance! She started that at a young age as well. She was probably five or six.

I always encouraged them to set goals and do their best! I supported them in whatever they thought their goal was. I expected them to do well! Maggie's grandma had a lot to do with them at a younger age and through high school their academics were most important. The week before she graduated from high school, she received her Associates Degree. I do not remember if it was in science, but that was a quite a proud moment! Winning Sterling Scholar in the science category was amazing! That was really good for her. She was just an all-around good student. She didn't have a subject that she didn't do well in. (Jones, personal communication, July 3, 2009)

Maggie has an older brother and two younger half-sisters. Maggie was raised with her brother, but has only had occasional visits with her two younger half-sisters. She looks to her older brother as a role model. He was successful in school as well and later went to college and finished a degree in math while playing football for his college. Maggie recalled talking with her older brother on the phone during her senior year. He helped her fill out scholarship applications for college and gave her advice about finishing high school and preparing for college.

Maggie's parents divorced when she was about 3 or 4 years old. Maggie and her older brother lived with their mother until she was 11 or 12. Her mother had issues with addictions, especially with alcohol. Maggie realized at a young age, while living with her mother, that she did not want to be like her. After she and her brother moved in with their father, Maggie rarely interacted with her mother until her senior year of high school.

Living in a single-parent household helped Maggie realize how important it was for everyone to work together. Working together was stressed by her father. Everyone was expected to help in all aspects of running their home. They all helped with cooking, cleaning, and yard work. There was no separation of duties based upon preconceived gender roles. Maggie continues to have this same philosophy with her spouse and family. Maggie's father commented:

There wasn't a male or female tour. The man didn't do the outside chores and the woman did the inside chores. We did them all! I was basically raised that way. I think everybody needs to know how to do everything around the house. (Jones, personal communication, July 3, 2009)

Along with the challenges of being raised in a single-parent household, Maggie also learned how to be a health care provider. Her father has battled diabetes the majority of his life. Maggie witnessed, first hand, the difficulties helping someone deal with this disease. Watching the health care professionals deal with her father's disease and personally helping as well sparked the desire in Maggie to become a nurse.

While growing up, Maggie cited her middle school and high school teachers as being very supportive of her development as an individual. In particular, she talked about her middle school science teacher and me as being most helpful. She cites me as being influential in helping her prepare for and eventually win the regional Sterling Scholar competition in the science category. She believes that by winning Sterling Scholar in science, she was able to gain several scholarship opportunities that would otherwise not have been possible.

Probably Maggie's most influential individual while growing up, other than her father, brother, and grandparents, was a high school advisor who facilitated a program

called Upward Bound. This program was for first generation students going to college.

This advisor helped prepare her for college by setting up schedules throughout high school that allowed Maggie to finish her associates degree while still in high school. She also urged Maggie to develop a sense of self that was important for her future success.

Maggie recalled:

I don't know if she still works there or not, but she was great! I loved her! She always got my college classes organized. She always helped me get everything I needed for that and she always would encourage me to do what I wanted with my career path. She would say, "If you want to be a stay at home mom that's what you should be, or if you want to be a rocket scientist, that's what you should be. You know, don't do anything that someone else thinks you should do." She was just really great at saying wherever your life takes you, be proud of it and just do what you want to do with your life. She would also say, "It doesn't matter where anyone in your family goes or where they were, you need to create your own life for yourself." (Maggie, personal communication, December 30, 2008)

Maggie's Upward Bound advisor also helped Maggie keep her life in balance. Being so focused on her studies, extracurricular activities, and helping maintain her household and caring for her father's health issues, Maggie was taking on responsibilities that many adults did not have to face. Maggie's advisor helped her keep things in perspective and still be able to function at a high level of efficiency without having a breakdown. Maggie believed that her middle school and high school teachers as well as her Upward Bound advisor were more influential and supportive of her as compared to her professors when she went to college to become a nurse.

When thinking back about growing up in the southeastern rural community in Utah, Maggie believes the small town allowed her the ability to be involved in whatever she wanted. There were fewer individuals competing for the same positions, be they on the dance team or student council. Maggie believed that she could build her leadership

skills more easily while attending a small high school because there was less competition in all areas, academic or extracurricular. The ability to gain a rapport with her teachers and Upward Bound advisor happened more easily as well. However, with this smaller setting, came fewer opportunities for rigorous courses at the high school as compared to a larger city high school. According to Maggie, growing up in the rural town afforded fewer opportunities in general as compared to a larger city.

Being one of the first individuals in her school's history to complete her associates degree while still in high school propelled Maggie forward into her college years at a young age. She was accepted into the University of Utah Nursing School earlier in her college career as compared to most students. Along with scholarships for being the Sterling Scholar winner in science, Maggie utilized her leadership abilities by being elected as President of the Nursing School Governing Council. Due to being in this position, Maggie was awarded an academic leadership scholarship. She was also awarded a scholarship that was geared toward women coming from rural areas who were pursuing careers in the medical fields. With these avenues of financial support along with continued support from her grandparents and father, Maggie was able to finish college and her nursing program debt free.

While in nursing school, Maggie appreciated an advisor who helped make sure that as many of her credits from her associates degree transferred to the University. This allowed Maggie to be accepted early into the nursing program. Maggie also talked about a close knit study group that was formed early in her nursing program that helped her be successful as well as form lasting friendships that still exist today. Needless to say, this

group was made up of likeminded individuals who worked hard and were dedicated to excellence. Maggie talked about other individuals who tried to become part of this study group but were not allowed entry because their motives were not the same as the rest of the group. They wanted to become part of the group in order to make it easier for them rather than be a contributing dedicated member. Maggie explained that the study groups in the nursing program were usually tight knit groups that maintained the same members throughout the program and there was little cross over. Her group consisted mostly of women and one man. She was quick to add that the ratio of women to men in her study group was similar to the makeup of the nursing program in general. She said that the ratio was about 10 females to 1 male at the time she was in the nursing program.

Another program that Maggie cited as being beneficial while she was in nursing school was the Student Practical Advancement (SPA) program. This program was geared towards having students, prior to graduation, shadow nurses in a particular area or unit. At the time, Maggie was interested in cardiac care, so she shadowed a nurse in the cardiac unit and learned the specific job related duties required for the position. Most nurses who worked in the SPA program had much success getting positions related to their area of focus after graduation.

During the summer before her last year of nursing school, Maggie met her future spouse while working in the community where she grew up. They began dating and approximately six months later, they were married. Maggie's spouse thought Maggie was very different from other women whom he previously dated. She had already completed her first degree and was close to finishing her bachelor's in nursing. He was drawn to her

immediately. Consistent with Maggie's character, she encouraged her spouse to apply for an internship related to his future degree in chemical engineering. In fact, Maggie had more confidence that he would get the position than he did. He recalled sitting in the car with Maggie right before his interview. He was not too far along in his engineering program, so he did not want to go through with the interview because he did not think he had a chance to get the position. With Maggie's support and cajoling, he went into the interview and landed the internship. The following spring, Maggie graduated from nursing school and was hired to work in the cardiac unit at the university hospital. She helped support her spouse and pay for his schooling in chemical engineering.

Maggie loves being a nurse. In particular, she liked working in the university hospital because there was the expectation that they would teach the students in the nursing school much like she was taught while she was in the program. She feels that she is giving back in a way that she would not be able to do if she had a position at a nonteaching hospital. Specifically, Maggie liked the freedom given to the nurses in the cardiac intensive care unit. Maggie had this to say about working in the ICU:

We had a lot more freedom in the ICU than a floor nurse, because we had the same four attending physicians throughout the year. Because our staff size was small, we were able to earn a lot of trust from them. They gave us a lot of freedom as a nurse. They gave us a lot more choice. They wouldn't dictate everything that we did with the patients. They gave us a lot of freedom to make nursing appropriate changes that we felt were needed. There was always an atmosphere of teaching, learning and contributing. (Maggie, personal communication, December 30, 2008)

In addition to the specifics related to her job as a nurse, Maggie also likes the flexibility nursing provides in terms of work schedules. This flexibility is also conducive for raising a family. In fact, Maggie and her spouse had their first child soon after she

was hired to be a nurse in the cardiac ICU at the university hospital.

During Maggie's first year working in the cardiac ICU, her spouse was finishing his last year in school to gain his chemical engineering degree. As a family, they decided that her spouse would quit his part time job and focus on finishing his degree. One of the main reasons this occurred was that Maggie was not able to gain much sleep. She was taking care of their daughter while her spouse worked and then she had to go to work as well. Her spouse began taking their daughter to school with him during the day so Maggie could sleep prior to working her shift at the hospital. In the spring, Maggie's spouse graduated and he was hired as a chemical engineer. They moved farther away from the hospital, so she cut her hours back. At this time they also had taken in one of Maggie's half-sisters because her mother was having problems again with her addictions. Maggie was also pregnant with their second child. Her half-sister lived with them for about 6 months and left in the late spring due to the added stress that this living situation caused.

Maggie had their second child in early summer of that year. Now having two small children, the family moved again. With this move, Maggie and her spouse decided that, since he now made more money than Maggie, she could stay home more. She quit her job at the university hospital and started working part time as a home health nurse who focused mainly on helping patients with multiple sclerosis and diabetes. She helped them learn about their diseases and how to properly administer their injections. By working part time, Maggie could maintain her nursing license and also continue practicing. Maggie felt that this decision allowed for the family members to be together

more often and not have to utilize day care. This is very important to Maggie and her spouse. Maggie never plans to completely stop nursing because she loves the work and it helps complete her as an individual. Maggie remarked:

I don't want to lose all my knowledge and skills and if I took a five-year break to raise my little kids I would go back and I would have lost a lot of knowledge. I don't want to do that either. I think that's why most nurses maintain their licenses because they don't want to lose the knowledge. I want to keep my knowledge and keep my skills. (Maggie, personal communication, April 1, 2009)

Her spouse is very supportive of her continuing to work part time because he realizes the benefits for Maggie and their family.

While working part time as a home health nurse, Maggie and her family moved for a third time to a small rural community in Wyoming. Maggie's spouse realized that this change was more of a sacrifice for her and this move was mainly for his career advancement. However, Maggie was able to maintain her contract with the same home health company and she completes more of her work with patients via the Internet and over the phone. She does not make as many home visits as compared to where she lived previously. While living in Wyoming, Maggie and her spouse had a third child as well. Along with having their third child, Maggie began her graduate school work in the nursing field. One of Maggie's goals is to become a nurse practitioner or midwife.

Maggie and her family are active members in the Church of Jesus Christ of Latter-day Saints (LDS). Maggie became a member just prior to meeting her spouse. Maggie explained that the tenets of their faith have had much to do with the decisions they have made regarding work and family. Being LDS did not factor into her original decision to become a nurse, but after becoming active in the LDS Church, she realized

how compatible the nursing profession was with the beliefs of their faith. The flexibility that the nursing profession provides is very conducive to raising a family and allowing Maggie to stay home with their children.

Maggie's spouse has become very supportive in running their household. Even though he was not raised in a household where his father helped with the cooking and cleaning, Maggie's spouse realized that it was very important to her that he be involved and help with all aspects of running their household. He understood that Maggie was raised this way, and she was adamant about continuing this way of living. It took Maggie's spouse a short amount of time to make this transition and help with the cooking and cleaning. Maggie's spouse is also very involved with helping raise their three children. After helping in this way, Maggie's spouse is now an advocate of this more egalitarian way to run their house. He was quick to add that he would expect the same focus for his daughters and son when they get married and have families.

When discussing women in science and nursing in particular, Maggie believed that she was never discouraged to pursue a science-related career. In fact, she has only felt supported and encouraged throughout her life in this regard. Maggie believes that the success she has had with her career and life in general is due much to the support she has received and her ability to learn and work hard.

Maggie believes men are now encouraged to break into a profession like nursing to a greater degree than women are encouraged to pursue careers in fields like chemical engineering. Maggie's experience has been that more men entering the nursing profession are also encouraged to move beyond their initial degrees and pursue levels that require

graduate work. Maggie indicated that every man who was in her nursing program was either planning to or had already begun to pursue degrees to become nurse practitioners or physician assistants. Along with these higher level positions comes higher pay. Most of the women in her program have remained at the RN level and do not plan to pursue the higher level positions. However, Maggie indicated the following regarding male and female relationships while working in the nursing field.

When I look at a scientist or researcher in my field, it makes no difference to me, if they're male or female. When I've worked in the medical field, it never seemed like it mattered. I never noticed women being treated differently in my profession. I don't think it ever mattered if you were male or female because the majority were females. And I think that you have to accept it for what it was. I feel everyone earned their respect. Everyone was on an equal playing field. Everyone came in and if you earned their respect, you got it. If you didn't earn it you didn't get it. It didn't matter if you are a male or a female. (Maggie, personal communication, April 1, 2009)

Maggie does see herself as a role model for girls and boys. She will always encourage individuals to look into nursing as a profession, especially if they are undecided as to what they want to pursue as a career. In regard to girls specifically, Maggie believes that they all should go to college, especially if they were raised in a small community. With her experiences growing up in a small town, she believes that girls need to be exposed to the greater opportunities that one realizes are available beyond the small town setting. Maggie remarked:

In small communities or even, may I say, in Utah communities, the roles of women are predetermined. A lot of women do not go to college. They stay home with their children and that's a lot of times what a lot of girls feel is their goal. And it's not necessarily to do something outside of their family or something educational or something in science. They all feel like they have a predetermined goal in life where you can still have that role, and still do something in science. In a town like where I grew up or here where I live or in other small towns I feel that things are black and white. You are either going to go to college or you're not.

You're going to go into science or you're not. I think one thing that you can encourage girls is that you can do both. If you want to be a mom and stay at home, I think you make a better mom, if you go to college.

I think it's extremely important for girls to go as far as they want to in terms of their education. I think every girl should go to college regardless of what they want to do, whether they think they want to go. I would never discourage a girl from going on. I think, especially coming from a small town, sometimes they don't realize how much is out there and how many things there are for you to do. And so I would always give them the words of wisdom to go to college and find something that they love and that they want to do. (Maggie, personal communication, April 1, 2009)

When discussing feminism, Maggie made the following comments:

(Laughing) I see those groups of women rioting about outrageous women's rights that don't make any sense. For some reason, and I don't know why they see the world revolving around women instead of seeing the world revolving around men and women as a whole. (Maggie, personal communication, April 1, 2009)

Maggie did not see herself as a feminist in the manner that she described. However, her spouse believed that her focus on goals and her intensity to achieve them is partly indicative of having feminist qualities. It is important for both Maggie and her spouse to work together in all aspects of running a household and raising their family. Much of this cooperative attitude has come from Maggie and now is championed by her spouse.

Susan

Susan was raised in a small rural community in Southeastern Utah. She grew up on a small family ranch with her three younger siblings. As a child, her parents described her as being strong willed, adventuresome, and motivated. Susan's mother described her by saying, "She had the terrible twos most of her young life." "She was headstrong, did what she wanted to, Adventuresome!" "She always wanted to get out and do things and to explore. This could drive a parent crazy!" "We would have a lot of talk sessions on

how she could channel all of the energy that she had.” These personality traits combined with being the oldest sibling influenced Susan’s role in her family (Hollingsworth, personal communication July 2, 2009).

Even though Susan’s family worked on their ranch, both of her parents worked outside of the home as well. Her mother has worked with the local school district as a special education teaching assistant and most recently as an attendance secretary. Susan’s father has worked as a rancher and heavy equipment operator for the National Park Service. Being the oldest sibling, it was Susan’s responsibility to make sure her younger siblings completed their chores as set by their parents. Susan recalled:

We always had chores that we had to do. It was my responsibility to make sure those chores got done. So, I had to be kind of the mean one sometimes in order to get that done. A big portion of the blame was put on me, if the chores did not get done. So I had to manage people at a young age, but I didn’t do that so well. (Susan, personal communication, May 5, 2009)

However, Susan credited these experiences from her childhood as beneficial now as she has to manage people in the law firm where she currently works. She believed she has better tact with people and some of the reason is due to her interaction with her siblings while she was young.

In large part, due to her personality traits and the role she played as being the oldest sibling, her relationship with her mother was often strained while growing up. Susan’s father also maintained that she and her mother often had disagreements because they had similar personalities and this caused the clash when she was young. It was not until high school that Susan realized the influence her mother had on her upbringing and how amazing she was as a mother and as an individual. Susan recalled a time when the

family went to the mountains to gather firewood for a widow in town. Susan had a slight headache that day and decided to stay in their cabin instead of working with the family. She remembers thinking that it was a wonderful day. When her family came back to the cabin before returning to their ranch, she remembered her mother being upset with her after Susan described her day. Her mother asked her how she could have had such a good day while the rest of them worked. Susan recalls that she probably could have worked that day and realized her mother was letting her make her own decisions, but was there to help guide her after the decision was made. Susan realized that her mother was always supportive of her but would let her make her own decisions and learn from the consequences for her choices. Today, Susan described her mother as her “best friend” and she called her often to share her experiences and seek advice.

Growing up and working on the family ranch instilled in Susan a strong work ethic and was the impetus for her early desire to become a doctor. She remembered a time when they were butchering cows and how she was interested in the organs and their function. Her father and others who were helping took the time in the middle of this endeavor to explain what each organ was and its function. Later that day, she and her mother had a discussion about her experience while helping butcher the cows. She and her mother talked about her going into medicine and becoming a doctor. She recalled writing about this event in her journal. After the experience butchering cows and throughout high school and into her first year of college, becoming a medical doctor became one Susan’s main goals.

During her high school years, Susan recalled situations that helped reinforce her

goal of becoming a medical doctor. She remembered, a time when she was in a biology class taught by me, a particular experience. The class was learning about viruses and bacteria. As part of the lessons, excerpts from *The Hot Zone* book were read to them. Susan recalled being very interested in the book which chronicled the experiences of scientists working on viruses for the Center for Disease Control. Susan related this about the experience:

I remember you giving me a science book that really made me think that I could go into the sciences at that time. The book was The Hot Zone. I really enjoyed that book. I remember thinking wow! I was really interested in this and I might really have a chance to work in the sciences! (Susan, personal communication, May 5, 2009)

Two other experiences during Susan's senior year stood out as being influential for maintaining her focus on becoming a doctor. She was selected as the Sterling Scholar in the area of science for the school. During the Sterling Scholar competition, Susan recalled that several individuals from her home town went to the event to support her. Susan did very well at the competition and was awarded the distinction of being the region winner in the competition in the area of science. With this recognition came various scholarship opportunities that she utilized at the university she attended her freshman year of college. The second experience occurred during the spring of her senior year. Along with creating her portfolio and preparing for the Sterling Scholar competition, Susan also took courses to earn her Emergency Medical Technician license. She began to work as an EMT for the community's ambulance service. Susan's parents remembered that they made sure she was well rested and ready to go if called when she was on rotation for ambulance duty. At that time, she was mainly on duty during the

weekends. Her parents discouraged working on Sundays, but they made an exception while Susan was on call. They realized how important being an EMT was for the community and for her possible future in medicine.

Susan also recalled another experience that she enjoyed during her senior year of high school. She was a member of a newly formed extension of her school's discipline procedures. A youth court was developed where students who had attendance issues could go before a court of their peers as an alternative to being disciplined in a traditional manner. Susan remembered that this was the first time she had any experience with the judicial system as she and the other students on the court were trained by local professionals in the legal system. To this point in her life, this experience was very different from the focus that she had been maintaining related to science and medicine.

Along with helping Susan develop a strong work ethic while growing up on the family ranch, Susan's parents instilled in her a strong faith in God. She and her family are LDS and Susan credits her faith in God and her church teachings as being a major guiding force for her and in helping her make important decisions in her life. In regard to changing her focus from becoming a medical doctor to becoming a lawyer while in college, Susan made these remarks:

My religion plays a pretty huge role in, who I am and the career that I chose. When I was thinking about becoming a doctor, and I was asking guidance from God, I really felt I really couldn't lead the type of life that I wanted if I became a doctor. I would probably immerse myself in it and not want children or possibly marriage. (Susan, personal communication, May 5, 2009)

Susan qualified her position further when she recalled:

In my religion women are encouraged to stay home. They are also encouraged to get an education. I just couldn't see being a doctor as being compatible with

future plans. As far as what job I have, this goes back to my religion in believing that was part of a divine intervention. One job led to another which led to another and then led to this one. I firmly believe that God had intended that and leading to this job because I wouldn't have taken this job if I hadn't felt so strong that it was right for me. (Susan, personal communication, May 5, 2009)

Susan's faith continues to be a major influence and support in her life.

When Susan recalled her experiences living in a small rural community, she believed that she was supported by many individuals who saw her potential while growing up. She believed this to be one of the main benefits from living in a small town. Being able to be involved in Sterling Scholar, earning her EMT license, being a member of the youth court, and performing many duties for her church were all more easily obtained because there were fewer individuals vying for these opportunities. At the same time, she also realized after going to college, that there were fewer overall opportunities. She missed having a wider range of advanced placement courses that she could have taken at a much larger school. Susan recalled that she was a "big fish in a small pond" which she quickly realized when she began the college phase of her life.

Going to college was a new experience for Susan and even though her parents wanted her to go and supported her completely, they could not give her specific guidance as both of her parents' formal education stopped after receiving their high school diplomas. Both parents were very adamant that Susan go onto college because they had regrets that they did not move forward in their schooling beyond high school.

During her first year of college, Susan quickly realized that pursuing a profession related to medicine and becoming a medical doctor in particular was not what she wanted to do. Susan recalled that science was not a "good fit" for her. She further qualified this

by discussing her experiences in her prerequisite science courses that she would have needed to help her get into medical school.

To tell you the truth, when I sat down and started doing a lot of physics and physical chemistry and that kind of stuff, I hated it. There was nothing worse than organic chemistry. I know a lot of people feel that way, but I really didn't enjoy it. I hated physics, I hated, what else did I take? I dropped an advanced biology class because it was just. I hated labs. I thought I would really like them when I got in them, but oh my goodness. I hated labs. Yeah. If you didn't get it exactly perfect, it wasn't correct. I dreaded going to labs. My microbiology lab was just; it was pulling teeth just to go. (Susan, personal communication, May 5, 2009)

Susan finally realized that she would much rather take courses she enjoyed while going to college and pursue a profession that would fit with the courses she was taking contrasted with “pulling her hair out” and taking courses she hated for an end, being a medical doctor, she might enjoy. To her, being a woman had nothing to do with her choice not to become a doctor or pursue a science-related career. She mentioned that all she wanted to do, for the majority of her growing up years, was to be a medical doctor. In addition, when she thinks of scientists, she thinks of women because one of her close friends is a female scientist who conducts research related to the development of drugs for cancer patients.

During the summer after her first year of college, Susan had an opportunity to work for a lawyer in her home town because the lawyer's secretary had quit suddenly and she was looking for a replacement. Susan recalled that someone told her to go and talk to the lawyer about working for her while she was home for the summer. Since the law practice was just a two person office, Susan and the lawyer, she was quickly immersed in doing research for the lawyer as well as other duties. Susan found that she was good at this type of work and thoroughly enjoyed it! At this point, Susan's decision to change her

future profession was almost complete. Susan, after completing her undergraduate degree, worked for a Chapter 13 Trustee and she enjoyed this work as well. By this time, she decided to go into law as a profession and become a lawyer.

During Susan's first year of law school, she was intimidated by her peers and their backgrounds. Most of the peers with whom she studied came from families where their parents were doctors and lawyers. Their families had the expectation that they would gain professional degrees and Susan came from a family where her parents did not have any formal education beyond high school. Some of her peers' parents, who were lawyers, had cases heard before the Supreme Court. Susan stated this in regard to her feelings at the time:

I thought that those students who had parents who were lawyers were better than me. Here I am just a little country bumpkin, first-generation doing this. I had no idea what was going on. I at least had some idea from my college experience what to expect. Other than that, I had no clue. Both of my parents just have high school diplomas. So they had no idea. They knew that it was hard but I don't think they ever understood the intensity of it. (Susan, personal communication, May 5, 2009)

Even though Susan had feelings of inadequacy, she also felt she had something to prove. She wanted to succeed in law school and become a lawyer. She realized that her study group, which was made up of her first year peers, was going to be instrumental to her success. She credited this group with helping her get through her first year in law school. Without this group, she believed she would not have made it through with satisfactory grades or made it through at all. According to Susan, the first year of law school was most critical. This is when most people drop out. After making it through the first year, there is good retention and most individuals graduate with law degrees.

When discussing the demographics of her law school class, over half were women

mostly from an upper socioeconomic class. After graduation, 95% of her class obtained employment as lawyers in some capacity. Susan is of the opinion that women make better lawyers than men. This is why we see more women going into law today as contrasted with men. She qualified this by saying:

My personal opinion is I think women are better at it. I think women have a natural inclination to be good at negotiation, but also working towards an end rather than being just cutthroat. I think they are better with clients, a lot of the time than men. I think women just have a natural inclination to do that type of work. (Susan, personal communication, May 5, 2009)

Susan was hired directly out of law school by a firm that specializes in bankruptcy cases, Chapters 7 and 13. She works with the debtor side, so she deals directly with her clients. Susan prefers working with the individuals rather than the “bigger faceless companies.” She feels like she is more of a help to the individuals. When discussing being a woman in her law practice, she acknowledges that there exists some discrimination because she is a woman. Susan qualified this when she said:

There is definitely a good old boys club, and I think sometimes myself and a couple other women who do the type of law that I do. We are sometimes ostracized and treated differently because we are female. There are definitely attorneys out there that treat me much differently at work than other guys in the office. (Susan, personal communication, May 5, 2009)

Susan related a situation when a male lawyer from a different firm would not work with her on a case, and they eventually had to go to the judge. The judge directed the other lawyer to work with Susan. From that time forward, he worked with Susan and her client. Susan mentioned that, on occasion, some of the male lawyers from her firm go to lunch and they do not invite her or some of the other women lawyers. Susan feels that if they were more forward and asked to come along that there would not be a problem. However,

Susan is not one to invite herself, so she does not do this as a consistent practice. For the most part, Susan feels supported by her colleagues, especially her boss. She does not feel that being a woman has had a negative influence on her career to this point in time.

Susan credits her boss as being highly supportive of her. She said that even after three years working for him that his door is always open and they often discuss her cases. He listens to her and most often times supports her position. Susan feels that he took a risk hiring her directly out of law school, but has helped mentor her from the beginning. She also believes that he does not expect her to only be a “money making machine” for the firm. Several of her colleagues that she graduated with from law school believe that their main function is to make money. Susan is grateful that she does not work for such a firm.

Susan’s parents continue to support her in her position as a lawyer. Both parents were somewhat disappointed that she did not become a doctor, but when she explained to them the reasoning behind her decision, especially as it related to their church teachings, they both were supportive of her decision to go into law. Her father said that he wanted her to be happy and that he was pleased she became a lawyer. He feels that she is a great role model for her younger siblings in all aspects of her life. Her mother added that she was also very pleased that she continues to rely upon God in helping guide her in her life path.

Susan met her spouse at a singles’ function at their church. They were married about 1 year later. Susan also credited her spouse as being very supportive of her career as a lawyer. He was a mail carrier so he did not make as much money as Susan, but she

made sure he was involved in every decision regarding financial matters and the running of their household. He was there to listen when she had a bad day and she was able to share relational issues she may be having with clients or coworkers, since he was not directly connected to the cases or her office. One of the areas where he was particularly supportive and helpful was in the everyday functioning of their household. Susan's spouse was ready to help with cooking and cleaning on a consistent basis. His father was a role model for him in this regard as he often cooked and cleaned while Susan's spouse was growing up. For Susan's spouse, this is part of what a spouse does to help out around the house and be part of making a home.

When discussing her future as a lawyer, Susan believes she will continue to practice law even when she and her spouse decide to have children. Her firm is willing to allow her to cut back and work from home as she and her spouse would like her to be at home with the children as much as possible. Due to their financial situation, Susan still has many government loans to repay, she did not think she would be able to take time off from work while their children were young. Susan continued to enjoy practicing law, but she believed that the only way she could advance in bankruptcy law would be for her to open her own private practice or build a firm. She did not have a desire to do this as this would conflict with her future plans of having a family. However, Susan was also apprehensive about starting a family and cutting back on work. She liked the intellectual stimulation she received working as a lawyer and she was concerned that she might not get this same stimulation from a 2 year old. When asked about giving others advice about becoming a lawyer, especially to women or girls, Susan was quick to say that she would

support anyone going into law, especially women. As a way to impart some of her knowledge about becoming a lawyer, she recently became an adjunct faculty member at a local college. She felt that this is a way of “giving back” to others.

When asked about being a feminist, Susan gave this response:

We were just talking about this the other day. When I think of the word feminist, I think of the bra burning, chanting hippie, but at the same time I think of myself as a feminist. I think over the years I have learned to define it as anybody who is standing up for the rights of any woman, whether they're doing it in a radical way, or standing up for the rights for a woman to stay in their home and raise their children and not being ridiculed for being a stay-at-home mom. I see myself as a nontraditional female, who would encourage any female to do what she wants which she feels is her direction and not be plowed by stereotypes or doing what she is told she is supposed to do. I don't think there is such a thing as a woman supposed to do something. I believe it is different for each woman and her path is hers to choose. And she shouldn't be told that her place is anywhere. It is her place to decide. (Susan, personal communication, May 5, 2009)

For Susan, it was important to support women in all that they do and that there should not be a stereotype for what role a woman should take in life. It should be the woman's choice and they should be able to be whatever their life's path is directing them to become.

CHAPTER V

RESULTS

This chapter presents results from the data analysis for the two research questions:

(1) In what ways do perceived gender roles, developed throughout childhood and early adulthood, impact women's career decisions? (2) How will the analysis of data and the propositions discovered in this study lead to transformation in the researcher?

Propositions developed from the categories/subcategories and themes in the study finding that gender role development impacted career decision through three primary areas: (a) the various supports experienced by the cases through family, school, and community (including for some, religious affiliation); (b) opportunities provided through various levels of school and community experience; and (c) adoption of a postmodern feminist lens as it relates to the four cases' social class, lived experiences, culture of growing up in a small rural community, and the development of their career personas. Data for the three areas will be described within each case, then a cross case comparison will be completed. Following the discussion of the case results, I will review the results of my reflection and transformation by using my researcher journal and making comparisons with applicable interview data from the study. (All names referenced in this chapter and subsequent chapters are pseudonyms.)

Supports—Within Case Results

Throughout their stages of life, the four cases had strong support from parents and/or family members. All the cases were strong willed, independent, and relationship

oriented. Parents/family members helped guide and nurture these individuals' personalities. Each case had a very supportive spouse in relation to home responsibilities and work. In addition, teachers, mentors, or collaborators helped support these individuals at various times in their lives as well.

Nancy

In Nancy's case, her mother has been the most supportive of her throughout her life, especially from an emotional stand point. Nancy's mother commented about her support of Nancy as she left for graduate school.

She loaded up her dog and traveled all by herself to a state and a city and a school that she didn't know. I was so proud of her for that! I always supported her, emotionally. She calls me. I do not judge what she says, sometimes I'm just a sounding board. She always knew and knows to this day that she has somebody here that supports her no matter what.

In regard to her mother, Nancy commented, "I'm definitely closer to my mom than I am my dad. She and I talk on the phone at least three times a week if not more and sometimes it's daily."

Nancy's parents were divorced when she was in high school. She has maintained a "relationship of convenience" with the father she grew up with. During the time of the divorce, Nancy also discovered that her father was not her biological father. Nancy has only met her biological father on a couple of occasions and has not developed a relationship with him at the present time. However, Nancy does make reference to her current stepfather as being supportive, especially regarding her decision to pursue her initial degree in geology and eventually a career in hydro-geochemistry. Nancy's mother commented on Nancy's discussion with her stepfather:

She said these were her options, and I don't really like any of them. He said why don't you take the Geology of the Colorado Plateau. He said, I took that class and I found it very interesting and she took it. She came home and she said, I'm changing my major. I love it! She played catch-up the next year. She carried 21 hours, one semester and caught up on her credits. That's really how she ended up in the science field.

During graduate school, Nancy and her mother talked about how times had changed and that she should find herself a *house husband* to support her in her academic and scientific research career. Nancy's mother shared their discussion regarding the changing times.

Recognizing the times have changed, I remember when Nancy got older, we talked about it. She had talked about, as she recognized that she was going further and further in her education, we sort of jokingly said, you need a house husband. We talked about the role reversal, and how that was so okay. If it worked out that way it would be great. When she got married, I think most of their friends had more of a sharing type relationship. I talked to her about it that, however it worked, was fine.

However, Nancy met her future spouse while working on her Ph.D. She found, in her spouse, another scientist that could relate to her and be a sounding board for her scholarly endeavors. He often acts as an editor for her work and she for his. Nancy commented:

I view my husband has a pretty big support in order to further my career, because it certainly takes a lot of confidence to be where I am in my field, and my confidence waivers some. He's really good at being there, and props me up when my confidence waivers. In general, he is just there. If I'm really working hard on a proposal, he takes care of everything around the house. He's emotional support and when it comes to taking care of stuff around the house. And if I'm really busy and trying to get something out the door he's definitely there to help. He helps to guide me in my relationships with collaborators. When I get frustrated with things, this just happened yesterday, I get an e-mail from somebody that catches me off guard. And my initial response is inappropriate. I can't think how to proceed in a diplomatic way he becomes a voice of reason. We do that for each other. That's a 2 Way Street between the two of us. (What is his field?[my question]). He's a geologist. He reads my proposals, and my papers. If I'm having

troubles getting a problem out on paper, then he will sit down and we will talk it through. He can pick out of what I say and point out what the important aspects are. He really helps me focus my thoughts when I'm sitting down and trying to write something.

Nancy's spouse also believes in sharing equally in running a household. With her spouse, Nancy has found an individual that supports her in all aspects of her life, career and family related. Nancy's spouse remarked:

My support is being open, and let her know that she can do whatever she wants to do. It is okay with me and we can work it out no matter what. I'm supportive in terms of her decisions where she wants to go with her career.

That is how I was raised. (Do you think that had a big influence on you being able to do the same with Nancy?[my question]). Yes, absolutely! My parents taught me to be real tolerant of things in general. It is not like I have to be tolerant in our relationship, but the understanding part and being able to understand other people's perspectives and in trying to put my feet in their shoes was influenced by my upbringing. In general trying to work together on things is basically how our relationship is. We just work together on everything. That is basically it.

That is an interesting thing about our relationship. I don't think we take roles. She is better about doing laundry than I am. I will do laundry and that's not a problem at all, but she will do more than I do. I think her tolerance level for letting laundry stack up is lower than mine (laughing). As far as roles, we cook together, we shop together, and we do everything together. We clean the yard together, she will mow the lawn and I will sometimes mow the lawn. One of the things that she will not do is work on cars with me. It is more of a hobby for me, changing the oil, rotating the tires, and that kind of stuff. She is not really interested in that. She cleans the house better than I do, but I don't think she regards that as her role.

Nancy and her spouse eventually want to have children, but at the time of this research, they had not ventured into this realm. In response to the question about the possibility of having children in the future, Nancy commented:

That is a loaded question (Laughing). Certainly, we are planning on having kids. We are kind of at the point right now trying to decide the career path and trying to make that happen. One of the things is I have to write grants to fund myself on soft money right now. If I could work with a research institution, I could possibly take a break when we have kids. The other option is that we are two career family

and I take a little bit of a break and then go right back into it.

While in high school, Nancy spoke about the support she received from her teachers. In particular, she cited her Spanish teacher as being very supportive. Nancy was the foreign language representative in the Sterling Scholar competition for her high school. She also spoke fondly of an outdoor education class, which was taught by me, as being a course that helped Nancy learn about her strengths as an individual.

During her college years, Nancy talked about some of her college professors as being supportive of her as an academician. Some of her science professors encouraged Nancy to continue her academic career and to obtain a Ph.D. in her chosen field of hydro-geochemistry. Nancy commented:

I didn't really get interested in science until college. I had a really great intro to geology teacher who encouraged me quite a bit. And then, actually my undergrad research advisor was a chemist. He was very encouraging for me to go forward to continue on to graduate school. These are probably the main people.

My chemistry professor also encouraged me a lot. He is a very good teacher and was genuinely interested in how I was doing in class and what my future plans were.

I think that I had professors who were really interested in my development as a scientist, and they encouraged me to continue on because they saw something in me that they thought I would be successful. So, I went on to grad school and they encouraged me to ask questions and to actually do research as an undergrad. I think that encouragement to actually do the research and to not be afraid of not knowing the answer to a question was certainly beneficial to me. I was always the person who wanted to know the right answer.

While in graduate school, Nancy also had the support of collaborators, other graduate level and doctoral level scientists. For Nancy, collaborating on scientific research is the most fulfilling as she can look at a broader perspective when dealing with a research question related to her field of study. Nancy made the following remark

regarding the importance of collaboration in her research, “I am certainly someone who needs collaboration. I can’t do the science I do totally on my own. Those professional relationships that I have to build are definitely supporting my career.” In contrast, Nancy did not have positive experiences working with geologists from industry. She believed that the geologists from industry were generally surprised that a woman could be a competent geologist in the field and that she knew what she was doing in regard to field work. As a result of these experiences, she chose to remain in academia and not pursue a career in industry. After our last interview, Nancy continues to advance in her career and accepted a research assistant position at the college where she worked on her Master’s degree.

Jane

In Jane’s case, she cites both of her parents as being supportive of her. Her parents have been married for over 40+ years. However, she references her mother more often than her father in regard to supporting her life’s endeavors. Jane remarked:

I think I was really close with both of my parents, and they were very supportive. I think one of the biggest things would have been early in childhood and my mother spent a lot of time and my dad being supportive while I used to have my running and that sort of thing. And they’re very supportive with that. They were extremely supportive of me for my education, and going into the field of veterinary medicine. And they opened a lot of doors for me. So, I think being very close to them helped.

They’ve always been so supportive. I think, had they not been supportive I’m not sure I would have had the drive. They made it easy for me to accomplish my goals. They didn’t do it for me, but they put things in place that made opportunities available for me.

In her early school years, Jane struggled to learn how to read. She did not become

a competent reader until she was in the fifth grade. Her mother, being a teacher as well, focused her attention on Jane's reading issue. She made sure that she received the necessary support through the special education department at Jane's elementary school along with personally helping her at home. Due to these early experiences in school, Jane had a low self-concept. She turned to physical outlets to help her cope with her inability to read and develop a strong sense of self-worth. She began to run at a young age and eventually trained for and completed a marathon before she was 12 years old. She speaks fondly of her mother's support of her early morning training sessions. She would sometimes run 8 miles before school. These early experiences helped shape Jane's personality. She was very independent and was tenacious in pursuit of her goals. She persevered through any obstacle to achieve her goals. Jane's mother commented:

I always told her she could do whatever she wanted to do if she wanted it bad enough. It was something I always told all my kids at school. We can all do whatever we want to do. It just depends upon how bad enough we want to do it. It started out with her running. And how did I support that? When you're in the fourth grade, and she's out running, I got on my bike and went with her because she was training for the half marathon. She was hitting the streets at four o'clock in the morning.

About the same time that Jane was training to run marathons, her mother set up a meeting with Jane and a local veterinarian because Jane always loved animals and wanted to pursue veterinary medicine as a career. This local veterinarian became a mentor for Jane and helped provide experiences that solidified Jane's desire to become a doctor of veterinary medicine. Jane remarked:

Getting the encouragement back from a veterinarian I used to work for which was Dr. P. Banister. He encouraged me to be able to go into veterinary medicine, because at the time, I didn't think I was smart enough to go into the profession. So, he gave me a lot of encouragement saying, I could do it, so, most of the

encouragement came from him.

Dr. P. Banister commented on his support and connection with Jane:

I met Jane when she was about 13. She actually worked for me at my office for the last couple years that I was there. She had super interest in veterinary medicine. She was really an intelligent kid. I pushed her to try to get into veterinary school. Of course, she did very well with that. I've tried to maintain contact with her over the years and watched her career. I still talk to her a couple of times a year.

I've been friends with her parents for years. So I've known the family as well. When she was a 13-year-old, she had an incredible work ethic. She could actually do reception and tech work better than anyone else I had working for me at the time (laughing).

She has been probably the most motivated and driven out of all those that I have mentored.

During her college years and especially during veterinary school, Jane's mother continued to support her. Due to her mother's financial help, her mother took on various jobs in addition to her teaching position at the local high school, Jane was able to graduate with her doctor of veterinary medicine degree debt free. This was no small accomplishment as most individuals in her cohort incurred a considerable amount of debt while they completed their veterinary degrees. Jane recalled what her mother did for her while she was in veterinary school: "When I was in veterinarian school, she took a second job washing dishes to help me pay for the schooling, so she was a big support for me."

During the same time period that Jane started her practice in Florida, she also met her future spouse at one of her friend's weddings. Jane and her spouse were married soon after they met and they also started a family. They had their first child within their first year of marriage. Jane credits her spouse as being selfless in regard to their family and

her career. He kept his teaching and coaching career on hold so he could stay at home and tend to their daughters so Jane could develop her practice. Jane continues to help around the house and still does a considerable amount of the cleaning while her spouse tends to their children and prepares most of the dinner meals. Jane made the following comment.

Probably the biggest support is my family support. Specifically, my husband J. to be so supportive, because it can be stressful, it can be long hours, it could be going in on my days off, and without his support, I would have a hard time doing it or being successful. He is very supportive of the work that I do. He also has taken his own career and put that on hold to make sure mine is going where I would want it to be, especially while our kids are so young.

In regard to his support of Jane and their family, Jane's spouse made the following remark.

I take the girls to school. I am kind of the head of household manager, I guess. I guess the term would be, I'm a soccer dad. I go to work early so I come home in the morning around nine o'clock. I get breakfast for the girls. My primary focus throughout the day is them. I do things around the house and when Jane gets home, I support her. I take care of her. That would be my role.

Jane also talked about the support that she received from her teachers while growing up. She referred to her elementary teachers as being instrumental during the years she was learning how to read. Jane talked about the outdoor education course, which I taught when she was in high school, as being important in her continued pursuit of physical activities as a means to bolster her self-image. The activities in the outdoor education course provided a vehicle to support her independent and tenacious personality. Jane eventually became an accomplished rock climber. Jane was her high school's representative for the science Sterling Scholar during her senior year as well. Jane believed that her teachers in elementary and high school contributed more to her future direction in life as compared to her professors in college. Jane commented:

The other encouragement mainly came through my teachers, including you. I had learned that I was transposing letters and numbers and that sort of thing. But I really got through it working one-on-one in special ed. with my teachers. My second and third grade teachers were excellent, as far as helping me get through school and helping to get the special attention I needed to learn to read. I think it was mostly high school and middle school teachers more so than college professors that directed me to go where I wanted to go with life.

After graduating from veterinary school, Jane accepted a position with a veterinary practice in Florida. During this time, she developed a relationship with a senior partner in the practice. This relationship is one of mutual support as he looks to Jane for new techniques that she learned coming directly out of school and she looks to him for guidance as he has been practicing for many years. His years of experience have been a valuable support for Jane as she began her career. Jane remarked:

He is definitely a role model. He's a veterinarian that graduated before you know, I was born. He's been practicing veterinary medicine for 40 years, so he and I go to a conference together then we discuss veterinary medicine inside and outside of work. He's great, because I look to him for his experience, and he kind of looks to me for newer medicine, and/or that sort of thing. So we kind go back and forth.

Jane plans to always work as a veterinarian, but possibly cut back on her hours so she can have more family time.

Maggie

Maggie cited her father and paternal grandparents as being most supportive of her throughout her life. Maggie remarked:

He was a good dad and he was always involved. He always tried to do the best that he could. He was there for us, he supported us. He was involved in all our activities and that made me want to be like that with my kids. The way he was, I want to be with mine. We had my grandparents near us and they were very involved. They helped out financially a lot with my dad. They did a lot of things. They supported my brother and me financially for a lot of academic things and other activities. We would not have been able to do a lot of those activities

without their financial support. And that changed who I am now. My children have a very strong and close relationship with my grandparents, especially my grandma because she is only one still alive.

Maggie's parents divorced when she was 3 or 4 years old. Her mother had struggled with addictions most of her life, especially with alcohol. Maggie and her brother lived with their mother until she was about 11 or 12 years old. During that time, she developed a sense of what type of relationship she wanted to have with her future spouse. She also realized that she did not want to be like her mother. From the time she was 11 or 12 years old, she and her brother lived exclusively with their father. Her father believed that everyone should share in the running of a household and that there was no separation of duties based upon gender. Everyone was responsible for cleaning, cooking, doing laundry, and yard work. Maggie's father commented, "After we moved into this house, she helped out with everything. I always told them there was no sex (gender specificity) in chores. Everybody did everything around here. She pretty well picked up on that and I think she still lives that way." Maggie recalled that her father attended all of her school activities including traveling to her athletic events. He also wanted Maggie and her brother to do well academically as he believed their education would be the key to their future success in life. Maggie recalls that she put her academic pursuits first, followed by extra-curricular activities and then going out with friends. These priorities were also supported by her father. In regard to priorities, Maggie's father remarked:

It was there academics and then their athletics and friends.(In that order then?[my question]) Yes. It was important to keep them busy. If their academics were kept up they were allowed to go out. She did very well with it. I expected them to do well! Maggie's grandma had a lot to do with them at a younger age and through high school their academics were most important.

Maggie talked about her brother as being supportive of her, especially during her senior year in high school. He helped her with scholarship and college entry applications as he had already experienced these activities and was able to give her useful tips and advice. Their father had not gone to college, so he was not able to be much assistance to Maggie in this regard. Maggie made the following comment regarding her brother's support, "I would have to say my older brother Jacob was a really great role model for me. He always did really well in school, and he always tried really hard to do what he wanted to do with his life."

Maggie's father had been a diabetic for most of his adult life. After Maggie and her brother moved in with her father, she often had to help him during times when he was struggling with his disease. She became a competent care provider for her father. Because of her experiences caring for her father, the desire to be a nurse became a goal for Maggie. Maggie was able to complete her prerequisites for the nursing school faster than the average student because she had already obtained her Associates Degree at the same time she graduated from high school. While in college, her father and paternal grandparents continued to be supportive of her endeavors. Her grandparents helped her financially and her father, mostly from an emotional standpoint.

The summer prior to her last year of nursing school, Maggie met her future spouse while working at a restaurant in the community where she grew up. They dated for about 6 months and were married. Within the first year of marriage, they had their first child at the same time Maggie graduated from nursing school. Her spouse was working on his Bachelor's degree in chemical engineering so this created a very stressful

situation. Maggie was working full time so her spouse began to take their daughter to school with him so Maggie could sleep during the day and be ready for her night shift at the university hospital. Maggie's spouse was raised in a traditional household. His father did not help much with domestic duties. However, Maggie's spouse quickly realized that this way of living would not work for their situation. Maggie was raised in a household where everyone shared in all domestic tasks. Maggie's spouse began to help with all aspects of running a household. He now believed that this was the best way to be a family and he expected their children to be the same when they have their own families. This support from Maggie's spouse has allowed her to continue in her nursing career on a part time basis and meet family obligations as well. Maggie's spouse made the following comments regarding his role in their family:

I help her set the table. After dinner, I generally get the kids ready for bed and put them to bed. I help them brush their teeth. I do not take care of the baby much but I take care of the older two. I make sure the cars are running well and when she needs to use something I make sure it works. She does most of the cleaning, but I do help clean as well.

Maggie's spouse shared how his experience growing up was different than Maggie's, but later changed his views. He remarked:

My father used to go out to the garage and work. I will stay inside and help Maggie clean up after dinner. I don't ever remember my dad doing that very often. I'll help her get the laundry or fold the laundry. These are things we've developed over time that she has wanted. At first I didn't like it very much, but now it doesn't bother me. It is now normal. At first, we kind of went back and forth. We do this with a few things. This is one of the things that took me a couple years to get used to. (Is this something that you would expect your kids to be that way now?[my question]) Yeah, I expect my son especially to help out with some of these things. It is something you should do, at least in my mind now. I would expect my daughter to behave the same way with her husband.

Maggie's spouse continues to encourage her to maintain her nursing license and work in the field. He commented:

I would say the hardest point of her career was moving here to Wyoming. In Utah it was very easy for her to work due to the proximity of her work location. I just made sure when she had to be at her shift, or going to see a patient, I would make sure I was home. We would work out our schedules so I could watch the kids and she could leave. Since we have been in Wyoming, I've encouraged her to go when she has a patient but it takes a lot more time in Wyoming to see patients than in Utah. It is no problem for me to watch the kids. They are easy to take care of. The biggest thing for me is I tried to help her keep her license by encouraging her to keep working. We haven't needed the money but she enjoys it and it helps her keep her sanity to get away from the kids for a while. I push her to work for that reason.

With the continued support of her spouse and family, Maggie has returned to school to further her education in the nursing field. She would eventually like to become a nurse midwife or nurse practitioner.

Maggie cited her teachers, especially her science teacher in middle school and me, during her high school years, as being very supportive of her academically. During her senior year, Maggie was the Sterling Scholar representative in the science category and she believed that I had much to do with her being nominated and for her winning the science category for the region. Maggie commented:

Well, obviously like my teachers in high school, who were great teachers, you, Mr. Carter, he was a math teacher but he did science in middle school, both of you were great. You helped me a ton in science. You always encouraged me to do Sterling Scholar. In fact I am sure that you nominated me for the competition. I feel like that's why I got an academic scholarship from the University of Utah, my Sterling Scholar. I was encouraged a lot by you to do science.

Along with her teachers, Maggie cited one of her high school advisors as being most supportive of her academically and emotionally. This advisor helped her successfully complete her associates degree while still in high school. This advisor also

helped Maggie work with her over achieving personality and keep her well-grounded regarding her personal life and academic pursuits. Maggie made the following comments regarding her high school advisor:

Sarah Underwood, she was the upward bound adviser. I don't know if she still works there or not, but she was great! I loved her! She always got my college classes organized. She always helped me get everything I needed for that and she always would encourage me to do what I wanted with my career path. She would say, "If you want to be a stay at home mom that's what you should be, or if you want to be a rocket scientist, that's what you should be. You know, don't do anything that someone else thinks you should do." She was just really great at saying where ever your life takes you, be proud of it and just do what you want to do with your life. She would also say, "It doesn't matter where anyone in your family goes or where they were, you need to create your own life for yourself." That always helped.

Sarah Underwood made the following comments regarding her support and influence of Maggie while Maggie was in high school:

The first year that I started as a counselor for upward bound her older brother was already in the program, so I met her through him. I asked her if she wanted to join also. She was from a low income family and first-generation planning to go to college. She was being raised by her father, who was not a very healthy man. I figured she could use a little bit of help also along with her brother.

She was an over achiever and not in a healthy aspect. She stayed very very busy and involved in school and all activities. She also took care of her father, who was ill. My main focus with her was to help her keep things in balance. I never thought she wouldn't be successful, I just worried about the price that she was willing to pay to be successful as a young person.

In order to achieve the associate degree, she had to take summer classes also. During that time, I think she made her first "B." I was truly concerned about how that affected her. I called her in and asked her how she was doing with that. She had a real hard time with that. She was taking a class from a professor who wrote her a letter. He must have recognized it even though it was a distance course. So, I felt that I was right on, because he must have noticed it as well.

She is so bright and such a leader that I recall one time saying to her that I know you'll go get your bachelor's degree and you will make a wonderful nurse, but there will come a point in time where I can see you running the entire ward, if not

the entire floor of a huge hospital. She has that ability. She has very good organizational skills. She is just a natural leader.

Maggie believed that her middle school and high school teachers' along with her high school advisor's support were more influential regarding helping her mold her personality and for her future academic and career success than any of her college professors. Maggie remarked "On that same note, the class sizes were small and teachers knew you personally versus larger class sizes that occur in larger schools. It just seemed like I had a personal connection with all my teachers which I didn't experience at my large university classes."

Susan

In Susan's case, her parents have been married for 35+ years and have been a constant source of support for her in an emotional sense more than economically. When Susan was young, she had a strained relationship with her mother due to the expectation that Susan be a supervisor of her younger siblings. However, as Susan matured, she realized the importance of what her mother did for her.

Susan continues to have a strong bond with both her mother and father. Susan refers to her mother as being her "best friend" and she calls her almost every day. Susan had this to say about her relationship with her mother.

My mom and I did not get along very well when I was young. I can't ever remember specifically saying I do not want to do this anymore but I know that was the gist of a lot of our arguments. (So you think that had an influence on the relationship that you had with your mom when you were young? [my question]). Yes, I think it did. That was part of a hand both of us having, my dad always said we had the same personality, and I think we clashed at the time. (How about now or as you have gotten older? [my question]). My mom is my best friend. I talk to her every day, all day long if we could. (So, what was the change there for you?

[my question]) I think probably my great high school years. I began to realize what an amazing woman she is and all that she has done for our family. The things that she did were not to hold me back, but rather to help me as much as she could under the circumstances. And once I moved away, we became much closer. I realized how important she was to me and the valuable things that she taught me.

According to her parents, Susan was always “head strong” and independent. Her parents realized when Susan was young, they had to guide and support her in a way that they did not try to change her, but utilize her strengths as an attribute for her future success. Susan’s mother made the following comments regarding their support and guidance of Susan:

She was always really headstrong when she was a child and we learned really fast that we couldn’t change that, but we could guide it. So, we did our best to teach her values that we thought were important and then she just took off and flew. She did her own thing and did it great! (Is there anything else? [my question]) We are really proud of her.

Susan’s father added the following regarding Susan.

Oh, when she decided she wanted go to school and she made up her mind that she is going to do it, nothing got in her way. That was the way it was with her all the time. If she wanted to do something, she’s going to find a way to do it, not in mischievous ways! If she set a goal there was nothing that got in her way.

Susan’s mother mentioned how they supported Susan when she was a senior in high school after she became an emergency medical technician. Susan’s mother commented, “When she was running ambulance she would be out in the middle of the night or all night or on Sundays. We usually discouraged activity on Sundays, but in this case, we had to support her. So we would support her and made sure she got the sleep she needed.”

Soon after Susan began her law practice, she met her future spouse at a church

gathering for young singles. Susan maintained that her spouse is a constant support for her, especially emotionally as it relates to her career goals. He is helpful around the house in regard to cooking and cleaning. Her spouse is proud that Susan is a lawyer. Being supportive in this manner has allowed Susan to continue her focus on her career. Susan made the following comment:

Now, in regard to my husband, he encourages me to work and likes that I am an attorney. He's there to encourage me when I come home when I've had a bad day. (What does he do? [my question]). He's a letter carrier. (S2, p. 5 lines 19-21)

Susan's spouse made the following comments in regard to supporting Susan and her career:

I would say it is probably more of a support role because it is not a very easy job. When she comes home after a stressful day, I try to just be there, I guess. I try to help motivate her. (Can you give me a specific example of one of those times and what you did to help her? [my question]?) I usually end up listening after work. She will come home and talk about some clients or other things.... It is interesting. I love that she is a lawyer and it is cool. We both share a lot of the cleaning and stuff. I usually have a day off during the week, so that allows me to do the running around town type errands for the family. We both share in cooking dinner and cleaning and that sort of stuff.... My dad did a lot of the cooking when I was growing up. My mom was going to school. When I started grades school, she decided to go to college to get a nursing degree. When she was at school, my dad was left to do a lot of the cooking and cleaning. So it's not a very big change in relation to how I grew up.... Whatever needs to get done, who does it, it does not matter to me. We both do enough so it is not lopsided.

Even though they want to begin a family soon, Susan will most likely continue in her career, but possibly cut back on her hours. However, Susan believes that she will never completely stop practicing law as it fulfills part of who she is as an individual.

Susan also cited me as having been supportive of her, especially during high school when she wanted to pursue medicine as a career with future sites on becoming a medical doctor. Susan commented:

I remember you giving me a science book that really made me think that I could go into the sciences at that time. The book was the *Hot Zone*. I really enjoyed that book. I remember thinking wow. I was really interested in this and I might really have a chance to work in the sciences.

She also talks about me as being supportive when she was selected as the Sterling Scholar representative in the science category for her high school.

During college, Susan talked about one professor who pushed her to excel and indicated he believed she was a very smart and capable student. Susan stated:

I had some college professors that really encouraged me. I had one for statistics. He told me I was one of the brightest students he had ever had and that really helped me go a long way. Everything that he did taught me I could do whatever I wanted.

In law school, she viewed her study group as supporting her and helping her achieve academically. Even though most were from families that were from a higher economic class than Susan, she developed a bond with them that she maintained throughout law school. Susan commented:

When I was in law school, it was imperative that we do group study. There is no way you can learn everything on your own.... Oh! all of them were at the top of our class. They were, I wasn't. They helped me elevate my grades the first year. Another thing in law school, if I had not studied in the group, I probably would not have made it through my first year, because I just did not know what was going on. They did me a favor.

When Susan landed her first position as a lawyer, she developed a mentor/mentee relationship with her boss. She credits him with helping her become a good lawyer and their relationship is one that she views as important for her continued success in her law career. In regard to her boss, Susan stated:

The support of my boss is one. I really lucked out and have a boss that stands behind me. He always takes my side first if a client calls and complains. Some of our clients are crazy. Jim's support is huge, not only did he give me a job, he took

a chance on me straight out of law school. He still helps me and he still will sit down with me after three years working with him. We will sit down and he will say this is what we need to do. And he always asks me questions. His door is always open. To me, that is huge because it makes me feel that I can do it and I'm not out all alone. And I'm not just expected to make money, which a lot of my classmates feel that they are just moneymaking machines.

Supports—Cross Case Comparison Results

Parents and/or Family Members

In all four cases, one or both parents supported them throughout their lives. This support was mainly emotional. At each stage of their lives, each case's parent or parents played a pivotal role in encouraging them to pursue their careers and help guide and give advice. A strong connection continues to exist between each case and their parent or parents who supported them.

In regard to Nancy, in addition to her mother, her stepfather provided encouragement to pursue an undergraduate degree in geology. Her relationship with the father she grew up with until her parents divorced when she was 14, was never close or cited as being very supportive. Nancy has yet to develop any form of relationship with her biological father at the time of this research.

In Jane's case, specifically related to her mother, the support Jane received was emotional and financial as well. In contrast to Nancy, Jane's parents have been a role model for her in regard to maintaining a healthy marriage as they had been married for 40+ years at the time of this research. Jane was given many opportunities while growing up due to the support and encouragement of her parents. Even though Jane did not cite her father in specific instances, she did mention that he was supportive in general.

Similar to Nancy, Maggie's parents were divorced as well. In Maggie's case, her parents divorced when she was younger as compared to Nancy. Having been raised in her early years by a mother who had problems with addictions and then in her late pre-teen and teenage years by her father who had significant health problems, her grandparents and brother filled support roles that her father was unable to provide. Maggie's grandparents not only supported her emotionally, they also supported her financially. Since her father had never gone to college, her brother became a role model and support in regard to helping Maggie prepare academically and emotionally for college. However, Maggie's father had been a constant support for her and encouraged her to excel academically and athletically. Even though he did not attend college, he realized the importance of gaining a college education for his children.

In Susan's case, both parents have provided consistent emotional support for her throughout her life. Similar to Jane, Susan cited her parents as being significant role models for her in regard to maintaining a healthy marriage and being there for her in all of her endeavors. Susan's parents supported her in much the same manner as the parents from the other cases indicating, that to be successful in a professional career, science-related or law, parental support and guidance are critical. From the cases experiences, the support they received from parents and other family members was unconditional.

Spouses

Along with support from parents, siblings, or grandparents, all four cases were married to individuals who were very supportive and influential regarding the development and maintenance of each of their careers. For Nancy and Maggie, they

married just prior to completing their educations for their professions and Jane and Susan married right as they began working in their professions. The timing of all their marriages was at a critical juncture in the development of their careers.

Nancy met and married her spouse while she was finishing her Ph.D. Being a geologist as well, Nancy's spouse was actively involved helping Nancy as an editor of her scientific papers and being a sounding board for her when she is having difficulty with her research collaborators. In addition, it is common practice for Nancy and her spouse to work together maintaining their house and times when Nancy was pressed to get a research paper written for her work, her spouse would take on more of the household duties to ensure she could complete her paper on time. Nancy and her spouse did not have any children at the time of this research, but plan to have children in the future. Nancy plans to continue working in academia, at the college level, when this time comes and her spouse was supportive of her continuing her career.

Jane and her spouse were married soon after she accepted a position at a veterinary practice in Florida. As with Susan and Nancy, Jane cited her spouse as being instrumental in her development as a veterinarian. In additions, Jane and her spouse had their first child soon after they were married. Jane's spouse kept his teaching and coaching career on hold in order to be a soccer dad and maintain their household while Jane developed her veterinary practice. Being a support to Jane and their daughters was a role that Jane's spouse was proud of and plans to continue into the future.

Similar to Nancy and Jane, Maggie was married to an individual who supported the maintenance of Maggie's nursing career. Similar to Jane and her spouse, Maggie and

her spouse began their family soon after they were married. However, in contrast to Nancy's and Jane's spouses, Maggie's spouse had to make adjustments to the expectations of having a more equal sharing of household duties. Since Maggie was mainly raised by a single father who had expectation for all of them to work equally in maintaining a household, Maggie had similar expectations when she and her spouse began their family. Maggie's spouse quickly realized that the equal sharing of household duties was the better way to support Maggie, her career, and their children. He now expects that their children will do the same when they have families of their own later in life.

At the time of this research, Susan was in the process of getting married. She cited her spouse as being there emotionally for her as well as being an active participant in all household duties. Susan's spouse was very supportive of her being lawyer and planned to continue to support her being actively engaged in her law practice after they begin their family as well. In comparing the spousal support of the other three cases' to the support Susan received from her spouse, it was readily apparent that Susan's spouse was supportive in much the same manner.

Teachers, Mentors, or Collaborators

All four cases had support from individuals other than family members. The support was given at critical junctures in all of their lives which helped each case achieve the education and experiences necessary to obtain their career goals.

Nancy shared how her teachers, especially me and her Spanish teacher helped guide her in her academic path. Nancy also cited her undergraduate college professors in

helping develop her research skills and eventually motivating her to continue in the geologic fields as a graduate student. Nancy eventually completed her Ph.D. in hydrogeochemistry.

Similar to Nancy, Jane cited positive influences from teachers while growing up. Specifically, she shared her experiences with her struggles learning to read and how two of her elementary teachers, along with her mother, helped her overcome her reading difficulties. She also cited me as being influential while she was in high school. In contrast to Nancy, Jane did not cite any college professors that stood out as being major influences in her path to becoming a veterinarian. In addition, Jane had a mentor who was a practicing veterinarian. She began working with him from the time she was 12 or 13 years old. She cited this mentor as being one of the main driving forces for her in maintaining her academic path and completing her veterinary degree. Jane's mentor continued to have contact with Jane and followed her career development. As Jane began her veterinary practice, Jane developed a relationship with an older veterinarian who had been practicing for over 40 years. Jane cited this relationship as being very influential in her development as a practicing veterinarian.

In comparison to Nancy and Jane, Maggie cited teachers who were influential and supported her development as an individual and student as well. Specifically, she cited her middle school and high school science teachers, which included me. Maggie's experience with her college professors was similar to Jane's. Maggie believed that the support and influence she received from her teachers in middle school and high school had more of an impact on her future success than her college professors. In addition,

Maggie had an advisor, while in high school, who had the greatest influence on her with the exception of her immediate family members. This relationship was similar to the relationship Jane had with the veterinarian while Jane was growing up.

In comparison to the other three cases, Susan had support from teachers as well. Specifically she cited me as having been a strong influence regarding her initial focus in the sciences and having sights set on becoming a medical doctor. Similar to Nancy, Susan mentioned a college professor who helped her develop a sense of her academic abilities, which in turn gave her the self-confidence to continue on the path to becoming a lawyer. In contrast to the other cases, Susan shared how a study group helped her focus and maintain good grades during her first years in law school. In addition, after she finished law school and was hired by a bankruptcy firm, she developed a mentor/mentee relationship with her boss. She considered this relationship as being critical to her continued development as a lawyer. The relationship Susan had with her boss was similar to the relationship that Jane had with the senior veterinarian in her practice. In comparison with the other cases, Susan had similar supports from teachers and mentors suggesting that these supports were necessary for her success at obtaining her law degree just as these supports were critical for the other cases' success obtaining their science-related degrees.

Opportunities—Within Case Results

Along with the supports provided these participants throughout their lives, all of them had a variety of opportunities and experiences that helped shape their personalities

and guide them in their pursuit of careers and family. In many instances, these experiences were not positive. However, these experiences were influential in these participants' lives in regard to developing perseverance, independence, and a drive to succeed. In addition, for Susan and Maggie, being members of the LDS church was an opportunity that helped guide and validate their decisions related to their career choices. For Susan, she was a life-long member and had several opportunities to develop her leadership skills while growing up as well. For Maggie, she became a member between the end of high school and the beginning of college, so the influence of the LDS religion came later for Maggie.

Nancy—Family Experiences and Opportunities

Both of Nancy's parents worked outside of the home. As a result, Nancy was a mother figure to her younger sister. Nancy welcomed this role as the older sister. These experiences helped mold Nancy's personality. She has been independent and goal oriented from a young age. She also had a giving spirit as a result of her earlier experiences. Nancy commented:

Growing up in the family that I grew up in, my mom and dad both worked most of the time two jobs. As a result, my sister and I were home alone a lot and I was given a lot of responsibility to care for her. It was up to me to make sure she got home from school, make sure we got our chores finished, and our homework finished. I think that shaped who I am because that gave me a lot of responsibility at an early age. Because of that, I learned early on how to get things done and how to be responsible.

In addition to having a supervisory role regarding her younger sister, Nancy spoke fondly of her childhood in terms the activities she liked to participate in with her sister.

Oh man, we played a lot of games, monopoly (laughing), board games, a lot card

games, we played Rummy a lot, and Yahtzee. We were outside all the time, riding bikes. Read, I read a lot. My sister and I also played “house” and with Barbies. I specifically remember playing “business” where I would be a banker and she would be a secretary or other roles. When the Capp family lived down the street from us (I’m not sure if you remember any of those kids or not) all of us would get together and basically play house” but in a neighborhood setting, we all had different houses and babies, we would play all day long.

Nancy’s mother commented on Nancy’s personality when she was young and the relationship Nancy has with her sister.

She has always been very independent! She was in Girl Scouts and she went to Girl Scout camp when she was five years old. It was up above Provo at that camp. It was about four days long. Nonetheless, I took her up there, dropped her off. She did not have a problem. She was five years old. I don’t think I could do that with her sister now.... She and her sister were very close even though they are three years apart. They played together very well. She had a good friend, and they played a lot of, she played with dolls. She liked to read, she read a lot. She liked to and still likes to do crafty things. She likes to make things and create things. She did that as the child.... She liked to play sports. She played softball. Both she and her sister, when they got into high school, I begged them to play sports, but each of them wanted to be on the drill team. And dancing yes! (Anything else? [my question]) She likes to hike, and she was always, it is interesting considering the field she ended up in, she was always bringing home rocks!

Nancy spoke fondly of her mother and recalled times growing up when she would bring she and her sister to rock and mineral shows. Her mother also took them fossil hunting on several occasions. Nancy’s mother shared her memory regarding taking Nancy and her sister to the rock and mineral shows:

Every year she would always want to go to the gem and mineral show when it was here. That is interesting because she was so adamant that she would never go into the science fields. And here she ended up as a geologist so I tease her about that.

Having gone through her parents’ divorce, Nancy believed the experience helped solidify her independent nature. However, at the same time, she learned more about her family background and has not completely dealt with her feelings regarding her family

circumstances when she was younger. Nancy made the following comments regarding these experiences:

And then my parents got divorced when I was like 15. Certainly there are things about that event in our family that helped shape me, but I do not think I can express that into words. (Was the divorce, something that you sensed coming on? [my question]) Oh yeah, I could see it coming. I was old enough to understand what was going on. I had already had my first boyfriend and broken up, and so I could certainly see it coming and my mom told me pretty early before they started the divorce proceedings. She told me before she told my sister.

Nancy qualified this further when she added:

It was a lot harder on my sister than it was on me. In that situation too, I tried to make sure she was okay through all of that. So, I think I have always felt somewhat responsible for her and trying to make sure that she was safe and that she was okay. (Do you still have that role with your sister? [my question]) Yes, definitely. She calls me for advice when they're buying a house, or facing something. So, I think there still is that role between the two of us.

At the same time period as her parents' divorce, Nancy realized that the father she knew growing up was not her biological father. Nancy commented:

The father that I grew up with was not my biological father, but I didn't find out about that until I was about 14 or 15. So, that really wasn't a factor until I started high school.

Nancy summed up her feelings regarding her parents' divorce and finding out that her father was not her biological father when she made the following remarks:

I hadn't really put much thought into that until recently I started thinking about it more lately. But I think I was a pretty strong kid. I just didn't think about it too much. You know, it was just life, the way life is. These were the cards that were dealt to me and it's not that unusual. So I don't know that it had a huge impact on me. It wasn't something I remember thinking that my whole world has changed and I don't know what to do. I never tried to find my biological father or to make contact with him.... He made contact with me one summer when I was 18 and I just blew it off. I did not want to deal with it. In some sense, it made me a pretty, sort of all my life experiences, strong-willed person. I grew up being really independent. I took care of my sister and when it came time to find my biological father, I remember thinking, I don't really need him. He wasn't around for 14

years and I did fine, so I didn't need him at that point either. Those kinds of family experiences certainly gave me a sense of security in my independence.

After her parents' divorce, Nancy had conflicting emotions. She remarked:

So when my parents divorced, it was certainly a tumultuous time. We were going back and forth between the parents. It was difficult to figure out where to place my loyalties. I didn't see it then, but I see it now, my parents are so different. So, I wouldn't say it was an identity crisis, but when you have two parents that are so different, doing different things, makes them proud or not proud of you. It was difficult to figure out who I was in between two divorced parents. Again, I think that I came out of all of this being a pretty independent person. I'm definitely closer to my mom than I am my dad. She and I talk on the phone at least three times a week if not more and sometimes it's daily. (Laughing) My dad and I, the relationship there has always been sort of I do not want to say one of convenience, but there is not a lot of effort to develop that relationship. It's kind of what it is.

Regarding the divorce and how this changed the family dynamics, Nancy's mother made the following remarks:

Her dad was not really very active in their lives anyway. So, nothing much really changed for them, except the trauma and all those emotional issues that come with a divorce. In terms of our lifestyle, whenever we went to an activity, a ballgame, going to state drill team, or whatever, it was always just me. When we went on vacations or did some activity it was always me. Their father never went.

Nancy—School and Community Opportunities

For Nancy, most of the opportunities related to school that she recalled as having an impact on her were related to her high school experiences. She shared her experience being the Sterling Scholar in foreign language her senior year.

In terms of just general things that stick out in my mind as being important for my development, one was the Sterling Scholar competition in getting encouragement even though it was not in the science field. It was in foreign language. It was still, I think, the first time I felt that I could, you know go outside of Southeastern Utah and compete with other students.

In addition to her experiences being a Sterling Scholar, Nancy shared her feelings about

the uniqueness of having the opportunity to take the outdoor education course that was taught by me. Nancy remarked, “I think opportunities to take classes like the outdoor education class that you taught was something that happens in a smaller community that would have never happened at a larger school.”

Looking back, in regard to having an influence on her choice to take her first geology course in college, Nancy shared the opportunity she had to take a college level geology course during her senior year in high school. Nancy commented:

Angela Hoffmeister and I went on a field trip with Bart Stone. He took us to some point, and we went out and looked at rocks. I think we went to B. Grandstaff Canyon. I remember that. I remember being outside, and I knew I liked being outside. And so that’s how I ended up taking a geology course in college.

Nancy—Postsecondary/Recent Opportunities

After Nancy decided to change her major to geology while an undergraduate, she began participating in the honors program at her college. As a result, she had opportunities to conduct research as an undergraduate that most individuals do not have until graduate school. Nancy commented, “I was involved in a research project as an undergrad. It was an honors thesis project and I was able to interact and do field work with Ph.D. students and masters’ students from CU Boulder.”

In addition to conducting research, Nancy was able to present her work at a national level convention. Nancy remarked, “And then also with that research project I presented research at a national meeting, a Geological Society of America meeting and that was kind of another opportunity.”

During her work on her Ph.D., Nancy continued to have opportunities that helped

solidify her career path. After having negative interactions with geologists who worked in industry, Nancy decided she would not want to work in that capacity. In contrast, her experiences with research in academia helped her realize she wanted to continue as a research scientist. Nancy commented:

I had a lot of opportunities to work with scientists in national labs as a Ph.D. student. I felt like those were really great opportunities to know what I would really be doing as a research scientist as opposed to going into industry. So that really defined my career. I decided to go into research science, instead of into industry.

Jane—Family Experiences and Opportunities

For Jane, she recalled her parents giving her and her sister a variety of opportunities while growing up. Jane commented:

For play, during early childhood, I remember playing outside, riding our bikes, various sports, later on, rock climbing, of course. I recall other activities like going down the river. Other childhood memories, I remember enjoying doing dress up with my mother's clothes. We would usually put on my mom's clothes and use her makeup and that sort of thing.

Jane's mother added the following comments regarding their family outings as they related to Jane:

We spent a lot of time at Lake Powell. She has always been very physical, physically active. She went boating, water skiing, and slalom skiing at age 6. She also went fishing and camping. These were a lot of outdoor activities that led to her high school activities like river running, rock climbing, and that kind of thing.

Jane recalled the most influential opportunity she had during her childhood was when her mother set up the meeting with Dr. P. Banister, a local veterinarian, when she was around 11 or 12 years old. Jane remarked:

My mother probably set the biggest opportunities for me and that is when I was about 11 or 12. She had met Dr. Banister at a social gathering and then I had the

opportunity to go in and shadow him as a veterinarian and that was probably my biggest opportunity to be exposed to the profession and getting my foot into the workings of the profession.... I also worked with a bear study several years ago with Dr. Banister. I also worked with the raptor Center and that was with Dr. Banister as well. I worked with Joe and Mary Banning's raptor rehabilitation center. Those were additional opportunities.

However, when Jane entered her freshman year in high school, Dr. Banister moved from the community. This was devastating to Jane and she turned to other physical activities to take up her time. Jane's mother made the following remarks about Jane during this time.

Dr. P. Banister moved when she was a freshman in high school and this totally devastated her. He moved to Florida. She actually made two trips back east to visit him and work with him in his clinic back there.... Once he left, she tried to run track. She was good at it. She went to state her freshman year. She didn't really like it and lost interest in running. This is when she started climbing. So almost all the things she did was outdoors.

Jane—School and Community Opportunities

For Jane, other than sharing that her elementary and some of her secondary teachers had more of a positive impact on her future than her college or veterinary school professors, she did not highlight specific courses while in school that influenced her. Instead, she spoke of her inability to read and how she overcame this issue as being most impactful to her while she was young. Jane made the following comments regarding her difficulties with reading.

Probably my biggest discouragement was when I was in elementary school. I always really liked animals and I think at that time, I already had made up my mind, but I could not read. So, I was in special ed. trying to catch up with the other students in class to be able to read. I did not learn to read until I was in fifth grade. I believe, they decided I had a learning disability, probably a mild form of dyslexia, which I was able to overcome....I really got through it working one-on-one in special ed. with my teachers and working with my mom at home. I did not

have trouble with it in college. I am a very slow reader. I do have really good comprehension, but I think it was always a mental thing in the back of my mind, thinking that you know, I couldn't read, but I went forward and didn't have any problems in college. I did very well.

In relation to her difficulties with reading, Jane's mother made the following comment.

She really struggled with school to start with and I finally got her in with a special ed teacher. Again, this was all back when she was in elementary school. She got to feeling because she was taken out of a situation with friends that she was dumb. She had to have help with reading and they took her out for extra reading help. She then missed some math. She then began to struggle with math. She didn't really have a whole lot of great self-confidence until she was in the fourth grade with Mr. Royal.

Jane—Postsecondary/Recent Opportunities

Near the end of veterinary school, Jane had an opportunity to go Africa and work with animals native to that continent. As a way of saying thank you to her mother for all the support and encouragement through the years, especially while Jane was in veterinary school, she took her mother with her to Africa. Jane remarked, "I had the opportunity to go to Africa to do some veterinary work through a course. This course gave me the opportunity to do some work in South Africa with their native animals."

After Jane graduated and began her practice as a veterinarian in Florida, along with developing a mentor relationship with the veterinarian who was a senior member of the practice, she mentioned using an Internet based network as an opportunity to provide better care to her patients. Jane commented:

There is something called VIN, which stands for the veterinary information network which is a paid website I belong to that, one can access information from anything like case studies or posting questions for specialists or other people to answer. This is another form of networking that I utilized on a consistent basis.

Maggie—Family Experiences and Opportunities

For Maggie, her childhood memories were filled with both positive as well as life changing experiences that impacted who she became as an adult (see Appendix D, JuA2). These experiences helped Maggie develop a strong desire to be successful in all that she did both academically and in relation to her family. This drive to succeed began at a young age. Some of Maggie's fondest memories were related to when she and her brother played together. Maggie commented:

I loved to dance when I was young and also as I got older. When I was a child I liked to play soccer, play with dolls, go fishing, and camping. My brother and I were just talking about this the other day, I used to own a ton of Barbies when I was little but I actually remember my brother and I played with G.I. Joe's and we would pretend to blow up the Barbies and they would end up in a thousand pieces (laughing). It seems kind of gruesome, but we really thought it was fun. We spent most of our summers swimming at my grandma's house.

Maggie's father made the following remarks related to his and Maggie's paternal grandparents' involvement with Maggie during her middle school and high school years:

When she was younger, she liked to ride bikes, swim, and play baseball and soccer. (laughing) She liked to dance. She was very involved in dance! She started that at a young age as well. She was probably five or six.... We traveled to all their sports activities together. We would all go together to Maggie's dance competitions. We would go fishing. We all loved to go fishing. We would go out and get wood. We would gather a truckload of wood and take a sack lunch with us and take our .22s and have a shooting competition.

When Maggie and her brother were young, her parents were divorced. Initially, Maggie and her brother lived with their mother. When Maggie was about 11 years old, her father gained sole custody of her and her brother. In regard to how Maggie's parents' divorce affected her outlook on life, especially regarding how she wants to be with her own family, she remarked:

As for my parents being divorced, and how that changed who I am today, it makes a huge difference in how my marriage is and how I live my life. Just because I never want to be in that situation with my husband and my kids like I was with my parents growing up. My mom was never really involved with us when I was young. And after my dad got custody of us, she didn't come back until I was a senior in high school. She still isn't a big part of what we do. This has a lot to do with her addictions.... The biggest thing was, she was an alcoholic. Because of this, my brother and I never wanted this to be a part of who we are because of what it did to her. To think of what kind of person she could've been but she was not because of living with an addiction makes me want to never be like that.

In addition to Maggie's experience dealing with her parents' divorce and her mother's addictions, Maggie also helped care for her father from the time she moved in with him. Her father had dealt with diabetes for the majority of his adult life. Maggie's father believed her experiences dealing with his diabetes was a main reason for Maggie wanting to pursue a nursing career. Maggie's father commented:

I know that one of the main reasons why she got into nursing was because of my health and she watched a lot of the people that took care of me. That is when she learned the respect for that profession and that is why she went into nursing herself. She has turned out to be one excellent nurse! I think that had a big impact on her life at a young age. She has watched a lot of it and since then she's been through a lot of different experiences.

Maggie's drive to succeed academically and being supportive of her family while growing up became an issue when she was in high school. Her overachieving nature was a source of stress that Maggie had to learn how to deal with in order to maintain her ability to function. Maggie's mentor, S. Underwood recognized this stress and helped Maggie to cope during her stressful times. S. Underwood remarked:

She was an over achiever and not in a healthy aspect. She stayed very very busy and involved in school and all activities. She also took care of her father, who was ill. My main focus with her was to help her keep things in balance.... I think a lot of that came from her childhood. Her mother was not perfect, and had a lot of problems. I think she felt she needed to be perfect for her father and for her

grandparents. And this was in all aspects of her life.

Maggie—School and Community Opportunities

Maggie believed during high school, she had opportunities that helped her focus and propel her into an early career as a nurse. She was able to accomplish much academically while in high school. Most notable were being the Sterling Scholar regional winner in science and achieving her Associates degree at the same time she graduated from high school. Maggie made the following remarks related to being involved in the Sterling Scholar competition.

I got to do Sterling Scholar when I was in high school, which I don't think I would probably have been able to do in a bigger school. It would have been much harder challenge to be chosen and because of that I got scholarships for college. Leadership opportunities in a small town are much easier to come by, because there are not as many kids.

Maggie commented further regarding Sterling Scholar when she added:

I feel like that's why I got an academic scholarship from the University of Utah, for being the regional winner in the science Sterling Scholar category. I know they only gave half tuition scholarships at that time, but they gave me a full scholarship for other academic areas.

In regard to achieving her Associates degree at the same time she graduated from high school, Maggie's high school advisor commented:

As a matter of fact, she was one of the students that achieved her Associate degree while she was still in high school. She also was the head of the drill team and just really involved in things. In order to achieve the Associate degree, she had to take summer classes also.

Maggie's father had been proud of her accomplishments as well. He made the following comments regarding his feelings about Maggie's accomplishments.

She has a good life. She deserves it. She's put a lot of hard work in through her

years in high school and college. She was able to accomplish things that people that were 5 or 6 old years older than her were not able to accomplish yet. I respect her for that. She did it in a short order with a lot of hard work.

Maggie—Postsecondary/Recent Opportunities

As Maggie began her college career, her past successes (see Appendix D, JuA5) helped her achieve grants and other scholarships as she moved forward in her pursuit of her nursing degree at the University of Utah. Maggie commented:

I definitely think that grants and scholarships were great opportunities for me. I had an academic scholarship when I started for the first two years I was at the University of Utah. That was for my prerequisites. When I eventually entered into the nursing program, I had to apply for nursing scholarships. I was the President of student council of the College of nursing, so I had a full leadership scholarship at the College of nursing for that position. It paid for tuition. I also had a privately funded scholarship through the College of nursing for women from rural communities pursuing medical careers. It was a cash scholarship that covered the rest of my expenses. I really think that without those things, it would've taken me much longer and it would have been more difficult for me to finish.

While Maggie was in nursing school, she had opportunities to work at the University of Utah Hospital along with practicing nurses. This was an opportunity for Maggie that helped her on her path to becoming a nurse. Maggie remarked:

The other thing is that the nursing school had a lot of really good programs that got students involved with the hospitals and units that they were interested in working at post college. It was called the SPA Program, the acronym stands for: student practical advancement. You could work on a unit at the University Hospital under a nurse and basically take care of their patient's right along with them.

Maggie commented further about this opportunity, "I was interested in the cardiac end of nursing, so I got a job, a paid position, in that unit. I basically shadowed a nurse and learned how to be a nurse in that unit. They had 90% placement after graduation."

After Maggie graduated from nursing school and was hired by the University of

Utah Hospital, she was able to give back to other nursing students. Maggie commented on having student nurses while she was working.

That was part of what they would require. When we were hired they would let us know we would have students. That hospital is a learning facility, so that's what is expected. I loved it because I loved giving back the knowledge to someone else. I always loved it when they learned something completely out of the ordinary, something that comes around in the unit only once a year. We could teach them about a patient with this disease or this problem or this piece of equipment, and they got to see it as a nursing student. Or just simply get to teach them the textbook knowledge at the bedside. I always really enjoyed it, but some did not. I think that was just an expectation working there was that we would do that.

Later, after Maggie's spouse finished his engineering degree, they moved to Wyoming. Maggie began working on her own as a contract nurse dealing with pharmaceuticals. Maggie remarked:

What I do now is I have my own business where I do pharmaceutical contracting with a pharmaceutical company. I go into patients' homes and I teach them how to do injections, like diabetics, people with multiple sclerosis, people who do daily injections. I go and show them how to administer their medications correctly.

For Maggie, being a nurse was compatible with having a young family. Being a newer member of the LDS church, Maggie cited the tenants of her religion as being supportive of her decision to become a nurse as well. Maggie did say that she had already wanted to become a nurse due to her experiences helping her father cope with his diabetes, but her religious beliefs validated her decision. Maggie commented on her views regarding the influence of their religious beliefs.

I definitely think our religion has a lot to do with why I don't work full time as a nurse. When I was looking into what I wanted to do, I looked at nursing. I wanted to do something like nursing that I could do and still be a mom and it wouldn't consume my life. I felt like I could take a break, like I am now and stay with my kids, and it would be okay for me to do that and then go back full-time later on. I feel that it's important for moms to stay home if it is reasonable. I think that

religion plays a role in what I wanted to do for sure.

Susan—Family Experiences and Opportunities

For Susan and her family, being lifelong members of the LDS faith had provided numerous opportunities for guidance regarding many of their life's decisions. Susan's mother related the following regarding the importance of their religious beliefs and the values the teachings of their faith instilled in her, her family, and Susan.

Church taught me family values. It felt so right, and so comfortable. I look at other people and other people's lives and learn from that. I do not have to experience things personally. I could see the difference between a happy family and an unhappy family. I've chosen to develop a happy family, and the influence of God in our lives.... Susan is a good girl. She has held strong to the values that we have taught her when she was younger, to rely on family, and to rely on God for direction in choosing her path.

Furthermore, when Susan shared her reasoning for changing her career path from medicine to law, she cited her relationship with God and the tenants of her faith as being influential and supportive for her decision. Being a lawyer was more compatible with the life style that Susan wanted to have for her future marriage and family. Susan remarked:

I really felt I really couldn't lead the type of life that I wanted if I became a doctor. I would probably immerse myself in it and not wanted children or possibly marriage. I would have probably wanted to get married, but I would not have invested an appropriate amount of time in it. I can just see that it was a lot of time away from home. In my religion women are encouraged to stay home. They are also encouraged to get an education. I just couldn't see being a doctor as being compatible with future plans.... As far as what job I have, this goes back to my religion in believing that was part of a divine intervention, one job led to another which led to another and then led to this one. I firmly believe that God had intended that and leading to this job because I wouldn't have taken this job if I hadn't felt so strong that it was right for me. I got the job I have now because of the job I had before law school. I wasn't going to apply for this job because my first job made me think I was not going to touch bankruptcy with a 10 foot pole. However, I really felt prompted to apply for this job. And, I almost applied too late. I sent out my resume, and they hired me on the spot. I attribute that to how things come from the Holy Spirit. My religion has helped me realize that it gives

me hope too on the bad days that they're not so bad because not every day is good as a lawyer. It relieves a lot of the stress knowing that there is a God that he's always there to help me. I could go on and on about this one but I think this is probably enough.

In addition, Susan was the oldest of her siblings and she was given added responsibility to make sure chores were completed around their ranch as both of her parents worked outside of the home. This experience helped mold Susan's personality into one of being an authority figure and fiercely independent. Susan did not appreciate this role when she was young and this caused resentment towards her parents, especially her mother. Susan commented:

Being the oldest in the family has helped shaped who I am. I had a lot of responsibility, more responsibility at a younger age, at least as compared to my siblings. Both of my parents worked. So from a young age, I was always left home with my brother and sisters as the supervision. In that sense I had to grow up and be responsible for them. We always had chores that we had to do. It was my responsibility to make sure those chores got done. So, I had to be kind of the mean one sometimes in order to get that done. A big portion of the blame was put on me, if the chores did not get done. So I had to manage people at a young age, but I didn't do that so well.

Susan added:

Every summer! If I got in trouble because something did not get cleaned, I hated it because I was the mean horrible big sister that was bossy. Being the one making them do what they were supposed to do was not easy. But I was the one who had to make sure it got done before mom and dad got home. At the time, I hated it!

Susan's mother made the following remark about Susan and having to supervise her siblings while she and her husband worked.

She sometimes had a hard time with her brothers and sisters. She was the energetic stubborn one and, she didn't always see eye to eye with her brother and sisters. If she got something into her head, that's she wanted to do. So like I said we tried to get her through those instead of just turn her loose

However, Susan believed that these early experiences helping manage her siblings while

her parents had to work has been beneficial for her now as she must manage people in her law firm. Susan stated, "I see that in my life now being very important as I have my own assistants and other people that I am over at work. I want to do that nicely. I think growing up with that experience has helped me."

For Susan, not all of her experiences with her siblings were viewed as being a supervisor. She also played with her siblings. Susan commented on her early years with her siblings.

I played with my siblings a lot. We were our own entertainment. Umm, we would go hiking or what we thought was hiking up through the neighborhood. Umm, we would ride bikes and work with the ranch animals here. When I was really little I would ride horses and play a lot in the swimming pool, just Marco polo things like that. We did not do a lot of board games. Of course, me and my sister played a lot of imaginary games we would make up on the spot (laughing) like house where we would just pretend.... We had one game; I can't remember what it was called now. The rules changed every time, but it did involve a ball. Uh, we played Barbie's. I played with my Little Pony too, but I did not have many of those. My Little Pony was the little plastic horses. We had a few Barbie's and baby dolls. Trucks, I liked trucks too. We did normal kid stuff. We did not go to the park a lot. It was more mainly around the house, playing together.

Susan and her family often went to the mountain to gather wood and go fishing near their cabin. Susan commented:

We were always out doing something around the house, doing something with the cows or going to trips to the mountain and gathering wood. It was usually some sort of work when we got to go to the mountain but I never really thought of it as work.

Susan's mother and father commented on their outings to the mountains and the activities they would undertake.

As a family we would go to the mountain a lot. We had animals so, we were always taking care of them. We would go horseback riding, four wheeling when they were three wheelers. When we are at the mountain we would get wood. She also loved to fish. She loved the outdoors and right now, she misses the stars were

she lives in a big city as compared to the mountains.... When she was two or three she wanted to milk the cow like her Daddy. She wasn't afraid of anything and we just needed to open her eyes to what was there.... She liked to go to the mountain and go fishing. We fished together. She would walk from the cabin to the lake by herself to go fishing.

Susan—School and Community Opportunities

In addition to the opportunities and activities Susan was involved in with her family, she cited opportunities related to school and her church affiliation. Even though Susan initially wanted to become a medical doctor, she shared the opportunity to be part of a youth court while in high school. Susan remarked:

In high school I started doing Youth Court. Umm. That was kind of the first, my first interaction with anything legal at all.... The small community helped with that. I was able to really excel in Youth Court especially in a small community where that program was supported. That gave me a lot of experience and a lot of know how.

Susan shared her experience being the Sterling Scholar regional winner in the science category for her high school. Susan commented about the importance of this experience:

In terms of specific events that were a benefit one would be Sterling Scholar. I remember everybody pitching in to help me with Sterling Scholar, especially with my book. During the competition itself, there were many people from my community that came to cheer me on, teachers and people like that.

In regard to her opportunities related to her church activities, Susan remarked, "I think, in church, getting different recognitions from people that were always willing to be there and sacrifice to help me. One was getting the young recognition award."

Susan's mother made the following comment regarding the work Susan did related to their church.

We would do a lot of service projects through our church for other people. She was always a big part of helping organize the service projects that we would have.

She was always just in the middle of things and we felt that was teaching her good values for her energy.

Susan—Postsecondary/Recent Opportunities

Along with the influence of her faith, Susan also realized that the science courses she had to take as a premed student were drudgery for her. She detested courses like organic chemistry and physics. She did not want to go through these courses in order to become a medical doctor. Susan commented:

I don't think it was science itself that was an actual fit. I think it was what I wanted to go into. This might be a cheesy answer, but it did not come easy. To tell you the truth, when I sat down and started doing a lot of physics and p-chem and that kind of stuff, I hated it. There was nothing worse than organic chemistry. I know a lot of people feel that way, but I really didn't enjoy it. I hated physics, I hated, what else did I take? I dropped an advanced biology class because it was just. I hated labs. I thought I would really like them when I got in them, but oh my goodness. I hated labs. I think it was the precision. (Did you say precision? [my question]) Yeah. If you didn't get it exactly perfect, it wasn't correct. I dreaded going to labs. My microbiology lab was just, it was pulling teeth just to go.,, My anatomy classes, I always wanted to study for them. Why should I tear out all of my hair and do all these classes I hate for an end that I would probably want when I could start doing something I liked and do something with my life that I wanted instead of being miserable all the way through school.

Her religious beliefs and dislike of science courses in college solidified Susan's decision to become a lawyer instead of a medical doctor.

In addition, Susan continued to have opportunities after high school that helped define her as an individual and propel her towards a career as a lawyer. After Susan began college and became disenchanted with her science courses, she had an opportunity to work for a lawyer while at home on summer break. Susan remarked:

I just happened to get the opportunity to work for Hanna Long. Her secretary had quit on the spot and someone recommended that I come in for the summer and I found that I loved that work. I kind of got a taste of what she did. It was just a two

person office, so I got to do a lot of under work, the research and things like that. I found I really enjoyed it.

Susan had another opportunity to work for Chapter 13 bankruptcy law firm before law school as well. Susan commented:

Before law school, I worked for a Chapter 13 trustee also. I was doing kind of the opposite of what I do now. I really enjoyed that too, just the little putting things together and the law, analyzing things, thinking about them. I found I was really up to par on that.

Soon after Susan was hired by her law firm, she had another opportunity to be an adjunct professor and teach law. Susan commented on the opportunity to teach.

In early June 2009, I will begin a position as an adjunct professor at Kaplan University. I will do this in addition to my current job and hopefully will be able to impart my knowledge and advice to people hoping to pursue a law degree.

Opportunities—Cross Case Comparison Results

Family Experiences and Opportunities

All four cases had opportunities and experience while growing up that helped shape their character and influence their paths to their eventual careers. Experiences related to family dynamics and relationships were most influential. In two of the cases, other adult mentors were invaluable in their development as well. For one case, the influence of her religious beliefs and training were also cited as being critical to her development and decision making.

When Nancy was young, she had the responsibility to make sure her younger sister finished chores as assigned by their parents as well as getting her home from school and helping her finish homework. Nancy welcomed this opportunity and believed it was

part of being the older sibling. Nancy believed having this early responsibility helped make her more independent and goal oriented. Nancy and her sister would often play board games and cards as well as spend hours outside playing with the neighborhood children.

In addition, Nancy liked to find solace in the desert environments as well as bring home rock specimens. Nancy's early desire to bring home rocks was an interesting premonition for her path to her undergraduate degree in geology. For Nancy, the experience of going through her parents' divorce was the most validating for her independent nature and drive to succeed. Instead of allowing this experience to be defeating, she utilized it as an opportunity to develop her independent nature even more.

In contrast to Nancy, Jane's parents have been married for over 40+ years. Jane's parents have been a role model for her in regard to maintaining a strong, healthy marriage. Furthermore, Jane was the younger sibling in her family so consequently, she did not have to take responsibility for the care and supervision of her sister like Nancy.

However, Jane had two other experiences when she was young that influenced her perseverance and drive to succeed. Her inability to read until fifth grade lowered her self-confidence and belief in her abilities to pursue her passion with helping animals. As a result, in comparison to Nancy, Jane utilized the outdoors for solace as well. Jane became involved in running at a young age as well as water skiing and river running as a means to develop her self-concept. Eventually, with the help of some of her elementary teachers and her mother, Jane was able to overcome her difficulty with reading and this experience helped her develop a never give up attitude. Along with her experience with

reading, she also formed a strong bond with a veterinarian who became a lifelong mentor. For Jane, his influence helped Jane maintain her dream of becoming a veterinarian.

Similar to Nancy, Maggie's parents divorced as well. However, Maggie's parents divorced when she was much younger than Nancy's. Until Maggie was 11 years old, she and her brother lived with their mother. The entire time that Maggie lived with her mother, her mother had issues with addiction to alcohol. The experience dealing with her mother's addiction helped Maggie realize what type of family life she wanted to form in her future.

In addition, Maggie spoke of swimming at their grandparents and her father shared their experiences gathering wood on the mountain, camping, and having shooting competitions. Furthermore, Maggie's father dealt with being a diabetic for the majority of his adult life. Having to help manage her father's diabetes was a strong force for influencing Maggie to pursue a career in nursing.

Similar to Jane, Maggie had a mentor who helped her realize how to balance her active life and maintain her focus on becoming a nurse. Jane's and Maggie's mentors were cited as being invaluable in their development and to their future success in their chosen careers.

In comparison to Jane, Susan's parents had been married for many years as well. For Susan, her parents were role models for maintaining a strong marriage as well as being her models in regard to their LDS faith.

Similar to Nancy, Susan was the oldest in her family. As a result, she was given the responsibility of making sure her younger siblings finished their chores and other

work assigned by their parents. However, unlike Nancy, Susan did not like this role when she was young and it created tension between her and her parents, especially her mother. As an adult, however, Susan believed those experiences have helped her manage individuals at her law firm more efficiently after learning from her mistakes when dealing with her siblings when she was young.

In comparison to the other three cases, being active and participating in activities outdoors was part of Susan's experiences as well. Susan cited going to the mountain and gathering wood, fishing, and working with their animals as being memorable.

The influence of religious training and involvement was influential for Susan throughout her younger years. She cited opportunities to be involved in youth leadership activities in her church that influenced her choices and eventually validated her decision to pursue a law degree instead of becoming a medical doctor. In contrast, the other three cases did not cite a religious influence in their lives when they were young as being significant in their development. Other than the early religious influences, Susan had similar opportunities when she was young as compared to the other three cases.

School and Community Opportunities

All four participants cited opportunities in school that influenced their growth and development. Most notable were the opportunities associated with high school, but for one case, their elementary experience was more influential.

Nancy mentioned being the Sterling Scholar representative from their high school in foreign language was cited as being influential in her development. She believed the Sterling Scholar competition was the first time she felt she could compete academically

with students outside of her community.

In addition, Nancy mentioned the opportunity to take a college level course in geology while in high school. Nancy cited that experience as being influential for her changing her major to geology when she was an undergraduate student.

In contrast to Nancy, even though Jane was the Sterling Scholar representative in science for their high school, she did not cite that experience as having any specific influence for her future success. Instead, the help Jane received from her elementary teachers in regard to learning to read was cited by her as the most influential opportunity prior to college. Even though her experience with reading was cited as a negative, the outcome was positive and instilled in Jane that she could accomplish any goal she focused upon. Jane's tenacious spirit was partially fueled by her experience learning to read.

In comparison to Nancy, Maggie took full advantage of the expanding opportunity to take college courses while in high school as well. She eventually completed her Associates degree at the same time she graduated from high school. Having her Associate degree advanced Maggie more quickly through her initial years of college and allowed for early admittance to the nursing school at the University of Utah.

In additions, Maggie believed that being the winner in the science category for Sterling Scholar helped her garner a partial academic scholarship to the University of Utah. Without being Sterling Scholar, she believed she would not have had the opportunity to receive as many scholarships.

Similar to Nancy and Maggie, Susan mentioned the support she received from

teachers and others that went to the Sterling Scholar competition to cheer her on as important because she realized how many individuals wanted her to succeed. Similar to Maggie, Susan was the regional winner in the science category which she believed helped her maintain her initial desire to become a medical doctor.

Furthermore Susan's opportunity to be involved with a Youth Court at her high school was cited as being her first experience with the judicial system. This experience was, in part, influential in her future decision to become a lawyer. In terms of similarities and differences regarding opportunities during school and in the community, Susan's opportunities were similar to the other cases'.

Postsecondary/Recent Opportunities

In addition to their early opportunities, experiences, and school-related opportunities, all four cases continued to have experiences and opportunities in college and beyond that helped solidify their career paths.

Nancy had the opportunity to be in an honors program and conduct research with graduate students while she was still an undergraduate in geology. In addition, she was able to present her research at a national level geology convention. This experience was cited by Nancy as having been influential in helping her decide to remain in research and pursue a career in academia instead of industry.

Similar to Nancy, while finishing her last year in veterinary school, Jane had the opportunity to go to South Africa and work with native animals of that continent. Jane would not have had this opportunity if she had not have excelled during her time in veterinary school.

Similar to Nancy's and Jane's experiences, Maggie also had the opportunity to work in the University of Utah hospital prior to finishing her nursing degree. This allowed Maggie to gain experience in various areas of nursing and eventually work in the cardiology unit. For Jane and Maggie, these were culminating activities just prior to beginning their careers in their chosen fields. For Nancy, her undergraduate experience was the spring board to graduate school and eventually finishing her Ph.D.

For Susan, she had an opportunity to work for a local lawyer in her home town. This opportunity came prior to her changing career paths from medicine to law. She cited this opportunity as being a major influence when she chose to change career goals. This experience was similar to Nancy's undergraduate experience that helped her decide to go to graduate school and continue on her path to becoming a research scientist instead of working as a geologist in industry. While in law school, Susan had an opportunity to work for a law firm dealing with bankruptcy cases. Susan eventually was hired by a bankruptcy firm, but this time she worked on the client side instead of the prosecution. This experience was similar to Maggie's experience working with different nurses which helped Maggie confirm her initial area of nursing interest. In the end, Susan had similar opportunities during college as compared to the other cases.

Post-modern Feminist Lens—Within Case Results

The lived experiences of the four cases greatly influenced who they became as adults. The culture of growing up in a small rural community and being educated in the same schools throughout their lives affected the opportunities and experiences afforded

them. All four cases were very independent and did not want to be placed into a category of being considered a “stereotypical feminist.” Instead, they took more of a holistic view of what it means to be female. Their views regarding feminism fit well with the postmodern feminist perspective in which their home town culture, social class, home roles, work roles, career persona development, and views of feminism set the stage for who they became as an adult. Therefore, according to postmodern feminism, to place women into a myopic frame is incorrect. These perspectives aligned well with how the four cases of this study lived and developed their current personas in their careers as well as gender roles in relationships. In addition, all four cases felt they had a need to give back to other individuals, especially girls to help them build self-confidence and their personas as they go through life.

Nancy—Small-Town Culture Defined

Nancy believed there were positive as well as negative aspects with growing up in her rural home town. She discussed how having opportunities to take the outdoor education class taught by me as a unique aspect to living in the rural setting. In addition, Nancy remarked:

I was given a lot of freedom to just roam around town and do what I wanted because it was a safe community. When you know everybody it is a pretty safe community. Certainly, small class sizes, and knowing all of your teachers was definitely a good thing.

Being able to take solace in the desert environment was also a positive. For Nancy, being able to easily get away from people and take time in the desert to reflect was a unique opportunity that would not have been available in a suburban or urban setting. However,

there were draw backs to living in the rural setting as well. Nancy made the following comments regarding her difficulty finding a group she could relate to while growing up.

I think some of the negative things there were a lack of opportunities in terms of having people with similar interests or similar goals or at least that's the way I felt. That's what I feel now in that it was sort of hard to find a group of people that were similar to me and my interests and people to hang out with. I just felt like I ended up molding myself to fit as opposed to just finding people that I naturally fit with. I certainly had a real sense that being smart was not cool. So I don't think there was a group like that to hang out with.

Nancy qualified her feelings further when she commented:

When I talk to the people I hang out with now about their experiences growing up, they were members of knowledge bowl teams and had friends that they may still keep in touch with. Many of them went on to college and onto graduate school. They had these kinds of goals and aspirations all the way through school. They had friends that had similar goals and similar interests. So I don't think I could characterize completely a group that I would have liked to have hung around with, but I certainly didn't fit with a lot of the people.

With a Ph.D. in hydrogeo-chemistry, Nancy's focus was on research and continuing on a career path as a full professor. At the time of this research, Nancy had an associate research position at the college where she received her Master's degree. She continues on the career path to becoming a full professor. She occasionally came back to her home town to visit family. Since there were no opportunities in her home town to continue on her chosen career path, Nancy does not plan to move back anytime soon.

Jane—Small-Town Culture Defined

Jane described the environment around her home town as being influential to her upbringing. She often went outdoors for physical outlets such as running, hiking, and rock climbing. Jane made the following comment regarding the environment surrounding her rural community:

I would say that it was probably very influential just based on the person that I am. I am not exactly sure who I would've been growing up in a city, so I think the natural environment was huge. I probably didn't appreciate it, but I certainly do now. I definitely miss it and I want to expose my kids to it like I had. I think a lot of what I am and who I am today has to do with being in a natural environment.

In addition, Jane commented on the size of the community and how everyone knew each other and she viewed this as a positive. The only negative aspect that Jane shared had to deal with the school system as having fewer opportunities due to the financial condition of the district during the time she was in school. Jane remarked:

The pros would be growing up in a small community just for being able to know the town and that sort of thing, knowing more people than we didn't know. I don't think there are a lot of downsides, except for potentially the school district not being in such a great economic condition. When I was in school there were probably things that were not offered that would've been offered in other places.

Jane did have the opportunity to return to her home town and share the environment and community with her spouse and two daughters. She worked for one of her home town veterinarians for a year, but due to financial and personal reasons was not able to stay. Jane and her family moved back east to the practice where she began her career as a veterinarian.

Maggie –Small-Town Culture Defined

For Maggie, there were many positives to growing up in a small rural town. Namely, she liked that the opportunities were more readily available because there was less competition. Maggie commented:

There were a lot of opportunities with what was available, education wise. You didn't have many limitations growing up in a small town as for numbers of people trying to reach to same goal as you. If there was an opportunity and you wanted it, it was usually always available, because there weren't a large number of kids going to do the same thing. On that same note, the class sizes were small and

teachers knew you personally versus larger class sizes that occur in larger schools. It just seemed like I had a personal connection with all my teachers which I didn't experience at my large university classes.

In addition, Maggie remarked:

As a person it helped me come out of my shell. I think it helped me become a better adult because of the opportunities I was able to do growing up in a small town.... The community is more involved with the children as a whole. People are more concerned about what is happening to their communities. People are more concerned about you in a small town. They care about who you are and how your life is going and what your kids are up to.

Maggie also shared the limitations of growing up in a small town when she commented:

In small communities or even, may I say in Utah communities, the rules of women are predetermined. A lot of women do not go to college. They stay home with their children and that's a lot of times what a lot of girls feel is their goal. And it's not necessarily to do something outside of their family or something educational or something in science. They all feel like they have a predetermined goal in life where you can still have that role, and still do something in science. In a town like where I was raised or here where I live or in other small towns I feel that things are black and white. You are either going to go to college or you're not. You're going to go into science or you're not. I think one thing that you can encourage girls is that you can do both. If you want to be a mom and stay-at-home, I think you make a better mom, if you go to college.

Maggie also believed that, even though there were opportunities in a small town, they were limited as compared to the opportunities in a more urban setting. This was especially true for the rigor of the courses offered in the schools.

Due to Maggie's spouse's career, they moved on a consistent basis. They move to better positions within his company. At the time of this research, they had no plans to move back to her home town.

Susan—Small-Town Culture Defined

For Susan, growing up in a small rural community in southeastern Utah had its

benefits as well as drawbacks. In regard to the benefits, Susan made the following comments, “We would go hiking or what we thought was hiking up through the neighborhood. Umm, we would ride bikes and work with our farm animals. When I was really little I would ride horses.” Susan discussed further regarding working with their farm animals. She commented, “From the time I was really little, I can remember we would butcher cows and if I was interested in what the organs were, people would let me know, or tell or tell me what they did.”

In general, Susan believed another benefit of growing up in a small community was the overall support she felt from all who were involved with her as she grew up.

Susan remarked:

There was a lot of support. It seemed like everybody was pulling for me in some way or another. The things that I wanted to go for, I could. People saw the potential in me, if that doesn't sound conceited. People were there for me with every endeavor that I tried.

In terms of the drawbacks of growing up in a small community, Susan made the following comments:

I believe the cons were limited opportunities. There wasn't quite as much to go for. I thought I was pretty hot stuff, but in a small pool. The fish in a small pond syndrome. I found that out later. I realized that later. There were definitely limited opportunities. I think there might have been other scholarship opportunities out there.

Susan added:

There are programs not offered here that are in larger schools, a wider range of AP courses and classes that I could have taken in a larger school. Opportunities like quiz bowls as smaller schools typically do not have, just programs that are not offered in a smaller community or school.

After graduating from law school, Susan was hired by a law firm specializing in

bankruptcy cases from the individual client/debtor side rather than creditor side. There was limited opportunities in her home town, for this specialization. At the time of this research, Susan no longer lives near her home town and returns, on occasion, to visit her parents and other family members.

Nancy—Social Class Defined

Both of Nancy's parents worked while she was growing up. Nancy's father was in law enforcement and her mother worked for the Children's Justice Center in Nancy's home town. Neither of her parents had much formal education beyond high school. Nancy commented, "Growing up in the family that I grew up in, my mom and dad both worked most of the time two jobs." In regard to continuing her education beyond high school, Nancy's mother made the following remark:

There was never, in my house, a question as to whether she would go to college or not! We spoke of it as if it would be a normal progression of her education, like going from kindergarten to first grade. It was never discussed that you might go to college or you might not. It was just that you will go to college.

When Nancy was young she mentioned playing house with her sister and neighborhood children. Nancy would often play the role of the banker. When asked why she always chose this role, she remarked:

Well, I guess I viewed it as a pretty powerful job, one in which it is viewed as being successful. I viewed it in my mind, as someone that is successful. I think that is part of growing up in the small community. You could definitely see successful people, and I sort of aspired to that. You know, to that role. I was always wanted to be the boss, I guess. That was a pretty well-defined job in my mind. That person was the boss over a number of people.

Jane—Social Class Defined

Both of Jane's parents had a college education and pushed Jane to pursue a college degree as well. Jane's paternal grandfather was a prominent physician from Southern California and her maternal grandfather was a manager of a plantation in Hawaii. Jane described her parents:

Well, my mother was in teaching. She was a schoolteacher, and my father being a sheriff. My sister and I, growing up, we had a lot of opportunities to do things outdoors and they had a lot of things for us to stay busy with.

Jane's parents had always been supportive of all that she had done and continues to do with her life. This was especially true when it came to her educational pursuits. Without the constant support and encouragement from her parents, Jane would have had a much more difficult time achieving her career goal of becoming a veterinarian.

Maggie—Social Class Defined

Maggie, along with her brother, was the first in their immediate family to go to college. Neither of her parents had a formal education beyond high school. When asked about her father's desire for Maggie to go to college, Maggie commented, "When I chose a college, he encouraged it and was just excited I wanted to go to college. Any parent, I think should be excited that a child wants to go to college and do something." Maggie shared more about her families' situation when she shared her feelings about her paternal grandparents. Maggie remarked:

We did have an interesting dynamic when we lived with my dad. We had my grandparents near us and they were very involved. They helped out financially a lot with my dad. They did a lot of things. They supported my brother and me financially for a lot of academic things and other activities. We would not have been able to do a lot of those activities without their financial support

When asked to share information about his life, Maggie's father made the following remarks:

I have lived in Southeastern Utah for 42 years. I went through the whole school system here. I've been employed by the County for 19 years as the shop foreman and Fleet manager.

Susan—Social Class Defined

Susan was the first in her immediate family to go to college. Both her mother and father stopped their formal education after graduating from high school. Susan's mother commented on her background.

As for myself I was born and raised in Southeastern Utah. I'm a small-town girl. I got married right out of high school and started a family. Like I said, Susan is my oldest.... I love being home and being part of the family and the community family that I am in touch with. The only regret I have is that I didn't go on and get a college education, the experience of a college background. I couldn't do that and have my family.

Susan's father shared information regarding his background and belief in education. He commented, "I was born and raised right here. I've been involved in ranching all my life and I run heavy equipment for the National Park Service." When I asked Susan's father why he pushed Susan to get more education beyond high school, he responded, "Not having one! "When I asked him if he regretted not having more education, he responded, " Definitely!" " I regret it, but I am one that probably would not have gone to college. But I regret not having an education. I regret not having more book learning." When asked why he believed having more education was important, he responded, "Well, better job, better pay. You do not have to do manual labor as much. You can pick and choose a little more. I have to take whatever I can do. If you have an

education, you can have a little better job field.”

Susan did not mention her background when she shared her experiences when she first entered college. However, when she began law school, she became acutely aware of where she came from and felt out of place with the average student. Susan made the following comments.

There are those students whose parents went before the Supreme Court and so I thought these students had been immersed in this their whole life. And here I am just a little country bumpkin, first-generation doing this. I had no idea what was going on. I at least had some idea from my college experience what to expect. Other than that, I had no clue. Both of my parents just have high school diplomas, so they had no idea. They knew that it was hard but I don't think they ever understood the intensity of it.... For most of our classes the students were probably within a five-year age range. I think first, it made me freaked out. But I think it made me work a little bit harder, because it wasn't easy for me. I think I had something to prove. (Did you have any other classmates in law school that had a similar upbringing or background as you? [my question]) Yes there were a few and probably more than I thought, especially first-year. But I got connected with all those students from the professional families.

Nancy—Home Roles Defined

Prior to accepting the associate research position at the college where Nancy received her Master's degree, she worked for the University of Wyoming. However, she and her spouse lived in the Denver area. Nancy described her typical day when she worked for the University of Wyoming.

I spend two days a week in Laramie in the office and then I spend the rest of my days at home. So my typical day is very intermixed. I get up and check e-mail in my pajamas. Then, I kind of split my home duties with my work duties throughout the day. When I need a break from writing or something, I get up and take care of something around the house.

For Nancy and her spouse, they shared home related duties. According to Nancy's spouse, he did not see a division of roles at all. They shared equally in domestic duties.

However, he indicated that Nancy did not have the same tolerance level for laundry piling up, so she did the laundry more often. He liked to work on cars and maintains them as Nancy did not like to work on vehicles. Nancy's spouse viewed the running of their household as a team effort.

Jane—Home Roles Defined

For Jane and her spouse, there was a sharing of household responsibilities. When Jane was first beginning her practice, Jane's spouse considered himself to be a soccer dad. He would leave for work early in the morning and return in time for Jane to leave. He took care of their daughters so Jane could focus on her practice. Jane cited her spouse's support as being critical to her development as a beginning veterinarian. In terms of how they separated their household duties, Jane remarked:

Yeah, I clean my house on the weekends like today, where I'll do you know, clean my floors. I rented a steam cleaner today to clean my oldest daughter's carpet and our tile. I'll do the laundry and that sort of stuff on the weekends. And I will try to make meals the days I am not working. My spouse will usually cook dinner for me on the days that I am working because I get home late.

Jane's spouse made the following comment regarding his role with household duties:

I do a lot of different maintenance things around the house. I take care of the yard so I do a lot of maintenance around the yard, mowing, sprinkler system, and garbage hauling. I clean the kitchen, and I do a lot of cooking. If I put a number on that I would probably say 60 or 70% on the cooking. I also do some of the laundry and upkeep of the house like cleaning after the girls. I try to do my best (laughing).

For Jane and her spouse, the sharing of household duties along with her spouse's main duty of caring for their daughters allowed Jane to develop her veterinary practice and at the same time maintain a focus on their daughters. They did not utilize day care because

they wanted their daughters to be raised with their values and not a care provider's.

Maggie—Home Roles Defined

Maggie's household duties changed during the first couple of years she was married. She and her spouse began their family soon after they were married. In the beginning, Maggie was the main source of income as she had the full time job and her spouse was still completing his engineering degree. Her spouse worked part time and went to school full time. Trying to care for their first child became very difficult for Maggie because she worked night shifts. In response, her spouse began to take their daughter to school with him so Maggie could rest for her evening shift at the hospital. After Maggie's spouse graduated with his engineering degree, he accepted a position with an oil company and they moved to Wyoming. Their roles reversed and Maggie started nursing part time and her spouse worked full time. Maggie described her typical day after moving to Wyoming.

I mostly stay at home with my kids. The way I work my business, my pharmaceutical company, is they send me an e-mail every day of new patients, updated patients, and patients with a change in status. I do that every morning. I get on to check to see if I have emails and then I go into my patient system that is on the Internet. I do it all paperless so I don't have to worry about any medical records. I put all the information in on my system on the Internet.

Maggie described further how she structured her day with her children and how she felt about working part time:

We have a pretty set schedule at home to keep the kids on a routine. We get up in the morning and I check all my patient logs, we eat breakfast, we take a bath in the morning, and then we always read for at least a half an hour. After we are done, we do something constructive, blocks, play dough, puzzles, something skill building.... I wouldn't give it up to work every day. I think it's great! I love it with my kids. I never thought I would stay home with my kids. I never

anticipated, I guess I never thought much about it when I was going through college if I would stay home with my kids or not. I always anticipated that I would be working full-time in whatever manner. I did work full time 40 hours a week until my oldest was about a year and a half old and my husband was done with school. We were in a better situation. We came to the point where we said, there is no reason for both of us to work. Let's try it and see how it works. I loved it. And I still do.

For Maggie's spouse, he viewed his role as a support at home. He remarked:

When I get home, I feel like one of my bigger responsibilities is to get the kids away from her. Many times they have driven her nuts by then. I try to get them away and play with them, get them out of her hair. She finishes dinner I help her set the table. After dinner, I generally get the kids ready for bed and put them to bed. I help them brush their teeth and put them in bed.

For Maggie and her spouse, they shared household duties and view it as a team effort. This was more difficult for her spouse in the beginning because he grew up in a family where traditional gender roles were the norm. He quickly realized that Maggie was raised differently in her single-parent household and began to work as a team. Maggie's spouse now feels this is the best way to be as a family.

Susan—Home Roles Defined

Susan, prior to being married, had some difficulty with completing work and home responsibilities by herself. Susan made the following comments:

Now, when I get home it will be dark, so it will be hard to do anything. It will then be time to go to bed. So, finding that balance has been a little bit difficult. I know it is out there. I know, some days I think I will get it, but definitely not every day. I do find it easy though to separate personal life from work. Umm. If I'm at work I am ok with not worrying about things at home and I try not to take work home or think about it or obsess about it.

After getting married, Susan's spouse began to help around the house, so it made it easier for Susan to come home and relax. While he was young, Susan's spouse

observed his father helping out with all aspects of household duties, especially cooking and cleaning. His mother went back to school to become a nurse when he was young, so his father helped out. This was the way Susan's spouse wants to be as well. For Susan and her spouse, there was an equal sharing of household duties.

Nancy—Work Roles Defined

For Nancy, collaboration was a key element for her to conduct research. Even though she was in a field dominated by males, she believed that gender does not matter. However, she indicated that working in industry would have its challenges regarding female and male roles. Nancy made the following comments regarding gender and her role as a scientist.

I think there is a certain amount of, I don't know if I want to call it ego or confidence that comes along in order to become a scientist. You have to be comfortable enough with yourself to know that your intelligent enough to answer a question. Just to be able to think in a scientific manner, and think intelligently about a subject and not have the right answer is a skill that has to be developed and then you also have to develop a comfort level with that, as opposed to always feeling that you have to have the right answer. I have certainly met both men and women who always have to have the right answer.... I certainly know women that are both very collaborative, but also focused in on a single set of problems. I wouldn't say that of all the women I know, they are trained in one way or the other. I see that in the men that I know as well. At least at first pass thinking of the people that I know, I don't think that there is a difference between men and women.

However, Nancy believed that there was more friction between men and women who work in industry. She indicated that male geologists working in industry tend to be surprised when they meet a female who was competent in the field. Nancy does not see this kind of relationship as often working with Ph.D. scientists conducting research in academia.

Jane—Work Roles Defined

In regard to being a veterinarian and also a woman, Jane shared her views about developing a career in veterinary medicine. Jane commented:

I think maintaining a profession can sometimes be difficult, especially for the women that are working at having families. In some cases it's hard to have a family, and also have a professional life. It's really not affecting me that way, but there are times I feel torn between my work and my family. I would say, I think there are many women, who have been in my field dropped out of the field while they had young children and that sort of thing.

In addition, Jane commented on the status of women in science and specifically in veterinary medicine today as compared to when she was young and first interested in becoming a veterinarian. Jane remarked:

Does gender matter? I don't think it matters. I definitely think there is a gender gap in that I think gender matters when it comes to salaries and that sort of thing. But I don't think if someone is a good scientist or not has anything to do with gender. I would say there are certainly differences for sure. As far as gender? I would say no because the gender gap has changed significantly in the last 20 years. When I was a kid I remember looking at statistics 90% in the field were men and 10% were women. I think there was a huge gender gap at that time. Now they're really many more women in the field of veterinary medicine so now there really isn't anything gender related.

However, when Jane's mentor, Dr. P. Banister was asked about the state of veterinary medicine, he had his own idea for the change in the ratio of female to male veterinarians. He believed that the focus of veterinary medicine had changed from mainly dealing with large farm animals to dealing with small animals and exotics such as reptiles and other species. He believed that this change in focus had drawn more women to the profession. Along with this change, the salaries of veterinarians have not kept pace with other professional doctors. The lower pay had been a detractor for men to continue working towards veterinary degrees.

Maggie—Work Roles Defined

For Maggie, working as a nurse was something that she wanted to do since she was young. Helping care for her father as he dealt with his diabetes was one of the main reasons for her desire to become a nurse. Since nursing is still a female dominated profession, the role of a nurse had been defined for years, but times are beginning to change. Maggie talked about the relationships between the nurses and doctors. She commented:

Because our staff size was small, we were able to earn a lot of trust from them. They gave us a lot of freedom as a nurse. They gave us a lot more choice. They wouldn't dictate everything that we did with the patients. They gave us a lot of freedom to make nursing appropriate changes that we felt were needed.

In addition, Maggie believed more males had begun to enter nursing due to the movement within nursing to other specialty areas with higher pay. For example, moving to nurse anesthesiologists had drawn more male nurses than female, according to Maggie. Maggie also believed there had been more of a push to attract males to nursing as compared to attracting females to other science-related fields such as engineering. Maggie remarked:

The only disadvantage I ever saw or remember bothering me was there was so much push to get more men in nursing. There was a big push to portray nursing as not a female dominated career because men have a difficult time becoming a nurse. There were a lot of extra scholarship opportunities for minorities and in nursing these were for men. I think that there was so much push to get men into nursing because there was a low number of men and really no problem with the number of women. I never remember my husband, who is a chemical engineer, coming home and saying, man there is this big push to get women into chemical engineering. It doesn't seem like there is a push for females to be in other places like there was for men in nursing.... I think part of it is because physicians' assistants, nurse practitioners, and nurse anesthesiologists are becoming such good career paths in medicine. They are high paying and in high demand. Many more physicians are using them. I think what nursing was trying to do was take

those men looking to make large salaries in other fields come to nursing. Nursing pays well, but not as well as say chemical engineering like my husband does. This is where I saw they're trying to pull men into the nursing field by enticing them by those higher-paying positions. People see where a nurse on the floor makes \$25 an hour and you don't see the other nursing positions that make better money as compared to a bachelor degree nurse. I know for a fact that when I was working as a nurse more men went to graduate school than women. More men left the ICU to pursue higher education than women did. I don't think there was a preference, but I don't know though. I never looked into graduate statistics to see how many more men were in the courses as compared to women. I cannot think of one man that I worked with, that was not moving on. They were just using their bachelor's degree as a steppingstone for something more. But mostly, the women were planning on staying there and they were not planning on going anywhere.

Maggie planned to maintain her nursing license and, when her children were older, go back full time. She believed that nursing was a compatible profession with raising a family because she could continue to work part time and maintain her license and at the same time be actively involved in raising her children. Maggie does plan to further her education and become a nurse practitioner or nurse midwife in the future.

Susan—Work Roles Defined

For Susan, being a lawyer had its times when traditional male and female roles have surfaced. Susan remarked:

Sometimes, there is definitely a good old boys club. I think myself and a couple other women that do the type of law that I do are sometimes ostracized and treated differently because we are female. There are definitely attorneys out there that treat me much differently at work than the other guys in the office.

Susan further qualified these times when she commented:

Actually, just the other day, someone called and needed some information regarding something in and we were discussing the terms, he was really ignoring me. We were deciding what we're going to do, either go to court or have a hearing. And after quite a bit of back and forth, he said, I don't want to do it this way. I will just beat you in court. I wasn't exactly happy with it, but we just came to an agreement. I decided to consult with some other attorneys in my office.

They said for them, and he was always accommodating, he would do whatever I ask you, but I think just because I was young, or a woman or a combination of both he thought. I can take advantage of this one.

Susan will be assertive when she felt that was the way she needed to operate in order to get her point across or get the best result for her client. She will take the issue before a judge in order to get a fair proceeding in place. Susan made the following remarks:

I do not hesitate to take something before the judge if I feel that I'm getting a raw deal, because somebody thinks that they can bully me. I may not get the best deal, but that's what it takes sometimes. It might be a compromise, but if someone does something outrageous, that is kind of a protection. If they do not want to compromise at all I will take them before the judge. In this instance, the judge kind of slapped his hand and said to work with her. After that we are able to come to a compromise, but it wasn't until we went to someone with a higher authority. I don't know if that was because I was a woman or if he was just not a good lawyer. I don't see the gender differences between the trustees or the judges. So, that helps.

Nancy—Career Persona Defined

For Nancy, there were many aspects to developing a scientist persona. To begin, she believed that even though there was no differences between men and women in regard to their ability to become a scientist, women had a more difficult road to developing their careers, especially if they were beginning a family at the same time.

Nancy remarked:

I think that comes when you have a female that wants to be successful and also have a family, to have children and to raise children. It's a biological fact that you have to carry a child and then you have that child, there is some amount of time where you're unavailable for travel, you're exhausted for nine months while you're pregnant and nine months is quite a long time when you're trying to get tenure, or trying to have a successful post-doc that lasts for two years.

In addition, Nancy added:

There are certainly things, I do not want to call it a disadvantage to getting ahead

in a career, but I think it's a difference when it comes to career development between men and women in my field. This is mostly because my work requires a lot of travel to go to meetings, and I go to national labs to collaborate with people, and if there are nine months that you don't want to travel, that puts you at somewhat of a disadvantage when you're competing directly with a male scientist that is not in that situation.

The ability to develop a scientist persona for Nancy involved specifics related to the type of research she does. Nancy made the following comments about her research as compared to other scientists.

I am happier working on problems that have some sort of applied aspect to them as well. To be in my field to work solely by yourself means that you're focused in on a very narrow aspect of some problem and what you do is not going to be directly applicable. So, I seek out collaborators that are doing interesting work, and I'm interested in, and those that do numerical models. I will never be someone who will just sit down and write code, but I see the value and I use people's codes in my research. So, I have to collaborate with them.

In addition, Nancy added:

I actually try to incorporate in my research all these things. I'm not detail oriented enough to just be an experimentalist. I'm also not somebody who can solely rely on a calculation to give me an answer. I always want to take that number, and then try to find a physical situation that describes that number. That's probably why I like to look for collaborators, because I really don't fall into any of those camps, but I guess if I had to put myself in one of three, I would place myself in the field systems. I take what experimentalists do and numerical modelers do and apply that to a field system. There is an aspect of qualitative research in what I do and geologists are inherently more qualitative because you can't get a quantitative look. It's hard to define all of your parameters quantitatively in a field system. That would be just too difficult to do.

Nancy summed up her development as a research scientist when she said:

I think I'm still developing an identity of a scientist, so I think that's an ongoing process for me. I don't think there was any point where I said I'm going to be a scientist. However, after a certain period, the goal that I met, I finally felt like a scientist.

At the time of this research, Nancy and her spouse had not started their family.

However, at some point, she and her spouse want to have children. For now, Nancy continued to focus on her development as a scientist and her path to becoming a full professor.

In addition, while completing her Ph.D. and beginning her work as a research scientist in academia, Nancy had the opportunity to become part of and work with the Women in Science and Engineering program (WISE). With this program, Nancy had the opportunity to give back and help other girls and women strive to achieve their goals related to science. Nancy made the following comment regarding WISE:

I participate in women in science and engineering, the WISE program. I do their summer camps by teaching workshops for them. I volunteered as a mentor in the past. In terms of increasing participation of women in science and engineering, I value that because I still think there is a need for encouragement for girls to participate in science and engineering. Even if they choose not to have it as a profession just so they know they're capable and also as a self-esteem booster and self-confidence building exercise.

Nancy further qualified her participation in WISE when she said the following regarding the need to improve confidence in girls and in boys as well.

I just try to tell girls, if they're interested then they should pursue it and that it's a learning process all the way through. I don't know if I give really specific information. When I participate in some of these other things, I try to build confidence. I think confidence is a problem for a lot of teenage girls, teenage boys for that matter too. I try to be really encouraging and be positive and tell them they're doing great things. And they're capable of doing whatever it is that they want to do. I try to encourage them that if they want to do something to go for it and not really question if they're capable or not. Because, I believe they are capable. I think it is a confidence issue when somebody thinks they're not capable before they even attempt something.

After Nancy completed her Ph.D. and continued her work in academia, she had begun to move through her initial career stages. At the time of this research, she accepted a research associate position at the school in Colorado where she received her Master's

degree. Nancy was on the path to becoming a full professor at that institution.

Jane—Career Persona Defined

Jane had made a childhood dream become a reality. For as long as she could remember, she had wanted to work with animals and become a veterinarian. Jane's mother shared some photos (see Appendix D, JaA1) of Jane when she was young and the following story regarding Jane's love of animals.

In one of the pictures she is about two years old with a Great Pyrenees puppy. The other one, she is about six years old, with a big Siamese tomcat that she hauled around. She was always picking up animals. When she was in the sixth grade, she ended up actually having to stand in a corner with her nose to the wall because she brought six baby squirrels into this one teacher's room. She had to feed them every hour and that was her punishment. She never complained about what her punishment was. She would do anything anyway. She was always pushing the envelope. She knew what the rules were.

Jane shared her thoughts about practicing veterinary medicine and why it was important to whom she had become as an adult. Jane remarked:

Sometimes emotions play into that. All in all it's a very good profession. I think it's an honorable profession. People respect the fact that I'm working with animals, and it's a compassionate profession to be in.

In addition, Jane added:

When you're doing something for money as far as a livelihood and it's nice if you can do something honorable, and it is motivating and helpful. There are lots of people who are working at a profession where they may not love what they do, or feel good about what they do, but they're still bringing home a good paycheck. In my case, I feel lucky because I like what I do. I feel like people respect me and that sort of thing so I think it's a little bit of all of those why I chose this profession.

Jane planned to always practice veterinary medicine, but may possibly cut back on her hours in the future to spend more time with her family.

In addition, as Jane continued working as a veterinarian, she had the opportunity to give back to young people and share her experiences while growing up and how she became a veterinarian. Jane believed this was a way to give back as she was mentored in a similar manner by Dr. P. Banister. Jane made the following comments regarding her opportunities to mentor other young people and possibly help them begin building their personas:

I love to encourage girls and boys as well to go after their dreams. If I have the opportunity when I hear of a kid and they want to come in and learn more about what I do, I try to encourage them to come in. I have a 12-year-old coming in on Mondays to shadow me. So I try to encourage them to work hard in school and take opportunities to broaden their horizons, if this is what they want to do. Specifically in veterinary medicine most of my opportunities to mentor are with young girls.

Maggie—Career Persona Defined

For Maggie, being a nurse was very compatible with raising a family. Even though she chose to become a nurse before she was married and had children, she saw the benefit of being a nurse. Maggie commented, “It’s been really great. It’s been really great for my kids and I love it. I love being a nurse and a mom. It’s been great for our family.” Maggie qualified her belief about the compatibility of nursing with being a mother when she stated:

I looked at nursing. I wanted to do something like nursing that I could do and still be a mom and it wouldn’t consume my life. I felt like I could take a break, like I am now and stay with my kids, and it would be okay for me to do that and then go back full-time later on. I feel that it’s important for moms to stay home if it is reasonable.

In addition, whenever Maggie had the opportunity to talk to girls about what they wanted to do after they get older, Maggie was quick to share about being a nurse. Maggie

commented:

Whenever I have a girl ask me or if I hear a girl say, “I’m not sure what I’m going to do with myself when I grow up” like a high school girl or someone in college.” 100% of the time I say, “Have you ever looked into being a nurse? Because it’s great I love it.” The advice I give them is to look at, what kind of lifestyle it can give you, in a sense of the day to day hours that you work and the commitment you have to give to it and I always offer up my opinion if they want on what’s great about nursing and about science.

Susan—Career Persona Defined

Until she finished her first year of college, Susan always wanted to be a medical doctor. When she described her idea of who a scientist was, she made the following comments:

I wanted to be one for so long and the scientists that are closest to me are female. A friend of mine who does research on drugs for cancer is a female. So, when I think of scientists they are all female.

In regard to her persona development as a lawyer, Susan believed that women make better lawyers than men. Susan made the following remarks about women lawyers:

My personal opinion is I think women are better at it. I think women have a natural inclination to be good at negotiation, but also working towards an end rather than being just cutthroat. I think they are better with clients, a lot of the time as compared to men. I think women just have a natural inclination to do this type of work.

Susan felt comfortable being a lawyer and believed this profession fit better with her life plan. She planned to continue practicing law even after she and her spouse start their family. She may cut back on her hours and possibly work from home, but she believed that practicing law helped complete who she was as an individual.

When asked to discuss when Susan had the opportunity to share what it was she liked about being a lawyer, Susan commented:

There have been people who have asked me about law, such as teenagers. I think this happened after my first year of law school, and I think at that point my brain was all mush. At that point, I probably would've discouraged them, but I have never had any huge opportunities to tell anybody. (Do you have any words in general, or is pretty much the same as what you told me? [my question]) About the same, law is a great profession. I am very happy doing it and I'm lucky, where I work. It's a goal worth pursuing.

Nancy—Feminism Defined

For Nancy, she used the personalities of several of her female friends to define feminism. According to Nancy, to be a feminist was to have the best interests of women as the standard. Anyone who was a feminist would want women to be successful.

However, Nancy would like terms like feminist to no longer be necessary. According to Nancy, this would be true if there would be true equality among women and men in the future. Nancy made the following comments regarding being a feminist.

I see all of my friends, all of my female friends who I view as being strong women. I know there's the classic image of bra burning and that kind of stuff. You know, the crazy. (Laughing), outraged women, but if somebody asked me what a feminist is I would collectively take the personality aspects of all the women I know who are strong, capable women and put them together. I would then make one person out of that image. (So, do you see yourself as a feminist? [my question]) Yes, I think so. However, I don't think you have to be a female either. A feminist is just someone who wants to see women succeed in what they do and my spouse and I just had a conversation about this. Since I participate in women in science and engineering, we were sort of discussing the merits of programs like that and whether in some respects are bringing attention to a gender bias that we're trying to get rid of. So, if you don't think you need women in science and engineering. Then why do you still do it. If you're striving for a community where everybody is equal, and then you wouldn't need that kind of a program. But we still have that kind of program. It's hard to erase that bias in people's minds I think that the word feminist is kind of like the women in science and engineering, the word feminist should be phased out, eventually. Hopefully we will get to a society where there is no difference between anybody and their desire for women to succeed or their view of whether women are capable of succeeding or not. The word feminist to me, I hope that it gets phased out, eventually. We will not have to call someone a feminist. If someone is not a

feminist, are they opposed to seeing women succeed? So I kind of view it as a negative. Everybody to me is a feminist, unless you're opposed to having women succeed and then you wouldn't be called a feminist.

For Nancy's spouse, he believed women who were strong and independent, who strived for equality in whatever they did, would be considered feminists. He described his mother as a feminist as she went back to school when he was young to become a lawyer. This was during a time when women did not go back to school very often while raising a family. He also said that his mother continued to be there for their family as well. He indicated that he believed the stereotypical definition of a feminist as the radical extremist was not a good definition. He believed that Nancy was a feminist similar to his mother. He also described himself as a feminist according to his definition.

When discussing feminism with Nancy's mother, she indicated that she thought about her grandmother and others of that era who fought for equal rights for women in regard to the suffrage movement. Nancy's mother indicated that she had always believed that men and women were equal and instilled this in her daughters. However, she does not consider herself a feminist, but acknowledges those who set the stage for equality in the past.

Jane—Feminism Defined

For Jane, the term feminist brought up a specific image. In regard to feminism, Jane stated:

What image do I see when I think of a feminist? It's usually an angry white female.(Laughing) (Do you see yourself as a feminist? [my question]) No, I really don't. I guess I support women in the workplace and in their field. I wouldn't say that I would consider myself a feminist.

When discussing feminism with Jane's mother, she always believed she had equal rights. She never saw issues with her work or working for her boss as being a gender issue. In addition, she always felt a sense of independence because her spouse, being in law enforcement often worked shifts and she was home alone raising her children. She believed that women needed to be independent, especially financially. She instilled this value in her children. Like Jane, she did not consider herself to be a feminist.

In addition, when discussing feminism with Jane's spouse, he shared how philosophically the more radical feminists were the individuals who received most of the media attention. His definition of feminism was more holistic and focused on independence and working on equal terms with men. He did not think Jane was a feminist. Instead, he viewed her as fiercely independent and driven, much like he described himself.

Maggie—Feminism Defined

Maggie described a feminist as a woman who was the stereotypical radical feminist. Maggie made the following comments regarding feminism:

(Laughing) I see those groups of women rioting about outrageous women's rights that don't make any sense. For some reason, and I don't know why they see the world revolving around women instead of seeing the world revolving around men and women as a whole. (Do you see yourself as a feminist in any way? [my question]) No!

When Maggie's father was asked about feminism, he believed it was more of a political term that described any individual, female or male, who felt they were somewhat better than anyone else and that their views were correct. He did not view Maggie as a feminist.

Maggie's spouse believed that feminists were females who felt that all men were jerks and they would do whatever it took to get their way in any given situation. They were overbearing and rude. In regard to Maggie being a feminist, her spouse believed only in the area of her drive to succeed would he consider her to be a feminist. He said that he believed she was 1/5 a feminist.

For Maggie's mentor, Sarah Underwood, she viewed a feminist as being a well-educated, sophisticated, almost overbearing, and narrow-minded woman. She too did not feel Maggie was a feminist.

Susan—Feminism Defined

Susan had taken a more holistic view of feminism and defined it in the following manner.

When I think of the word feminist, I think of the bra burning, chanting hippie, but at the same time I think of myself as a feminist. I think over the years I have learned to define it as anybody who is standing up for the rights of any woman, whether they're doing it in a radical way, or standing up for the rights for a woman to stay in their home and raise their children and not being ridiculed for being a stay-at-home mom. (That's the next question. Do you see yourself as a feminist? [my question]) Yes, I do. I see myself as a nontraditional female, who would encourage any female to do what she wants which she feels is her direction. And not be plowed by stereotypes or doing what she is told she is supposed to do. I don't think there is such a thing as a woman supposed to do something. I believe it is different for each woman and her path is hers to choose. And she shouldn't be told that her place is anywhere. It is her place to decide.

When discussing the definition of feminism with Susan's spouse, he defined feminism as being mainly women who did not want men to do anything for them. These women were very independent to the point of them taking offense if a man opened a door for them or compliments them on their attire. These women were radical. When asked if he thought Susan was a feminist, he said unequivocally, "no."

In contrast, Susan's mother believed that being a feminist meant being independent, but not to the point of being radical. Being a feminist meant that a woman was not afraid to be themselves and go out and experience life. Susan's mother believed she was a feminist and she raised Susan to have similar beliefs about being a woman. She also stated that faith in God and having him be the guide for one's life as an important part of being a woman in today's world.

Post-modern Feminist Lens—Cross-Case Comparison Results

Small-Town culture defined. All four cases agreed upon the positive aspects of growing up in their small rural community. The unique desert environment lent itself to exploration and outdoor activities that would not be as easily obtained in a more urban setting. In addition, the small community allowed for them to excel in school and be involved in many activities because there were fewer students competing for the same opportunities. Less competition was cited by Maggie, specifically. Having personal connections with their teachers and advisors were an added plus as well. Jane and Maggie did not feel this same connection at the college level. However, Nancy and Susan cited college professors who had influenced their career paths in positive ways.

All four cases believed that the community had a sincere desire to support them and see them succeed. Growing up in this community allowed for these cases to personally know many of its residents. Due to these personal connections, the community felt safe and secure. The safety of the community was specifically cited by Nancy.

The four cases agreed upon the drawbacks regarding growing up in their

community as well. For example, there was less diversity within the student population, so it was more difficult to find a peer group for Nancy. According to Nancy, she believed a culture of having strong academic goals was not evident as well. Furthermore, all four cases agreed that there were fewer academic opportunities like quiz bowls and a larger variety of advance placement classes were not available in their small school. According to Maggie, with the overall lack of diversity and opportunities in the community, a broader view of what could be obtained outside of their community was not easily understood or embraced.

Even though all four cases spoke positively of their experiences growing up in their rural community, all four lived and work in other areas. With the exception of Jane who attempted to come back and establish her veterinary practice in their home town, the other cases had not mentioned wanting to move back on any permanent basis.

Overall, Susan had very similar experiences as the other three cases regarding growing up in their small rural community. Other than her experiences growing up in the LDS religion and working with one of the lawyers in her community, her rural upbringing did not affect her choice to pursue a career in law over medicine.

Social class. With the exception of Jane, the other three cases were the first in their immediate families to complete college degrees. Maggie completed her first college degree at the same time she graduated with her high school diploma. In addition, Nancy had a Ph.D. and Jane and Susan had professional doctoral level degrees. However, Maggie planned to continue her education in the future. She planned to obtain a graduate level degree related to nursing. With the exception of Jane's mother, all of the other

parents of the cases had blue collar careers. For their home town community, the families of the four cases would be considered middle to upper middle class.

In regard to Susan, her parents were similar to Maggie's and Nancy's in that they did not have any formal education beyond high school. However, Nancy's father had training to become a police officer. For Susan, her parents provided her similar support and opportunities as compared to the other cases. Social class was not a mitigating factor for Susan changing her career goal from medicine to law.

Home roles defined. Growing up, all four cases' parents worked outside of the home. Due to this, Nancy was expected to be a supervisor of her younger sister. For Jane and Maggie, they were the younger sibling in their families, so they did not have the same responsibilities. Of the four cases, Maggie's father raised his children to share equally in all household duties. Even though the other three cases were raised in more traditional households where their mothers did most of the domestic tasks, equal sharing of all domestic duties was supported and encouraged in Jane's and Nancy's cases, especially.

All four cases were married to individuals who believed in and worked to the best of their abilities to share equally in taking care of their homes. In Maggie's and Jane's situations, both started families soon after they were married. With children in the picture while Maggie and Jane were establishing their careers, their spouses took on more of a child caring role. In Maggie's case, her spouse brought their daughter to his college classes in order to allow Maggie to rest during the day so she would be ready for her nursing shift. Jane's spouse placed his career on hold which allowed Jane to develop her

veterinary practice. With the exception of early morning work, Jane's spouse remained home and took care of their daughters.

In addition, Nancy was married to a geologist, so he had the ability to support her career by being an editor for her work as well as sharing equally in all household duties. They had a team effort in all aspects of their lives together, work and home.

For Susan, her upbringing was very traditional with the exception of her mother working outside of the home. Most of what occurred around Susan's home revolved around working on their small ranch, going to the mountain to collect fire wood and go fishing, and the importance of their religious faith. In comparison to Nancy, Susan was the oldest sibling in her family. Susan was expected to be a supervisor and care taker of her siblings as well.

In addition when Susan got married, her spouse shared equally in all household tasks similar to the other cases' spouses. He was proud that Susan was a lawyer and supported her in whatever capacity was required. Spousal support had been a critical part in the success of all four cases' careers. In contrast to the other cases, Susan's religious beliefs and the connection her beliefs had to the roles women and men take at home was one of the main reasons she chose a career in law over a career in medicine.

Work roles defined. For Nancy, her specialty in hydro-geochemistry placed her in a male dominated arena. However, in academia, she felt that she was respected for her ability which was in contrast with the experiences she had with some male geologists who worked in industry. This was one of the reasons why she chose to be a research scientist at the college level rather than work in industry.

Being a veterinarian, Jane was now in what has recently become a female dominated field. She felt supported by the other doctors in her practice, especially by a senior member who had been a veterinarian for over 40 years. Their relationship was one of mutual respect and they shared their expertise with each other. This was similar to the support Nancy felt from other Ph.D. research scientists. For Maggie, she was in a female dominated field that had been from the beginning of this career field. However, the defined roles had begun to change. Maggie had experiences where doctors allowed her to utilize her professional judgment more often than was done in the past. She believed this was due to the relationships forged between the nurses and the doctors at the University of Utah Hospital. In addition, she believed that more males had been entering nursing due to the ability to move up in pay grade when they gain specialized training and advanced degrees. It was Maggie's experience that more males moved on to work on their advanced degrees as compared to the female nurses she had known.

In comparison to the other cases, Susan had negative interactions with some male lawyers when she began practicing law. She believed that they did not respect her because she was either a woman or a new lawyer. However, Susan believed that the qualities that women share enabled them to be better lawyers than men in many situations. Other than a couple negative experiences, Susan felt confident in her abilities as a lawyer and believed she was supported, especially by her boss. Susan viewed her boss as a mentor, similar to Jane and her relationship with the senior member in her veterinary practice. Since Susan did not feel the work required as a medical doctor would fit her life plan in regard to family, she chose to become a lawyer instead.

Career persona defined. For each case, they were on their way to developing a persona for their careers. All four cases believed the ability and merit of an individual was more important than their gender when it came to establishing personas for their professions. This was especially true for science-related fields.

Nancy, being in a male dominated science field, looked more at the type of researcher one was rather than gender. Collaboration was critical for her because she was more of a field researcher. According to Nancy, she was not able to control the variables like one who conducts experiments in a laboratory. Therefore, she sought to collaborate with researchers from a laboratory setting who were working on a certain aspect of her field work. Nancy believed she was still in the beginning stages of developing her scientist persona.

Establishing a persona as a veterinarian for Jane had been related to the work itself. She believed that being a veterinarian was an honorable profession that was well respected by people. This was an important aspect to developing her persona. In addition, being able to make a living doing something she loved and had wanted to do from the time she was young had been empowering. For Jane, she had been developing her persona since the time she was a young girl.

As Maggie worked part time as a nurse and full time as a mother, she was developing a persona that fit well in both settings. For Maggie, being a nurse had been a complementary profession with being a mother. Since nursing has been a female dominated profession from its beginning, Maggie had also been working through the different aspects with the inclusion of more men in the field. Maggie saw the disparity

between male nurses choosing to do graduate work related to nursing as compared to females as a possible change to the personas in nursing.

Susan, who was the negative case study and a lawyer, shared how she thought of women when she thinks of an image of a scientist because all the scientists she knew were women. In relation to being a lawyer, Susan believed that women were becoming equally as common in the profession as men because women have a natural ability to be better at many of the qualities required to be a good lawyer. Therefore, developing a persona as a lawyer had not been difficult for Susan. As a result, after Susan chose law for her career path, her ability to develop a lawyer's persona was similar to the other cases' abilities to develop their personas for their science-related careers.

Feminism defined. Nancy shared a more holistic view of what it meant to be a feminist. She looked beyond the stereotypical view of radical feminism held by Jane and Maggie. For Nancy, she developed her definition by taking the positive qualities of all the women she knew and created a composite definition. Based upon her definition, Nancy viewed herself as a feminist. In contrast, Jane and Maggie did not feel they were feminists based upon their definitions of radical feminist perspectives. However, Jane and Maggie believed in supporting women in having equal opportunities and pay for the jobs they perform.

Susan looked at her own lived experience and created a definition that fit with a view of women as not being stereotyped or forced into a myopic frame. Instead, Susan believed women should be able to choose their own path and career. In addition, Susan believed women should be supported in whatever path they followed. Similar to Nancy,

Susan believed she was feminist base upon her personal definition.

All four cases believed in supporting women in all aspects of their lives, work and family related. By looking at the cases' experiences related to growing up in their rural community, their social class, home roles, work roles, and development of their career personas, it became readily apparent that the lens that grounded their experiences fit well in a postmodern feminist perspective.

Researcher Transformation

This section will address how the analysis of the data and the propositions discovered in the study led to my transformation personally and as a researcher. As a male researcher, I was raised in a family with traditional gender roles. Throughout the data collection and analysis phases of this study, I kept a reflective journal. In this journal, my path of self-discovery was documented. With qualitative research, the researcher is no longer the objective observer but rather a more active participant.

As I began my study and was preparing to conduct my first round of interviews, I reflected upon my role in my family. These were my thoughts:

11/20/08—General Beginnings

It will be interesting to hear what the participants have to say in regard to the initial interview questions. As a husband for almost 16 years, I have prided myself in sharing the family responsibilities that have traditionally been a wife's role. However, I am open to determine if my perceptions of my role are accurate. I may not be as aware as I perceive.

As I continued through the data collection phase of my study, I began to separate my journal entries into two sections. The first section dealt with my general thoughts

regarding my experiences with my work, family, and research. The second section dealt with the study framework and any specifics related to what I needed to do to progress through the process.

Four themes related to researcher transformation emerged in the journal entries: (a) struggles with maintaining a timeline to finish the study, (b) influences related to work that affected the progress of my study, (c) my perceptions of my role as a supportive spouse, and (d) my connections to the case studies. For each theme, I will share my transformation along with the applicable researcher journal entries. In addition, I will show connections to applicable transcript data from the interviews conducted with the four cases, their parents, and spouses.

Struggles with Maintaining a Timeline to Finish the Study

Throughout my journal entries, references were made to my timeline and ability to complete the study. I began the data collection for this study in November of 2008. I thought that I would be able to have the data collection, analysis, and the writing phase completed by early spring of 2010. My initial plan was to defend my dissertation in the latter part of the spring of that year. I was able to consistently work 30-60 minutes per day, thinking that this would be an adequate amount of time. However, my focus and dedication waivered as can be discerned from the following entry.

3/30/09

It seems that I gain momentum and then it slips away. I have the greatest of intentions to work at least 30-60 minutes per day and then this does not happen. As I continued working through the data collection and analysis phase, I believed

that the time I was dedicating to working on the study was not enough. My plan was to block out more time so I could keep on my target for a spring 2010 defense. The following were my thoughts at the time.

4/26/09

I finished my transcription for Maggie's 2nd interview and sent it to her as an attachment for member checking, 4/25/09. I will begin Jane's transcription tonight. I think that I will need to block out time in the near future to complete the transcriptions and also to make contact with Susan for our 2nd round interview. I am beginning to feel the need to push a little harder so I can keep on schedule to defend my dissertation by next spring.

However, I did not block out time as I had previously planned. I was consistently working on the study and believed I was making progress, but knowing my goal of defending in the spring of 2010 was becoming more difficult to achieve. I made the following comments in June of 2009.

6/15/09

It is interesting to me how quickly time moves by. It is already mid June and I am beginning to feel I am not working quickly enough to be ready to start the writing phase by the end of the summer even though I have been working consistently on a daily basis the past couple of weeks. I really want to get this finished so I have more time to devote to family/household tasks and my job.

Later that summer, I made similar comments, but my thoughts were not put into action as would have been necessary to achieve a spring 2010 defense.

7/4/09

I continue to work at least 1 hour per day on my dissertation. Time goes by so quickly. I definitely think it will be a push to have my dissertation ready to defend by the spring, but I will do this. It is time to get this wrapped up and finished.

As I continued to work on the study through the fall of 2009 and early winter 2010, I was able to complete the data collection, but I was not able to complete the analysis phase or

begin the writing phase. I was disappointed in myself and realized that my goal of defending my dissertation during that spring was not going to happen. I began to realize, that I needed to relax and focus on working consistently and not stop for any length of time so I would not lose momentum. The following two entries showed my change in attitude.

3/29/10

Wow!! What happened to the rest of February and now March! I thought that I had made an entry in my journal more recently than February 8th. Obviously an April defense is not going to happen as I am still finishing my analysis.

3/30/10

If this takes until Christmas, 2010 or next spring, 2011, that is what will be the case. The main focus will be to finish!!!

Even with the change in attitude in regard to finishing, I was still moving more slowly than I had anticipated. However, I maintained focus with the main goal of persevering through whatever I needed to accomplish in order to complete the study. The following entry demonstrated that I was continuing on the path to completion.

6/7-8/10

As I continue to reflect upon my progress, I am also not on track. What is new!! By April, I had planned to be in the writing phase, but here it is June 8, 2010 and I am almost ready. I need to work on my literature review for a while and then I will be ready. I realize that I need to keep working and I will finish! I am making progress, just not as quickly as I would prefer.

Interestingly, working on my literature review took longer than “a while” as I alluded to in the previous journal entry. The revisions to the literature review were not finished until a year later which pushed the completion of the writing phase for the rest of the

dissertation well into the spring and early summer of 2012. I maintained focus on my main goal to obtain my doctoral degree. However, it was not until I realized that I was up against the eight year limit for completing my doctorate that I blocked out the time necessary to complete the writing phase.

As I reflected upon my timeline for completion and how it took more time than my original goal, I thought about the comment made by Maggie's father regarding her tenacity in completing her associates degree while she was still in high school and the completion of her nursing degree. He said:

She has a good life. She deserves it. She's put a lot of hard work in through her years in high school and college. She was able to accomplish things that people that were five or six old years older than her were not able to accomplish yet. I respect her for that. She did it in a short order with a lot of hard work.

Similar to Maggie, even though it took me longer than I had anticipated, hard work and dedication to accomplishing my main goal was never lost. I realized that in order to accomplish my goal of obtaining my doctoral degree, I needed to be as tenacious as the four cases were in accomplishing their career goals.

Influences Related to Work That Affected the Progress of My Study

After having taught science for 18 years, I became principal of the same high school. I was principal during the entire time I was working on the study for my dissertation. After reading through my researcher journal for the analysis and writing phases, I was struck by the impact some of my experiences as principal had on me. I commented on one of these experiences in the following entry.

4/9/09

We are at Disneyland, but I still managed to begin my transcription of the interviews. I however, have been dealing with an issue related to school. Unfortunately, one of our students entered another's home and attempted to kill him by hitting him in the head with a baseball bat. Today, the student that was hit had to undergo a second surgery to repair spinal fluid leaks that are still occurring in the area of his right ear. This has definitely been the most difficult situation I have had to deal with since becoming principal two years ago.

In addition, the beginning of school in the fall of 2009 brought more intense issues that I had to manage as principal. The following entry described the events and how the time investment as principal had impacted my focus on my reflection of my progress on my study.

9/7/09

It has been over one month since my last entry. I cannot believe how fast time goes by. We opened the new school year with students on August 13th and we have had to deal with many issues, such as the termination of one of our classified employees for improper conduct, 7 safe school violations, including 6 that were drug related!

As the 2009-2010 school year came to a close, more issues affecting my focus on my study occurred. I commented:

6/7-8/10

May was crazy with school as we finished early due to the new construction of our school buildings. The last day of school and graduation was May 18th. In keeping with our intense school year, I had to deal with a YouTube video created by a graduating senior which depicted the violent deaths of two of my staff members, one of whom was my associate principal. Needless to say, we suspended the student and he did not walk in the graduation ceremony. The parents felt that this was too harsh of a consequence as did several other parents in the community. This situation would have been much easier to deal with if the parents understood the gravity of the situation.

Being able to deal with the stress of the principalship and still continue to be able to

focus on my study was laudable. The ability to deal with stressful experiences and still maintain focus on their educational and career goals was an attribute all four cases in this study shared as well. For example, Nancy shared her feelings about how her parents' divorce affected her independence when she commented:

So when my parents divorced, it was certainly a tumultuous time. We were going back and forth between the parents. It was difficult to figure out where to place my loyalties. I didn't see it then, but I see it now, my parents are so different. So, I wouldn't say it was an identity crisis, but when you have two parents that are so different, doing different things, makes them proud or not proud of you. It was difficult to figure out who I was in between two divorced parents. Again, I think that I came out of all of this being a pretty independent person.

My Perceptions of My Role as a Supportive Spouse

As I read through my researcher journal, I made comments regarding my role as a supportive spouse, especially as I compared and contrasted myself to the spouses of the case studies. It became apparent that I was not sure I had the same level of support for my spouse as some of the spouses did for the cases in my study. This was a concern for me as I had always believed I supported my spouse better than average. This conflict was readily apparent when I commented:

4/26/09

It has been interesting being a male and interviewing my study participants. I have always felt I have been an involved husband and Dad, more so than the average. I also had believed that I understood my wife and supported her goals. However, I am beginning to think that I have not been the best in that if my wife needed for us to move because she had a career goal that required us to do so, it would be very difficult for me to do this. I think that my wife would still be ready to move for me much more readily than I for her. This is definitely more of a traditional role relationship.

I elaborated further when I commented about Jane's spouse in the following entry:

11/27/09

It is interesting as I work on my data tables and see how the spouses support their wives. In particular, one spouse described himself as a “soccer dad.” He has become the main care provider during the day while his spouse works. I reflect upon this as we just had our fall sports awards banquet and my spouse talked about how I have gone “above and beyond” in terms of being a dad and spouse. I cook dinner and take care of our children during volleyball as she is the head coach. This might not be as all-encompassing as the “soccer dad,” but I can have some of the same feelings and can support my spouse so she can pursue one of her passions.

I wanted to feel that I supported my spouse similar to Jane’s, even if on a smaller scale.

However, Jane unequivocally praised her spouse’s support of her developing career as a veterinarian. This was especially evident when she commented:

Probably the biggest support is my family support. Specifically, my husband J. to be so supportive, because it can be stressful, it can be long hours, it could be going in on my days off, and without his support, I would have a hard time doing it or being successful. He is very supportive of the work that I do. He also has taken his own career and put that on hold to make sure mine is going where I would want it to be, especially while our kids are so young.

In the following entry, I summed up my feelings about the importance of spousal support, specifically related to my own wife. I then commented more generally regarding the spousal support that would be necessary for women to be successful and fulfilled in all aspects of their lives just as men have for centuries. This entry could be considered a personal guide for my improvement in the future as well as a summary for a large portion of this study.

6/7-8/10

It has been interesting finishing my proposition summary table because I have been placing sections from the emerging category table in this proposition table as support. In particular, I placed sections of my journal. It has struck me that my expectations of how much I help with family responsibilities and in regard to the quality of this help is not the same as my wife’s perceptions. This is a difficult

balancing act and has always been a point of contention. My wife is one that will not talk about these issues too readily and keeps them bottled up inside. It manifests itself in her being distant. In looking at the study participants relationships with their spouses, there is a perception issue of how much the other helps with at least two of the participants as well. They have worked through these perceptions, however. It is interesting to note how, in my job as principal, I deal with many intense emotionally laden issues and seem to be able to have open dialogue, but when it comes to my relationship with my wife, it is much more difficult. This seems odd to me, but when I talk to my friends and close co-workers, they have the same difficulties. When it comes to communication, our closest relationships, especially with our spouses, is [sic] the most difficult. However, this is the most important relationship in regard to communication. Through all of this, I have come to the conclusion that the relationships that are most important also come with the most difficulty in terms of communication and making sure adequate support is present for the other to succeed in their life and life's work and passions. For women to be able to succeed in their careers, especially those that are science related, and be able to raise a family and feel they are doing a good job, it is imperative that their spouses to be full participants. For this to also occur, it is imperative that more studies like the one I have been involved with is conducted my male researchers. This will be the best way for males to understand the importance of their role in supporting their spouses in their careers and family lives.

My Connections to the Cases

Due to my connection with the four cases in this study (I was their science teacher when each of them was in high school), I was concerned about the possible bias that would result from these former relationships. In the following entry, I commented on my reaction the first time I interviewed Susan and Nancy.

12/1/08—Following the first two initial interviews

I interviewed Susan and Nancy 11/29/08. It was interesting to hear how these two women answered the questions. It was apparent to me that, at times, they were trying to give "correct" answers. It was difficult not to lead them in anyway and allow them to answer freely. This is imperative to reduce bias in the question and answer sessions. It must be their answers and they cannot be swayed by my presence or prompting. I feel that I did a good job in these initial interviews. I need to talk with Becky to determine how specific I can be with my follow up

interview questions.

In addition to being their former teacher, I also reflected about their lived experiences and how each of them believed they were successful due to their work habits and not their innate intelligence. I believed, due to my family background, I could relate to their beliefs. I made the following journal entry regarding the postmodern feminist connection to my contention.

1/7/09

I have been thinking of my connection in terms of a postmodern feminist lens as it relates to cultural background, etc. I find myself feeling a connection to the study participants in regard to feeling that their work habits more so than their intelligence has helped them get to where they are today. Is this a societal thing for women? Coming from an immigrant background, I have often thought of myself as inferior to many professionals. I want to honor my ancestors for their decisions to come to this country and I feel that I am fulfilling some of their dreams and aspirations. However, I feel that I have achieved what I have in regard to academic and professional success through my hard work and dedication and not from my intelligence. Is there a correlation between my life's path and that of my study participants?

When Susan made the following comments regarding her first year in law school, I believed this matched well with the feeling of connection I had with study participants.

There are those students whose parents went before the Supreme Court and so I thought these students had been immersed in this their whole life. And here I am just a little country bumpkin, first-generation doing this. I had no idea what was going on. I at least had some idea from my college experience what to expect. Other than that, I had no clue. Both of my parents just have high school diplomas, so they had no idea. They knew that it was hard but I don't think they ever understood the intensity of it.

Thus, the connection moved beyond the extension of a former teacher-student relationship to a collegial provocation that induced important self-reflection on who I was as a scholar and as a person.

CHAPTER VI

DISCUSSION

The purpose of this study was to determine how perceived gender roles developed throughout childhood and early adulthood impacted the career decisions of women in science-related career fields. An additional purpose was to determine if the experiences of the researcher as he analyzed the data and the propositions discovered in the study would become a transformative agent. A multi-case framework, as discussed in Yin (2003), was utilized so within case analysis and a comparison between cases would be achieved.

Propositions

During the analysis of the data, it was discovered that the relationship of gender roles to the decisions made by the four cases in this study, were arbitrated through the areas identified in the main propositions emerging from this study. The three main propositions were: (a) supports from family, school, and community, (b) opportunities at various educational levels, and (c) varying degrees of adoption of a postmodern feminist lens.

Supports

Parents, immediate family members, and spouses. For all four cases in this study, support from immediate family members, specifically from parents was critical throughout their lives. Each case study had at least one parent who supported their

academic pursuits and later their choice of career. The support from the parents was unconditional in nature. Similar findings were discussed in Bhanot and Jovanovic (2009) and Scott and Mallinckrodt (2005). In Bhanot and Jovanovic, it was discovered that mothers had more of an influence when their daughters were young and Scott and Mallinckrodt discovered that fathers had more influence later in life when their daughters were undergraduate students. However, Scott and Mallinckrodt contended that if a father's support was given conditionally, meaning that their daughters needed to act in certain ways to please their fathers, then the support had a negative impact on the daughters. For the four cases in this study, there was a dominant parent who supported them from the time they were young. The determining factors for which parent was dominant depended upon the family demographics and dynamics for each case.

For example, Maggie ended up living with her father after her parents divorced. Even though she moved in with her father when she and her brother were older, she cited him as most supportive and involved. This was due to her mother having issues with addictions to alcohol while she and her brother were living with her. In addition, Maggie indicated that her brother was a role model for her. He helped her prepare college and scholarship applications. She cited her paternal grandparents as being supportive as well, especially from a financial standpoint.

Nancy's parents were divorced as well. Even though Nancy's parents did not get divorced until she was 15 years old, her father was not very involved with Nancy and her sister when they were young. Nancy's mother shared how their father did not come on family vacations with them or go to their sporting events. Nancy described her

relationship with her father as one of convenience rather than supportive and close.

Therefore, Nancy indicated that her mother was her main support throughout her life as she was always there for her, especially from an emotional stand point.

In these cases, where family support arose within the context of a nonnuclear family, requiring parents to take on nontraditional roles, Nancy was the only case who selected a career in a male-dominated career field. Maggie, who arguably experienced the most nontraditional role model from her father, selected a female-dominated science-related field, nursing. In contrast, Jane was raised by both parents. However, she cited her mother as being the dominant support throughout her life. Jane shared numerous situations when her mother supported her. For example, her mother would ride along on a bicycle while Jane ran before school when she was training for a marathon. Her mother set up the relationship between Jane and the veterinarian who became her life-long mentor as well. When Jane was in veterinary school, her mother worked extra jobs so she could help pay for Jane's expenses. Jane did not cite any specific instances of support given by her father. However, she did indicate he was supportive in general.

Similar to Jane, Susan was raised by both parents and she cited her mother as being the most supportive throughout her life as well. Susan shared how she had a strained relationship with her mother when she was young due to the expectation of having to supervise her younger siblings. However, as Susan moved through high school she realized what her mother was doing when she was younger and developed a deeper love and admiration for her. Her mother's support helped focus Susan's independent and stubborn nature. In regard to her father, Susan indicated that she worked with him around

their ranch and the two of them liked to go fishing together. Like Jane, Susan shared that her father was supportive in general.

Jane's and Susan's support from their parents contradicted one finding from the study conducted by Gibson and colleagues (2011). Their findings suggested that often girls from families, whose parents have little formal education and hold traditional family roles, hinder their daughters from going to college. In addition, these parents often believed science-related careers should be pursued by men. While this did not hold in Jane's case, it seems to have held in Susan's case. Interestingly, Susan came from the most conservative background of the four cases. Similar to the study participants in the Gibson and colleagues' study, Susan's parents believed the most in maintaining traditional gender roles compared to the rest of the cases, especially as this is translated through the practice of their religion. Susan's parents had no formal education beyond high school. However, even with their background, Susan's parents supported her when she wanted to become a medical doctor and then again when she chose to practice law instead. Susan's parents, through their lived experiences, realized the importance of continuing one's education beyond high school. Both parents voiced regret for not pursuing additional education. As a result, from the time she was young, they instilled in Susan the need to continue an education beyond high school. Her parents instilled in Susan a strong work ethic and reliance upon God and the beliefs and training of their religion as well. Ultimately, this belief served as one basis for Susan to switch to law.

Along with support from parents and other immediate family members, the four cases in this study cited supportive spouses as being critical factors in their ability to

develop and maintain their careers. All four spouses took on many tasks associated with maintaining a household. For example, they all helped with cooking, cleaning, and doing laundry. In Maggie's and Jane's family, their spouses took on child care roles as well. Specifically, Jane's spouse had been the main care provider for their children during the day when Jane was working. Thus, regardless of the experience any of these cases had with fathers and mothers functioning in traditional roles in their homes, each was able to negotiate with their spouses on a shared view of home responsibilities. Without the support of their spouses, these four cases would have had a much more difficult time developing and maintaining their careers.

Having supportive spouses could potentially be a mitigating factor for findings of a study conducted by Sallee (2011). In this study, moving forward in a research career in science was often negatively impacted when women or men chose family obligations over their research. These findings were supported by an earlier study conducted by Monhardt and colleagues (1999). The findings in this case study indicated that supportive spouses regarding home and family obligations improved the capability for the four cases to develop and move forward with their careers. Although one of the cases eventually switched to a nonscience career specifically because of her religious beliefs related to her potential role as a mother and her perceived incompatibility of that role with a science career.

Advisors/counselors, teachers, mentors, supervisors, and professors. In addition to their parents, immediate family members, and spouses, the four cases received support from other adults at various times in their lives as well. For example, Maggie

cited an advisor she had while in high school that kept her grounded and focused on her academic goals related to science and finishing her Associates degree. Maggie's advisor was concerned that Maggie's overachieving nature was not healthy. She helped Maggie deal with her academic needs as well as sort out how to best cope with her family situation, specifically helping care for her father as he dealt with being a diabetic. This was similar to findings suggested by Guiffida (2008) where the researchers contended girls should be listened to by their advisors and counselors and given the guidance necessary for them to achieve their science-related goals as well as personal needs.

Along with advisors and counselors, teachers were cited as being supportive of the cases in this study. Maggie cited me as being supportive and helped her realize she could compete in the Sterling Scholar competition in the science category. Susan cited me as well in regard to helping her successfully compete in the science category in the Sterling Scholar competition. Nancy discussed how her Spanish teacher helped support her in competing in the same competition as the foreign language representative for their high school. Jane mentioned the support she received from her elementary teachers regarding helping her learn to read as being critical to her future academic success. Being able to read helped Jane realize she could keep her dream alive for becoming a veterinarian.

In addition to teachers, two of the cases had mentors who supported them in achieving their career goal. Jane cited the veterinarian she worked with while she was young as her main mentor and driving force for maintaining her desire to pursue a career in veterinary medicine. Jane also cited a senior veterinarian in her practice as being an

individual who she sought out for advice because of his vast experience. In turn, he went to Jane for advice regarding newer techniques because she had recently graduated. Their relationship was one of an equal give and take. Susan mentioned her boss at her law firm as being a mentor and support for her when she was struggling with a case or other lawyers. He was always there to listen to her and give advice when necessary. As discussed in a study conducted by Rudasill and Calahan (2010), having support from influential advisors/counselors, teachers, and mentors, was deemed necessary for girls to continue their academic pursuits, especially related to science.

In addition, Susan and Nancy cited professors during their undergraduate years as being supportive of them academically. For Nancy, her chemistry and geology professors helped her realize she could become a Ph.D. research scientist. For Susan, one of her professors helped her realize that she was an intelligent and capable student who could pursue whatever path she chose. Fox and colleagues (2011) suggested that mentoring by professors was a key element for helping retain women in science-related programs. Interestingly, all of the professors cited by Susan and Nancy were men which supported the findings of the study conducted by Downing and colleagues (2005). In their study, they found that undergraduate women in science often cite male mentors as being most supportive of their academic pursuits. However, in another study conducted by Settles and colleagues (2007), their findings suggested that women would be more successful in their pursuit of a science degree and related career if they were mentored by other women because men would not be able to empathize with the difficulties faced by women.

In sum, it appears from the analysis of these four cases that family, school, and

community supports are necessary for women to enter post-secondary education or beyond regardless of the specific field of endeavor. The supports received by the negative case, who went into law, were similar to those received by the other cases who went into science-related fields. It appears, with these four cases, that there is no specific pattern of support regarding neither the sex of the parent or mentor who provides that support nor the timing of support from any person of a particular sex. The support itself is what is important.

Opportunities

Along with supports provided the four cases throughout their lives a variety of opportunities were provided as well. Not all opportunities and experiences were positive. Some opportunities and experiences could be seen as confirming traditional gender roles for each case, while some could be seen as challenging those roles. However, the four cases utilized their experiences as opportunities to grow and become more independent. As a result these four cases developed perseverance and a strong work ethic. In addition, all four cases developed a goal oriented attitude. They have all achieved much at the various stages of their lives, personally and academically.

Early opportunities and experiences. Maggie's parents divorced when she was young, and she and her brother lived with their mother until Maggie was 11 years old. Her mother battled addictions, especially with alcohol. As a result, Maggie realized at a young age that she did not want to be like her mother and formed a plan for what she wanted her life to be like when she eventually married and had a family. When she was 11 years old, she moved in with her father and she had the opportunity to be exposed to

all aspects of running a household. There were no gender specific roles in her father's home, so Maggie was instilled with an attitude that household duties were shared equally among the family members. In addition, Maggie's father had battled with diabetes for most of his adult life, so she was exposed to the health care that was necessary to help her father. This experience was one of the main impetuses for her desire to become a nurse.

Like Maggie, Nancy's parents divorced as well. However, Nancy was older than Maggie when her parents divorced. Being the older sibling, Nancy often had the responsibility of caring for her younger sister because both of her parents worked. Nancy felt an even stronger desire to help her younger sister after their parents' divorce. Living with her mother and sister, Nancy had to share in maintaining their home in a similar fashion as Maggie. These experiences helped Nancy become a responsible goal oriented individual at a young age.

In both Maggie's and Nancy's case, they would have been considered talented at-risk students as discussed in Kerr and Kurpius (2004). In their study, Kerr and Kurpius shared a program that targeted talented at-risk girls so they could develop their efficacy towards science-related course work and eventual careers related to science. In Maggie's case, she was in a similar program with her high school advisor that helped mitigate her at-risk factors. In contrast, Nancy's strong connection with her mother and sister appear to be the mitigating factors for her success. For Nancy, the effect of her relationship with her mother was similar to the findings in Basu and Barton (2007). In their study, they shared an example of a relationship between a girl and her mother as being a strong factor in the young girl's ability to develop an identity which was conducive to pursue science-

related course work. However, in Nancy's case, she did not pursue science coursework until college.

In contrast to Maggie and Nancy, Jane and Susan lived with both parents while growing up. In comparison, Jane was the younger sibling in her family similar to Maggie. Jane did not have to be in a supervisory role with her sibling. Nonetheless, Jane had an impactful experience growing up as well. She had difficulty learning to read and was not a proficient reader until she was in the fifth grade. This impacted Jane's self-concept, especially regarding her love of animals and future plans to be a veterinarian. As a result of her academic issue, Jane focused on physical outlets. By the time she was 12 years old, she had already run a marathon. Her physical abilities helped improve her self-esteem and boost her confidence. Her physical abilities coupled with overcoming her inability to read set the stage for Jane to be tenacious in her pursuit of her goal to become a veterinarian. In addition, her mother set up the opportunity to meet and begin working with Dr. P. Banister, the veterinarian who became her life-long mentor. Working with Dr. Banister gave Jane experiences in all aspects of being a veterinarian. These experiences solidified Jane's desire to go into veterinary medicine. The opportunities provided Jane by her mentor support the contention provided in the Rudasill and Calahan (2010) study regarding supports necessary for girls to succeed in science-related careers.

Susan was the oldest sibling in her family, so similar to Nancy, she was given the responsibility to supervise her younger siblings. In contrast to Nancy, Susan did not like this role, and this placed a strain on her relationship with her parents, especially her mother. This represents an interesting challenge on Susan's part to gender-based roles

inculcated in her traditional, intact, religious family. However, as Susan realized later, those experiences helped her when she has had to supervise employees at her law firm. In addition, being the oldest put Susan in a position where she learned how to deal with the running of a household as well as deal with the variety of tasks associated with running a small family ranch. The most influential opportunity Susan had growing up was being raised in the Church of Jesus Christ of Latter-day Saints religion. As Susan grew up, her faith became even more steadfast. When Susan was deciding to change her career focus, she indicated that her faith in God's plan for her as well as her beliefs in her church teachings solidified her decision to go into law instead of medicine.

In contrast to the findings in Kerr and Kurpius (2004), instead of a special program to help mitigate the at-risk factors in girls' lives, it appears that the relationships Jane and Susan had with their mother's along with Jane's focus on physical outlets and Susan's religious beliefs helped them develop a strong identity for their future career pursuits.

School electives/course options/experiences. Being from a small rural community, all four cases went through the same school system. In High school, all four excelled academically. However, they all shared the concern that there were fewer opportunities to take classes such as AP courses. This was supported by the findings in a study conducted by Klopfenstein (2004) where fewer AP courses were offered in the rural school districts in Texas. Even with fewer opportunities to take AP courses, the four cases felt that the small class sizes and personal connections with their teachers were a positive compared to if they had gone to a larger more urban high school.

The opportunities received from their teachers, including me, as well as from advisors and counselors helped these four women focus and excel academically and personally. Specifically, Maggie shared her feelings regarding her advisor and how she painted a realistic picture of life and helped her understand what college life would be like. In Guiffrida's (2008) study, giving students a clear picture of college life was one of the suggestions given for helping students from rural areas succeed in college. Susan cited the time in her biology course when I gave her a book about viruses and after reading the book helped solidify her early desire to become a medical doctor, though ultimately she entered law. Jane and Nancy shared how having the opportunity to take the outdoor education class, taught by me, was a unique experience that they only could have had in their rural setting. Interestingly, in the study conducted by Rudasill and Calahan (2010), they found that even with girls who were advanced academically will often avoid higher level science courses in high school. Their data showed that societal expectations and gender roles were still mitigating factors in their decisions not to take these courses. For the four cases in my study, this was not true. From the data in this study, it appears the combination of supports and opportunities provided by significant adults in their lives helped them develop a different outlook regarding science and excelling academically.

Postsecondary/current opportunities. As the four cases entered college and continued on their paths to their current professions, they had opportunities that helped them stay focused on their goals.

Nancy. With the encouragement from her professors, Nancy became a member of an honors science track which allowed her to conduct research as an undergraduate

student. She was able to present her research at a national geologic convention. This experience helped propel Nancy on her path to graduate school and obtaining her Ph.D. in hydrogeo-chemistry.

Being in a male dominated science field did not deter Nancy from her goal. Studies have been conducted that have illustrated the issues that women have had to contend with when they enter science fields dominated by males. For example, Fox (2001) conducted a study that found women in science fields dominated by males often feel ostracized when working in collaborative groups and their research not taken seriously. In a similar study, Sallee (2011) found that the male hierarchy in place in many male dominated science departments was maintained and perpetuated by the professors who were to act as mentors. The status quo in these departments was androcentric in nature as discussed by Harding (1991). The only negative experience Nancy made in regard to her path to becoming a scientist in her field was when she worked with geologists from industry. In contrast, Nancy felt that the Ph.D. scientists she worked with in academia accepted her and they welcomed the opportunities to collaborate with her when conducting research.

Even though Nancy had positive experiences working with scientists in academia, she still believed that more encouragement for women to pursue science-related careers was needed. She shared the work she did with the women in science and engineering program (WISE). She believed that often, women do not pursue science-related careers because they lack confidence in their abilities. Working with WISE, Nancy believes she can help build the confidence levels in other women just as she had experienced from

being mentored by her undergraduate science professors.

Jane. Jane's tenacious attitude in regard to achieving her goal of becoming a veterinarian was not deterred by her earlier difficulties with reading. She continued on her path to veterinary school and excelled with all of her course work. Interestingly, Jane did not cite any professors at the undergraduate level or during veterinary school who provided her with opportunities or mentoring to any significant degree. This contradicts the findings of Fox and colleagues (2011) where they found that the influences and mentoring by college professors was important for women to be successful in their pursuit of science-related careers. Prior to beginning her practice as a veterinarian, Jane had the opportunity to go to Africa to work with native animals of that continent. This experience further validated Jane's love for her chosen profession.

Similar to Nancy, Jane had the opportunity to give back as a mentor. Jane mentored a young girl who was about the same age as Jane when she was first mentored by Dr. P. Banister. Jane believed it is important to give back and provide opportunities for boys and girls to help them achieve their goals and realize they are capable of achieving what she has if they choose.

Maggie. Maggie was able to complete her Associates degree while in high school because she had the opportunity to be in a program similar to the one described in Kerr and Kurpius (2004) that helped academically talented at-risk students. Having completed her Associates' degree, Maggie was able to get her prerequisites to apply for the nursing school completed two years earlier than the average student. This allowed her to begin her studies and gain leadership opportunities at an early age. Maggie became the

president of the student nursing organization which allowed her to get a leadership scholarship that paid for the majority of nursing school. Along with these opportunities, Maggie was able to work with nurses in the university hospital and gain experience which helped her obtain her first full time nursing position with the same hospital.

In addition, Maggie had a similar mind set as Jane and Nancy when it came to encouraging young boys and girls. Whenever she has the opportunity to talk with young people Maggie will ask them what they plan to do when they are adults. If they do not know, Maggie explained that she is quick to share her experiences being a nurse and how great the profession can be. Maggie also shares how important it is for girls to get an education before they start a family. She believed that gaining her nursing degree prior to starting her family had made her a much better mother as compared to if she had not followed this course.

Susan. Just prior to beginning law school, Susan had the opportunity to work with a lawyer from her home town when she was home on a summer break. Susan's opportunity provided by the lawyer from her home town adds to the findings of the study conducted by Rudasill and Calahan (2010) where opportunities and supports from mentors is critical for girls to be successful in their pursuit of science-related careers. From the findings in this study, it appears that this is the case for any career path, not just science related as suggested by Rudasill and Calahan. This experience along with the validation from her religious beliefs solidified her desire to pursue law as a profession. During law school, she had the opportunity to study in groups with students who came from families with generational lawyers in their backgrounds. This opportunity helped

Susan successfully navigate through her first year in law school and eventually graduate with her law degree.

Soon after Susan began her law practice, she accepted an adjunct professor position at a local college where she lives. For Susan, this was an opportunity to give back to others and impart some of the knowledge she gained after recently completing her law degree and beginning her career. Opportunities like these further validated Susan's choice to become a lawyer instead of a medical doctor.

In sum, similar to the findings regarding supports afforded the four cases in this study, the opportunities afforded the cases were not unique to the three who are working in science-related fields. The case who eventually pursued a law profession had similar opportunities throughout her life as well. The main difference for the lawyer was the opportunity to be raised in the LDS religion which had specific influences on her decision to pursue law over medicine.

Post-Modern Feminist Lens

As discussed in Rosser (2005), at the heart of postmodern feminism is the belief that women should not be viewed from one universal lens. Instead, the socioeconomic backgrounds, lived experiences, ethnicity/race, and culture of each individual should be taken into account in order to gain a better understanding of the persona of each individual and the lens in which they view their circumstances. Furthermore, at each stage of an individual's life, all these factors become cyclic and interact with each other. Just as the other propositions in this study merge and effect the other, it is also true for

the social class, ethnic/racial backgrounds, lived experiences, and the culture of growing up in a small community of the four cases in this study.

Social Class and Culture of a Rural Community

The four cases in this study were all Caucasians. For their rural community, economically, all of them were from the middle to upper-middle class. Therefore, according to a study conducted by Chinn (1999) and based upon their birthright, they already had the cultural capital of the white middle class. With this cultural capital brings a social network which would have allowed these women to have an advantage over women or men from other ethnic/racial backgrounds and lower economic means. This advantage is especially true in regard to moving through their educational paths and into their careers. However, in another study regarding the possible deficits from growing up in a rural community, Bouck (2004) contended that with the higher incidences of families living in poverty, lack of resources for schools, and teachers who have limited opportunities for professional development, students coming from rural areas are at a distinct disadvantage compared to students coming from more affluent school districts with more opportunities, and families in higher socioeconomic brackets. Therefore, it appears from the findings in this study that the four cases were afforded the opportunities and supports from the influential adults in their lives due more to Chinn's contention than Bouck's. In addition, the attitudes of the cases' parents along with the support and opportunities they provided their daughters, mitigated any negative influence the lack of resources the school district was able to provide, i.e., additional AP courses and other academically related activities.

To confound growing up in a rural community further, in an essay written by Howley (2009), he contended that by preparing our students from rural areas to go to college and work in corporate America, the cultural *morés* of rural communities was being destroyed. There is a mass exodus from rural areas and the fiber of the communities is being lost. All four cases shared positive as well as negative aspects of growing up in their rural community. At the completion of the writing for this study, all four participants lived outside of their home town. With the exception of the nurse who lived in a rural community in Wyoming, the rest of the cases lived in suburban/urban communities. However, it was noted earlier, that Jane tried to move back and develop a veterinary practice but left after one year due to financial and personal reasons. A difficulty exists as the opportunity to further their careers in their home town does not appear to be present at this time. Their ability to come back to their home town is impacted by the lack of support and opportunity for advancement in their professions. Therefore, is the cases' exodus from their home town validating Howley's contention? If so, does his thesis possibly stifle the academic pursuits of individuals from small rural communities if they choose to stay, especially regarding women who have potential in science-related fields?

Families from rural areas often hold traditional gender roles regarding family responsibilities. This contention supports Gibbson and colleagues (2011) claim that girls from such families often limit the opportunities girls have to pursue college degrees. This is especially germane to girls interested in science because, as contended by Rudasill and Calahan (2010), if a society or culture believes in traditional gender roles this is still a

mitigating factor for academically advanced girls to take higher level courses while in school, especially advanced level science courses. In contrast, it appears from the findings in this study that the four cases, even the lawyer who came from the most traditional family regarding gender roles, were not limited by their family backgrounds, but instead consistently encouraged to pursue their career goals. Therefore, Howley's contention about the mass exodus from rural communities and its impact on the *morés* of rural communities may hold true. The question remains, how do we encourage girls from small rural communities to pursue their career goals, especially related to science fields and still provide them with the support and opportunities necessary for them to remain in these communities if they choose?

Lived Experiences

The supports and opportunities provided the four cases by the influential adults in their lives created the fabric of their lived experiences. Even when the opportunities were not viewed as positive by the four cases, with the supports provided by the adults in their lives as suggested by Bhanot and Jovanovic (2009) and Scott and Mallinckrodt (2005), they were able to utilize the negative experiences as a means to develop responsibility, perseverance, strong work ethics, and goal oriented attitudes that served them well throughout their lives. With these personality traits well ingrained, all four cases were able to excel academically which prepared them for success in their future careers.

Persona Development

All four cases, at some point in their lives, wanted to go into a science-related

field. Through their lived experiences, supports, opportunities, and growing up in a rural community, each case successfully navigated through their lives to excel academically and develop a successful career. A study conducted by Carlone and Johnson (2007) looked at how opportunities and supports provided for women in science had an impact on the science-related career field chosen and the scientist persona developed by their study participants. For example, women who were praised by their professors for their abilities to conduct research as well as had the ability to navigate within the more androcentric domains as discussed in Harding (1991) and Sallee (2011) became Ph.D. research scientists. For Nancy, she was praised for her research abilities as an undergraduate student and she related well with other research scientists in academia. The persona of a research scientist fit her well. Another science persona as discussed by Carlone and Johnson was that of an altruistic scientist. Individuals who developed an altruistic persona typically were focused on the humanitarian side of science. Those with altruistic personas typically worked in applied science fields such as medicine or environmental studies. For Maggie, her experiences dealing with her father's diabetes developed in her a level of caring that led her to her career in nursing. In Jane's case, she had an affinity for animals from the time she was very young and coupled with the support from parents and the mentoring she received from Dr. P. Banister led her to a career in veterinary medicine. A third science persona as described by Carlone and Johnson was that of a disrupted science identity. Those with this identity were most often from other ethnic backgrounds and they had been discouraged from pursuing science because of their cultural beliefs. For Susan, she related how she hated the science courses

she would have had to take to be a pre-med student. She was not discouraged by her professors. Rather, the discouragement came more from within due to her dislike of the course content. This coupled with her strong religious beliefs disrupted her identity for becoming a doctor. Her pursuit of a career in law fit her persona and religious beliefs more appropriately than a career in medicine.

The initial focus of this study was to determine how the perception of gender roles impacted the decisions made by the study cases in relation to their chosen careers, the analysis of the data demonstrated that each case held traditional as well as nontraditional roles in relation to work and home responsibilities. In the end, each case was able follow a path that was conducive for their beliefs about being a woman. In addition, they were able to negotiate an equitable sharing of roles throughout their lives that was conducive to their success in their careers and in relation to home responsibilities.

In sum, through the four cases' experiences growing up in a rural community, having the cultural capital of the white middle class, and the supports and opportunities provided by the influential adults in their lives, each case was able to develop a persona that fit their particular career field. By looking at the combination of these aspects for each case, the effect of perceived gender roles as arbitrated through a postmodern feminist lens was more readily achieved.

Researcher Transformation

As I completed my writing for this study, I was immersed in the data in a way that was different during the analysis phase. This time it became more of a journey of self-

reflection rather than a mechanical routine of teasing out emerging categories and themes. As Watt (2007) described in her reflection of how she changed as a researcher and person after reading over her researcher journal numerous times, I became more connected to the four cases in my study. I gained more empathy for the journey each took to achieve her career goal as well as with their parents and spouses as they supported and provided opportunities for them at critical times in their lives.

Specifically, I reflected on my connection in relation to my family demographics when I was growing up. In terms of the support my parents provided for me, it was unconditional in the same way the support was provided to each case by their parents. As I look at the success of the four cases, and the support provided them by the adults in their lives, I think about my own life and the individuals for whom I have an influence. After conducting this study, I have a renewed focus on providing support and opportunities for those in my sphere of influence, especially my own children and spouse. For example, I would want my daughters to pursue a career as well as encourage my sons to negotiate an equitable sharing of home responsibilities which would allow their spouses to maintain career and family aspirations. This is similar to Ngunjiri's (2007) study when she realized that she needed to be more than just a researcher in academia. In addition, she needed to honor those she studied by becoming a living example of the propositions she discovered while conducting the research.

As I reflected more deeply, I realized how important it was for these four cases to be supported during the developmental stages in their career. If the spouses of the four cases were not as supportive in all aspects of running their households and sharing in

child care, the outcomes may have been entirely different. As I think about the past eight years while I worked on my doctoral degree, if I had the main responsibility of running our household, providing care for our children, and working as principal of our high school, there would have been no way I would have completed this degree. Continued support in all aspects of running a household and caring for children while developing and maintaining a career is critical. This made me think about my relationship with my spouse. Would I be prepared to support her at the level required if she chooses a different career path? After conducting this research, I have no better way to honor the four cases and their families than to give back to my spouse if the opportunity presents itself.

Finally, the four cases' success in their careers and family lives became a source of pride for me as I reflected on the time I was their teacher. It occurred to me that few educators had the opportunity that I did to reconnect with former students in such a way as to be able to share more intimately in their life stories and allow their voices to be heard. This was a very powerful experience for me. As discussed in Creswell (1998) one of the hallmarks of cases study research is the relationships forged between the case study participants and the researcher which allows for the rich details of individuals' lives to be heard and expressed.

Limitations

The limitations of the study included the physical distance between the study cases and my location. This limited my accessibility for prolonged observation in the participants' living and working environments. My personal connection to the

participants was limiting in that there was a greater chance of personal bias entering into the study, mine and theirs. The science-related fields dealt with in this study were limited to veterinary science, nursing, and hydrogeo- chemistry.

The limitations for this study as defined were as follows.

1. The cases in this study were former students of mine who were willing to be interviewed and participate in this study.
2. Each participant was Caucasian and representative of the middle to upper middle class for their home town.
3. Physical accessibility to each participant was limited, one lives approximately 350 miles away, another lives 420 miles away and the other two are approximately 980 and 2,100 miles away.
4. As the researcher, I had prior knowledge of the participants which created a situation for possible bias from the perspectives of the researcher and the cases.

Conclusion

At the beginning of this study, I set out to determine how perceived gender roles impacted the career decisions made by the four cases. In the end, gender roles became a scaffold in the lives of the cases. The connection as observed in the revised flow chart (see Appendix E) was a better representation of how gender roles related to the propositions that emerged from the analysis of the data. The propositions that emerged, though discussed separately, depended upon each other just as the postmodern feminist lens that grounded this study depended upon the connection of the lived experiences,

culture, and ethnic/racial backgrounds of the four cases to better understand the lens in which they viewed their circumstances.

Support from parents and other immediate family members, mentors, teachers, advisors/counselors throughout the lives of the four cases along with the opportunities afforded them were the main determining factors for them to successfully navigate through their lives. With support and opportunities in place, decisions were made along their life's path that led the four cases successfully to their chosen career. In addition, through the analysis of the data, I gained a heightened sense of the importance of supporting women in their career path, especially in relation to home responsibilities. The ability for spouses to negotiate an equitable solution for running of a household will be critical for both parties to maintain their careers and family responsibilities. By completing this study, I was able to "walk in the shoes" of the four cases and gain a picture of their reality.

The findings from this study would be useful for educators, especially science teachers, counselors, and administrators so they can gain a better understanding of the support and opportunities required for girls to be more successful academically and prepare them for the next phase of their paths to their future careers.

When teachers create classrooms utilizing gender inclusive strategies, girls as well as boys will be able to perform at a higher level and gain a deeper understanding of the concepts required to be successful in a science-related educational path. In addition, counselors need to provide authentic experiences so girls will have a better understanding how to continue on an educational path leading to a science-related career or the career of

their choosing. By creating programs that specifically target talented at-risk girls, counselors will provide another level of support that is beneficial for their future success in the science fields.

As the current principal of the cases' former high school, I will focus on hiring teachers who will develop classrooms conducive for the success of girls, especially in the science fields. I will continue to share the findings of this study with my staff so they will have a renewed faith in the role they play in girls' as well as boys' lives. As educators we play a critical role in the success of all of our students. This role cannot be understated.

In addition, college professors would benefit knowing that their continued support is just as critical for helping women complete their education prior to entering their career as it was shown in the findings of this study. Furthermore, parents and spouses would benefit from understanding how critical their support and encouragement are in the success of their daughters' and spouses' ability to achieve their career goals. By negotiating an equitable sharing of home responsibilities, the relationship between the spouses will be more fruitful and the career goals for women will be more readily achieved as have been the case for men for years.

In the future, it is suggested that more research similar to this study be conducted by men in order for them develop a greater empathy for the path that women need to follow in order to be successful in relation to school, work, and home responsibilities as well as the ability to negotiate a more equitable sharing of household responsibilities. In addition, more research should be conducted related to rural communities and the impact growing up in small towns may have on the ability for girls to go to college and pursue

careers specifically related to science. It is further suggested that studies be conducted to determine how rural communities could provide opportunities and supports for women who have science related and other professional careers to remain in rural communities. Since the four cases in this study were all Caucasian and middle to upper middle class, more research should be conducted with ethnically diverse populations to determine if the same supports and opportunities within these groups would have the same outcome. Finally, an empirical study using survey data given to a larger population with similar sampling demographics would be beneficial to determine if the propositions from this study were isolated to these four cases and their specific situations.

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APPENDICES

Appendix A

First-Round Interview Questions

First-Round Interview Questions

1. Main Open ended Question

(These questions are for the case study participants.)

Please take some time and tell me about your chosen profession.

2. Focused Questions

- Thinking back to your childhood, what kind of activities did you enjoy doing for play?
- Do you recall times in your life when you felt encouraged to pursue your interest in science? Where did this encouragement come from?
- Do you recall times in your life when you felt discouraged to pursue your interest in science? Where did this discouragement come from?
- What kinds of opportunities did you have throughout your life that led you to where you are today in terms of your career?
- Thinking back through your life, which individuals acted as role models for you?
- During your college/graduate education, did you study in a group setting? If so, what was the make-up of these study groups?
- Working in your chosen career field, what are the roles of collegial networks? Explain what these networks look and feel like to you.
- What is your typical day like in relation to home and work responsibilities?

3. Open ended Questions

(These questions are for the respondents that come up in the initial interviews with the main case study participants and will be interviewed to add depth and richness to the sources of evidence.)

When you think of (add the name of the main case study participant) what thoughts come to your mind?

4. Focused Questions

- If applicable, thinking back when (name of case study participant) was young, what activities did they like to do for play?
- If applicable, thinking back when (name of case study participant) was young, how did you encourage her interest in science?
- If applicable, thinking back when you spent time with (name of case study participant) when the subject of science or science-related careers came up, what did you discuss?
- If applicable, what do you see as your role in relation to home responsibilities? How do you feel about this role?

Appendix B
Informed Consent Form

Informed Consent

Introduction/Purpose	Stephen Hren, a doctoral student at Utah State University, is conducting a research study to determine how your life histories affected your decisions in regard to your respective careers and how my role as a male researcher meshes with this process.
Procedures	If you agree to be in this study, the researcher will interview you about your career and life history that led you to your chosen career. Follow up interviews will be conducted with you as well as interviews with outside individuals that may come to the forefront in the interview process. I will ask your permission before contacting these additional people. Archetypal documents that you feel are representative of your journey to your career today will also be utilized. These sources of evidence will be utilized to enrich and validate the data from the study. You will also be asked to check the transcripts of the interviews with you to determine if your voice and accounts are being represented accurately. I will also have outside individuals check the transcripts of the interviews to determine if your voice and accounts are being represented accurately. I will be keeping a researcher journal that will be my self-reflection of the study processes. This journal will be peer reviewed by a female member of my doctoral cohort and an external auditor knowledgeable with qualitative research and case study in particular will be following the analysis of the data collected in the study.
Risks	There will be minimal risk involved in this study. Other than the possibility of bringing up emotions from your past that may not be positive, being involved with this study should not be harmful to you.
Benefits	Being involved in this study may or may not be of direct benefit to you. The assertions or propositions made from the analysis of sources of evidence will help further the information in the career fields that you are currently involved in. This study will open the door for more male researchers to conduct similar studies and help educators and professionals in the sciences, especially men, to be more informed in regard to issues and perceptions among women and how this relates to their decisions towards career paths and maintenance in science-related fields.
Voluntary participation & right to withdraw	Your participation in this study is completely voluntary. At any given time during the course of the study, you may withdraw without any negative consequence.

Confidentiality	All data or sources of evidence will be kept confidential. Files will only be shared with the individual that is participating in the study at any given time (There will be four individuals in this case study). Pseudonyms will be utilized for the names of the participants as well as any identifying place names or origins of data that may lead to identification of the participants. Data will be stored separately in locking file cabinets.
IRB Approval	This study will be reviewed by the Institutional Review Board (IRB) from Utah State University to determine any possible negative impacts to participants. This will take place before this study can be undertaken.
Reporting of Results	The results of this study will be reported in a doctoral dissertation at Utah State University.
Documentation of explanations provided	Stephen Hren has explained this study to you and answered your questions to your satisfaction. If you have other questions, you may reach Stephen Hren at 435-259-6043 or at the following e-mail address: hrens@grandschools.org.

Signature of principal investigator: _____
Dr. Rebecca Monhardt

Signature of student researcher: _____
Stephen Hren
435-259-6043

Signature of subject: _____
By signing above, I agree to participate.

Phone Number

Date

Appendix C

Second-Round Interview Questions

Round 2 Interview questions for the study participants

General questions for all Participants

(Remember to have them expand on their answers and ask immediate follow-up and clarification questions when and where appropriate.)

1. What were the pros and cons of growing up in a small community in terms of where you are now? Were there any specific events/influences where the rural community was a benefit to you?
2. How important or influential was the natural environment or surroundings in which you grew up to you in terms of shaping who you are today?
3. When you think of scientists, does gender matter? Talk to me about your thoughts on women in science generally and then specifically related to you.
4. Do women have different barriers, difficulties, and/or challenges to become successful in your career path or maintain a career as compared to men?
5. Thinking about your life experience, what words of wisdom would /do you give girls that would like to pursue your chosen career field? What about words of wisdom in general?
6. What influence does a personal religion or faith/spirituality have on your career/life decisions? If so, how?
7. Do you plan on taking a break of any kind from your current profession? If so, when and/or will you take this break? How long do you think you will take a break from your profession?
8. If you do not plan on taking any breaks from your profession, what is your motivation to continue working?
9. What are some barriers or supports that you feel are necessary for you to maintain or advance in your profession?
10. Tell me about your family dynamics/history while growing up that helped shape who you are today.

Specific Questions for each Participant

Susan

1. Last time, you mentioned that any discouragement that came to you while growing up came from within. Can you put into words that self-discouragement? Why were you discouraged to pursue science or your current profession?
2. Why did you feel that science was not a “natural fit”? What did you mean by “natural fit”?
3. You mentioned that your study groups in Law School were mainly made up of individuals that came from a professional background; some of their parents were lawyers and doctors. Talk to me about the nature of that initial intimidation in law school. (Did it relate to personal attributes, experience, or being young?)

Nancy

1. You mentioned wanting to teach during our last interview. Why does teaching appeal to you?
2. When playing business, why were you the banker?
3. You mentioned your Mom had taken you fossil hunting. Is there a way to connect the dots between an experience fossil hunting and you eventually pursuing geology?
4. How did the relationships you developed with your geology/chemistry professors and research scientists help you develop an identity of a scientist?
5. Why do you think you were never discouraged to pursue science?
6. Why does the collaboration with other scientists in other disciplines appeal to you? Do you think there are “scientist personalities” and do you have one?
7. You did not mention your spouse in our first interview, even when asked about your home and work relationships. Please tell me about your spouse and his role in your home.

Jane

1. You said that being a veterinarian was honorable, compassionate, and garnered respect. Are these attributes a motivation, a goal, and/or a reason for pursuing a particular profession?
2. Think about your personal attributes and overcoming your inability to read until the 5th grade. It appears you have tenacity and perseverance, so talk to me more about those qualities and how they have led you to your success today.
3. You mentioned that, besides cooking, you still do most of the house work. Is this OK with you?

Maggie

1. Is an advanced degree something you desire, why or why not?
2. In terms of influencing girls to pursue science, you mentioned Middle/High school teachers. What should middle and high school teachers know about their influence on girls pursuing science careers? Do you think this is a critical time for support and influence for girls?
3. You never mentioned your Mom in our first interview. What role did she play in your life?
4. Do you see yourself with the same attributes as your role models, happy with life, optimistic, and excited for others’ successes?
5. You said that living in a smaller community has been positive for raising your children. What is it about small communities that are positive in terms of raising children?

Appendix D

Artifact Data

STUDENT ENTRY FORM (page two)

Highlight the most important honors and awards you have received that relate to your category.

*I will earn my Associate of Science degree from CEU at the end of the current semester. I have stressed science based classes to prepare for my field of study. Because of this, I will enter the nursing program first semester of college.

*I was awarded a volunteer appreciation award from Allen Memorial Hospital for the work that I received certificate because it encourages me to

*I received an Outstanding Academic Achievement Award in the field of nursing.

*I was awarded a National All-Star award for my work.

*I was awarded a National All-Star award for my work.

*I was awarded a National All-Star award for my work.

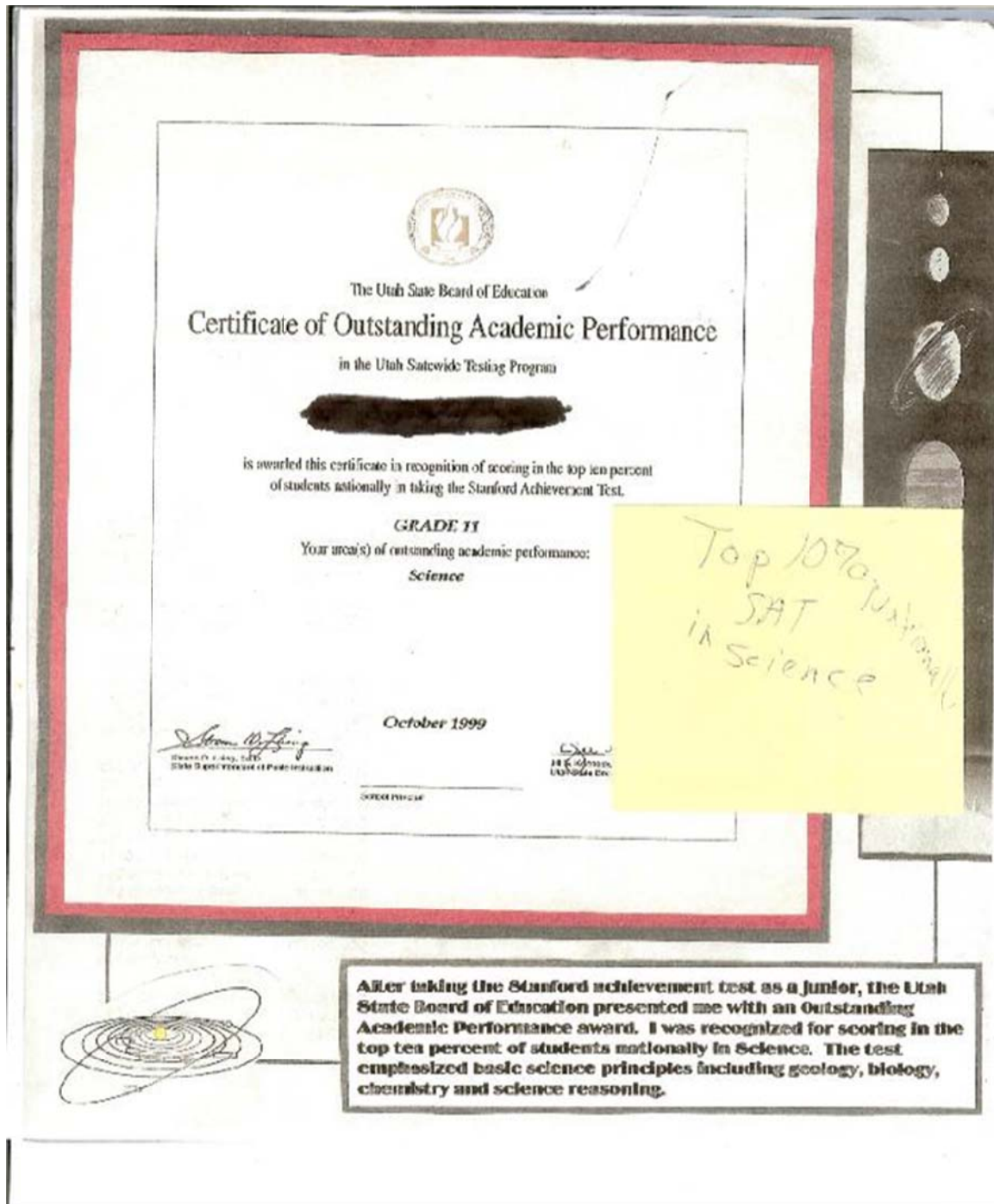
Tell us about yourself. What makes you unique? What do you?

*I am unique because of my perseverance and willingness to accept responsibility. No matter what the odds are I will not let the hope of achieving my goals die. I will do whatever it takes to accomplish them. I do not give up because of setbacks; instead, I will overcome the odds and pursue my goal.

*My parents were divorced when I was quite young. My father gained custody over my brother and me. He has had many medical problems throughout my life. It has challenged me to become a more responsible and independent person that can work through problems despite the difficulty. Being without a parent because of their hospitalization is a demanding incident, but one that helped me realize that unfortunate circumstances in life are not road blocks but chances to grow as a person.

*The occasions when I had to go through family medical difficulties I chose to become a nurse practitioner. They are the people that support the family and work closely with the patients. I know that as a young adult I observed the fact that the nurses were the ones that did the work and had the responsibility of the major care of the patient. I want to be hands on and responsible for the care of patients in situations like my own. I want to help families in need as mine were. I know that without the help of the medical staff at the various hospitals, many members of my family wouldn't still be here and that is why I wish to become a nurse; someone that can make a difference in people's lives.

1) Maggie, MaA2: Maggie's Sterling Scholar narrative regarding the effect of her past experiences with family.



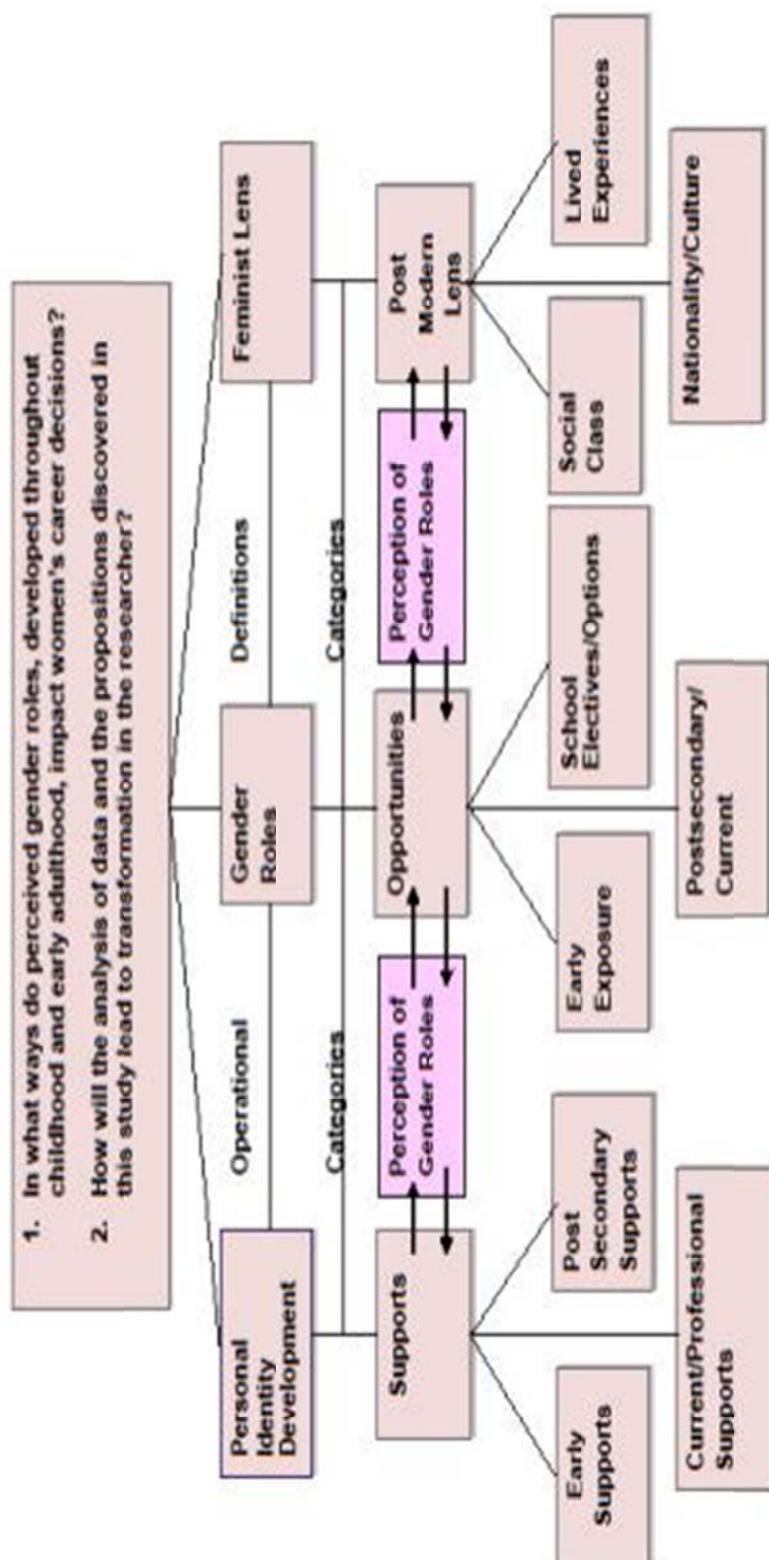
2) Maggie, MaA5: Past successes helped Maggie receive scholarships for college



3) Jane, JaA1: Jane showed an interest in animals at a young age.

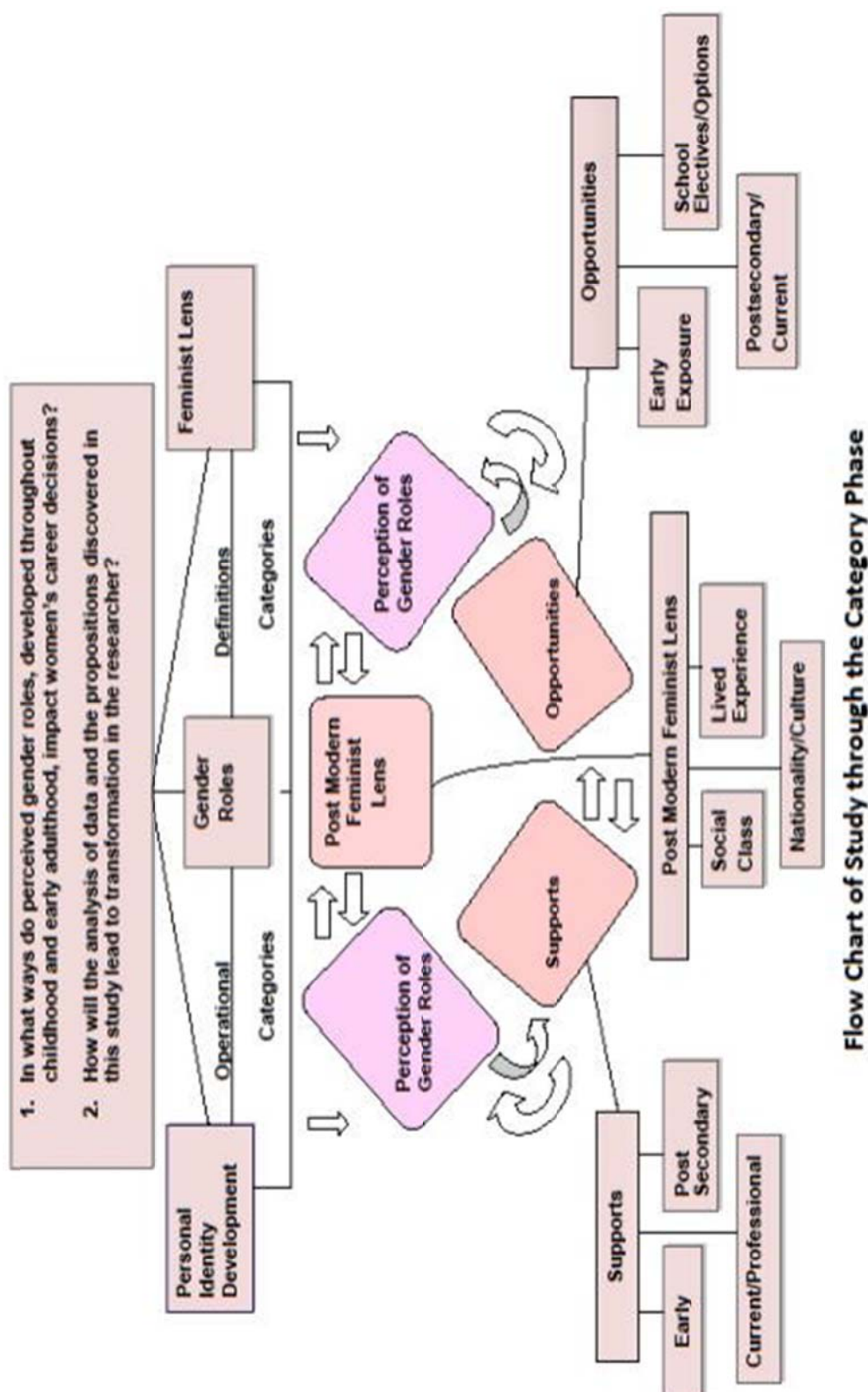
Appendix E

Early Version of Flow Chart



Flow Chart Of Study Through The Category Phase

Appendix F
Revised Flow Chart



Appendix G
Auditor Attestation

Attestation of Audit Trail

I have watched with enthusiasm, Mr. Stephen Hren's dissertation, as it has unfolded. I was contacted early in the process and then a series of emails with data and questions were exchanged. Throughout the process Stephen was open to feedback and made adjustments accordingly adding to the fidelity of the study. Utilizing a constant comparative methodology and other strategies to build trustworthiness, the study has emerged in ways that will add depth to literature on this topic. I responded on documents via the 'insert comment' function of word.

Transcripts of interviews were sent after initial analyses had taken place. Stephen had not taken the opportunity to probe subjects on first-round interviews. When subsequent interviews were conducted, a richer picture emerged giving better objectivity with regard to assumptions regarding the 'lens' through which the subjects were responding. What follows is an example of third-party (i.e., auditor) questioning to stimulate additional depth of inquiry.

Transcription Excerpt

"...other encouragement mainly came through my teachers, including yourself." (J11, pp. 1-2, Lines 23, 25-29, p.2 Line 1)

Auditor Response

Were you ever able to probe this in more detail? You are not fishing for compliments or affirmation, but trying to determine the nature of that encouragement for her.

Below is an example of an exchange as the categories of comparative were emerging.

Stephen, this chart of emerging Categories and Subcategories is excellent. I have nothing to say other than to ask something. Have you considered at any point, operationally defining the categories themselves? For example, 'supports' is a concept most are familiar with; however, in the context of this study there are some specific connotations. Were you to operationally define you categories, your subcategories would be direct correlates to what was meant by the categories which emerged and in essence have developed for you some grounded theory.

A chart was sent with categories on one side of the page and quotations from subjects on the other. The quotations were organized by date, page, and line making the audit trail easy to follow and understand. Later a flow chart of the process of emergent categories was developed which helped to paint a gestalt of both the direction, and the content of that phase of the study. In addition, emergent grounded theory was evident which helped conceptualize the remainder of the research.

As a result, based on the data I have reviewed and with continuous communication with Stephen Hren about the ongoing collection of that data, I attest that this study has been conducted in a trustworthy manner and that the conclusions drawn have clearly emerged from the data obtained. Measures such as triangulation, member-checking, reflexivity, and categorical emergence were employed with consistency and rigor and thus the evidence to support the findings of this study are both credible and trustworthy.

It was an honor and a pleasure to serve Stephen in the capacity of study auditor.

Michael F. Killeen, Ph.D.

VITA

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Major: Curriculum and Instruction
Dissertation Title: *A Multi-Case Study of the Impact of Perceived Gender Roles on the Career Decisions of Women in Science-related Careers*

Administrative Endorsement, K-12, Utah State University, Logan, UT 2004

M.Ed., Utah State University, Logan, UT 1997
Major: Gifted and Talented education and endorsement
Project: Developed curriculum for an Outdoor Education class

B.A., University of Colorado, Boulder, CO 1986
Major: Environmental Conservation
Minor: Environmental Population and Organism Biology

Professional Work Experience:

2007-present: Principal of Grand County High School, Moab, UT

For the past 5 years, I have been the Principal at Grand County High School. During this time, I have focused on being an instructional leader. Student learning and teacher instructional improvement is evident in my ability to conduct and complete staff evaluations efficiently and on time. Disaggregation of student test data as well as grades has been a focus. We completed our Accreditation self-study which culminated in the Accreditation team visitation in April, 2012. In terms of fiscal responsibility, during my tenure, our school has moved from having a substantial deficit to a positive cash flow and balance.

1989-2007: Science Teacher, Grand County High School, Moab, UT

During my 18 years as a science teacher at Grand County High School, I developed three courses, an outdoor education course that focused on team building and group dynamics, a rigorous college prep field biology course, and a college prep chemistry lab. During my tenure as a science teacher, we had 6 regional Sterling Scholar winners in the science category.

1988-1989: Substitute Teacher, K-12, Lake County School District, Leadville, CO

My most notable experience substitute teaching was during the 4th quarter of the 1988-1989 school year, I took over as the 8th grade science teacher. During this time was when I began to build my base as a solid educator.

Presentations:

During the spring of 2005, I traveled to Anaheim, CA and presented at the National Science Conference. I shared how I had developed partnerships with local biologists in order to give the students in my field biology course real world experiences working in the field and collecting scientific data. The student data were utilized by the biologists to add to their research data bases.

Publications:

As the principal, I have written numerous articles for the local paper related to the high school.