Lived Experiences and Perceptions on Mentoring Among Latina Scientists and Engineers

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A Dissertation Submitted to

The Faculty of
The Graduate School of Education and Human Development
of The George Washington University
in partial fulfillment of the requirements
for the degree of Doctor of Education

January 31, 2010

Dissertation directed by

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The Graduate School of Education and Human Development of The George Washington University certifies that Anitza M. San Miguel has passed the Final Examination for the degree of Doctor of Education as of November 30, 2009. This is the final and approved form of the dissertation.

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Dedication

I wish to dedicate this dissertation to my daughter, Andrea Isabel. Since the day you were born you have brought so much joy and happiness to my life and to our family. You are the light of my eyes and my inspiration to complete this degree. I give thanks to God each day for having you in my life. You are a special and blessed child!

Acknowledgements

"*To produce excellence, you must study excellence.*"

Dr. Donald O. Clifton

My life dream of obtaining a doctoral degree has finally come true. This dissertation is not only the culmination of years of study but the reflection of many generous and inspiring people that made it possible. I am blessed and honored to have family, friends and colleagues who supported and encouraged me throughout this improbable journey. They were there to lift my spirits, inspire me, give me technical guidance, and provide encouragement when everything looked dark, particularly after the birth of my daughter 14 months ago.

I would like to express my deepest appreciation:

To my Dissertation Committee chair, Dr. Mikyong Minsun Kim, who took me under her wings, supported and encouraged me to excel. Without her guidance and persistent help this dissertation would not have been possible;

To my Committee members: Dr. Carolyn W. Graham, who encouraged and in some way persuaded me to become a qualitative researcher; and Dr. Joel Gómez, for his support and encouragement;

To my extended committee members: Dr. Brenda C. Williams and Dr. Frances A. Colón for their support, encouragement and time;

To Deborah Cohen for her persistent encouragement to pursue my doctorate degree and unconditional support since the day we first met at a conference in San Francisco, CA, 13 years ago;

To Dr. Reynolds Ferrante and Dr. Sondra Patrick for believing in me and encouraging me to apply to the Doctoral program;

To the participants of the study for taking the time to participate in the study;

To my parents for providing me with the foundation to become the person I am today;

To my husband for his unconditional support and encouragement since the day I embarked in my doctoral journey. Finally, WE are done!

To God, my Creator and Savior, who guided me through this process and has given me the knowledge and understanding to complete my education. Glory and honor to YOU! Philippians 4:13 “I can do all things through Christ which strengthens me.”

Abstract of Dissertation

Lived Experiences and Perceptions on Mentoring
Among Latina Scientists and Engineers

The purpose of this qualitative study was to reveal the lived mentoring experiences of Latinas in science and engineering. The study also sought to understand how Latina scientists and engineers achieved high-level positions within their organizations and the impediments they encountered along their professional journey. The theoretical framework for this study sought a transcendental phenomenological view with an interpretive perspective that is an interpretive paradigm. Utilizing a phenomenological approach, rich descriptive data were collected to obtain a better understanding of how the study participants achieved successful careers and whether mentoring was a contributing factor. Eight Latinas scientists and engineers were obtained using a purposeful participant selection method.

In-depth interviews, coding, analysis, and careful interpretation resulted in eight major themes. These particular themes revealed common traits and characteristics that these participants shared that made them successful: (a) Trailblazer; (b) Passion and Belief; (c) Support and Encouragement; (d) Networking; (e) Goal-Oriented; (f) Mentoring Type (Grooming, Networking, and E-mentoring); (g) Criticality of Mentoring; and (h) Luck and Opportunities. These eight themes contributed to the participants' professional development and success.

The results revealed that (a) it is important to have multiple mentors at all levels; (b) various types of mentoring can be equally effective; (c) mentoring can be critical to an individual's success; (d) the support and encouragement of mentors is essential, both personally and professionally; and (e) mentoring relationships should not be forced, that

they should be a mutual agreement in which both the mentor and the mentee willingly and enthusiastically participate. The findings suggest that implementing mentoring programs would have positive implications on the Latina population and that this may encourage them to pursue careers in science and engineering.

Recommendations for this study focused on establishing and formalizing mentoring programs, attracting more Latinas to careers in science and engineering, and the need for further research. This study has implications for the future development of mentoring programs for Latinas in science and engineering.

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CHAPTER I

INTRODUCTION

Minority women are underrepresented in the science and engineering professions. The underrepresentation is even more severe when it comes to Latinas (Etzkowitz, Kemelgor, Neuschatz, & Uzzi, 1994; Finley, Ivanitskaya, & Kennedy, 2007; Leslie, McClure, & Oaxaca, 1998; National Action Council for Minorities in Engineering [NACME], 2005). This underrepresentation of Latinas in science and engineering presents an issue of national importance in higher education as well as in the workforce. As the Latino population grows, it is imperative to develop programs to help these minorities succeed in the professional world so that they assimilate and contribute fully to our society (Finley et al., 2007). According to the U.S. Census Bureau (2004), by the year 2050, the Hispanic population will increase by 25%. By that year, Latinos will be the largest minority group in the United States (Job, 1998; President's Advisory Commission on Educational Excellence for Hispanic American, 1996; Schmidt, 2003; U.S. Census Bureau, 2004). These numbers show the magnitude of the population affected.

The purpose of this phenomenological study is to reveal the lived mentoring experiences of Latinas in science and engineering. The study also seeks to understand how Latina scientists and engineers achieved high-level positions within their organizations and the impediments they encountered along their professional journey.

The theoretical framework for this study takes a transcendental phenomenological view with an interpretive perspective, an interpretive paradigm. Feminist theory provided a lens through which to view and understand the lived mentoring experiences of Latinas in science and engineering. This study applied a phenomenological research approach

utilizing the data collection method of intensive interviews with participants to obtain rich and detailed descriptions of the participants' experiences and perceptions about mentoring.

For the past 2 decades, much has been written about the lack of mentoring for women, but virtually no research exists on the mentoring needs specific to Latinas, much less Latinas aspiring to careers in science and engineering. To help young Latinas with such aspirations, the researcher must go to the source for clarity and understanding (L. Drain, personal communication, September 25, 2007). Much of the empirical data found in the literature generalizes the need of mentoring of women and minority groups, but few, if any, studies have conducted qualitative research that allow Latinas in science and engineering to give the story of their experiences. This phenomenological study was conducted to reveal the lived experiences and perceptions of Latinas in science and engineering as it relates to their mentoring experiences.

Chapter 1 presents the statement of the problem, purpose of the study, research questions, significance of the study, paradigm of inquiry, theoretical framework, a brief description of the methodology, limitations and delimitations of the study, definition of terms, and concludes with a summary.

Chapter 2 provides a review of the literature, including a brief description of Latinas, mentoring definition and models, peer mentoring, women and mentoring, and mentoring Latinos, concluding with the literature gap.

Chapter 3 provides a discussion of the research methodology, research questions, rationale for phenomenological research, research method, data collection and analysis

method, trustworthiness, participation method, and concludes with a summary of the chapter.

Chapter 4 sets forth the results and analysis, including a thematic analysis of the themes that emerged. Finally, Chapter 5 provides a discussion of the findings, limitations, recommendations, implications for future study, and conclusions.

Statement of the Problem

Latinas face a variety of dilemmas while pursuing their professional careers. First, like many working women, Latinas have to balance their professional and personal lives, a dilemma that arises from the reality that women often run the household while pursuing their professional careers, and women are expected to perform both well (L. Sanchez, personal communication, September 26, 2007; Peery & Grady, 1998; Vargas, 2007; Villegas & Vincent, 2005*)*. Latinas must also be willing to blend their professional and personal values with those of the company for which they work.

Second, Latinas may face the challenge of cultural stereotypes and perceptions (Job, 1998; Peery & Grady, 1998; Suarez-Orozco & Suarez-Orozco, 2001; Villegas & Vincent, 2005). Cultural stereotypes and perceptions may be manifested in the way Latinas feel about their careers, their priorities in life, and their English language skills. For example, a Hispanic woman with a heavy accent or poor English writing skills may be perceived as not capable and be overlooked for career advancement opportunities (Job, 1998). Another stereotype of Latinas is that they are considered to be uneducated and are thought of as being "the cleaning lady." A persistent idea is that an educated Latina woman is the exception rather than the rule (Job, 1998). Furthermore, those Latinas who have a bachelor's, master's, or even a doctorate degree are often viewed as

having made it through affirmative action rather than through their own merit (Job, 1998).

A third challenge facing some Latinas may be their socioeconomic status (Suarez-Orozco & Suarez-Orozco, 2001; Villegas & Vincent, 2005). A large number of Hispanic immigrants come to the United States in search of better opportunities. These individuals tend to be from the lower social classes in their own countries and, as a result, tend to be poorly educated and low-skilled workers (Rothe, 2004). This is particularly true of Mexican and Central American immigrants (Rothe, 2004). This lack of formal education results in a higher concentration of Latinos in occupations of lower socioeconomic status (Job, 1998; Kochhar, 2005; Suarez-Orozco & Suarez-Orozco, 2001) and a lack of representation in professional, higher paying occupations (Kochhar, 2005). According to Kochhar, 61% of Latinas work in service and sales occupations. Still, Latinas are more likely than Hispanic men to be in professional occupations. In 2000, only 16% of Latinos worked in professional occupations compared with 34% of Non-Latino white and 42% of Asian workers (Kochhar, 2005). These dilemmas describe challenges Latinas face that hinder their achievement of a prominent position within their organization, such as science and engineering.

One viable way to help ease these challenges and to help Latinas succeed in the professional world is mentoring (Brown, 2002; Chesler & Chesler, 2002; Chesler, Single, & Mikic, 2003; Leslie, McClure, & Oaxaca, 1998). Mentoring is a one-on-one relationship between an experienced and knowledgeable individual and a protégé (individual with less experience and knowledge) for the purpose of helping the protégé develop skills necessary to succeed academically, personally, and professionally (Daloz,

1999; Kram, 1983; Kram & Isabella, 1985; Palepu, Friedman, Barnett, Carr, Ash, Szalach, & Moskowitz, 1998). Mentoring can help accelerate the development of Latinas pursuing a career in science and engineering and allow for their full participation and contribution to our professional society. They help individuals achieve greater academic performance, achieve leadership positions, and stimulate the individual to develop academically and personally (Kosoko-Lasaki, Sonnino, & Voytko, 2006).

Based on the aforementioned dilemmas, it is imperative to develop mentoring programs to assist Latinas to develop academically and professionally, particularly during their early academic years, when many of their traits and future behaviors are formed (A. Avalos, personal communication, March 2, 2007). Developing mentors and other role models may be a key to the success of Latinas in science and engineering and their eventual professional success (Haring, 1999). Mentoring may help Latinas not only to pursue a science and engineering careers, but also to excel in it (Haring, 1999; Leslie, McClure, & Oaxaca, 1998).

Purpose of the Study

The purpose of this study was to understand the lived mentoring experiences of Latinas in science and engineering utilizing a phenomenological research approach. A secondary purpose was to understand how Latinas scientists and engineers achieve high-level positions within their organizations and the impediments they encountered in their professional journeys. Findings from face-to-face interviews with successful Latinas in science and engineering professions were the basis of this study.

Research Questions

The research questions that guided this study were as follows:

1. What are the challenges that successful Latinas experience in advancing their careers?
2. What do Latinas perceive as facilitating their career advancement?
3. How did mentoring experiences of Latina scientists or engineers influence their career success or advancement?
4. How do Latinas perceive the effectiveness of mentoring as a viable mechanism in achieving a successful career in science and engineering?

Demographic data were collected through conversation and observation to comprehend the depth and breadth of the research questions. This data helped in the interpretation of the results. The following demographic data were collected: (1) country of origin; (2) age; (3) college degree obtained and name of college; (4) occupation; and (5) parental level of education.

Significance of the Study

This study provides insight into the mentoring experiences of Latinas in science and engineering careers in four distinct ways. First, the research from this study provides information to those in positions in higher education and other professional careers to help young Latinas in science and engineering programs achieve successful careers. Second, the research from this study grants Latinas a positive perception about pursuing careers in science and engineering. Third, this study contributes to the body of knowledge and helps fill the gap in the literature concerning the importance of mentoring Latinas, as there are limited numbers of qualitative studies on this topic, particularly in science and

engineering careers. Fourth, this study validates the importance of mentoring young Latinas and fosters academic and professional excellence in science and engineering (L. Drain, personal communication). This particular point became clear to me after attending a Latinas Congressional Breakfast and Las Primeras® Awards Gala: Honoring Latina Achievement. I realized the importance of closing the gap in the literature and providing information that would help educators, administrators, researchers, and employers assist Latinas in achieving academic excellence and professional success.

Paradigm of Inquiry

The purpose of this study was to understand the lived mentoring experiences of Latinas in science and engineering. The study also sought to understand how Latina scientists and engineers achieved high-level positions within their organization and any impediments they encountered along their journey. This purpose aligned with the philosophy, strategies, and intentions of interpretive research paradigm (Ajjawi & Higgs, 2007; Crotty, 1998).

The interpretive research paradigm is based on the epistemology of idealism, which encompasses the philosophy of phenomenology (Ajjawi & Higgs, 2007; Higgs, 2001). The central goal of interpretivism is to interpret the social world (Higgs, 2001). Interpretivism is frequently associated with the school of thought of Max Weber and Wilhelm Dilthey (Crotty, 1998). Weber suggested that human sciences is concerned with the *Verstehen* (understanding) needed in the human and social sciences, as opposed to the explicative approach, *Erklären* (explaining), that is found in the natural sciences (Crotty, 1998). Dilthey proposed, "natural reality and social reality are in themselves different kinds of reality and their investigation therefore requires different methods" (Crotty,

1998, p. 67). Both Weber and Dilthey compared *Verstehen* (understanding) with *Erklären* (explaining), and concluded there was a difference between qualitative and quantitative research methods (Crotty, 1998). Weber and Dilthey's research approach focused on interpretative understanding in order to access the meaning of the participants' experiences, as opposed to explaining their behavior (Ajjawi & Higgs, 2007; Smith, 1983).

The interpretive research paradigm was considered as the most appropriate paradigm for this research study because of its potential to generate new understanding and meaning of the underrepresentation of Latinas in science and engineering careers, as well as a better understanding of the Latino culture in the United States. This paradigm also generated new understanding of how Latinas in science and engineering achieved a high-level position within their organization and impediments they encountered along their academic and professional journey.

Theoretical Framework

Transcendental phenomenology was used as the philosophical foundation for this study. Understanding the lived experiences marks transcendental phenomenology as a philosophy (Creswell, 2003). Under this phenomenology the researcher sees the phenomenon "freshly, as for the first time (Moustakas, 1994, p. 34). Transcendental "adheres to what can be discovered through reflection on subjective acts and their objective correlates" (Moustakas, 1994, p. 45), while phenomenology "utilizes *only* the data available to consciousness" (p. 45). Through transcendental phenomenology, the study derived textural-structural descriptions of meanings and essences of the mentoring experiences of Latina scientists and engineers, which involved making an interpretation

or meaning of the data (Creswell, 2003). Phenomenology as a philosophy makes use of the participants' experiences and gives human meaning through an interpretivist perspective (Brownell, 2004; Koch, 1995).

Meaning is the basis of transcendental phenomenology; thus, it is a design for acquiring and collecting data that explains and describes the human experience (Moerer-Urdahl & Creswell, 2004). Transcendental phenomenology is both interpretative and descriptive, hence considered ideal for studying and interpreting the lived mentoring experiences of Latinas in science and engineering. This phenomenological approach provided a systematic design and detailed data analysis that leads to an essential description of the participants' mentoring experience.

The aim of phenomenology is to gain a deeper understanding of the everyday experiences while gaining insightful descriptions of the way individuals experience the world (Crotty, 1998; Koch, 1995; Moustakas, 1994; Van Manen, 1990). Through this study, deeper understandings of how a few Latinas have achieved successful careers in science and engineering was achieved. The purpose of the study strongly aligned with transcendental phenomenology by providing the means to interpret and describe the lived mentoring experiences of Latinas in science and engineering careers. In addition, the theoretical framework enlightened this study on Latinas and the aforementioned careers by addressing women's oppression, discrimination, alienation, and equality (Tong, 1989) through feminist theory. A feminist theory approach along with transcendental phenomenology is appropriate for this study because it provides an understanding of the lived experiences of Latinas in science and engineering careers. Feminist theory provides a lens through which to view the lived mentoring experiences of Latinas in science and

engineering careers (Duncan, Kemper, & Menninger-Corder, 2005), whereas transcendental phenomenology provides the philosophical view, through the empirical description and interpretation of the lived mentoring experiences of Latinas.

Feminist theory provides a framework of women's oppression, discrimination, alienation, and equality (Tong, 1989). This framework aligns with the struggles and challenges that Latinas face while pursuing successful careers. There are distinct types of feminist theory—for example, Liberal Feminism, Marxist Feminism, Radical Feminism, Psychoanalytic Feminism, Socialist Feminism, Cultural Feminism, Existentialist, and Postmodern Feminism (Tong, 1989). Liberal and Psychoanalytic Feminism are appropriate feminist theories to answer and analyze the research questions of this study.

Liberal feminism believes that society allows individuals to employ their autonomy and fulfill themselves as individuals (Tong, 1989). Their emphasis is on equality for both men and women. They desire to free women from oppression due to the patriarchal gender roles that sometimes define women lives (García, 1997; Rincón, 1971). There are two types of liberal feminism: classical liberals and welfare liberals. Classical liberals believe that the state protects civil liberties while providing all individuals with equal opportunity, whereas welfare liberals believe the "ideal state focuses on economic justice rather than on civil liberties" (Tong, 1989, p. 12). Therefore, liberal feminists are committed to equality for all and welfare liberals are committed to economic justice.

In the book *Feminist Thought: A Comprehensive Introduction* (1989), Rosemarie Tong discusses the writing of Mary Wollstonecraft (1759–1799), a liberal feminist. Wollstonecraft believed that education "will allow a woman to assume responsibility for

her own development and growth" (p. 16). She further discusses that unless society provides "the equally educated women with the same civil liberties and economic opportunities a man has, she will be able to exercise her hard won autonomy only within the private, or domestic, realm" (Tong, 1989, p. 17). The writings of Wollstonecraft align with the challenges and dilemmas that Latinas face while pursuing their professional careers, as mentioned in the statement of the problem. The lack of representation of Latinas in science and engineering careers is due to the inequality of women in these fields in addition to the low number of Latinas obtaining a higher education degree (Chapa & De La Rosa, 2006; González, Stoner, & Jovel, 2003). Also, there is a correlation between educational attainment and employment opportunities for Latinas (Chapa & De La Rosa, 2006; Cuarón, Vigil, & Renteria, 1979).

Psychoanalytic feminism is rooted in Sigmund Freud's theory of sexuality. However, feminists of the 1970s argued that women's social position and power relative to men had little if anything to do with the female biology. Feminists believed that it had to do with the social construction of femininity (Tong, 1989). Betty Friedan disliked Freud's emphasis on sexuality. She believed that women do not need sexual freedom, but freedom to grow as an individual and develop their own character and personality (Tong, 1989). Juliet Mitchell, a psychoanalytic feminist and sometimes considered a socialist feminist, developed a dual-systems theory in which "woman's status and function are *jointly* determined by her role in production *and* in reproduction, the socialization of children, and sexuality" (Tong, 1989, p. 176). She believed that in terms of production, women lagged behind men even though women are as physically and psychologically capable and qualified for high-paying and prestigious jobs as are men (Tong, 1989).

Mitchell's dual-systems theory aligns with the underrepresentation of Latinas in science and engineering careers. Even though educated Latinas are capable of doing the same job as men, they still lag behind in achieving jobs as high-paying and prestigious as those of men.

The paradigm of inquiry and the theoretical framework are all aligned to support the purpose of this study: to understand the lived mentoring experiences of Latinas in science and engineering, how they achieved high-level positions within their organizations, and the impediments they encountered in their professional journeys. The paradigm of inquiry, interpretive research, generated new understanding and meaning of the underrepresentation of Latinas in science and engineering as well as a better understanding of the Latino culture in the United States. The theoretical framework, transcendental phenomenology and feminist theory, provided the description and interpretation of the lived experiences of Latinas while addressing the underrepresentation, discrimination, alienation, and equality (Tong, 1989) of Latinas.

Few Latinas have overcome the barriers of discrimination and few have obtained positions of authority and policy levels (Cuarón, Vigil, & Renteria, 1979). This means that Latinas could be considered as being oppressed and disenfranchised. Latinas will be able to surpass and break the barriers of discrimination by educating themselves. It is through education and mentoring that Latinas will be able to attain successful careers in science and engineering.

Research Methodology

This study utilized a phenomenological approach to examine Latinas in science and engineering and how they achieved high-level positions within their organizations by

revealing their *lived experiences* (Creswell, 2003; Van Manen, 1990). Phenomenology focuses on "describing the 'essence' of a phenomenon from the perspective of those who have experienced it" (Merriam, 2002, p. 93). Empirical transcendental phenomenology, as defined Moustakas (1994), "involves a return to experience in order to obtain comprehensive descriptions that provide the basis for a reflective structural analysis that portrays the essences of the experience" (p.13). Phenomenological research attends to the individual's everyday experience and how their experiences are structured. A phenomenological approach allows the researcher to obtain rich descriptive data from the participants, while at the same time acquiring a better understanding and developing the meaning of the phenomena that are expressed and described by the participants in a study (Creswell, 2003; Moustakas, 1994).

This study used a transcendental phenomenological approach to understand and interpret the lived mentoring experiences of Latinas in science and engineering careers. The phenomenological approach allows for making reasonable linkages between the interview data and the emerging themes (Gomez & Fassinger, 1995; Moustakas, 1994). Phenomenology further allows the researcher to obtain the account directly from Latinas in science and engineering and provides a voice for Latinas. In-depth and repeated interviews allowed the researcher to comprehend the lived mentoring experiences of Latinas.

Delimitations

A phenomenological inquiry attempt to understand the lived experiences of Latinas in science and engineering was difficult because of the underrepresentation of Latinas not only in science and engineering careers but also in high-level positions within

the private sector. As the literature shows (Gomez & Fassinger, 1995; Job, 1998), the Hispanic/Latino population is not homogenous. To maintain a homogenous population in phenomenological research, only Latinas with a science and engineering degree and currently working in a "high-level position" within their organization were selected for this study, for they share similar experiences.

Science and engineering careers encompass the following fields of study: (a) Science—biological and agricultural sciences; earth, atmospheric, and ocean sciences; mathematics and computer sciences; physical sciences; and health such as medicine; and (b) Engineering—aeronautical and astronautical, chemical, civil, electrical, industrial, materials and metallurgy, and mechanical engineering (NSF, 2004). Psychology and social sciences professions were excluded from this study.

"High-level position" refers to tenured faculty members, junior and/or senior researchers, managers, program directors, decision-makers, and officers of private sector or local, state, or federal agencies. It also refers to Latinas who have attained professional achievement, i.e., recognition, leadership, and upward mobility; uniqueness and contribution to the organization and the field of science and/or engineering; and potential as a mentor.

Maintaining a homogenous population of participants is important in phenomenological studies (Creswell, 2003). The fact that the participants were all women made for a homogenous population.

Purposeful sampling was used in this study. Since only Latinas in science and engineering careers and in "high-level position" within their organization were studied, the findings may not be generalizable to the general population.

Limitations

There are three potential limitations in this study. The first limitation was the geographical representation of the sampled population. The study's sample was limited to Latinas within the researcher's geographical area, that is, the Mid-Atlantic States. These women may have different backgrounds and experiences from those in other geographical regions, so the research findings may not be applicable everywhere.

The second limitation was that the selected population was not homogenous. The Latino population is a highly heterogeneous group (Gomez & Fassinger, 1995). Latinas are as diverse as the countries they represent. Although Latinas may speak Spanish, their cultural heritage might differ. A Latinas could be categorized either as an immigrant or as a woman born and raised in the United States from Latino parents. Those women born and raised in the United States, although Hispanic, might have a sense of their Hispanic heritage that does not mirror that of the women who are immigrants. Furthermore, the Latina immigrant faces challenges and hurdles different from the Latina born and raised in the states, for example, fluency in English (L. Drain, personal communication, October 1, 2007).

The third limitation was the underrepresentation of Latinas in science and engineering careers. As a result, the study was opened to all Latinas in science and engineering careers and in a high-level position within their organization.

Definition of Terms

The following definitions are included to clarify the major terms used throughout this study.

Hispanic. A person whose native language is Spanish. These include women from Spain but exclude those from Brazil (Hispanic, n.d.).

Latino(a). A person who comes from a Latin American country, including Brazil, where Portuguese is spoken; a Latina woman (Latino, n.d.).

Mentor. An experienced, productive individual who relates to a less-experienced individual, who facilitates his or her personal development for the benefit of the individual as well as the organization (Kram, 1995).

Protégé. Merriam-Webster's online dictionary (2007) defined protégé as a person who is protected, trained, or whose career is advanced by a person of experience, prominence, or influence (Protégé, n.d.).

Summary

This chapter presented a review of the statement of the problem, the purpose of the study, the research questions, the significance of the study, the paradigm of inquiry, and the conceptual framework; a brief description of the methodology; the limitations and delimitations; and definition of terms. The purpose of the study was to understand the lived mentoring experiences of Latina scientists and engineers, how they achieved high-level positions within their organizations, and the impediments they encountered along their professional journey. The study results will allow those who are positioned within higher education and other professional careers to develop programs to help Latinas pursuing careers in science and engineering to excel, following the roadmap of the study subjects. Having successful Latinas in science and engineering will attract others to pursue similar careers. Chapter 2 provides a review of the literature.

CHAPTER II

LITERATURE REVIEW

Minority women are underrepresented in the science and engineering professions. The underrepresentation is even more evident when it comes to Latinas. Still, little is known as to how Latinas in science and engineering achieved their academic and professional careers. As noted in the research (Grant-Vallone & Ensher, 2000; Kram, 1983; Noe, 1988; Wanberg, Welsh, & Hezlett, 2003), mentoring relationships provide encouragement, guidance, and the necessary tools for the protégé to achieve their goals. This study will expand on that knowledge. It is imperative, however, to examine the literature in order to analyze gaps and needs.

This literature review examined various areas related to mentoring women and mentoring Latinas in science and engineering. This review provides the foundation for understanding the importance of the study and highlights the gaps in the literature that the study intends to address.

Latinas

Latinas have different backgrounds, educational levels, and social classes (Job, 1998; Quintana-Baker, 2002; Verdugo, 2006). It is necessary to understand that Hispanic/Latinos are not a homogenous group and "their differences in ethnicity reflect significant cultural and economic variation" (Verdugo, 2006, p. 4). These differences may not be reflected in the literature, where the terms "Latin" and "Hispanic" may be used interchangeably and without regard to their backgrounds or country of origin. Although the two terms are sometimes used interchangeably, they represent different groups. Both were included to allow for a wider range of Hispanic/Latino groups to be

studied (e.g., Mexicans, Salvadorians, Puerto Ricans, and Spanish, among other groups), because their representation in science and engineering programs is limited (Baker, 2000; SJB Research Consulting, 2004). For the purpose of this study, both terms ("Hispanic" and "Latin") were used interchangeably. Although the two terms represent different groups, it is important to define both terms because Spanish speakers are divided on the meaning of both terms and others are just confused (Diaz, 2004), even in the literature.

In general terms, Hispanics/Latinos are the least educated ethnic group in the United States (Rothe, 2004; Suarez-Orozco & Suarez-Orozco, 2001; Villegas & Vincent, 2005). It is likely that Latinas, particularly immigrants, will drop out of high school and not attend college (Academy for Educational Development, 1992; Villegas & Vincent, 2005). Data from a survey conducted by the Academy for Educational Development (1992) cited pregnancy or marriage as the reason for leaving school. Programs have to be developed to help young Latinas graduate from high school and at the same time foster academic excellence. Young Latinas are the future leaders of our country. By understanding the lived experiences of Latinas in science and engineering, educators will be able to help young Latinas graduate and further pursue a college degree.

Other challenges facing Latinas include "inadequate preparation, a scarcity of role models, low expectations on the part of others, and unfamiliarity with the culture and idioms of science" (National Academy of Sciences [NAS], National Academy of Engineering [NAE], Institute of Medicine [IOM], 1997, p. 9).

Considering all of these challenges, few Latinas, particularly those from immigrant backgrounds, have been able to pursue careers in science and engineering. These women have achieved a career despite considerable obstacles, challenges, and

impediments. These successful Latinas may have achieved success on their own, through hard work, or perhaps with help from mentors. It is quite important to learn how these Latinas achieved their success so that the process can be repeated. Their experiences would be invaluable in developing mentoring programs for young Latinas. This study reveals how Latinas in science and engineering achieved a high-level position within their organization.

Latinas face various dilemmas that hinder their success in the workforce. Researchers (Kosoko-Lasaki, Sonnino, & Voytko, 2006; Kram, 1983; Kram & Isabella, 1985; Wanberg, Welsh, & Hezlett, 2003) have found that mentoring is beneficial to the success and empowerment of individuals. However, it is noted that there is a lack of mentoring programs in science and engineering careers. The problem is also present in higher learning institutions where there is a lack of mentoring of minority female graduate and postdoctoral students (National Science Foundation [NSF], 1999). The NSF reported, "Black, Hispanic, and American Indian women are less represented among science and engineering doctoral degree recipients than are minority men" (NSF, 1999, chap. 1). Without these programs, those Latinas attempting to pursue degrees in science and engineering may be discouraged from continuing and eventually completing their degrees. It is imperative to retain these individuals and give them the support they need.

Mentoring relationships have the potential to alleviate stress by increasing the protégé's self-confidence, forewarning of career stress, and suggesting ways to deal with it (Burke & McKeen, 1990). It is during the first years of the protégé's career that he or she needs the guidance and support of a mentor. Individuals who have an ongoing relationship with their mentors are better prepared for their careers (Steiner, Curtis,

Lanphear, Vu, & Main, 2004). This support can greatly benefit Latinas pursuing a career in science and engineering, where they remain significantly underrepresented in science and engineering programs in higher education as well as in the careers they are meant to lead to (SJB Research Consulting, 2004).

Researchers (Kosoko-Lasaki et al., 2006; Kram, 1983; Kram & Isabella, 1985; Wanberg, Welsh, & Hezlett, 2003) have identified mentoring as an important element in the academic and professional advancement of an individual. Women in general do not receive mentorship support from other women while pursuing their professional careers (Collins, 1983; Perry & Grady, 1998). Researchers (Etzkowitz, Kemelgor, Neuschatz, & Uzzi, 1994; Valian, 1999) have identified societal and climate issues as the main reasons in discouraging women from pursuing careers in science and engineering. For example, women are typically the ones raising a family or caring for the elderly (Rosser, 2003). They have to balance raising a family and pursuing a professional career.

The scarcity of women in science and engineering programs in higher education as well as in science and engineering careers can lead to "isolation, lack of mentoring, stereotypes about women's performance, and difficulty gaining credibility among male peers and administrators" (Rosser, 2003).

The problem is real. Latinas are a unique population with unique challenges. It is important to understand these challenges and provide Latinas with the support they need for them to become contributing citizens in our society. Mentoring programs for Latinas pursuing careers in science and engineering would help in this regard. The scarcity of women in science and engineering is of great concern, and validates the need for further study.

Latinos in Higher Education

The Latino population in the United States has grown by more than 57% in the past decade according to the 2000 U.S. Census (Chapa & De La Rosa, 2006; U.S. Census, 2004a). The U.S. Census (2004b) predicts that the Latino population in the United States will continue to grow at a much faster rate. Although the Latino population in the U.S. is growing, Latino participation in higher education is unable to keep pace (Chapa & De La Rosa, 2006; González, Stoner, & Jovel, 2003).

The number of Latinos with doctorate degrees is very low, according to Chapa and De La Rosa (2006). The low number of Latinos with doctorate degrees illustrates how few Latinos make it through the end of the higher education journey (2006). The underrepresentation of Latinos in higher education increases as the level of education increases (Chapa & De La Rosa, 2006). The same generality is true for Latinos enrolled in science and engineering programs (2006).

Understanding the underrepresentation of Latinos in higher education is crucial. Latino students come from diverse backgrounds with a wide range of factors that limit their participation and success in higher education. Some of these factors are (a) low-income households, (b) low levels of parental education, and (c) enrollment in underperforming schools (Chapa & De La Rosa, 2004; Rothe, 2004; Stanton-Salazar, 1997; Suarez-Orozco & Suarez-Orozco, 2001; Villegas & Vincent, 2005). In the previous section, I discussed in detail some of the aforementioned factors. Latino students are underrepresented in both higher education and in science and engineering programs. As the education level gets higher (i.e., Bachelor's, Master's, and Doctorate degrees), the Latino underrepresentation increases. It is for this reason that it is imperative to

understand how so few Latinos obtain their doctorate degree and to examine the role that mentoring plays in achieving this milestone. It is also important to note that "high-level of achievement" can be subjective.

Mentoring

An understanding of the literature of mentoring is essential to the proposed study, because the lived experiences of Latinas in science and engineering careers may include significant experiences in mentoring for themselves and others. This more extensive exploration of the mentoring literature provides an intellectual means to better comprehend the depth and breadth of the mentoring experience. The literature exploring the definition of mentoring, the importance of mentoring, and various types of mentoring, such as peer mentoring and the mentoring of underserved populations, are explored here.

Definition of Mentoring

An understanding of the definition of mentoring is essential to understanding the many forms and practices of mentoring; nevertheless, a precise definition for mentoring is difficult to determine. The word "mentor" can be traced to Greek mythology. Mentor was the trusted friend of Odysseus. When Odysseus left for the Trojan War, Mentor was responsible for raising Odysseus' son, Telemachus (Carden, 1990; Daloz, 1999; Sosik & Lee, 2002). Mentor was not just a teacher; he was also a transitional figure who assisted Telemachus in his growth and personal development (Daloz, 1999; Sosik & Lee, 2002).

Mentoring can be defined as a one-on-one relationship between an experienced and knowledgeable individual with a protégé (individual with less experience and knowledge) for the purpose of helping the protégé develop skills necessary to succeed academically and personally (Ibarra, 1993; Kram, 1985; Noe, 1988; Palepu et al., 1998).

This mentoring definition sets the limits of this study as it applies to Latinas in science and engineering careers.

Mentoring Models

Mentoring is considered a career enhancement strategy for women. Swoboda and Millar (1986) describe two theoretical models of mentoring that offer different mentoring perspectives for women, one to advance their careers and another to plan future career strategies. These two mentoring models are Grooming-Mentoring and Networking-Mentoring (Haring, 1999; Swoboda & Millar, 1986). A third model is emerging, E-mentoring (Packard, 2003). These three models are described below.

The Grooming-Mentoring model is utilized in formal mentoring programs. This model represents the classical conception of mentoring from Greek mythology (Carden, 1990; Haring, 1999; Sosik & Lee, 2002). In this mentoring model, the mentor is paired with a protégé to enhance the protégé's possibilities of transition (Haring, 1999; Kram, 1985). It is noted that in this type of mentoring relationship, the mentor is more experienced and usually older than the protégé. This creates a sense of hierarchy between the mentor and the protégé (Haring, 1985; Kram & Isabella, 1985). Further, this type of mentoring relationship tends to be homogenous; that is, the mentors usually choose protégés who are similar to them in one way or another (Haring-Hidore, 1987). This model is best suited to mentors seeking to pass along their knowledge and skills to create a protégé in their own image (Haring-Hidore, 1987; Swoboda & Millar, 1986). The Grooming-Mentoring model is also ideal for the protégé who wants to succeed the mentor in the organization (Haring, 1987). Formal mentoring relationships vary with the level and activity of the mentor and protégé (NAS, NAE, & IOM, 1997). The relationship

should be based on a goal "to advance the educational and personal growth of the student" (p. 3). The Grooming model assists underrepresented students, such as Latinas, by welcoming, nurturing, and encouraging the student to ask questions (NAS, NAE, & IOM, 1997). This type of relationship also challenges Hispanic/Latinas to develop critical thinking, self-discipline, and good study habits (NAS, NAE & IOM, 1997). Moreover, it is expected that the mentor knows important people in the field and that the protégé will benefit as a result of those connections.

The second model, the Networking-Mentoring model, requires a more flexible and mutually interdependent pattern of training, information sharing, and support (Swoboda & Miller, 1986). This model is characterized by contacts between two or more individuals in which each of them plays the role of mentor and protégé at different times (Haring-Hidore, 1987). This model relies more on the protégé taking an active role in the relationship and networking through his or her circle of colleagues. Moreover, this model could also be called the Peer-Mentoring model (Kram & Isabella, 1985). Peer-mentoring programs, for example, assist underrepresented minority students, such as Latinas, in their transition to the university environment (Good, Halpin, & Halpin, 2000; Ibarra, 1993). Peer-mentoring programs have been found to be effective in retaining students (Brawer 1996; Quilan, 1999). According to Swoboda and Millar, one disadvantage of the Networking model is that although, for example, networking-mentoring relationships enhance careers, they generally do not enhance a woman's career as rapidly as the Grooming model (Haring-Hidore, 1987). Somewhat implicit in the Grooming-Mentoring model is the expectation that the mentor knows important people in the field; for example, in science and engineering.

Advances in technology have made it possible for a third mentoring model, the E-mentoring model, to emerge. This model utilizes technology to promote the mentoring relationship, making face-to-face contact unnecessary. Technology-supported mentoring has increased an individual's access to mentoring opportunities and expanded the realm of who can mentor and be mentored (Packard, 2003). For example, MentorNet (The E-Mentoring Network for Diversity in Engineering and Science*)* is "a nonprofit e-mentoring network that positively affects the retention and success of individuals in engineering, science and mathematics, particularly but not exclusively women and others underrepresented in these fields" (MentorNet, http://www.mentornet.net/). An E-mentoring network provides protégés with one-on-one, email-based mentoring relationships with mentors from industry, government, and higher education (MentorNet, 2007). The mission of MentorNet is "to further the progress of women and others underrepresented in scientific and technical fields through the use of a dynamic, technology-supported mentoring network" (http://www.mentornet.net/). E-mentoring provides mentors increased flexibility to establish contact at times suitable for the protégé's schedule regardless of his or her geographical location (Packard, 2003). In contrast to the Grooming-Mentoring model and Networking-Mentoring model, the E-mentoring model allows mentors and protégés to communicate more frequently, without the need of a personal meeting. For women, this is a tremendous advantage because it provides access to mentoring without having to meet face-to-face with their often-male mentor. However, the use of technology for communication may inhibit the personal contact and nurturing necessary for achieving a successful mentoring relationship.

The Grooming-Mentoring model provides the formality and hierarchy needed to establish a solid mentoring relationship, while the Networking-Mentoring model provides flexibility to both the mentor and protégé. The E-mentoring model provides a way for both the mentor and protégé to communicate frequently despite the geographical location of both. Because of the unique challenges facing Latinas, a combination of the three mentoring models would be best. Combining the three models allows the face-to-face mentoring relationship to develop while allowing frequent interaction through technology. The three mentoring models discussed are relevant to the study, as the researcher determined which of the three models was prevalent among the Latinas in science and engineering.

Mentoring Conceptual Framework

Mentoring is considered an important tool in the upward academic and professional progression of individuals. Hunt and Michael (1983) developed a conceptual framework that provides a model for the future study of mentoring of Latinas in science and engineering. The conceptual framework consists of "the outcomes of the mentor-protégé relationship; the context within which mentor-protégé relationships emerge; the characteristics of the mentor and protégé; and the stages of the mentorship process" (p. 478).

Outcomes of the mentor-protégé relationship. The outcomes of a mentoring relationship may be positive or negative for the mentor, the protégé, and the organization (Hunt & Michael, 1983). Mentors often get satisfaction through helping the protégé achieve their goal. For the mentor, participating in a mentor-protégé relationship means that they are giving back to society (L. Drain, personal communication, October, 18,

2007). Organizations benefit from having mentor-protégé relationships. Some of the benefits for the protégé are (a) better education, (b) better pay, (c) being less prone to change jobs, and (d) satisfaction with their work and organization (Hunt & Michael, 1983). The benefits for the organization include the development of managerial talent for the organization. Mentorship helps produce active members in professional societies. The members become self-confident and knowledgeable, and they may become scholars. Negative outcomes are usually reflected upon the protégé. Mentoring relationships that are not complemented or are abruptly ended may result in "a loss of self-esteem, frustration, blocked opportunity, and a sense of being betrayed" (Hunt & Michael, 1983, p. 479). For the mentor this reflects negatively.

Context with the mentor-protégé relationship. Mentoring varies depending on the cultural context in which it takes place. The cultural context can be examined in terms of "organizational characteristic, careers or occupations, and social network or interpersonal relationships between mentors and other member of the organization" (Hunt & Michael, 1983, p. 479). Organizational structure and processes affect the mentor-protégé relationship. Kram (1980) identified organizational characteristics within the organizational structure that affect the mentoring relationship within the organization. The organizational characteristics identified by Kram (1980) are (a) presence of multiple management levels, (b) committee-based promotion decisions, and (c) the pyramid of positions within the organization. Regardless of the variables, affected will be the frequency, quality, and outcomes of the mentoring relationship (Hunt & Michael, 1983). Mentoring in the work environment is complex and involves organizational, occupational, positional, and interpersonal issues (Hunt & Michael, 1983). It is important

to note that the characteristics of the mentor as well as the protégé are critical for determining the initiation of mentorship.

Characteristic of mentor and protégé. Mentors can assume different roles during the mentor-protégé relationship. During a given day a mentor can assume the following roles: teacher, guide, counselor, motivator, sponsor, coach, advisor, role model, referral agent (develop action plan to guide the protégé toward career goals that have been set), and door opener (open doors of opportunity) (National Institutes of Health [NIH], n.d.). To assume the aforementioned roles successfully, the mentor needs to be supportive, patient, respected, people-oriented, good motivator, an effective teacher, secure in his/her position, an achiever, and accepting of others (NIH, n.d.). Successful mentorship depends not only on the mentor but also on the characteristics of the protégé. The characteristics of the protégé include those of being goal-oriented, seeking challenges, taking initiative, eager to learn, accepting of personal responsibility, able to work as a team player, flexible and understanding of the mentor's schedule, and having a positive attitude (University of Texas at Austin, 2006).

Hunt and Michael (1983) document other characteristics that are differential between the mentor and protégé. These characteristics are (a) age, (b) gender, (c) position within the organization, (d) power, and (e) self-confidence. Mentors are generally older than the protégé. Researchers (Levinson, Darrow, Klein, Levinson, & McKee, 1978; Phillips, 1977) have studied the age differential between the mentor and protégé. Their studies state that the mentor must be old enough to have accumulated the necessary experience that will benefit the protégé. The age of the protégé may be an important factor (Hunt & Michael, 1983). Young and aspiring scientists and engineers who are

some years younger than their mentor are normally chosen as protégés (Kanter, 1977; Levinson et al., 1978). The protégés' needs and concerns will depend on their career stage.

Stages of mentorship process. To fully understand mentoring relationships, particularly those that would benefit Latinas, it is necessary to look at the stages of a mentoring relationship. Researchers (Hunt & Michael, 1983; Kram; 1983) described four main stages of mentoring: (a) initiation, goals, and expectation are established; (b) cultivation, the mentor-protégé relationship strengthens, and the mentor provides support, guidance, and coaching; (c) separation, where the protégé may not need the guidance and coaching of the mentor; and (d) redefinition—the protégé has succeeded in his work and no longer needs his or her mentor. By this time, the relationship is based on professional alliance and lasting relationship (Hunt & Michael, 1983; Kram; 1983).

When starting a mentor relationship, the roles, expectations, and outcomes of both the mentor and protégé should be clearly defined. Mentors and protégés who clearly outlined their goals and expectations have the most productive and satisfying mentoring experience (Olson & Connelly, 1995); their expectations were well-defined. The same would be true for the development of mentoring programs for Latinas in science and engineering.

Peer Mentoring

Researchers (Good, Halpin, & Halpin, 2000; Grant-Vallone & Ensher, 2000) have noted that peer-mentoring appears as a viable approach to providing mentors to underrepresented groups such as Latinas. Peer-mentoring emerges when both the mentor and the protégé share common interests, help each other, and "de-emphasize seniority

and hierarchy" (Chesler & Chesler, 2002, p. 52). In particular, "Programs that foster peer mentoring and community building may be more likely to meet the needs for women faculty than traditional, hierarchical mentoring relationships" (Chesler, Single, & Mikic, 2003, p. 257). Peer mentoring is a feasible alternative to the traditional mentoring relationship. Peer mentoring has been adopted in some colleges and universities as a means of assisting freshmen women in their transition to the college life (Good et al., 2000; Quilan, 1993). Peer mentors provide support systems to improve the student's college environment (Good et al., 2000; Grant-Vallone & Ensher, 2000; Ibarra, 1993). Peer-mentoring programs may assist underrepresented minority students, in this case Latina woman, in their transition to the university environment (Good et al., 2000).

Peer-mentoring programs create support networks among underrepresented women and increase the retention and academic success of the women. Grant-Vallone and Ensher (2000) stated, "Peer mentors might provide some of the same functions as true mentors" (p. 637). For example, some of the functions that traditional mentors provide are information sharing, job-related feedback, confirmation, emotional support, personal feedback, and friendship. One key advantage of peer mentors is that the age difference is less. This allows more interaction between the peer mentor and protégé. In addition, peer relationships may serve both career advancement for the protégé as well as psychosocial functions (Grant-Vallone & Ensher, 2000). Because this study is limited to Latinas, peer mentoring is an alternative approach to mentoring Latinas in science and engineering.

Overall, both traditional and peer-mentoring relationships may be beneficial to Latinas in science and engineering careers. Both allow the protégés, including women, to

achieve greater academic and/or professional performance and stimulate the individual to develop professionally. Organizations should develop mentoring programs to enhance retention and academic/professional success of Latinas in science and engineering careers. As has been reviewed in the literature, researchers have identified both types of mentoring relationships as being beneficial to individuals, including Latinas. Providing Latinas in science and engineering careers with different mentoring relationships and role models would have positive implications on their career advancement and development as professionals.

Women and Mentoring

Mentoring is often identified as an important factor in the career success of both men and women (Burke & McKeen, 1996; Noe, 1988); however, the number of mentoring relationships available to women has not kept pace with the increasing number of women needing mentors (Chesler & Chesler, 2002; Noe, 1988). Without a mentor, women are unable to understand the reality of the male-dominated business culture (Noe, 1988; Stewart & Gudykunst, 1982). It is crucial for women to have the support and assistance of a mentor or role model during her academic and professional career (Huber, Huidor, Malagón, Sánchez, & Solórzano, 2006). Women also fail to obtain the sponsorship needed to identify them as highly talented and to direct and support them in their career advancement (Noe, 1988). "From an organization's perspective, the failure to identify and utilize talented women reduces effectiveness, and it may result in the organization not being able to meet equal employment opportunity or affirmative action goals" (p. 65). The mentor will provide academic and professional help as well as support during the women's academic and professional career (Huber et al., 2006).

Dr. Ruth Striegel-Moore, a professor at Wesleyan University, sees "the shortage of female mentors as a function of the contemporary role of women" (Schlegel, 2000, para. 5). The shortage of female mentors could be attributed to the challenge that women face trying to balance their professional career with family. The familial and caretaking roles expected of women compete with career demands (Chesler & Chesler, 2002; Chesler et al., 2003). Women who successfully achieve careers in science and engineering often face difficulties in their interpersonal relationships and self-esteem (Chesler & Chesler, 2002).

The shortage of potential female mentors leads to cross-gender mentoring (Ibarra, 1993; Ragins & McFarlin, 1990). Also, the lack of women in high-level management positions and the perception that men have more power than women are reasons for cross-gender mentoring relationships being prevalent among women (Ibarra; Ragins & McFarlin; Thomas, 1990; Chesler & Chesler, 2002). It is important to note that cross-gender mentoring relationships can create unfounded rumors because of the development of intimacy and sexually charged interactions (Chesler & Chesler; Ibarra). Research has shown that cross-gender mentoring brings difficulties to women who were reluctant to work late or socialize with their mentors for fear of gossip or negative reactions among their peers (Ibarra; Ragins & McFarlin; Thomas). Protégés with the same-gender mentor would be likely to receive more mentoring than those who have mentors of different genders (Feldman, Folks, & Turnley, 1999) because they perceive that the mentor will have experienced difficulties and challenges similar to their own (Chesler & Chesler, 2002). Due to their limited numbers, the same can be expected of Latinas in science and engineering careers.

Huber, Huidor, Malagón, Sánchez, and Solórzano (2006) recommended recruitment of faculty of color and the creation of faculty mentoring programs, in their 2006 Latina/o Education Summit Report. The first recommendation of the report suggested that institutions must recruit faculty of color to support the underrepresented student population, for example Latinos. The second recommendation suggests that institutions should create mentoring programs "that facilitate supportive mentor relationships between faculty and students while offering faculty members incentives to participate" (p. 11). Mentors are crucial during undergraduate and graduate school. Latina students need to be able to identify mentors who will assist them in finding financial aid, academic help, and emotional and moral support during their academic career (Huber, Huidor, Malagón, Sánchez, & Solórzano, 2006). The same could be said of Latinas pursuing careers in science and engineering or high-level positions within their organizations. Mentorship is a key factor in the college and professional careers of Latinas. Mentors are influential in the success of Latinas in pursuing a college degree as well as in achieving successful careers in science and engineering,

Mentoring Latino Professionals

The mentoring literature includes limited studies specifically about Latinos/Latinas in science and engineering. Most of the literature on mentoring is found in the business field (Daloz, 1999; Ibarra, 1993; Kram, 1983; Noe, 1988). Two relevant studies about Latino students, both male and female, majoring in science and engineering will be discussed. A third study about a faculty mentoring program and its effect in Latino college adjustment will also be discussed.

The first study, conducted by Brown (2002), evaluated Hispanic students majoring in science and engineering. These were students who succeeded against all barriers to find a place in the science and engineering community. Brown interviewed 22 Hispanic students (12 female, 10 male) who were majoring in science at a state university in the southwestern part of the United States. Brown utilized Seidman's (1998) in-depth interview technique to obtain rich, descriptive data. The high school and college transcripts were analyzed to determine the level of preparedness for each student (Brown, 2002).

The data collected from the classroom observation, high school and college documents, and from the focus groups also supported the seven themes that emerged. The seven themes are (a) familial support, (b) honors program, (c) challenging and interactive curriculum, (d) college preparation, (e) the caring, kind teacher, (f) small class size, and (g) small communities (Brown, 2002). The results of the study indicate that the aforementioned themes made a lasting difference among the 22 Hispanic students who participated in the study. The study concluded that educational leaders must seek new ways to engage and retain Hispanic students. The Mentoring program is one of those ways. The emerging themes from Brown's study provide a framework for educators to assist Hispanic students in choosing a career in science and engineering.

Brown's (2002) study, however, has a serious shortcoming. The author failed to discuss the nationality/specific background of the students who participated in the study. Brown also failed to discuss the role of mentoring in the students' educational journey. From the emerging themes, it can be generalized that "the caring, kind teacher" is the mentor. Although Brown discussed the different themes that emerged from the

interviews, a comprehensive discussion of how these themes affected each of the participants would have provided additional information as to the students' educational journey.

The second study, conducted by Quintana-Baker (2002), evaluated the characteristics of Hispanic U.S. citizens who earned doctoral degrees in science, technology, engineering, and mathematics (STEM). The researcher examined quantitative data from the Survey of Earned Doctorates from the National Research Council's Doctorate Records Project. The data were segregated according to three major Hispanic subgroups: Puerto Rican, Mexican American, and "other" Hispanics. The results of the study suggest that there is a disparity in the distribution of doctorate degrees earned among Puerto Ricans, Mexican American, and other Hispanics. Among these three groups, Puerto Ricans earned 29% of the doctorates; Mexican Americans are the most underrepresented with 24% of the doctorates; and other Hispanics earned 47% of the doctorates.

In this study, the author fails to discuss which factors influenced Hispanic students to pursue a doctorate degree. Quintana-Baker's (2002) study also generalizes the results to the three groups studied: Puerto Ricans, Mexican American, and other Hispanics. The generalization of the results might not be applicable or consistent throughout these three ethnic groups. Also, the author fails to discuss why he separated Hispanics into these three specific groups. However, the author did state that Hispanics are not a single homogeneous group and the results were not truly representative.

The study will broaden the results obtained by Quintana-Baker (2002) by analyzing qualitative data, specifically addressing the mentoring needs of Latinas in

science and engineering. The study will address a similar but more specific topic with a qualitative rather than quantitative approach.

The third study, conducted by Santos and Reigadas (2002), discussed the Faculty Mentoring Program (FMP) at California State University, Dominguez Hills. The purpose of the study was "to understand the student-faculty mentoring process and how mentoring facilitates Latino students' academic adjustment to college" (Santos & Reigadas, 2002, p. 40). The researchers used a quantitative approach in their study. Thirty-two Latino students participated in the study and they were part of the FMP. The students provided information about their relationship with their mentor. The results of the study revealed that students achieved college self-efficacy and academic goal definition after joining FMP. It was concluded that Latino students who had mentors of the same ethnic group perceived their mentors as being more helpful. Also, frequent contact between the mentor and the student was associated with the Latino students' adjusting to the college environment, furthering the students' career, personal development, and general satisfaction with the FMP (Santos & Reigadas, 2002).

In this study, the authors concentrated only on the data obtained for the Latino students. Data were also obtained for African Americans, European Americans, and other minority groups. The results of Santos and Reigadas' study (2002) assisted me with my study. Also, the results of the study provided a guide to understand the mentoring process based on the experiences of Latino students.

Literature Gap

The review of the literature demonstrates a literature gap, specifically in mentoring Latinas in science and engineering. Research that focuses solely on Hispanic/Latinas in science and engineering is limited or nonexistent. Even more limited is literature on the success and achievement of Latinas in science and engineering. Few resources have been allocated to research on Latinas (Cuarón, Vigil, & Renteria, 1979). The study enhanced the literature on Latinas and began to close the gap in the literature.

The seminal works of Ibarra (1993), Kram and Isabella (1985), and Noe (1988) all showed that mentoring is crucial to academic and professional advancement of individuals. Researchers (Brown, 2002; Chesler & Chesler, 2002; Chesler et al., 2003; Leslie et al., 1998) have found that mentoring is essential for women in science and engineering. Since the literature is limited on mentoring Latinas in science and engineering, the study has enhanced the literature. This study helps one understand how it is that few Latinas have achieved a high-level position within their organization. The study also gives a voice to Latinas in science and engineering.

The underrepresentation of women, including Latinas, in science and engineering is well known (Leslie et al., 1998; Quintana-Baker, 2002; Wanberg et al., 2003) but little studied. Little is known as to how Latinas in science and engineering have achieved their academic and professional goals and the role that mentoring may have had in their professional journeys. As noted in the research (Grant-Vallone & Ensher, 2000; Kram, 1983; Noe, 1988; Wanberg et al., 2003), mentoring relationships provide encouragement, guidance, and the necessary tools for the protégés to achieve their goals. It is essential to understand how the few Latinas in science and engineering have achieved a high-level

position within their organization to help young Latinas pursue careers in science and engineering. For this reason alone, the findings of this study could have significant implications in the lives of Latinas, thus enhancing the overall future well-being of our country.

This chapter presented a discussion of the following topics: (a) Latinas, (b) Mentoring, (c) Peer Mentoring, (d) Women and Mentoring, and (e) Mentoring Latino Professionals. The review of the literature demonstrated that there is an overall underrepresentation of Latinas in science and engineering. The literature, however, failed to determine whether this underrepresentation is also applicable to those who have achieved high-level positions. The literature does not elaborate on how successful Latinas achieved their success, nor does it elaborate on their representation within the larger population. In other words, it is known that Latinas are underrepresented in science and engineering but it is not known if the underrepresentation can be extrapolated to those in high-level positions. This study attempts to enhance the literature in that regard by helping to close the existing gap.

CHAPTER III

METHODOLOGY

This study utilized a phenomenological approach to examine Latinas in science and engineering careers and how they achieved high-level positions within their organizations by revealing their *lived experiences* (Creswell, 2003). Phenomenology focuses on "describing the 'essence' of a phenomenon from the perspective of those who have experienced it" (Merriam, 2002, p. 93). Phenomenological research focuses on the individual's everyday experience and how their experiences are structured. A phenomenological approach allowed me to obtain rich descriptive data from the participants, while at the same time to acquire a better understanding and interpretive meaning of the phenomena that is expressed and described by the participants in a study (Creswell, 2003; Moustakas, 1994).

This chapter provides a discussion of the research methodology, which includes a rationale for using phenomenology, research questions, site and participant selection, sampling, and data collection and analysis approach. A discussion of trustworthiness of the research is also presented. The essence of this study proposed to understand Latina scientists and engineers' perceptions of mentoring, how they achieved high-level positions within their organizations, and the impediments they encountered along their professional journey.

Research Questions

The research questions that guided this study were these:

1. What are the challenges that successful Latinas experience in advancing their careers?

2. What do Latinas perceive as facilitating their career advancement?
3. How did mentoring experiences of Latina scientists or engineers influence their career success or advancement?
4. How do Latinas perceive the effectiveness of mentoring as a viable mechanism in achieving a successful career in science and engineering?

Demographic data were collected through conversation and observation to comprehend the depth and breadth of the research questions. These data helped in the interpretation of the results. The following demographic data were collected: (a) country of origin; (b) college degree obtained and name of college; (c) occupation; and (d) parental level of education.

The semistructured interview questions that composed the Interview Instrument for this study were:

1. What do you think made you successful in your career?
2. What experiences do you consider helped you in achieving your current position?
3. What experiences do you consider as a hindrance in achieving your current position?
4. What does mentoring mean to your career?
5. What are your perceptions about mentoring Latinas in science and engineering careers? What are the benefits? What are the challenges?
6. How did you meet your mentor?
7. What is the significant quality of your mentor(s) that helped your career advancement the most? Helped the least?

8. How did your mentor(s) influence your career path?
9. How did mentors help you achieve the position you have achieved?
10. How do you feel about mentoring programs as a viable way to help Latinas achieve their academic and professional goals?
11. What others factors do you consider to be more or less important than mentoring?

Rationale for Phenomenological Research

The study utilized a phenomenological approach to understand the lived mentoring experiences of Latinas in science and engineering. The phenomenological approach allowed for making reasonable linkages between the interview data and the emerging themes (Gomez & Fassinger, 1995; Moustakas, 1994). Phenomenology made it possible to obtain the story directly from Latinas in science and engineering careers and provides a voice for Latinas. In-depth and repeated interviews made it possible to understand the lived mentoring experiences of Latinas. Researchers (Creswell, 2003; Denzin & Lincoln, 1990; Husserl, 1967; Moustakas, 1994; Van Manen, 1990) have different views and definitions about phenomenological research. According to Van Manen (1990), the aim of phenomenology is to gain "a deeper understanding of the nature of meaning of our everyday experiences" (p. 9). Moustakas (1994), conversely, defines empirical phenomenology as looking back to prior experiences to obtain descriptions that provide the basis for analysis and allow the participant to reveal the essence of the experience.

Phenomenology was used as a qualitative research method to find the "essence" of human experience that deals with a particular phenomenon. The essence was

expressed and/or described by the participants in the study (Creswell, 2003; Merriam, 2002; Moustakas, 1994; Van Manen, 1990). Phenomenology differs from other sciences in that it attempts to gain insightful descriptions of the way individuals experience the world prior to reflecting on their past experiences.

The seminal work of Edmund Husserl (1931), who is considered the father of phenomenology (Merriam, 2002; Moerer-Urdahl & Creswell, 2004; Van Manen, 1990) and a critical force in transcendental phenomenology (Moustakas, 1994; Van Manen 1990), is recognized as "the fountainhead of phenomenology in the twentieth century" (Vandenberg, 1997, p. 11). Husserl believed that all scientific knowledge "rests on inner evidence" (1970, p. 61). He was also concerned with the discovery of meaning and essences in knowledge (1970).

Phenomenological researchers (Creswell, 2003; Moustakas, 1994; Sandala & Adorno, 2002) perceived that the goal of phenomenological research is to examine how individuals make meaning of their lived experiences. As Moustakas states, "any phenomenon represents a suitable starting point for an investigation" (p. 26).

While researchers (Merriam, 2002; Moerer-Urdahl & Creswell, 2004; Moustakas, 1994; Van Manen, 1990) have stated that phenomenology is a philosophy, it has two major approaches: *hermeneutic phenomenology* and *transcendental phenomenology*. Hermeneutic phenomenology, hermeneutics, is "the theory and practice of interpretation" (Van Manen, 1990, p. 179), whereas transcendental phenomenology is a design for acquiring and collecting data that explains and describes the human experience (Moerer-Urdahl & Creswell, 2004). The core of phenomenology is *intentionality of consciousness* (Moustakas, 1994; Sandala & Adorno, 2002). This means that through intentionality of

consciousness the lived experiences of the participants have a meaning (Moerer-Urdahl & Creswell, 2004; Sandala & Adorno, 2002). Meaning is also the core of phenomenology (Moerer-Urdahl & Creswell, 2004). This research approach is called transcendental because the researcher sees the phenomenon "freshly, as for the first time" and phenomenological because "it transforms the world into mere phenomena" (Moustakas, 1994, p. 34). Transcendental phenomenology was used in this study as the appropriate methodology for this research. This approach facilitated the understanding of the lived experiences of Latinas in science and engineering careers within a reflective and interpretative research paradigm. This approach provided a systematic design and detailed data analysis method that leads to an essential description and interpretation of the participants' experience. To analyze the phenomenological data obtained in this study, the researcher followed Moustakas's (1994) systematic process. I described each Latina's lived experience with the phenomenon; identified significant statements and cluster statements into meanings and themes; synthesized themes into a description of the individual's experience (textual, structural, and textural-structural descriptions); and constructed a composite description of the meaning.

In summary, a phenomenological research approach was appropriate to use in this study for several reasons: (a) phenomenology allows the researcher to obtain the account directly from Latinas in science and engineering careers; (b) it provides a voice for Latinas; and (c) it allows Latinas to express and describe their experiences and opinion.

Data Collection Method

The first step to phenomenological reduction process is *bracketing,* or *epoché* (Moustakas, 1994). The researcher takes this approach before data collection in an effort

to understand the feelings expressed and revealed by the participant (Creswell, 2003; Koch, 1995; Moere-Urdahl & Creswell, 2004). Bracketing allowed the researcher to set aside her biases of the phenomenon while focusing on the views of the participants. Koch (1995) explains that bracketing "defends the validity or objectivity of interpretation against the self-interest of the researcher" (p. 829). Through bracketing, the researcher is able to reflect on her mentoring experiences as a Latina who achieved a career in science. Once I set aside my biases, I listened and heard the participants' story without my feelings and preconceptions. The epoché is provided in Appendix D.

The research method design for this study included intensive interviews of Latinas in science and engineering; coding; analysis; and interpretation of collected data. Latinas in science and engineering were selected because of the limited number of Latinas who have achieved a high-level position within organizations (Etzkowitz, Kemelgor, Neuschatz, & Uzzi, 1994; Finley, Ivanitskaya, & Kennedy, 2007; National Action Council for Minorities in Engineering [NACME], 2005). Latinas with the following characteristics were included: (1) a minimum of Master's degree or doctoral degree (preferred); (2) professional achievement, that is, recognition, leadership, and upward mobility; and (3) uniqueness and contribution to the organization and their field. These criteria were assessed by their professional title and/or level within the organization as well as their years in the workforce. The significant components of the data collection are described below.

Data collection consisted of a semistructured, open-ended, face-to-face (Creswell, 2003) interviews of eight participants (Sandelowski, 1995). Since Latinas in science and engineering are underrepresented, eight participants were appropriate for this research

because transcendental phenomenology requires at least 8–10 participants (Moustakas, 1994; Patton, 1980). A face-to-face interview process allowed the researcher to obtain the data from each participant individually, which permitted the participants to feel at ease with the interviewer.

The interview process began once approval from the IRB (Institutional Research Board) was obtained. The interviews began at the end of October 2008 and were completed by the end of January 2009.

A set of standard questions was presented directly to the participants via face-to-face interviews. The initial interviews lasted approximately 1 hour.

Responses to the interview questions were audio-recorded with the permission of each participant and later transcribed for analysis and comparison. Tape recording the interviews increased the accuracy of the study (Patton, 1980). Notes of the participants' gestures and behavior were taken during the interview in order to enhance the accuracy of the data collected. A journal was kept during the research process. The journal allowed me to document all communication with the participants and assisted in analyzing the data.

The interviews were transcribed verbatim. The verbatim transcription, considered by Patton (1980) as raw data, was conveyed as accurately as possible. A digital minirecorder was used, this being less invasive to the participant. Interview tapes were secured and locked to ensure confidentiality and decrease the possibility of losing the raw data. Pseudonyms were given to each participant to protect their identity. At the end of the study all tapes and notes were destroyed.

After transcripts of the initial interviews were prepared, they were sent to each respective participant for her to review. A second interview was then scheduled so the participants could point out any errors or omissions in the transcripts, and for the researcher to ask any remaining questions. During the follow-up interview the researcher was able to clarify any information that may have been misinterpreted during the first interview.

Initially, the researcher intended to conduct all the follow-up interviews also in person. Scheduling such interviews proved to be a difficult task because of the participants' busy schedules. When a face-to-face follow-up interview was not possible, the follow-up interviews were conducted over the telephone. The follow-up interviews lasted approximately 30 minutes each.

The suggested format used in phenomenological research of semistructured interview procedure was used. The informal conversational process allowed participants to be at ease with the interviewer.

Data Analysis Method

The purpose of phenomenological inquiry was to obtain the essence of meaning reported by the participants. Data analysis involved making sense out of the interview transcripts. Transcendental phenomenological techniques such as *textual* ("what"), *structural* ("how"), and *textural-structural* (composite) narratives, provided a composite of the meaning and experiences (Creswell, 1998; Moerer-Urdahl & Creswell, 2004; Moustakas, 1998) and were used to analyze the data. A textual narrative of the transcripts consists of descriptions of the experiences of what happened using the participants' words verbatim (Coffey & Atkinson, 1996; Creswell, 1998; Moerer-Urdahl & Creswell,

2004; Moustakas, 1994), while the structural narratives are those using the researcher's account of the revealed phenomenon (Creswell, 1998; Moerer-Urdahl & Creswell, 2004; Moustakas, 1994). The textural-structural narratives or statements are a combination of the textural and structural narratives. This combination was achieved by constructing an overall description of the meaning and essence of the participants' experience by incorporating the themes (Creswell, 1998; Moustakas, 1998).

Data analysis consisted of the following steps: (a) listing and preliminary grouping; (b) reduction and elimination; (c) clustering and thematizing; (d) final identification of themes; and (e) constructing for each participant structural and textural-structural descriptions (Moustakas, 1994; Van Kaam's 1966). As part of the reduction process, the technique of *horizonalization* was employed (Moustakas, 1994). Horizonalization is "the process of laying out all the data and treating the data as having equal weight" (Merriam, 2002, p. 94). Once the coding process was completed, interpretation followed. The codes were reviewed and presented in a manner that allowed me to be able to give meaning to the data, to establish categories, topics, and themes, and finally to interpret (Moustakas, 1994). The collected data were cross-referenced and analyzed in order to reflect commonalities and differences among the participants' lived experiences as they related to Latinas' professional development and mentoring. Data interpretation provided the meaning of the data. The analysis concluded with textural, structural, and textural-structural narratives of the interview data (Sandala & Adorno, 2002; Coffey & Atkinson, 1996; Creswell, 1998; Hoepfl, 1997; Moerer-Urdahl & Creswell, 2004; Moustakas, 1994) along with a thematic analysis.

Table 1 illustrates the relation of the research questions and the interview questions (see Appendix B). This relation demonstrates how the interview questions are aligned with the research questions.

Table 1

Relation Between Research and Interview Questions

Research Question	Relation with Interview Question (IQ)	
Research Question #1		
What are the challenges that successful Latinas experience in advancing their careers?	IQ # 1 IQ # 2	IQ # 3
Research Question #2		
What do Latinas perceive as facilitating their career advancement?	IQ # 1 IQ # 2	IQ # 11
Research Question #3		
How did mentoring experiences of Latina scientists or engineers influence their career success or advancement?	IQ # 4 IQ # 5 IQ # 6	IQ # 7 IQ # 8 IQ # 9
Research Question #4		
How do Latinas perceive the effectiveness of mentoring as a viable mechanism in achieving a successful career in science and engineering?	IQ # 1 IQ # 9	IQ # 10 IQ # 11

Validity and Trustworthiness

Four methods were used to ensure the reliability and validity of the research. First, *triangulation* (Creswell, 2003) of the participants' interviews was used to validate the accuracy of the findings by determining similarities and differences of the phenomenon. Second, *member checks* (the process of allowing the participant to review the transcribed interview) were used for accuracy and to assure that the intent behind each participant's responses was captured (Creswell, 2003; Merriam, 2002). This method provided a mechanism to capture detailed information from participants with a viable means to account for their own stories as they related to their mentoring experience. This process enhanced the trustworthiness and accuracy of the study. Third, *peer debriefing* was used to enhance the accuracy of the account (Creswell, 2003). The peer debriefer reviewed and asked questions about the study so that the account resonated with people other than the researcher (Creswell, 2003). The peer debriefer met with the researcher to refine the study's procedure after the data collection and during the data analysis. Fourth, *journaling* of the participants' gestures and behaviors enhanced the accuracy of the data collected as well as provided an audit trail. These four techniques assured the integrity, reliability, and validity of the data and, hence, the results.

Participant Selection

The phenomenological approach selected for this study allowed for a relatively small sample population (Moustakas, 1994) to be queried. It required a semistructured interview format from which the researcher was then able to analyze through subjective analysis.

Purposeful sampling is the prevailing strategy used in qualitative research, compared with probability sampling in quantitative research (Hoepfl, 1997; Patton, 1990; Sandelowski, 1995). A purposeful sampling approach allowed the researcher to deliberately select the participants of the study based on certain meaningful characteristics. The rationale of purposeful sampling is to purposefully choose the participants that will best aid the researcher to understand the phenomenon (Creswell, 2005, Sandelowski, 1995). In this case, Latinas in science and engineering who have achieved a high-level position within their organization were selected. Purposeful sampling does not require computation or power analyses to determine the sampling units (Hoepfl, 1997; Sandelowski, 1995). Patton (1990) identified and described 16 types of purposeful sampling. Of those 16 types of purposeful sampling, I chose homogenous sampling and snowball sampling to select Latinas in science and engineering who have achieved a high-level position within their organization.

Homogeneous sampling provides focus and reduces variation while simplifying the analysis (Crabtree & Miller, 1992; Merriam, 2002; Patton, 1990). Snowball sampling allowed for the expansion of the sample size by asking one participant to recommend others in the same area of expertise for interviewing (Groenewald, 2004; Patton, 1990). Snowball sampling is a useful technique when the researcher is trying to attain hard-to-find or underrepresented populations, such as Latinas in science and engineering (Trochim, 2006).

The participants for this research study were Latinas in science and engineering who are currently in a high-level position within their organizations. “High-level position” refers to tenured faculty members, junior and/or senior researchers, managers,

program directors, decision-makers, and officers of the private sector or local, state, or federal agencies. It also refers to Latinas who have attained professional achievement, i.e., leadership and upward mobility; uniqueness and contribution to the organization; and potential as a mentor. Participants were selected from available sources, including databases of women and Latino organizations in science and engineering, personal contacts, and personal references (snowball sampling). The participants were selected utilizing the following criteria: (a) a minimum of Master's degree or doctoral degree (preferred); (b) attained professional achievement, that is recognition, leadership, and upward mobility; and (c) uniqueness and contribution to the organization and their field. These criteria were assessed by their professional title and/or level within the organization as well number of as years in the workforce.

Participants were sought from the following professional organizations: Hispanic Engineers National Achievement Award Corporation (HENAAC), Latinas of NASA, National Academy of Sciences, and Association for Women in Science (AWIS). It is noted that some of these organizations are not exclusively Hispanic, but have Hispanics among their members. The researcher gained access to the potential participants of the above organizations through a gatekeeper, who is an individual with official or unofficial authority to control access to the site (Neuman, 2000). The researcher contacted the gatekeeper of these organizations. The gatekeepers were the Chief Operating Officer (COO) of the organization, the director of membership office, and project managers of the organizations.

I selected eight Latinas working in the science and engineering field. Of these, four were Puerto Rican; three were Argentinean, and one Venezuelan. Four of the

participants identified themselves as scientists and the other four identified themselves as engineers. Of the eight participants, five of them worked for a government agency, one of them for the private sector, and two of them in academia. Three of the participants had a master's degree as their highest degree obtained and five had doctorate degrees. Based purely on observation, the participants' age ranged from the mid-30s to mid-60s. The number of participants in qualitative research studies is not measured through computation; rather it is a matter of judgment (Rossman & Rallis, 2003; Sandelowski, 1995). For this study, a representative sample of eight participants was selected. A representative sample size would be Latinas from different countries of origin and who are from the private sector, local, state, or federal agencies. No attempt was made to segregate participants by age, country of origin, English-language skills, or any other parameter.

Summary

This chapter provided a discussion of the research methodology, including a rationale for using phenomenology; research questions; site and participant selection; sampling; and data collection and analysis approach. A transcendental phenomenological approach was used, which allowed me to understand the lived mentoring experiences of Latinas in science and engineering while being reflective and interpretative. This approach provided a systematic design and detailed data analysis, which led to an essential description and interpretation of the participants' experience. This method of inquiry allowed me to capture detailed information from participants, providing them with a viable means for giving an account of their own stories as they related to their mentoring experiences.

CHAPTER IV

RESULTS AND ANALYSIS

This chapter provides a discussion of the results obtained from the collected data and narratives of the participants' description of the lived experiences and perceptions on mentoring Latina scientists and engineers. The chapter is organized into three sections. Section one (Description of Participants and Demographic Data) consists of a brief description of both the participants and demographic data. Section two (Data Analysis) presents a brief description of the data collection and data analysis narratives obtained from the raw data. Section three (Transcendental Narratives: Textual, Structural, Textual-Structural) consists of narratives of the transcendental phenomenological techniques of *textual* ("what"), *structural* ("how"), *textural-structural* (composite), which provide a composite of the meaning and experiences. This transcendental phenomenological technique is used to tell the story behind the lived experiences and perceptions on mentoring Latina scientists and engineers. Section three also includes horizonalization, describing all the experiences relevant to the phenomenon—shown as tables—for each participant. This section also includes tables illustrating the common themes that emerged through the process of reduction, cross-referenced with the research questions. The chapter concludes with a summary of the findings.

Findings

All of the participants received a "Participant Letter" and consent form. To ensure confidentiality, the participant's signature was not required unless they preferred to sign it. The participants reviewed the transcribed interview, known as *member check*, while reviewing and editing the transcripts electronically for accuracy. A second interview

allowed the researcher and participants to review the transcripts and for the researcher to clarify any questions. During this second interview, the researcher was also able to clarify any interview questions that were misinterpreted during the first interview. The interview question was asked once again to the participant for clarification. The data collected during the member checks was incorporated into the corrected transcripts.

Description of Participants and Demographic Data

Participants were identified as eight Latinas working in the science and engineering field. Of these, four were Puerto Rican, three were Argentinean, and one was Venezuelan. Four of the participants identified themselves as scientists and the other four identified themselves as engineers. Five of the participants worked for a government agency, one in the private sector, and two in academia. Three of the participants had a master's degree as their highest degree obtained and five had doctorate degrees. Based purely on observation, the participants' age ranged from the mid-30s to the mid-60s.

Prior to each interview, the researcher obtained the following demographic data from each participant: (a) country of origin; (b) college degree obtained; (c) occupation; and (d) parental level of education (see Figures 1 and 2). Five of the participants obtained their graduate degree (master's or doctorate) at a university in the United States while three of the participants obtained their graduate degree from their country of origin. Three of the participants continued postgraduate work (postdoctoral program) in the United States.

All the participants were provided with a numerical pseudonym to maintain confidentiality. For example, P_1 for Participant number one, P_2 for Participant number two, all through Participant number eight. The order in which the participants are listed

corresponds with the order in which they were interviewed. It is noted that I did not attempt to segregate participants by age, country of origin, English-language skills, or parental level of education. Also to be noted is that for the father's level of education, one of the participants did not specify her father's level.

Figure 1: Data on parental level of education

Mother's Level of Education

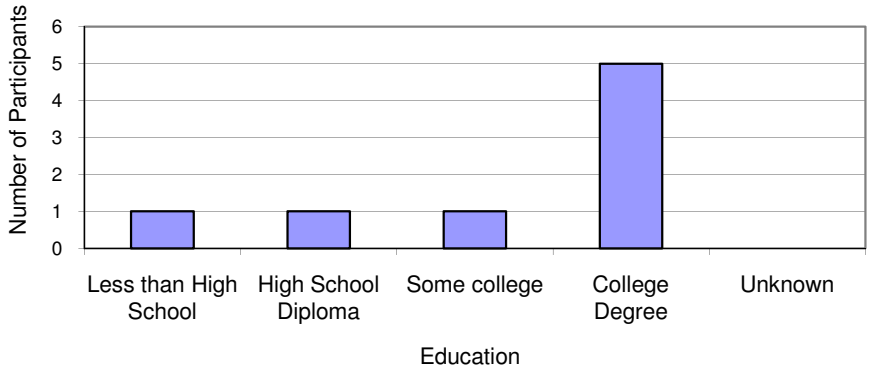
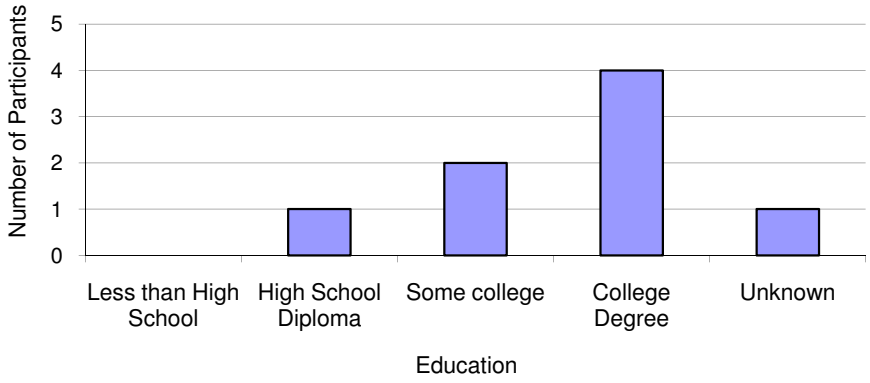


Figure 2: Data on parental level of education

Father's Level of Education



Data Analysis

Data analysis consisted of the following steps: (a) listing and preliminary grouping; (b) reduction and elimination; (c) clustering and thematizing; (d) final identification of themes; and (e) constructing for each participant's structural and textural-structural descriptions (Moustakas, 1994; Van Kaam's 1966). As part of the reduction process, I engaged in a horizonalization process (Moustakas, 1994). The process of horizonalization began with a thorough reading of the verbatim transcripts. Once the coding process was completed, interpretation followed. The codes were reviewed and presented in a manner that allowed me to be able to give meaning to the data, establish categories, topics, and themes, and finally to interpret (Moustakas, 1994). The collected data were cross-referenced and analyzed in order to reflect commonalities and differences among the participants' lived experiences as it related to Latinas' professional development and mentoring. Data interpretation provided meaning to the data. The data analysis resulted in three narratives: Textual, Structural, and Textual-Structural. All the participants' responses to the interview questions showed similarities and differences across participants.

Transcendental Narratives: Textual, Structural, Textual-Structural

This section provides a transcendental phenomenological summary of the collected data. The summary provides representative highlights of the participants' interviews. This section begins with an overview of the participants followed by the three transcendental narratives.

The following textural narratives present the story of each participant, providing their account of the phenomenon. Each interview began with an overview. Names of

employers, and organizations and/or committees the participants participated in were deleted and highlighted in black to maintain the confidentiality of each participant and their relationships with government agencies, private sector, or academia. These narratives (and headings) correspond to the interview questions and the responses given:

Participant # 1 (P_1)

Overview

P_1 is a tenured scientist. The participant obtained her doctorate degree at her country of origin, Venezuela. After obtaining her doctorate degree, P_1 came to the United States as a postdoctoral student. During the interview, the participant was observed as being very outspoken, determined, and proactive in the workplace. P_1 told stories about her mentoring experiences and how she did not know what mentoring really was until she had had the experience. It was also noted that the participant mentioned that she had an unpleasant mentoring experience. She was unable to share the story, as she explicitly expressed that she was not going to talk about that experience.

Textural Narrative

Career Success

> I really knew from the very beginning what I liked. The other thing, you probably have to be—more than besides persistence, you really have to have a goal. And you are going to find obstacles in every career. I really don't know how many steps other people are not going to have to go—science has its own inherent um…not background…it's an own inherent world…and you have to go through all these steps and the publication and this and that…I would say first, knowing what you want from the very beginning and really loving it, because science can be draining in the sense that … the satisfactions are when you achieve these goals of your research and publishing it. But it takes a long time for you to work in the lab to be published. You have to work sometimes two years just to be able to get enough data to publish a paper. That is very different from some people in other occupations that … that say, okay, let's construct a wall and they start with the stones, and then in two days they have a wall. This is so satisfying in the sense that you say this is what I want to do. I go buy the stuff, I put it there and in X

amount of time it's there. It's not as tangible in science and it's something that you invest a lot of time because you really are just questioning how things work or you have a hypothesis that tells us how some things might be working. That's how you initiate it. Well, I have a hypothesis that this is how … this specific element of science that I'm investigating works. And then you have to pursue it from so many different lines. Persistence is essential—you know, sometimes things just don't work and you have to then ask it from another view and ask it from another approach and just continue. And sometimes—if you want to call it disappointments, it's just that getting negative results or getting or not getting there as fast as you could have … it can be discouraging … but you cannot let that stop you from just pursuing it until you achieve what you need, which is getting that information to make … the story to support, or get the data to support your … your hypothesis and then … explain in the manuscript exactly what your findings are.

So, successful—I think that _____has been very advocate about mentoring. And when I began hearing about mentoring I really didn't get it—what is it with this mentoring? But you really sometimes don't know what you're missing until you…until you have it and now you say, okay, this is what mentoring is and really, yes, it does make a difference. I do believe that having good mentors or mentoring is essential for you to be able to succeed. I think it creates … um … it … it helps you in your persistence. Sometimes you say God is this the way—having somebody that can see it—okay, from outside, what is the problem? Be it scientific or the human part surrounding the sciences, because here again we're talking about two different things. To get a tenured track position you have to show that you're a confident postdoc and that you're able to publish and you are a good scientist. Nothing says that you are… you're good at the administrative aspects, nobody's capabilities of accessing that. When you're going to a teaching school—they want to know if you can teach well.

And they'll assess that by asking you to give some classes or asking you're ref—you're mentors or your references. How good does she present in seminars or interacting or giving classes? But besides that basically it's just achieving a certain amount of publications in scientific work that's going to be reflected in your references and say yes, she really, or he really knows how to think…has projection; really is…a good scientist that has all the basics. There, after that, you have the other component, which is you've got a tenured track position and you have to manage people, manage projects, manage budget¸ and these are all things that you probably learn along the way. Having somebody that really can aid you—it doesn't mean—it doesn't have to, you know, spoon feed it to you, but can assist you and sometimes you really just don't know how to approach something, and instead of stumbling along the way, having somebody that can really help you—and that's part of mentoring. It's not just teachers—somebody that says…I've been through this path and doing it—this approach would be—it's going to be a much easier path. Because you learn, it's something that I actually myself would like to say; probably approaching it this way is not the way. And —

some important things for you to get tenured track at _____ is you have to have this, this and this. Go through these steps. And, so they have established certain things, and the really personal thing that you've mentioned to me mentoring.

Helpful Experiences in Career Development

In studying in Venezuela we have to do a research study…not just in graduate, we have to do it at undergraduate level in high school. It's very particular to…Venezuela, in the last two years of high school we choose if we want to go to *Humanidades* or *Ciencias* which is arts or… Sciences… Humanities. So, if you're into science they really uh…support as you go into science. And then for your undergraduate degree you do have to have a thesis, just like you have in a master's… You have to have a thesis—I wrote a thesis. I had a project to work for one year, my last year, in the laboratory, and of course it is not a thesis. But it's a project, I have a book with an introduction, the methods, the materials, everything. So you're just getting embedded already from your undergraduate if this is something—if research is something that you really want to do. And you get exposed to how real—the real research is, even on a very small scale. But when you go to graduate level you really have…you know, you're pretty clear that that's what you want.

I really loved medicine. The only thing is I knew that if I studied medicine it would be to do research. So the question was do I biology, do I do a PhD in research, or do I do an MD and end up doing research that I really wanted uh…the clinical aspect is interesting for me, but just seeing the patients—patients without trying to figure out what it was they had, the process and how to be able to fix it was not enough. Just what is going on—that is what I wanted to work on. So I could have approached it either way, because there are many MDs that are conducting research, and actually, it's very good to have this because they come from the medical background, which is good to have, but I decided to go through biology and master's and doctorate.

Impediments to Career Success

I think you're being in a university setting or having a lab chief, or having a chairman that is not supportive of you. You know, it's going to be probably a big obstacle because they really have to want you there. I had…and it's very draining. You know, you have all these other things that you have to accomplish to be ready—so time consuming, and…this is what you want to do, but then having to deal with somebody that … for whatever reason is putting obstacles in your way, that are like extra…that probably doesn't help. Having the support…in that whatever the setting you are, be it a lab chief, a chairman, or a group leader, whatever the setting it is—I think it…it's essential. Having somebody that is supportive at that level—sees that you have—really, you are a go-getter and, then they will promote you. There are different ways, industry is completely different from _____, and government is a different setting from university. _____ has—

tries to be a little similar to a university setting. It could be a person. I think it's the support again. If you have a lab chief, as I told you, the lab chief, when you're a tenure track, the chairman or the lab chief has the role of a mentor. So, the lab chief is invited to give twenty talks in a month. They can't do them all because they don't have the time. They can say: you know what, I have a tenure track that works in my section that would be very good in this particular meeting because — he or she works on this. So, having somebody that really is out there helping your career progress. If you need new equipment…let's say, well…let's see what the other people need from us. See if everybody needs it—let's try to get together, let's see if this is something you really need. Of course, having this-, somebody that's supportive and mentors you will aid you. Somebody that is really not happy or—that doesn't want to be as positive with you, it's going to be…it's going to be detrimental, that's for sure.

Meaning of Mentoring

I really do believe that it is very important, because things now have evolved and… in a university, things are a lot more established, and at _____ things have become established. Like… let me repeat what I've been saying, as a tenure track and the tenure track system has been ongoing in _____now since 1994. These are the things... you're recruited, here's your letter of recruitment, here's the things that you have to do. There's a letter that summarizes the criteria for tenure at the _____, this is what a tenure track should accomplish, etcetera. So these things are…are more recent than in a university, where a tenured track and an assistant professor, an associate professor, professor, full professor, all the things are established and how uh…they might divert—diverge a little bit between universities—but the process is a more established process. So tenured at _____, you are an established investigator with your tenure, which is the same thing as when you're a professor in a university, or a senior associate professor, depending on the university. And then it keeps going back again to the question—mentorship. I really didn't understand uh, in Spanish, mentor is basically your supervisor, but that doesn't mean that they go out of their way to do other extracurricular things, really, but I didn't understand it because at the level of graduate studies it's just, you know, get your PhD and that's it. But when…and when I was writing my letters to come to the United States, etcetera, my supervisor didn't have any input in that, you know. I was just writing to the labs. I made my own letters, so probably a more supportive mentor would have been a lot more involved of where I was applying for a postdoc. I spent a year of my PhD here in the United States, and it was with the people that had worked here that I had a little bit more of a feedback. Okay, why don't you write to these people, or write to them. Why don't you modify the letter this way, which actually probably was better because they were in the system and had a—probably their feedback was [not clear].

My supervisor wasn't, so really I believe that's the difference between a supervisor and a mentor. But I would say I think supervisors can be mentors, but

mentors not necessarily have to be your supervisors. A lot of people—…some people find themselves—they may not want an obstructive supervisor, and you know, somebody who at least is there and signs things off, but doesn't interfere. But that's sort of the other side of the spectrum. What you would really like is a supervisor that can be a mentor. I'm the supervisor of my post docs, but I really consider myself more of a mentor. My goal for them is not only for them to get their data together for their publication, but for them to get their training, to get their publications so that they can pursue a career, and what is their goal? If they want to go into industry or they want to go to an academic setting, then how we approach it—a little bit different, because if they have academic, then what type of academic setting do you want? If you want to be a teacher, then you are going to have to be giving some classes —so you are going to have to take some time and prepare the classes. And then I'm supportive of that, but then I believe that this is a part of mentorship. You have to talk with people and understand what they want to do besides just training or giving them an opportunity to be here. And you know, we can learn things from books, like teaching them well this is how I do it, and you know, doing things like that. Mostly I think is the beauty of learning how to process the data, how to approach…

I suppose I think more um…the way of digesting the data, putting in the context what does it really mean, that's the back and forth of a beautiful setting in a lab, you can discuss, do you know what to do, and why do you want to do it? You're back and forth and then getting data and then trying to explain what it really means, etcetera. So that's part of the training. Then that could be done without the other part, I think. The other part is just for you to, in some ways— as a good mentor also in some ways—should do. My mentor here at _____ is a role model. I don't do it exactly like he did it because we people are different, but a lot of things I do because that's the way I learned and I appreciated it when I was in his lab. Maybe some of my postdocs will say well, we don't like it but that's … the way. I don't know if it's…it's fair to compare when you're parenting. Nobody really shows you how to be a parent, but you do some things because probably that's how you really remember your parents doing it with you. I don't know, and then it's not fair to compare because they're not your children, they're professionals, but you do things sometimes based on how you have learned them. And if it was successful and a positive experience, you say, well this was how—not only successful, this is how I felt the positive feedback for myself. I'm hoping that doing it this way was going to be a positive feedback for them as well.

Again, and I really think that people don't know what a good mentor is until they don't have that, or until they really have it and they say: look what a difference it had to have this person supporting me and really aiding me. A good mentor will help you, can help you in several ways …he/she is being asked to give a talk at a conference—he/she can't go. He/she will suggest your name; this is one the level to which mentorship can go. He knows that he will be projecting you, and if he can't do it... It's not only mentoring telling you what to do, it's also aiding you in your career. And I think that those are things that good mentorship can really

help. For me it's undisputable, having people, good mentors that back you up was essential for me to really be able to say, okay, I can go through this. Let's see the future; let's see how we get through this so we can just continue.

I would say in my case personally, I'm very assertive, very…—focused. I know what I want…and I really will go for it, and I'm vocal. This is what I wanted, but having somebody that would in the moment that there are obstacles say well, this is what you want or how you want it, but maybe that's not the way to go. Maybe you should consider this. And having good people that you trust that are good mentors to you that say that, of course it's…it's just really good—it does make a difference.

Perceptions of Mentoring Latinas

I have had postbac — two, I have had now two— and I've had a technician from Puerto Rico, from Latin origins. Uh… from my own perspective—it's difficult for me to say that there's a major difference between women Latina or women non-Latino. You know the number is very small, but if you ask me as a woman, a Latin woman versus other tenure track person, what is the difference, it's just the numbers. We are recruiting women that go into science. What difference does it mean being a Latino? Um…I…I suppose we could argue that there's differences in personalities, culturally. That's a tough question because there's really not enough numbers for me to say…um…one way or the other. And if you tell me if I was a woman…uh…I don't know…African-American woman, or a Latin woman, or an Asian woman, how different would it be…I don't know. If it's cultural, how different do they feel because they are African-American? How expressive they are or how assertive they are because of their cultural information versus mine... I don't know that anybody really knows that.

It's…the few women Latino that I know that are in successful places, the one thing I can tell you is that they are very assertive—that is the one characteristic. If they don't—how do I put it…they're not bullies…I'm very clear of what I want and what I don't want or when I just have to say no. No because da…da…da. Yes because da…da…da. And we are very clear and assertive. It's not like, well maybe... It's this, and because of this. You say, well, okay let's hear it, let's hear your point of view and why. But not, oh really, maybe…it's not this…gray, but why is it gray, and then you just say it—when I go in to discuss things with my SD I never go, uh, I am a woman, so how am I going to discuss this with him? I just go and I get my information, get what the problem is, what do I do to help him solve it, and discuss with him on some of the options I'd like you to consider. How different is that? —How it is for a man, I don't know. How do they negotiate for their salaries? I say, well, I think it should make no difference if I am a woman or a man, he publishes the same papers. It doesn't really matter what chromosomes we have. We should have the same salary if we are at the same level. It's not…it's not a question for me. And then …furthermore being woman and Latino, what difference does it make—nothing. You know, I…I really don't

believe that…that there should be that different, but—what characteristic would I say that you…that the women that I know have, Latino women that I know, which —again could be cultural, is that we are vocal. We are very uh…we have an opinion and we're going to say it. It's not like that's not what we think and we're going to remain quiet. No, we just say no, I don't believe that is right because da da da da…and uh… some people consider we're going to be… screaming. I just go in and I say, no, and you have to say why. Because I wouldn't accept no from man or woman, Chinese, or Asian or whatever. I'll say well no, excuse me—but why…

I think that as long as you go with the attitude that, of course you have to question why there is a difference. Why is there…this gap in the women compared to men at this higher level? And furthermore, is there an even bigger gap for Latin women at this level? But, probably looking at it from the side of where the women that have succeeded what are the characteristics that they have —that you could put them in common and might be able to aid them in achieving these higher positions would be something that is important as well. Both are complicated, as we have been discussing since the beginning. Trying to figure out why this number in women is so much lower at the high level. Is it because of family issues? Is it because family culture? I think that probably it's partly cultural social issues. I would have to believe, you know. In science, they are equally capable of publishing, of succeeding and getting the same grades, sometimes higher grades. What I would like, is to ask people that have decided to go on another route, is why? It's not incrimination, it's not accusation, it's just—let's… try to understand what made you decide that this was a better path for you, because obviously it's not the only one—not everybody wants the same thing. Like we would like—we want to increase the numbers and say, well what do we have to change or modify? Or is there something that we can—where we can really help? What… doesn't attract you to this? You have gone through all these steps to get here. Why do you not continue—why does getting to this next step not attract you? And why does it attract men? What is the difference? Um, that is probably one of the things that I would be interested in finding out.

Meeting Mentors

I really had a great mentor when I worked as a post doc. I interviewed in several places. And um, I came to this lab and I can tell you that this is also a personal decision. I really wanted somebody I could interact with—I could have chosen somebody that was very senior, famous. A letter from them was going to help in the future getting anywhere. But, I was probably going to see this person once a month, maybe. I did this one-year at _____ during my doctorate. The lab chief was very nice, but it's just that he was traveling, giving talks. It's like—I barely saw him. I said this is great to be in this environment in this lab, it has all these bright people, but I would really like to interact with this senior person or mentor a little bit more. So I really chose a person who had an excellent lab—being in the environment that was part of a much bigger section where there was many

different labs. He was sort of young and—but was already tenured, just like somebody would come to me, and probably at my age and my position now, just tenured. He had been tenured for a little while, but he had been very successful, and ended up being an excellent choice for me. He was very interactive, uh and not only scientifically, but the lab setting—he was a great mentor. I really have to say that we have completely different personalities he uh…he's completely American, completely quiet… I went back to Venezuela to finish my... One of those years during my doctorate, which was for three years, the middle year, I spent in Boston. I did one year of my work there. I never saw him like as a mentor; he was the big lab chief. He was very nice and then he was very supportive of the program in which I was coming and…

I went back and did another year and finished my doctorate, and then came for interviews during my last year of my doctorate for interviews for postdocs. After coming to Boston I knew maybe the places I wanted to go to, so I visited Boston. I stayed on the East coast because of family reasons; I wanted to be able to go back to Venezuela quick. If I moved out to California, it was like five hours to Miami and then—another hour. From New York, Boston, Washington, it was…so I knew I was probably going to be in the Northeast coast. But that selection was done because of family reasons. I —my father was not in extremely great health. So I said no, you know. Something happens and they call me and it takes me five hours to get to Miami, then, with the connections it's going to take me a day to get to Venezuela, and that's just too long. So...I did several interviews and I selected basically…I…I said to this person, who ended up being my first real mentor… that I would like to come to his lab and it was really a great, great experience. It really was…uh…and continues to be, he has his own lab, …a wonderful mentor. He actually, still to nowadays, when I was going to the tenure track, he was one of the people that I would go and talk with him etcetera. So even though I was already at another level, and I think he had—we had progressed, he …— saw me now as a colleague, he still was a mentor.

Key Qualities of Mentors/Mentoring

I think that probably from this post doc mentor that I had, he was very, very supportive. If I wanted to do something, if I went to him I said, this is how I want to approach this. This is why I want to do it this way, he would actually sometimes say, well that's not really what we do here, but let me—let's think about it and see if it really will follow that up…and if I had projected what I wanted to do and why I wanted to do it, and…and once we got the preliminary data and it was something that was exciting, he was extremely supportive. I think that's probably just the best circumstance—it could only be a plus. So…again all through… all during my post doc, I only had supportive environment. I have to say, it probably was in my tenure track when I encountered the first not so supportive environment—and it can be really…uh…an obstacle. And you can't choose, you know. You go to a place and get a job, and you can get somebody that's going to be very supportive or not quite as supportive and then you just

have to figure out how you're going to deal with…it. You—you just—do what is it that you need to do. This, so… this is here on the way so how are we going to deal with this…then you can continue doing the things… you just go over pebbles and big rocks you have to figure out a way in which you can just work it out… And everybody's going to find — different settings—obstacles… …you would wish that you could avoid them, the tenure-track system already is…is a lot of pressure. You have to go through reviews and you have to really show that you're able to handle your budget correctly, to obtain money, to uh…manage your money…that you're correctly getting a product for all this money that's been given for the science purposes. So, basically you're being assessed. Okay, we give you this, how much are you producing. In university settings they give you a grant, if you don't get this many publications or something to show for your grant, there is—the probability of you getting another grant is very slim. The same thing at _____ you know, hey… what you are going to do and then show what you have obtained, you have to produce.

Influence of Mentors

I suppose it's indirect in a sense I knew early on—I knew I wanted to pursue a tenure track position, because I really wanted to have my own laboratory. So it's more about—how positive were they in aiding me in all the things that I needed. From my positive experience basically, I can give you a good idea. When you're starting a new lab you can start it from scratch with your own ideas or…or you can basically say, well is there part of the work that I was doing that I can pursue once I have my on lab? That's going to be person dependent. And in my case, my mentor was extremely supportive of me in saying, well; these are some projects that you basically developed on your own, why don't you just continue pursuing them. So I was in a very, very positive area because I was able to really move very quickly. I really thank him…he was very generous. I really had developed the project by myself. But at the same time he could have said well no, they're very interesting and I'm going to continue pursuing them in my laboratory and he didn't do that. He said well, they're yours why don't you just continue with them and…I really have to be very thankful for this because it was a very big step on being able to…proceed quickly from...Which is what happens to many people. Or they give them a little piece of what they were doing. Or say okay, well I'm going to concentrate on this part; you do this part. Or furthermore they say, well yeah, you can work on it, but so am I. So then from being a mentor supervisor, now they're going to be competitors. There are many different scenarios, and I probably was in the most positive area in that sense. So it was really up until my tenure track that I really felt the obstacles besides the system. It's a very—you really have to be committed to begin with…but to be in a tenure track position with obstacles makes it extra hard. There's a lot of requirements and a lot of work that you have to do. You have to… review papers, you have to be known in the field, you have to be invited to meetings…and all this takes a lot of work…for them to invite you to review papers, they have to trust your opinion. They don't do that until you have proven yourself and you have published. And so it's …all

these steps that… you go through…and having anything affect on that—can be very detrimental. But again, that is the setting that I know. I suppose other places and other systems are just …as difficult. Independent of the system, having anything positive is not going to hurt. And having something bad is always going, of course to be uh…a little bit of a problem.

Achievement

Let's say… how much did they support you? Again, and as mentors it doesn't necessarily mean that all have to do as my mentor did. But the other thing is helping you deal with a problem. An example might be, you have two post docs and they're not getting along and you're not used to having two people fighting because they can't stand each other. That didn't happen to me, but I know of people this has happened. You say how do you deal with that you know? Because all of a sudden you go from being a post doc yourself, and having maybe a student or two, to having supervisor responsibilities. You say how do I deal with this? Do I get them one in the office and then the other one in the office? Do I sit with both of them in the office? Having somebody that has ten, twenty, fifty years more than you that probably has seen a lot, advise you on how to handle a problem, and says why don't you go through all these different scenarios and putting it in your position. In some cases, my mentor or the mentor of this person probably wouldn't know. When I've encountered them I have dealt with it talking with one by one. I say, you know, they come and they both give me their grievances. I see what's going on and I say okay. They both are maybe qualified because you wouldn't have hired them, but what do you do? So how do you solve a conflict? So then, do you talk with one, you talk with the other? So, do you take it to —a counseling ombudsman and say, okay here. You know, you have to figure this out. There are many different approaches and having somebody that you can talk…of…of this…when you get to problems it's easier to get some counsel. It's really nice. It's very helpful.

Along the way I've been in committees. I get to know people, and then for some aspects I would say, maybe this person would be able to give me a better idea of how to approach this. Or let me see it from a couple of perspectives—what do they both say. Now at _____, they are actually suggesting or really encouraging tenure track investigators to have two mentors besides their own supervisor, which should be a mentor. The direct supervisors can act as a mentor with you, but they're above you as supervisors. So there might be some things that you might feel comfortable or not comfortable discussing with them or you might be having a particular problem with them. So who do you discuss it with, if this person is your only manager? In fact, having other people for mentorship is invaluable. And it…it should not be assigned. You really have to be able to you choose mentors and it has to be mutual. You can say, I think you're a fascinating person—could you be my mentor? If the person really doesn't have the time or doesn't want to be your mentor it will not work. It's not going to be productive—it has to be a two-way thing.

So for the mentor, the way I've approached it is by saying I really would appreciate your input—if this is something that you want to take on. I explain that I'm not going to be knocking on their door everyday. People are busy, you know, everybody has ten thousand things to do. So having somebody call and ask—okay, what do I do now? That's not the point. So finishing the idea—it's a two-way thing. You have to choose, and it has to be that both (mentor and yourself) agree to the situation. The mentor agrees to take this responsibility. It would be great to be able to select the mentor…and you select the person, not somebody say okay, you are going to be mentoring. I think that, forcing mentorship is probably not going to work—and the other thing is you don't use them for everything. You're an independent professional. So it's just for that—having the guidance and getting advice—it's never going to hurt…

Thoughts of Mentoring Programs

Having workshops or something, in which you could show this group the advantages of mentorship. A group, meaning a smaller group, instead of talking to all tenure track, you say okay, I'm going to talk to women tenure track. You'd find that on…negotiation… this is something that women are not comfortable with. This is…something they were not taught how to do it, or and feel really awkward about it. Then…then you can have a workshop. Somebody comes, there are workshops where you put several people that have negotiated their way through and you ask them to explain how they negotiated and what approaches they took. Or furthermore, there are professionals that …that can teach us on how to approach these things. So, in the case of specifics, the question is mentoring programs more specific for Latinos.

Having role models or people showing them women and Latinos have been able to succeed. Because they might not have seen any of them. Well look at Senate, it doesn't mean that if a girl wants to be a Senator she should not be able to approach it—somebody can mentor her and say well okay these are the things you should do, go into political science, and maybe go in through this, doing uh…a studentship in Congress and being an aide or something…I don't know I'm just talking it out, but the same thing here. If you really think you're interested in science, then come and be a summer student to get embedded here, and then furthermore you have access to people that have been successful…and um…and again comes the role model—is that mentoring or is that teaching/mentoring? I think it's a little bit of both. I think that at the point is shows that you can get there, and…and how to do it.

I think at the beginning it's really important—to try to understand what really mentoring means, because a lot of people don't understand. What is a mentor for me? Somebody that really can serve in some way as a role model. Somebody that can give you some sort of guidance in particular situations if needed, and again, you are going to create your own path, but having somebody—in Spanish we say

the devil knows more because he's older, than because he's the devil. Somebody that has gone through many things. You see it on your own self. You learn from experiences and you decide, don't go that way. And say, oh no, I've been there.

Sometimes you're stubborn, you do it anyway and then you learn and uh…I think that again, what do I do now? Good mentorship will help you on the approaches. One thing that I would um…eh…stimulate—is for women to be more assertive. Without being—you don't have to confuse assertiveness with aggressiveness, no. It's just—men go to negotiate and say, well this is how we want it and this is what we want to do. They just are very clear and they have this conviction that this is how it's going to be done, or how they want it to be done. I sometimes see this wavering… wavering maybe is the word? "*Titubear*" [hesitate]…in women, well maybe, well really, do you think? You have to be able to—determine what you want. You have to have a background, understand how it's done. You have to get the information. But once you do that you have to decide, based on all this, what you want and how it should be done, or how you propose it should be done. And then be open to hear other people. But again, being able to support what you want—that you proposed this from the very beginning. And I think that, again, that would be one of the things I would encourage. You can be vocal and not vocal, probably being vocal sort of helps, but you don't have to be vocal. It's just that— being very clearly assertive, I think is a very big plus. In—at least in the scientific um…

Other Factors that Contribute to Success

Being goal oriented. I think that—uh knowing that this is what you really want is important. Right, but I don't know if that isn't already instinctive in anybody that is really ambitious in a good way…to be able to succeed. Maybe that's one characteristic—ambitious. Probably has a bad connotation, but to be ambitious. Ambitious people generally…they know what they want and they just want to achieve it. And…having that is of course going to be a big driving force. If somebody has to be pushing you to do something, your chances of really getting there are less—did you do this? Why did you do this? —First of all you're not going to have somebody pushing you—your back all the time. And then, there's probably going to be ten people who are going to want it more and they're going to succeed because they worked for it—it's a competition. Many people would love to have a tenured position…or…or be a full professor at a university. But you have to accomplish all these things and—you need to be uh…ambitious of get them. You know, have the goal of getting them, to be able to then go to the next step. If you do not, then you just basically are going to tumble before you even get there, because you didn't succeed at the…at the intermediate goals. It's just getting the plan and knowing exactly what you have to do. You didn't have your thesis…uh…theme. You didn't know it, so once you know what it is, what are the steps that I have to do to, get all my data for me to sit down and do it. So you have to have your plan and your goals.

Structural Narrative

P_1 owes the success in her career to the fact that she knew what she wanted from the very beginning. She always had a goal. P_1 met her goal and she loves her job. She believes that satisfaction comes when you achieve your research goals and publishing. P_1 believes science is not tangible, in other words you do not produce things or objects, but rather knowledge. Science requires a large time investment, because of this persistence is essential. P_1 perceives persistence is a quality she has. Sometimes things do not work and a new approach is needed. P_1 believes mentoring is essential to succeed, in other words having someone that can help you, and a good mentor can help you.

She talked about a helpful experience in Venezuela that helped shape her career. It involved a high school project during her last year of high school. In her country, students have to choose if they want to go on a Humanities track or Science track. She chose the Science track and got exposed to a real research project, which increased her desire to be a scientist.

P_1 has also had some negative experiences. As a hindrance she described working in a laboratory for an unsupportive lab chief or chairman. It was a draining and frustrating experience for her. She had a lot to accomplish, a lot to offer, but working for this person was time-consuming and added extra impediments. Therefore, she believes that it is essential to have someone that is supportive at all levels. For example, a laboratory chief can allow an employee to attend a seminar on his or her behalf.

The participant has had experiences with mentoring and believes that mentoring is important. She did not understand that fact until she began her post doctorate degree when she got help from her coworkers. She considers these coworkers mentors. She had a mentor while studying in Venezuela; however her mentor did not provide any assistance or support to write letters to help her move to the U.S. The participant stresses that supervisors can be mentors, but mentors do not have to be your supervisors. Currently she thinks of herself as both as supervisor and mentor, so she tries to help and support her mentees. She considers mentors, like herself, role models.

Her perceptions about mentoring Latinas are unique. P_1 believes that there is no difference between mentoring Latinas versus non-Latina. She perceives their needs are the same and that both can be approached the same way. The main difference is that there are more non-Latinas than Latinas in science and engineering, so it is a matter of numbers. Of course, there are some differences in personalities and cultures. She thinks that Latinas are not very assertive, which may impact their professional development. Also she does not see a difference between men and women. P_1 believes that all groups are equally capable of succeeding given the same opportunities.

It was P_1's personal decision to have her first mentor. She wanted someone she could interact and relate and she chose a person who had an excellent laboratory, a person she could learn from. This was a quality relationship where she received a lot of support from her mentor in a supportive environment. In contrast, when P_1 was pursuing her tenure track she did not encounter such a supportive environment. Her mentors have been helpful, by providing support throughout her career. Some of her mentors push her to do better and to develop projects of her own. Other mentors keep a tight leash and are afraid to delegate too much responsibility to the mentee because they fear that the mentee would become a competitor.

The participant's mentors have been older than her with considerably more experience. She has been able to use that experience to her advantage. She believes it is necessary to have different mentors depending to the situation; that could be an invaluable resource. She believes that mentors should not be assigned, that mentoring has to be beneficial to both the mentor and mentee. Forcing mentorship is probably not going to work.

P_1 shared her ideas about improving mentoring programs. She suggests having workshops to teach the advantages of mentoring programs. She also perceives that mentors can be role models not only for Latinas but women in general, so they can succeed in their careers. It is important to understand what mentoring is and how mentoring can encourage women to be assertive and therefore successful.

Other factors that have helped P_1 in her career include being goal oriented, knowing what she wants, and being ambitious. She believes that having a plan with a path to follow is essential.

Textural-Structural Narrative

The participant owes the success in her career to the fact that she had goals. As she said, "I really knew from the very beginning what I liked… you really have to have a goal… knowing what you want from the very beginning and really loving it". P_1 met her goal and she loves her job. She believes that "it's not as tangible in science and it's something that you invest a lot of time." Because of this persistence is essential, which is a quality she believes she has. "Sometimes things just don't work and you have to then ask it from another view and ask it from another approach and just continue." P_1 believes mentoring is essential to succeed, "having good mentors or mentoring is essential for you to be able to succeed."

She talked about a helpful educational experience in Venezuela that helped shape her career. It involved a high school project during her last year of high school. "I had a project to work for one year, my last year, in the laboratory, and of course it's not a thesis…" In her country students have to choose if they want to go on a

Humanities track or Science track. She chose the Science track and got exposed to a real research project, which increased her desire to be a scientist.

P_1 has also had some negative mentoring experiences. As a hindrance she describes, “having a lab chief, or having a chairman that is not supportive of you”. It was a draining and frustrating experience for her. “You have all these other things that you have to accomplish to be ready – so time consuming, and… this is what you want to do, but then having to deal with somebody that… doesn’t help.” Therefore, she believes that it is essential “having somebody that is supportive at that level”.

The participant has had positive mentoring experiences and “really do believe that it is very important”. She did not understand that fact until she began her post doctorate degree when she got help from her coworkers. She considers these coworkers mentors. She had a mentor while studying in Venezuela; however her mentor did not provide any assistance or support to write letters to help her move to the U.S. Currently she thinks of herself as both as supervisor and mentor, so she tries to help and support her mentees. She considers mentors, like herself, role models. “I think supervisors can be mentors, but mentors not necessarily have to be your supervisors.”

Her perceptions about mentoring Latinas are unique. P_1 believes that “it’s difficult for me to say that there’s a major difference between women Latina or women non-Latino”. She perceives their needs are the same and that both can be approached the same way. The main difference is that there are more non-Latinas than Latinas in science and engineering, “what is the difference, it’s just the numbers”. Of course, she says there are some differences in personalities and cultures. She perceives that Latinas are not very assertive, which may impact their professional development. Also she thinks that it should not make a difference whether one is “woman or a man, he publishes the same papers. It doesn’t really matter what chromosome we have. We should have the same salary if we are at the same level”.

It was P_1’s personal decision to have her first mentor, “I really wanted somebody I could interact with – I could have chose somebody that was very senior, famous”. She wanted someone she could interact and relate and she “chose a person who had an excellent lab”, a person she could learn from. This was a quality relationship where she received a lot of support from her mentor in a supportive environment. In contrast, “it probably was in my tenure track when I encountered the first not so supportive environment”. Her mentors have been helpful, by providing support throughout her career. “My mentor was extremely supportive of me in saying, well, these are some projects that you basically developed on your own, why don’t you just continue pursuing them”.

The participant’s mentors have been older than she with considerably more experience. She believes that “having somebody that has ten, twenty, fifty years

more than you that probably has seen a lot, advise you on how to handle a problem" is important. She believes it is necessary to have different mentors depending on the situation; "having other people for mentorship is invaluable". She thinks that mentors "should not be assigned. You really have to be able to you choose mentors and it has to be mutual". Mentoring has to be beneficial to both the mentor and mentee. "Forcing mentorship is probably not going to work – and the other thing is you don't use them for everything".

P_1 shares her ideas about improving mentoring programs. She suggests, "Having workshops or something, in which you could show this group the advantages of mentorship". She also believes that mentors can be role models not only for Latinas but women in general, so they can succeed in their careers. It is important to understand what mentoring is and how mentoring can encourage women to be assertive and therefore successful.

Other factors that have helped P_1 in her career include "being goal oriented", "knowing that this is what you really want", and being ambitious. She believes that "it's just getting the plan and knowing exactly what you have to do" is essential.

Horizonalization

The participant's story provides relevant terms that assisted the researcher in finding common themes that aligned with the research questions. Table 1 provides an account of the participant's experiences and expressions. In summary, Table 1 suggests that P_1 is a successful Latina scientist that due to strong mentoring relationships, her assertiveness and determination to succeed, she has been able to achieve a high level position. P_1 describes positive mentoring experiences except for one that she was unable to share the story.

Table 1

Horizonalization: P_1

Horizonalization of Latina Scientist and Engineers Mentoring Experiences (Direct quotes)
I really knew from the very beginning what I liked.
Knowing what you want from the very beginning and really loving it.
It's not as tangible in science and it's something that you invest a lot of time.
Persistence is essential. Sometimes things just don't work and you have to then ask it

from another view.
I do believe that having good mentors or mentoring is essential for you to be able to succeed.
Having somebody that really can aid you.
I really think that people don't know what a good mentor is until they don't have that, or until they really have it and they say: look what a difference it had to have this person supporting me and really aiding me.
For me it's undisputable, having people, good mentors that back you up was essential for me to really be able to say, okay, I can go through this.
Having somebody that is supportive at that level.
Supervisors can be mentors, but mentors not necessarily have to be your supervisors.
It's difficult for me to say that there's a major difference between women Latina or women non-Latino.
It's just the numbers.
It should make no difference if I am a woman or a man; he publishes the same papers.
Being woman and Latino, what difference does it make? – Nothing.
They are equally capable of publishing, of succeeding, and getting the same grades, sometimes higher grades.
Personal decision.
I really wanted somebody I could interact with.
I really chose a person who had an excellent lab.
So even though I was at another level, and I think he had—we had progressed, he… — saw me now as a colleague, he still was a mentor.
All during my postdoc, I only had supportive environment.
It probably was in my tenure track when I encountered the first not so supportive environment.
I knew I wanted to pursue a tenure track position, because I really wanted to have my own laboratory. So it's more about — how positive were they in aiding me in all the things that I needed.
So it was really up until my tenure track that I really felt…the obstacles besides the system.
But to be in a tenure track position with obstacles makes it extra hard.
Helping you deal with a problem.
Having somebody that has ten, twenty, fifty years more than you that probably has seen a lot, advise you on how to handle a problem, and says why don't you go through all these different scenarios and putting it in your position.
Having other people for mentorship is invaluable.
It should not be assigned.
You really have to be able to you choose mentors and it has to be mutual.
Forcing mentorship is probably not going to work—and the other things are you don't use them for everything. You're an independent professional.
Having workshops.
Having role models.
Being goal oriented.
Ambitious.

Getting the plan and knowing exactly what you have to do.
Have your plan and your goals.

Participant # 2 (P_2)

Overview

P_2 is an associate scientist at a government agency. The participant obtained her master's degree in zoology and doctorate degree in cytogenetic, both in Argentina. After obtaining her doctorate degree, P_2 came to the United States as a postdoctoral student at an institution. P_2 was observed as being very passionate about her research and about mentoring. She told stories about her mentoring experiences in Argentina and the United States.

Textural Narrative

Career Success

I think it's basically the enthusiasm, the convictions, believing in myself, and pursuing the ideas.

Helpful Experiences in Career Development

It was more creating episodes of events. The events were very critical. There were a couple of events that may make a real progress. First of all, they made me stay where I am. I am -- I came here as a postdoc for training. So the idea was that I would be here in a transient mode. So I would be here training, and then my commitment was to return to Argentina. That was the idea, just as a passenger here, but at the time that I was going to move or at the time I should be considering leaving and coming back to Argentina, a new position was offered to the lab, and I fulfilled it. So that was luck. Then at the same time when I was here for eight years, there was no mechanism to retain me for eight years. It was out of the -- picture, but what happened, another event episode happened, and it was that one of the discoveries, I was informed -- directly involved it had such a big human health impact that they asked me to stay. So I basically accept that, and I stayed, and then they created another. They created -- they put me in a new position, and you know, things were -- one thing was -- When I got that, that position 10 years ago, I -- I relaxed much more because I knew I could stay here, as I wasn't looking for jobs or so. And at that point, then I just started working on my foundation and -- and -- and it was a very good moment, I would say, because

everything started to produce fruit…and results… the project went really well. It was a completely new area of discovery. So there was a lot to do, and -- and that led me to my next promotion. That was from Staff Scientist to an associate scientist. I always say I was in the right place at the right moment, most likely.

Impediments to Career Success

I have to think hard because I think I was fortunate to have a lot of positive experiences which come to my mind first, but if I have to mention something that was on the way -- it's the bureaucracy and all those rules and regulations, visa issues, you know. At the moment I was given the position, they just came up with a rule that says no, you cannot be here for longer than eight years, or no, we are not going to give you a GS, which is the government. Right, we are going to give you a _____. Just at that moment or -- or what I encountered a lot was that in many situations, I was a trailblazer because I was the first one to be doing that or to be put in that position. I am the first one to apply for this, so no one knew what it was. So that is a little bit of a disadvantage. Because there are no committees formed. There is no history of other people getting those positions. So, see, when I think I am the fifth -- this associate position, I am the fifth person to have it in this institute. So there was not much legislation and experience in terms of who would get this position, what does it mean, is it a promotion, is it an award. And it's no good. It's no good to be the first person that goes into that pathway because you may encounter that things are unfair.

Meaning of Mentoring

Mentoring is very, very crucial, not only me being a mentee, but also being a mentor. So I am in a position now in that I am both, and although I was fortunate to have very good mentors, I also think it's very important to be candid because it is a relationship of trust, first of all -- and it goes both ways, and I learn from my mentees a lot, a lot. So mentoring is very important. It's critical for anybody in any career, I would say, and I believe very strongly about mentorship. And I don't think you have to have one mentor that is your supervisor. You can have multiple mentors. Some of them, they might not even know they are mentoring you, but they mentor you by the example.

Being from a different country, I have to learn a lot about the American dynamics and the American. And so, being from a different country, you have to learn the dynamics of the American system, which is very different. So, in -- in a lot of circumstances, what I did is I observed a lot, mainly in… not in mentor-mentee relationships from running committees or interactions of groups of people, how the leadership is delivered and how the action is taking place and how the verbal commands are sent, how different styles are from our country from this country. So that I observed a lot, and a lot of people, they don't know are my mentors because I took their style as a style I am going to achieve and learn – and to impose when I was thinking in those thought of leader [inaudible]…To

understand the dynamics. And then I -- I adopted some roles of some modes or styles that I consider successful or that I align more with or think I am more alike.

Perceptions of Mentoring Latinas

I think the challenges are that unless you are mentored by another Latina or Hispanic, you are probably not going to be mentored in an ideal or correctly or in the most successful way, and I say that because most of the Hispanic females that I know or that I think are in these areas may be kind of shy or not -- or they might not come forward with their beliefs, their thoughts. They might not be very vocal or very loud. They might be rather silent, reserved, and that could be misunderstood by like lack of creativity, lack of pushing forces, lack of internal drive, but it is not the case, unless you empower the Latinas and give them the possibility of voice their ideas, their programs, projects, their thoughts, opinions.

So, unless you know that, the mentoring might not be completely successful. Understanding where do we come from and our culture and how our culture is imprinted in our personality are very important for us to have a chance. More of the personality because you can come from different -- from the same country and have different personalities. More of the personality, the cultural background, it's not inherent of -- from us to come from schools or -- I was working as a scientist in Argentina, and my boss was so dictator, so vertical, that I was afraid to come here and give -- express my opinion because of that, and we come from a male-dominated society. So it was very hard for me. It was really surprising for me when I first came that my opinions and my thoughts would count, will be respected. I feel great. I feel that I belong, and that's very -- because when I came, it was so like -- we cannot compete or challenge that. So that is important to understand that. That is probably most of this cannot be where you come from, what are most of it -- how the rules play. So I think somebody has to understand that, to understand why sometimes you don't produce ideas or you don't verbalize ideas that could be bright, brilliant, but they are not put forward because of concerns, hesitations.

I think for a fact that I mentor my Latina students different than anybody else because I know they need a push on their self-esteem and you-can-do-it type of message consistently, consistently because that will empower them.

Meeting Mentors

My main mentor, I never met her until I arrived here. So I met her in the airport. Because again -- and here is another example. My boss was so vertical that he decided that I would come here to the States for one year, and he started writing the letters to her. The correspondence was among them. Actually, my idea before I was mentioned to come here was to go to Cuba and work there [inaudible]. And I arrived there to my boss to tell -- he said, "No, you are going to the States. I already arranged everything." So I came here. And how I met her -- but again,

how do you meet your mentors, your mentors I think are people that give -- give you examples of things they believe in with you. The relation of mentorship, mentor-mentee, doesn't need to be established in a formal way, like "Welcome, I am your mentor. Nice to meet you." No. You go talk to people and ask for advice, or you make a comment, and they produce and advise without even saying give me advice on this.

And for many of them, I don't even know if they know they function as mentors for me, but I have in different areas of expertise and have different people I attach to. I will ask. I will seek for feedback when I am going to do something. So it is like I proof my ideas with somebody else before going somewhere or doing something, so -- and they are in different areas. And you don't need to establish a relationship, a formal relationship --

Key Qualities of Mentors/Mentoring

I think a couple of points. One is trust. I put that at the beginning. There is trust both ways. I trust my mentor is going to give me the best advice possible, and will trust me as a person that can be mentee, can be the [inaudible] mentor. And that I should be there.

And also, the mentor should care about you honestly, honestly. He should or she should care about you, and -- and think about you, your talents, your skills, and give you advice and consult, give you advice based upon your talents and your skills, and that is something a mentor should always do is to understand where your skills are. Not all of the mentees have skills in all the areas, like not all of the mentors. There is not a perfect mentor that you can go for career development, scientific advice, personal. No. So that is why I have more people in those.

But see, for the mentees, the same, they don't have all the qualities. Like you may have a talent there, and the mentor should be wise enough to perceive that talent and to make you develop that, not in -- not in precluding the other one, the other little talent that you might have that might need developing and that might need, right, like let's suppose I am very good at speaking, giving oral presentations, but I am not very good at writing. That doesn't mean I will become a speaker of the work, I not write anymore. Both need work, but these are probably the most visible qualities, but the other needs work too.

Influence of Mentors

I don't know if they did directly influence my career path or I was so convinced that what I wanted to do, that I looked for mentors, I will pursue or encourage that. I would say they didn't put any blockage on it or any obstacles, but I don't know if they were -- if they really were pushing for it necessarily, influencing it. It was an internal force more than external.

Achievement

My mentor, my direct mentor here was very instrumental because she wrote all these memos that you have to write in such a wonderful way, and she was very instrumental in getting me the position that I have today because she was always supportive of -- of me getting promoted or getting a new position or staying here, and she -- she really went the extra mile to produce that. The other mentors, I always have to be thankful to all the people for all their recommendations, for things like that, and the other mentors always gave me good advice to make my stay here possible and successful always. I always feel that people -- I always feel comfortable when I talk to some of them and I feel that they care about you. That they want the best for you, and that's -- that's important. That's very important, and that's probably what I try to transfer or to convey to my mentees. Right? "I really care about you. I want you to get the best outcome possible," you know, count for the --

Go for the [unclear] reason, for the best reason, or don't cut yourself short, don't limit yourself. Don't limit yourself when -- if you don't qualify, they will tell you, but don't say up front, "No, I don't think I qualify for this," because you might qualify. So that's something I always tried to let them know. And I think I -- all my mentors always, always conveyed the message to me that they really care about me, and they trust and they support what I wanted to do.

Thoughts of Mentoring Programs

I think they are very helpful. I really feel very strong about it. I wanted to implement one here at _____, actually, for a staff scientist. Not necessarily Latinas, but all women. I am also very oriented toward women, positions for women at _____, and I wanted to do that, and I wasn't able to do it yet because I was -- one of the things I wanted to do was to take a training for Latinas which is a very intense training. It is four weeks during the year. Definitely everybody that goes through that. So I applied for it -- no. No, I didn't apply. I wanted to apply for it, and my mentor suggested to me that not this year, maybe next year, because this year I needed to write papers and basically I needed to fulfill her needs. I learned that. So I -- after return of that program, you have to put something -- as part of your return to the system, and what I wanted to put was a mentoring program for -- for staff scientists. There are not that many Latina staff scientists that work here.

So, I really believed that those -- those programs are very good; first of all, because it's a forum where you can vent or you can voice. You are going to find so many common interests among Latinas, families, same experiences and so -- and then you also may find help. Many successful people could overcome obstacles that are common to other facts. So that is another class of having a person that is the same level or a little bit up, that went through what you are going to and was able to overcome. So it's very important, very important.

This year I'm doing one [leadership program] now that it's at _____, and it's -- it's not as intense, but it's intense. So she accepted it. So -- It's for executive employees of ---, and it's really good. Still, it is not for Latina women. Basically, I am the only one there and also which I bring to the table; it is such a diverse point of view and the point of view of the minorities, which everybody needs to learn because more minorities are getting to the workforce every day. So you need to learn how they think, and the way they think about solving problems is different, and that's the beauty of the diverse workforce -- the opportunities of interacting all of these ideas.

Other Factors that Contribute to Success

Networking. That is probably more important than mentoring. Knowing people, shaking the right hands, listening, observing what do they have to say, learning what their interests are, and this is called -- and this, I want to say what their… "What it matters", "what it matters" is because if you know what the working matters is of your superiors, of your peers, then you can get much more of them. So, oh, yeah, much more than mentoring, than working in an office, and knowing "what it matters" and knowing the -- being a person people is very good because you can really understand the other people and learn how to interact in a more successful way for the team, not for yourself, for the team. Here, we work as teams.

You cannot do science and be isolated. So the best -- when you pick the talents -- when I have my mentees and I generate and idea and I want them to work on it, I know exactly who has to do what part, and I know when I put them in that task is because I know this is going to be the most successful outcome. If such and such does this, if such and such does that, and it works. Sometimes principal investigators do not care about the career of the others. There are guys here that they don't want to think about that. They have a project, and they don't care if they hurt the life of a postdoc and so they just throw a project there, and they say you, you, you do the same project. That's completely unethical, and it doesn't make any sense.

Instead, just spending more time with them and knowing their "what it matters" and their skills and where they carry a passion, that will probably get a much better outcome, and everybody will be happy also. So why not? I don't understand that. It's because it requires a little bit more of time and dedication. They are going to leave here happy, and they are going to have a good memory of their _____ experience ---.

Additional Information Voluntarily Provided by Participants

Mentoring Latinas is always rewarding. It's because you can tell how they change during their time, how do they come or how do they leave, empowering --

empowering women, I think it is so important, so important, because all this potential that they can put out because of their background and their history. It should be -- everyone should be able to facilitate that. So, yeah, mentoring Latinas, I think it is very, very rewarding.

And there is always – I was talking about that with my – my oldest daughter. She was saying that at the beginning of her school years, she was feeling embarrassed of being different. She was born in the U.S. She doesn't have any accent. She looks American more than Hispanic, but anyway, she -- she said, "I was embarrassed because you were eating different food, or you know, you are different, and now I feel so proud," she said, and I feel that I'm glad that metamorphosis took place.

And then I said, "But do you see when you talk to people, how different you refer to the Hispanic people, even when you talk to them in English?" -- I mean Spanish. Of course, when you talk to them in Spanish, there is such a freedom flowing. There is like a channel flowing that is so easy to navigate. You have established barriers and so on. And instead, when you talk to an American, you follow codes because you have to.

You have to follow codes. Even in an informal relationship, there are some codes, some things that you -- you need to think about mentally at this point after twenty years they are automatic, but they are there. They are there, and that those things, you know, prevent you probably from establishing a more casual or a more free relationship, and that is who we are. Warm, cozy. It's like you articulate your gestures. Whether you establish eye contact that we are looking for the person's reactions but it's not saying -- I'm sure people wrote books about that. And they have a lot of things to say about it. So, yeah, mentoring Latinas, I think is much more rewarding, or mentoring women.

I have one of my students. She always tells how much she changed after being in this lab and how much she has to tell about me, and she wasn't Latina. She was from Iran, and she is totally different. She is really so much focused, and she has done so much for her career. So mentoring women and being able to take them to the next level is much more rewarding.

Structural Narrative

P_2 attributes her success through her enthusiasm and her convictions. She has always believed in herself and is driven to pursue her ideas. She describes her career path as a series of episodes or events. Her initial thought was to obtain a postdoctoral degree in the United States and then return to Argentina. When she was about to leave for Argentina a very good position came to her attention. She decided to apply and was given the position. After eight years, per agency rules, she had to leave her position, however one of her discoveries was so significant that she was given another position. Job security allowed her the ability to relax

and she was able to concentrate on her work. She attributes her success to being in the right place at the right time.

As for negative experiences, she can not think of many since she has had many positive experiences. Thinking hard the only hindrances that she could think of were the rules and regulations of the government bureaucracy and visa issues that she has had. Also, that fact that she was a trailblazer made everything more difficult for her.

The participant considers mentoring in her career a crucial aspect. “Mentoring is very, very crucial, not only me being a mentee, but also being a mentor.” She recognized that mentoring is a relationship of trust and believes it is important to have multiple mentors. She adds that American mentors were different from her Argentinean counterparts. She noticed that leadership and commands were delivered in a different manner, so this required an adjustment on her part. P_2 recognized that a lot of people are her mentors. She carefully observed both styles, took the best from each, and developed her own.

P_2 considers mentoring Latinas a challenge. She perceives that the ideal mentoring relationship would have to involve one Latina mentoring another. She attributes this to the fact that Latinas might be quite and reserved (perhaps due to language issues) and as a result this could be misunderstood as lack of creativity, intelligence and lack of internal drive. Mentoring Latinas would empower than in a great way by giving them opportunities to voice their ideas and by freeing them. P_2 emphasized that it is important to understand where the person came from, her culture, and how her culture affect her personality. This understanding is critical to her success. She herself mentors Latinas differently from non-Latinas. She knows it is important to improve their self-esteem.

P_2 met her mentors by just approaching them and asking for advice. She perceives these are the best mentors; that mentoring does not have to be formal to be successful. It is important for the mentor and mentee to trust each other. This trust will allow the mentor to give sincere advice and will allow the mentee to receive this advice as genuine and trustworthy. It is imperative for the mentor to care about the mentees success. She believes that having multiple mentors is important, each addressing different areas.

Mentors did have a significant influence in her career, but she believes that it was her internal drive to succeed rather than an external force (mentoring) that allowed her to succeed. Her mentors have been instrumental in getting her in the position she is today, from helping her in her writing skills to going the extra mile to provide support. She believes strongly about the benefits of mentoring and believes mentoring programs give mentees a voice to express themselves.

Other than mentoring factors that have influenced her career include knowing people, shaking the right hands, listening and observing what others do and say. She also has dedicated herself to her career by sacrificing her personal time.

Textural-Structural Narrative

P_2 attributes her success to "the enthusiasm, the convictions, believing in myself, and pursuing the ideas". She describes her career path as "creating episodes or events". Her initial thought was to obtain a postdoctoral degree in the United States and then return to Argentina; "so the idea was that I would be here in a transient mode". When she was about to leave for Argentina a very good position came to her attention. She decided to apply and was given the position. After eight years, "there was no mechanism to retain me… another episode happened, and it was that one of the discoveries, I was informed – directly involved it had such a big human health impact that they asked me to stay". Job security allowed her the ability to relax and she was able to concentrate on her work. She attributes her success to being in the "right place at the right moment".

As for negative experiences, she cannot think of many since she has had many positive experiences. Thinking hard the only hindrances that she could think of were "the bureaucracy and all those rules and regulations, visa issues". Also, that fact that she was a "trailblazer" made everything more difficult for her. " I was the first one to be doing that or to be put in that position".

The participant considers mentoring in her career "very crucial". She has had mentoring experiences as both a mentor and mentee. She recognized that mentoring is a "relationship of trust" and believes it is important to have "multiple mentors". She adds that American mentors were different from her Argentinean counterparts. She noticed, "how the leadership is delivered and how the action is taking place and how the verbal commands are sent, how different styles are from our country from this country". P_2 recognized that a lot of people are her mentors. She carefully observed both styles, took the best from each, and developed her own.

P_2 considers mentoring Latinas a challenge. "I think the challenges are that unless you are mentored by another Latina or Hispanic, you probably not going to be mentored in an ideal or correctly or in the most successful way…" She attributes this to the fact that Latinas might be "silent, reserved, and that could be misunderstood by like lack of creativity, lack of pushing forces, lack of internal drive, but it is not the case, unless you empower the Latinas and give them the possibility of voice their ideas, their programs, their projects, their thoughts, opinions". It is important to understand "where do we come from and our culture and how our culture is imprinted in our personality". This understanding is critical to her success. She herself mentors Latinas differently from non-Latinas. She knows it is important to improve their self-esteem.

P_2 met her mentors by just approaching them and asking for advice. She perceives these are the best mentors; "the relationship of mentorship, mentor-mentee, doesn't need to be established in a formal way". It is important for the mentor and mentee to trust each other. This trust will allow the mentor to give sincere advice and will allow the mentee to receive this advice as genuine and trustworthy. It is imperative for the mentor to care about the mentees success. She believes that having multiple mentors is important, each addressing different areas. "There is not a perfect mentor that you can go for career development, scientific advice, personal. No. So that is why I have more people in those".

Mentors did have a significant influence in her career, but she believes that "it was an internal force more than external" that allowed her to succeed. Her mentors have been instrumental in getting her in the position she is today, from helping her in her writing skills to going the extra mile to provide support. She believes strongly about the benefits of mentoring and believes mentoring programs give mentees a voice to express themselves.

Other than mentoring factors that have influenced her career include "knowing people, shaking the right hands, listening, observing what do they have to say, learning what their interests are… Mentoring Latinas is always rewarding. It's because you can tell how they change during their time…"

Horizonalization

The participant's story provides relevant terms that assisted the researcher in finding common themes that aligned with the research questions. Table 2 provides an account of the participant's experiences and expressions. In summary, Table 2 suggests that P_2 is a successful Latina scientist that through strong mentoring relationships, her enthusiasm, convictions, believing in herself, and pursuing her ideas she has been able to achieve a high level position. P_2 described positive mentoring experiences. It was difficult for her to think of a negative mentoring experience.

Table 2

Horizonalization: P_2

Horizonalization of Latina Scientist and Engineers Mentoring Experiences (Direct quotes)
Enthusiasm
The convictions, believing in myself, and pursuing the ideas.

Just a passenger.
Luck.
I was in the right place at the right moment.
I was fortunate to have a lot of positive experiences.
Bureaucracy and all those rules and regulations, visa issues.
Trailblazer.
Mentoring is very, very crucial.
A relationship of trust.
It's critical for anybody in any career.
I believe very strongly about mentorship.
You can have multiple mentors.
I have to learn about the American dynamics.
I observed a lot.
Unless you are mentored by another Latina or Hispanic, you are probably not going to be mentored in an ideal or correctly or in the most successful way.
I mentor Latina students different than anybody else because they need a push on their self-esteem and you-can-do-it type of message.
The relationship of mentorship, mentor-mentee, doesn't need to be established in a formal way.
You go talk to people and ask for advice.
Trust.
Mentor should care about you honestly.
Always supportive.
All my mentors always, always conveyed the message to me that they really care about me, and they trust and they support what I wanted to do.
Those programs are very good.
It's a forum where you can vent or you can voice.
Knowing people, shaking the right hands, listening, observing what they have to say, and learning what their interests are.
Mentoring Latinas is always rewarding.
Empowering women.

Participant # 3 (P_3)

Overview

P_3 is a Latina from Puerto Rico. She obtained her bachelor's degree in Civil Engineering at a major university in Puerto Rico and her master's degree in Sanitary [Environmental] Engineering at a university in a Southern state. She indicates that engineering came naturally for her, even though engineering was not the common

profession of choice for females. Her desire to study engineering, she believes, came from the fact that both of her parents had bachelor's degrees in Mathematics. Subsequently, her dad eventually obtained a bachelor's degree in Civil Engineering. Math was part of her upbringing and led to her choice of career and her bachelor's degree. P_3 is a successful regional manager and vice president for a major civil engineering firm.

Textural Narrative

Career Success

> I think being a high performer, performing above expectations all the time, and I think my communication skills were a differentiator, as compared to other engineers. Many engineers are not very good communicators, but I have really strong communication skills, and that allowed me to do the things that I -- that were beyond my years of experience.

Helpful Experiences in Career Development

> Managing very large projects that were politically charged, helping to win awards for the company, being strategic, these are some of the things that my boss told me was the reasons why he selected me for this job. I had to compete for this job, so -- it was an interview -- it was an open solicitation for anybody who had an interest could raise their hand, and they created a short list. Over 12 or 15 people raised their hand, and from that list, they short-listed four -- we competed against each other, and I was the only Hispanic. I was probably the only Hispanic in the whole pool of applicants. There were two men and two women in the shortlist of four who were interviewed.
>
> I am still the most senior Hispanic in the firm. So I am the one that's kind of pushing the envelope. But also as a woman, I am also one of the most senior women in the company. There weren't many before me because there weren't very many women in engineering before me. And actually, in civil engineering, it is even worse because it was considered even more traditionally male, so there were not many. As an example, chemical engineering has typically more women than men because chemistry is pursued by a lot of women, but, you know, civil engineering, it is perceived to be like a man's job -- dealing because it's about construction and building and things that typically girls don't get encouraged to -- to learn about.

Impediments to Career Success

When I got this job, I didn't have any profit-and-loss experience, and it was perceived to be a weakness. So I had to -- when I interviewed for the position, when I made the short list, I had to think through what is my strategy to neutralize that weakness, and I knew that it was a weakness, as compared to the people that I competed against. So I had to show them that even though I didn't have that firsthand experience, I understood how to manage profit and loss, and I used my project experience to create some comparisons of, you know, what I do here in managing a big project, that it is similar to what you do in managing a big business, even though it's a -- you know, the responsibilities are different.

The other thing is that when I got this job, the position that I have is in the Northeast, and being Hispanic, there are still perceptions around what a Northeasterner 'looks' like. And when I got my debrief from my interview, when my announcement was made about my selection and appointment to the job, I know there were people who said, "Who is she? With that name, she is not a Northeasterner…" So there were preconceived ideas of what a person -- what the right person for the job should be or not. And to tell you the truth, the first time I applied for this position, which I now have -- I applied for it in the Southwest because I thought it played to my advantage there because there are a lot more Hispanics in the Southwest, and there are a lot of clients in our company, that we work for, that make the line decisions about our services, who are Hispanics. So I thought that it would be an advantage in that market for me to aspire to the job, but -- and it was funny because for that competition, I didn't even get short-listed, because "I didn't have enough California experience" is what they told me, but then when I applied to the Northeast job, some people viewed the fact that I was Hispanic as a negative.

Meaning of Mentoring

It has been very important because -- especially because of being a female and being Hispanic, I didn't have a lot of people around me who were like me. My first mentor was my dad, and I learned a lot about engineering in watching him doing his work, and I didn't really recognize him as a mentor at the time, but I now look back and I realize that he was the first role model that I had that provided me with some perspective of what you could do in this industry of engineering and science. And at all levels in my career, I have had really strong mentors, people who took a interest in my success, who were willing to give me coaching and advice, who were also willing to tell me when I didn't do things right, so that I knew what I needed to do differently or, you know, how it was perceived. So I think it's really important.

Perceptions of Mentoring Latinas

I think I have actually done some mentoring of Latinas in engineering. I have a couple of friends who are engineers, very successful women engineers who are in college education, you know, professors. So, for example, one of them got a grant to do some work that related to mentoring women, young women who were in undergraduate engineering schools, and she asked me to go down to her school to be a speaker.

And in our company, we also have a mentoring network for women, and not everyone is an engineer, but a lot of -- because of what we do as a company, a lot of our people are -- or a lot of our women are -- engineers.

So what we hear all the time is that women in general don't have enough role models, successful role models or people that they perceive to be like them who have made it to the top, and that this can be a barrier to the aspirations of women and their belief that they can get to the top and be successful.

So I think it is really important, and in our company, for example, we now have -- we have had this network in place now for five years with a focus specifically on women because we realize -- we realized there weren't enough women getting to the top management levels of the company, and we weren't making enough progress in advancing the women through promotions.

So we decided that one of the gaps was that they didn't see a lot of people like them at the top, and one of the things that we did is we created some visibility around the women that were already pretty senior, but that weren't necessarily known because it was such a big company.

For example, most of the women at my level, I didn't even know personally until we created this network. I had heard their names, but I had no concept of who they were, what they did, what they were good at that made them successful. So they weren't really a role model for me, even though I knew they were out there. So, one of the things that we did is create some visibility for those women, so that the women following us could see that there are people like them up there, even though perhaps we haven't gotten all the way to president level yet.

We have a lot of learning and development that is focused on women and that is open to everyone. We have some targeted development where you get selected to go to a special program -- that not everybody gets to go, and for that, you have to be a high performer, and you have to be -- the first -- the first one we did, we chose women with 7 to 15 years of experience, so the next -- sort of the next generation of potential future leaders. And they have to compete against each other to get selected to go because we only had like two or three slots per geography. So we couldn't accommodate everyone. So we had to choose the best of the best.

And then we also have some targeted or some informal mentoring programs-- we facilitate connecting people together, so people can find mentors. So there is an informal mentoring network in place where you can ask somebody to be your mentor, or you can volunteer to be a mentor, but we let the people choose who is the right person for them because a lot of it has to do with the chemistry between the two people and building some trust.

And what we have learned is that if you force it, it doesn't always work. So it is more important to provide the networking opportunity to let people find the right people – person – for them or the right group of people for them.

I have multiple mentors right now, some I use for technical things, some I use for management, and some I use for things related to my career development aspirations. Sometimes I even use them for personal advice and how to balance that against my career decisions, you know, but no one mentor can do all of those things at the same time. So what we tried to do is we tried to put people before them who can meet various diverse needs-- where they can see different kinds of people and how they --

Meeting Mentors

Most of them were people that I worked with -- that I developed rapports with first in the work that I was assigned to do, and then I realized that the relationship was growing, and I could use the relationship to help me get better and challenge myself, and to use them as a sounding board, but some of them happened without me even knowing.

And some of them, I actually made a deliberate choice, like I wanted to learn more about financial analysis. So I went to a woman CFO in our company, and I said "this is an area where I don't think I am strong enough, would you be willing to help me, and can I come to you with questions that I have that I don't want to ask of my boss, but that I would like somebody who really knows the matter to help me with?"

So she -- she kind of became my mentor in that very specific area of finance, but she wasn't a person that I even worked with, and the reason I chose her was because she was perceived to be one of the best, and she happened to be a woman, and I was connected to her through the women's network.

I do think the language of women is different. And I think not that men aren't good mentors -- I have a lot of mentors who are men. In fact, most of my mentors have been men, not women, because there are more men in my industry than women. So, for me to be mentored by somebody, usually -- you can get mentored by a junior person or a peer, but some of your strongest mentoring relationships are usually somebody who is more experienced than you. And there weren't very

many before me. So there weren't really other women for me to ask to help me, and most of the role models that I had, especially in the first 15 years of my career, were men. So those were my mentors.

And in fact, I think if I -- if I think about it right now, I probably don't even have a woman mentor at the moment. My strongest two mentors are guys, are men. One is my age. So he has about the same level of experience that I do, but he is in a higher-level position in the company, and the other one is my boss who -- who is a lot more experienced than me, but who also is my boss. But there are certain things that I can't ask him because he's my boss. And that is why you want to have multiple mentors, and that is what we usually tell both the men and the women. And then women have some unique issues, I think, as well, that probably haven't gotten enough attention in the workplace.

For example, we are dealing with this in our company a lot right now, women who are 30 -- in their early thirties, have been working for 10 years, and just had their first child. And all of a sudden, they want to take time off and work part time, but they perceive that as a negative in terms of being promotable. And they are very uncomfortable with the conversation around 'what am I giving up if I choose not to work as hard as I did before I was -- I didn't have a child', because -- because it is a very competitive environment, and people are always being evaluated against each other to determine who are the strongest performers.

So, typically, a woman wouldn't feel very comfortable asking that question from a guy, but they will ask it off a woman. Like when we have had some of our meetings with the women only, that issue comes up every time, 'what do you do when you have a child, and to what extent is that going to hurt you or help you if you decide to slow down a little bit or if you ask for some special accommodation that allows you to have more flexible work hours, does it change the assignment that you get, does it change the perceptions around your contribution or performance or commitment?' And those are very -- those issues are more with the women than with the men.

Now, it's changing some because there are now more couples who are both professionals in the workplace. So the husbands of these women are all -- they also have different expectations because they are dealing with women who are at the same level as them and as successful as them. So it is changing. Both of them are having to learn how to deal with this for both men and women, but there is likely to be more situations where the women rather than the men will ask for extended maternity leave or for reduced work hours for a period of time because, typically, you know, in the traditional role, it would be the woman's job to take care of the baby.

Key Qualities of Mentors/Mentoring

My best mentors have been people that I felt would be totally brutally honest with me, but that the – that I felt would also support me and champion me every step of the way, even when I made a mistake. So I needed to feel that I could trust them for candid feedback and advice, but that they wouldn't hold that against me -- that I could trust them in their interactions with me, in our work together, colleagues or peers or subordinates, and if I -- and I have had some mentors who have been really good subject-matter experts, but I haven't developed the deepest trust with.

So there are still things that I wouldn't share with those people because I am not comfortable, because I don't know necessarily that they will be able to separate their knowledge of me and my development needs completely from how they view me in the day-to-day execution of my job.

You know, if I share something with someone and I am worried it could be a perceived weakness about myself and I don't believe that that person can put that information in a closet and forget about it after our conversation is done, then I am less likely to share it with them.

So trust and -- trust and the ability to -- to coach you and advise you without using the knowledge that they gain about you in their day-to-day interaction with you, that is what I look for first, more than anything else.

If somebody -- if a mentor gives you a criticism or says this is not good or it is not valued and they don't offer you suggestions about how to get better, it is not very helpful, and it actually can turn you off and sort of interfere with the mentoring -- mentor-mentee relationship because it is easy to -- especially when you are vulnerable and you are talking about things you could do better, it is easy to feel criticized. So a mentor that only gives you the feedback and doesn't give you some potential approaches to get better in that or to -- or doesn't help you to -- find resources that can help you get better --

Once somebody told me you really shouldn't do this, and here is an example of where you did it and it wasn't effective and it wasn't useful, but then when I asked him, well, how could I have handled it differently, they couldn't answer my question, and they couldn't give me some constructive new approaches. So then, at that point, you are kind of deflated. It's like, okay, well, that input is not -- I mean, yeah, okay, that is the perception, but I don't know what to do about it to change that --

And for -- I'll give you an example that is female related. A lot of women struggle with being emotional in a workplace, probably more so than men. I mean, I've had -- I'm a boss of a lot of people. So I have folks, women that work for me, and I have had men also get very upset and emotional with me. So it is not that men cannot do it, but women are -- go there a lot faster, a lot easier

because we tend to be more expressive. So, usually, we wear our emotions on our face, and we say something about it, and then you sort of break down.

So telling a person you are mentoring, you shouldn't cry in front of your boss is not very helpful, unless you tell that same woman, okay, if you get emotional, here are some ways to deal with it, so you don't cry.

But I have had people, you know; tell me somebody came into their office. A woman came into their office and started crying, and you know, I can't help them, or as they tell me, okay, I ask 'what did you say and what did you do', because part of the problem is you need to give them some alternative ways of dealing with their emotions -- and to acknowledge they are going to get emotional, and that's okay. But we have that a lot. We have a lot of this in the 30-something women in the office. They get really -- if you tell them they didn't do something right, they get -- they start crying. That's not very helpful.

But if I go tell an employee, that is not very helpful, don't do it again, I'm not really mentoring her -- So what I do is I use examples a lot, and I say this has happened to me, and here is how I dealt with it -- in a positive way one time, and here is another example when I totally screwed it up, or I will be doing a good job, and here is what I learned from that. So now she has an image of, okay, two different ways of responding to the same thing, one that worked well for me, one that didn't, and now she can say, okay, is this something I could try the next time I get emotional?

So it's really giving them some resources or solutions that allow the person to overcome that challenge because it is a challenge, and it happens with men as well, but I think it happens more often with women because women are -- in our society they are told that it is okay to be expressive, and men are told that it isn't.

Influence of Mentors

There's been a little bit if everything. I had a mentor who actually -- I had a couple of mentors who actually really opened a major door for me.

For example, one of my biggest promotions in my career was at a very early age to manage a project that was really big, and I hadn't done anything near that magnitude before, and -- and one of my mentors was the person that kind of stuck their neck out for me and said, "She is ready. She is capable. Yes, she hasn't done it before, but she can do it, and I will make sure that she succeeds," and he kind of vouched for me, and he encouraged my supervisors to give me the promotion, even though there were some people saying, "We can't give it to her because she hasn't done this before, and it's too much risk for the company." So there's an example of a very specific active thing the mentor did to create a new opportunity for me that probably would have been hard for me to get at that point in my career.

And I was ahead of my years when I got this assignment. It was definitely -- I was definitely young for the responsibility I was given, but his sort of -- his encouragement and his voice, active vocal input made a difference in the decision they made, that the company made, to let me manage this job.

And that was a big thing because that is when I went from -- I was doing a great job, but I was still very much at par with my peers, and when that happened, I got ahead of my peers. So it was really a step up for me in terms of my responsibility in the company, and that allowed me to grow faster as well, which also created new opportunities.

And then I have a lot of mentors who basically just give me coaching and advice. I call them when I have questions or when I have situations that I have dealt with that I am not sure I have responded to in the best possible way, and I am looking for some feedback: how would you have handled this differently; did I do it right; what could I have done differently, if anything; have you had this experience happen to you before and how did you deal with it. And those people are just my -- my advisors, but they are not necessarily actively involved in opening doors for me or recommending me for promotions and things like that. So there is a little bit of both, but obviously, I had a couple that actually really opened the door and gave me their -- sort of their seal of approval, and those are the ones that I -- I look back, and I feel that I owe them the most in my career path because they really sort of took a risk with me and -- encouraged me. And then they were there to support me, to make sure that I would be successful as well.

Like my current boss, for example, I mean, when he selected me for this job, some people didn't think I was the right person for the job, and when he -- when he gave me his expectations, he also told me, "Now I am going to set high standards, but I am also going to -- I want to tell you that I will be here for you as a resource because your success is my success. So it doesn't help me to just set high expectations and walk away and not -- and not do anything about it." "I want to make sure that you can count on me to help you be successful in this job."

And for example, with him, I have a mentoring relationship with him, even though he's my boss, and we actually do ‘time-outs’ where we are talking about things that need to be done in the job and things that are going well or not going well, and then we sort of take a time-out and say, okay, now can we have a mentoring discussion off the record? And that is how we know that we are switching from one role to the other, and I have enough trust in him to do this. I have known him long enough that I feel he is able to navigate back and forth because his role as a boss and his role as a mentor are different, but not everyone can do that. Especially, when the person is your boss, you know, that is kind of unique to be able to have that (a mentor) in the same person.

But I will tell you, for example, I was the first person of color promoted to this position in the whole company, and the first woman in -- in the current history of

the company, because the job has changed a lot over the years. And he told me that it was very important for him to make sure that I would be successful because everybody else was looking up to me, and I was the only visible role model that was Hispanic, you know, and the first person of color to be in this job. So he said, you know, "This is a big deal for the company, and we need to make sure you are successful, and we are going to do everything we can to give you the tools and resources that you need."

Because again, if they go in having role model issues, then when they see somebody who is like them, who has made it to a pretty high level, they are more likely to feel encouraged to keep challenging themselves.

And for me, I was a very young mom. So I have always had children. So I have always managed career and parenthood and everything else, and that is also kind of unusual because a lot of the women now tend to wait longer to have kids because they want their careers to be established before they start a family. I didn't have that luxury. So, again, you know, I get a lot of questions from the young women about how did you do it? I said, "Well, I don't know."

It wasn't perfect. It wasn't perfect. I mean, I made mistakes along the way too, but -- but you do what you have to do, and you know, I didn't have the luxury of saying, "Well, no, I can't do a particular project or task" -- you know, I needed the job. I wanted it. I was appreciative of the opportunities, and I wanted to be a good parent too.

You just do it, you know, but then you go back and say what worked and what didn't, and yeah, that you can share those experiences with -- with other women, and that's helpful, I think, because then they can put it in context and see, yeah, I mean, I'm not unique. These kinds of things happen to everyone.

Achievement

This one in particular, I had a mentor before I got this job, this position, who was my development mentor in a targeted development program that the company has in place. So I was actually selected for this program, and he was assigned to me to be my development mentor. And it was a three-year program, and there were very specific things that we worked on during those three years that truly prepared me for this job.

I didn't know at the time that I would be in this position, and in fact, I didn't even have this position as a target, but when this position became open, my mentor called me and said, "You should consider this job. You are more ready than you think you are, and a lot of what we have worked on for the last three years has prepared you for this job."

And I didn't -- I didn't think I wanted the job, and I didn't think I was necessarily qualified or ready for the job because, for example, I knew I didn't have enough profit and loss experience, and that was a criteria for the job.

So he coached me through, well, what you don't know, what you do know, here is how you have done those kinds of things in different jobs, and he actually coached me for my interview and helped me prepare for my interview for the job. I called him several times. I asked him for advice on how to handle my -- how to capitalize on my strengths, how to – and what to say in the interview around my weaknesses. He helped me practice with Q-and-A before the interview. So, I mean, those were very helpful, very meaningful things that he did for me to help me be prepared for the job.

It was kind of a dual decision -- I had to choose a sponsor. I had to choose someone, and I had to also kind of choose from a pool of people [who were willing to be development mentors in this program].

And I already had a good relationship with this person, and I felt that he -- he and I were very alike, and we had already worked together long enough that I knew that his style was similar to mine. So I felt that he would be a good person for me to be in this program with because he tended to respond similar to me in certain areas, and I had not found very many people that I felt that I actually could relate to, who were men that I actually felt had similar strengths and weaknesses to mine.

So I kept -- so it was kind of mutual, but, you know, he was in a pool of potential sponsors that I could choose from, and I had a strong affinity with him, and that made him -- you know, that was -- I requested him, but there was no guarantee that I would get him as my sponsor because many program participants requested him. Many people requested him, but I did get him.

And, so that was really, really good because we had a very strong affinity. You know, our styles -- I mean, I already had the trust, and I knew him enough to know that he -- that I could learn a lot from him because he had similar strengths and weaknesses to me.

Thoughts of Mentoring Programs

I think they are critical. I don't -- I mean, I think in -- in -- in the industry, we haven't done enough of it, and part of the reason we haven't done enough of it is because there's a perception that ‘why focus on that one particular group, like women or Latina women’, that are you then being exclusive of other under-represented groups, and does that mean you are playing favorites or something.

And there is a little bit of a stigma as well around having a very formal mentoring program. For example, when we created the network in my company, some of the women didn't want to join because they thought it would actually hurt them to be part of the mentoring network, because then their male peers would feel threatened or would feel that in some way they women were getting more attention than the men were, and the women didn't want to have any tension between them and their male colleagues. So I -- and I think that issue is very real, that there is a perception that if you do mentoring for a targeted group, that means that you are somehow excluding the rest of the employee population, but the reality is that there aren't enough Latinas in our industry, and there still aren't enough women at the senior levels. And you can't change those results yourself, unless you actively do something about it.

So we told the women in our company, "Well, get over it. It's no big deal, because we had no mentors like us in the past. We had men mentors, but we had no women mentors. We had no Latina mentors," and I wish that I had had that in my early -- the earlier part of my career because it could have helped me, and I didn't have it. We are recognizing that these things are one more tool in the tool kit. It is not the only answer -- but it is part of the tool kit that should be available if you want to be -- if you want to change the results.

So you think that having -- being a Latina, for example – I am a Latina having a Latina mentor, a woman as well, that it's a plus? I mean, not -- not that the men would not work, but it was more to my advantage to move on -- with a different set of questions that perhaps you couldn't go with to anyone else.

And again, whether you need that or not and at what point in the different phases of your career do you need that (a Latina mentor), you can't really predict, but it is good to have that option.

For example, I am mentoring some young Latina women in our company. Some of them are not even in my office. So I don't even know them personally, and the reason they reach out to me is because they saw an article about me in the internal website, and they said, "She's from Puerto Rico. She's Latina like me, and she's been very successful. I could probably learn something from her," and they just picked up the phone and called me and asked me if I would mentor them.

And I have never met them. Like I have a woman, a young woman who is a transportation engineer in our – in one of our _____ offices, and we have now been doing these mentoring/coaching sessions for about nine months, and I have never met her face to face, but I, I think she considers me one of her best mentors right now. And she told me, "Thank you so much because there are all these things that I don't know how to deal with, that I am not sure who to ask." And in her case, it has been a lot easier for her to ask me the questions she wants to ask me, for example, because part of it, some of the issues, especially the issues that have to do with dealing with management, dealing with situations at work that are

borderline, people-related -- that are not necessarily about are you doing your job well, but around perceptions that relate to your style, which can be different if you are a woman or can be different if you are a Latina--and how the -- how other people deal with this in their work environment. It is very hard to express those things in a second language.

So, for her, for example, she told me herself, "It's so much easier for me to ask you the questions in my own native language than it is if I have to ask the same question in English because I can explain it to you in a way that you understand it right away, in our language," and I didn't have that! So I think it's an asset to have somebody like that in your mentoring circle, but how much of it do you use and when do you tap that resource, it depends on what experiences you have and what you have to deal with and what opportunities are available to you.

And we have a mentoring network in the company as well that is open to all employees. So we have the women's network, but we also have mentoring as an initiative in the company.

And what we tell all of our employees is that, "You should seek a mentor. You should ask people to help you get better at the things you need to get better at, and that there are a lot of people out there who are very willing and able to do that, but you have to ask. If you don't ask, you are not going to get the help you need."

So she -- and what we usually do -- we call -- one of the things we talk about to all employees is setting up one-on-one appointments, and we tell them that you don't have to do this face to face, necessarily. You can set up a phone call with somebody for 30 minutes and say, "I just need to talk to you about a problem that I had, so I can learn from what I did and how to do it differently or better next time," and so that is what she does.

She sets up one-on-one sessions with me, and the frequency varies. Sometimes I hear from her two months in a row, and sometimes I haven't heard from her in a quarter. And she will e-mail me and say, "Okay, time to have a session," and we get right on the phone. And then sometimes she will send me a very targeted question in an e-mail, but we have an agreement. I have a commitment that I made to her to be her mentor, and she has a commitment that she has made to me to seek feedback just-in-time.

So sometimes she will just send me an e-mail and say, "Hey, I have this question. I just need a quick answer from you," and I reply in an e-mail and we don't even talk, but then other times, she's got a little agenda, and she says, "I have four things I want to talk to you about today for an hour."

And I just give her one hour of my time. Sometimes if it's a person that I mentor in this office, I will go to lunch with them, and I will buy them lunch. And why lunch? Because it is a lot easier to get advice and, you know, talk about difficult

things outside of the work environment, and so I encourage it. So one of the things I do is I encourage people to -- if they have the time, let's just go out of the office, let's meet for breakfast or let's have lunch or let's stay an hour after work and go, you know, have a quick drink or something because, again, you are likely to get a more -- And a more fluent conversation, you know, and that's, again, the whole part of building the relationship between the mentor and the mentee.

Other factors that Contribute to Success

I mean, for success, you have to have a number of things. You can't just have one thing. Performance is really important. You know, just doing your job well and doing it consistently well, so being consistent in your performance, as well as doing a good job, and exceeding expectations is imperative. I mean, people that -- people that do a good job but don't stretch – aren't perceived to have the same value in the market as people who stretch themselves and take on risks and volunteer to do things they have never done before. So those things are important.

And you can be -- you may have a good mentor, but if you are not doing those things, you are not going to be successful. So you need to have those. You need to have the results, the performance, and the drive. You also need to know that you manage -- we tell our people, "Only you manage it. You manage your own career. Your success or your failure is going to be largely encouraged by what you do for yourself, not what others do for you. So do not assume that people have to give it to you or make it easy for you to be successful. Challenge yourself to "go where you haven't gone," and that is going to be more important than whether someone says 'I can do this job or not, this person can do this job or not'.

But I think -- I think having mentors and people that you can trust to go to for advice is very important at all levels in a career, and the sooner people learn that, the better, and the sooner they stop being shy about asking for help, the better. And some people are really shy.

And I would say that my experience in -- in the Latino culture this has been even more the case -- and I have worked in both environments. I had an assignment in _____ for two years full time, and in that assignment, our team was half _____ people and half _____, and I was the big boss. They all worked for me, and the Americans were much more willing to admit their mistakes and much more willing to ask for help than the _____ were.

So, in general, my experience, my observations have been that in the Latino culture, we tend to get taught to not be vulnerable in front of others or not to admit what you could do better in front of others or that you have a question, and that is a weakness in some ways because especially -- every employer is different, but in our company, we have a consensus-based culture, and a lot of your success depends on being very honest in groups and sharing experiences and not being

afraid to be criticized or to accept feedback or to ask for feedback in front of others.

And so, in our company, if you don't do that well, you are not as effective as you could be, and I have seen that the Latinos tend to struggle with this, more so than the Americans. And in our culture, we get -- in the Latino culture, we get told to negotiate things one-on-one. And that isn't always possible in the work environment, and sometimes you have to negotiate with three people in a room.

And I don't think we get taught enough about how to do that well in the kind of market we are in, especially now. I mean, almost everywhere you are now working with people from all backgrounds and all nationalities. So it is no longer this wide mass, you know, of Anglo-Americans. It's people from all sorts of different backgrounds, and I think we don't -- you know, we don't --

I didn't know early enough, probably, that it was okay to do that. Now, I am an outgoing person. So I was never shy, but if you happen to be shy and you don't know that it's okay to do that, that's having two strikes against you, you know.

So -- so, again, knowing that just because somebody gives you negative feedback, that this doesn't mean that you haven't done a good job and also being willing to accept and act upon the feedback that you get, is very important.

And sometimes you could have a very good mentor, but if you dismiss what they are telling you or if you find all the reasons in the world as to why what they told you isn't right according to you, then you are not really learning anything from that mentor.

And I see that. I see people who rationalize [dismissal of] the feedback that they get, and you know, the reality is that even if you don't agree with the feedback that you get, it is your reality because that's how you are being perceived. So you still have to do something about it.

Whether you agree with it or not, or whether you think they had the right information or not before them, if that's the perception, then it's your reality, and you need to manage that perception in some way or change it.

Additional Information Voluntarily Provided by Participant

Just in general, that in engineering, I mean, women in general aren't encouraged to pursue degrees in science and engineering, you know, and there are still some biases around gender relative to what women and men are capable of doing in the workplace, and I don't think we can -- even though I think the world is a lot more open-minded today than it used to be, I still think that we have to pay attention to those issues, that we need to actively encourage women and Latinas to get in the fields of engineering and science because there are too many norms in society that

would cause you to conclude that this is not even an option for you, and I think -- and again, if your parents don't have the background, let's say your parents are right-brain people and they are artists for example -- and you love math, they are not likely, they are probably not necessarily going to encourage you to pursue a field in math because they don't know it.

It's just like my children became right-brain professionals, and I can't advise them as well in what they do, as I could if they had chosen something related to engineering because I don't know their subject matter.

I don't know if you are familiar with _____, the _____, but the only thing they do is they try to encourage kids in high school -- to pursue education, careers in math and science and engineering. They do a lot of work. They do work all over the U.S., but they do a lot of work in the Southwest because there are very high concentrations of Hispanics and Latinos in the Southwest, and what they find -- and I have worked with this organization-- and what they find is that the parents want the kids to not go to college because they want them to just go get a job and bring money to the household because the parents are usually very -- of moderate means. They didn't go to college. Some of them didn't even finish high school, and they have financial constraints. So they are taking the short-term route, which is 'bring me a check now and help your family', rather than encouraging them then to educate themselves, so they can aspire to more in the future; and this is a very hard decision to make.

And many of these kids don't have the support they need at home, and we see them hanging out with older Latinos and with a lot of Latinos that come from families who have not gone to college before them, and then we also see them being discouraged by their women relatives, who question 'why would you want to be in a man's field if you can choose to be in a woman's field.'

And I got told that myself. Everyone in my family discouraged me from becoming an engineer, except for my dad, because they thought that I was crazy because I wanted to go in a man's field, and why would I do that. One person told me, "You could be a doctor. You could be a lawyer. You could be a communications, public relations person. Why would you not do those things and want to be an engineer? That's a man's field, and that's not a very good field for a woman to be in."

But I had some -- I also had people who encouraged me to pursue my path, and then I think with the language, I think there is a similar issue. I think for Latino -- Latinos in general, if English is your second language, this is going to make you a little bit more shy, you know, especially if you are growing up in the U.S. and you have ambition and drive and you want to go to college or you want to become, you know, a degreed professional, and you are not comfortable with your English. That can be something that can hurt you or can slow you down a

little bit, and a lot of it is just confidence and having somebody that helps you to do it better, and not everyone does that.

Like if you're learning English from somebody who speaks Spanish, your English is going to have an accent, but if you are learning English from somebody who speaks English, then you are going to speak like an American, you know, like it's your first language.

So those things aren't necessarily barriers, but they can definitely shape perceptions or add to somebody's capabilities and potential, you know, and so they need to be managed, and a lot of the mentoring programs help to do that, help to provide the skills and the confidence that women need or the Latino needs to be able to -- to know in their heart that they can achieve the same success as anybody else, if they have the talent and they work hard.

Structural Narrative

P_3 attributed her success to her good communication skills and that she always performed above expectations. She was able to climb the corporate ladder quickly because she was driven and motivated, and worked on significant award-winning projects. For the position she currently holds, she had to compete through an open solicitation process. She was the only Hispanic applicant. By winning this position, she became the most senior Hispanic in the firm.

P_3's lack of experience with profit and loses was seen as a hindrance and perceived as a weakness. She worked hard to neutralize this perceived weakness during the interview process by utilizing the project experiences that she did have and draw comparisons.

When she was selected, she was perceived as an outsider and many questioned her selection, mainly because the position was in the Northeast and she was not perceived as a typical Northeastern.

P_3's experiences with mentoring have been positive. She considers her father as her first mentor, although she did not recognize that fact until years later. She has had strong mentors at all levels in her career.

As far as mentoring experiences within her company her understanding that there are not enough successful role models particular to women much less to Latina women. She thinks that this is a barrier to the aspirations of female engineers. Her company however focuses on women since they realized that very few women make it to top management level. Her company has developed a program to increase the visibility of senior female employees. She perceives that her company's mentoring program is informal; they facilitate connecting with people within the company to ask for assistance and to ask for individual's wishing to volunteer to be a mentor. For this informal mentoring program to work it is

essential that there is chemistry between the mentor and the mentee and that trust between them. This bonding and trust can not be forced, it has to come naturally. She has used multiple mentors depending on her mentoring needs. She has used technical mentors, management mentors; career development mentors, and even mentors for personal advice. She stressed that a single mentor can not do it all.

The success of P_3 mentoring experience has come from developing rapport with the mentor when first assigned. This rapport sometimes happens naturally, but sometime you have to make a deliberate effort. Her mentors have been mostly men since there are not many women in her profession. The mentoring relationship she feels becomes stronger when the mentor has more work experience.

P_3 believes that there are certain essential qualities that a mentor must have. These are honesty, trust, ability to coach and the ability to give advice. She thinks strongly that mentoring and criticism are different things. To criticize without providing a corrective course of action is not helpful; it is not mentoring. Mentors give feedback but it has to be positive and constructive to be effective.

Her first mentors opened major doors for her to advance and resulted in promotion at an early age. She had to manage a large project, which she had not done before. Her mentors supported her, encouraged her, and provided constructive criticism. She was then able to move ahead and be recognized by her peers. She also has had good mentoring relationship with her bosses by developing trust and sometime unique boss-employee relationships. Her company also has a more formal mentoring program, which helped her prepare for the interview and eventually land her current position becoming the first minority women to have it.

P_3 thinks that mentoring programs are critical to advance careers and industry has not done enough. One of the reasons for this, she perceives, is that there is a stigma associated with formal mentoring programs, where people think that if you need mentoring is because you need help and you are not self sufficient. Women in her company feel that joining a formal mentoring program will hurt them professionally.

She has been a mentor herself. She currently mentors another engineer over the phone. The other engineer is physically in a different state and they have never met in person. Both have made the commitment to themselves. She has helped the mentee to deal with management situations and seek feedback just in time. She thinks it is an asset to have mentors even if it is outside the work environment. In addition to mentoring, other factors that have contributed to her success are the ability to perform, to exceed expectations, being driven, being able to manage your one career, and challenge yourself. Also, you have to find people you can trust at all levels.

Finally, she believes that for women to succeed in pursuing careers in science and engineering they need to be encouraged to do so and getting the support from home. She believes there is a bias against women in this profession. She considers that English as a second language is a barrier.

Textural-Structural Narrative

P_3 owes her success to "being a higher performer, performing above expectations all the time, and I think my communication skills were a differentiator, as compared to other engineers". She was able to climb the corporate ladder quickly because of "managing very large projects that were politically charged, helping to win awards for the company, being strategic…" For the position she currently holds, she had to compete through an "open solicitation" process. She was "the only Hispanic" applicant. By winning this position, she became the most senior Hispanic in the firm. "So I am the one that's kind of pushing the envelope".

P_3's lack of experience with "profit-and-loss" was seen as a hindrance and "perceived to be a weakness". She worked hard to neutralize this perceived weakness during the interview process by utilizing the project experiences that she did have and draw comparisons.

When she was selected, she was perceived as an outsider and many questioned her selection, mainly because the position was in the Northeast and she was not perceived as a typical Northeastern. "I know there were people who said, "Who is she? With that name, she is not a Northeasterner…"

P_3's experiences with mentoring have been positive. "My first mentor was my dad, and I learned a lot about engineering in watching him doing his work", although she did not recognize that fact until years later. She has had strong mentors at all levels in her career.

As far as mentoring experiences within her company, her understanding that there are not enough successful role models particular to women much less to Latina women. She thinks that this is a barrier to the aspirations of female engineers. Her company however focuses on women since "we realized there weren't enough women getting to the top management levels of the company". Her company has developed a program to increase the "visibility around the women that were already pretty senior, but that weren't necessarily known because it was such a big company". She considers that her company's mentoring program is informal; "we facilitate connecting people together, so people can find mentors… you can ask somebody to be your mentor, or you can volunteer to be a mentor, but we let people choose who is the right person for them because a lot of it has to do with the chemistry between the two people and building some trust". This bonding and trust can not be forced, "it doesn't always work". She has used multiple mentors depending on her mentoring needs. She has used technical mentors, management

mentors; career development mentors, and even mentors for personal advice. She stressed that “no one mentor can do all of those things at the same time”.

The success of P_3 mentoring experience has come from developing rapport with the mentor when first assigned, “most of them were people that I worked with”. This rapport sometimes happens naturally, but sometime you have to make a deliberate choice. Her mentors have been mostly men since “there are more men in my industry than women”. She believes the mentoring relationship becomes stronger when the mentor is “more experienced than you”.

P_3 perceives that there are certain essential qualities that a mentor must have. These are honesty, trust, ability to coach and the ability to give advice. She thinks strongly that mentoring and criticism are different things. To criticize without giving a corrective course of action is not helpful; “it actually can turn you off and sort of interfere with the mentoring”. Mentors give feedback but it has to be positive and constructive to be effective.

The participant believes that her first mentors “opened major doors” for her to advance and resulted in promotion at an early age. “One of my biggest promotions in my career was at a very early age to manage a project that was really big, and I hadn’t done anything near that magnitude before, and one of my mentors was the person that kind of stuck their neck out for me.” Her mentors supported her, encouraged her, and provided constructive criticism. She was then able to move ahead and be recognized by her peers. P_3 also has had good mentoring relationship with her bosses by developing trust and sometime unique boss-employee relationships. Her company also has a more formal mentoring program, which helped her prepare for the interview and eventually land her current position becoming the first minority women to have it. “I was the first person of color promoted to this position in the whole company, and the first women in -- in the current history of the company”.

P_3 believes that mentoring programs are critical to advance careers and industry has not done enough. One of the reasons for this, she perceives, is that “there is a little bit of a stigma as well around having a very formal mentoring program”, where people think that if you need mentoring is because you need help and you are not self sufficient. Women in her company think that joining a formal mentoring program will hurt them professionally.

She has been a mentor herself. She currently mentors another engineer over the phone. The other engineer is physically in a different state and they have never met in person. Both have made the commitment to themselves. She has helped the mentee to deal with management situations and seek feedback just in time. The mentee told her “It’s so much easier for me to ask you the questions in my own native language that it is if I have to ask the same question in English because I can explain it to you in a way that you understand it right away, in our language”. P_3 thinks, “it is an asset to have somebody like that in your mentoring circle”.

In addition to mentoring, other factors that have contributed to her success are the ability to perform, to exceed expectations, being driven, being able to manage your one career, and challenge yourself. "Your success or your failure is going to be largely encouraged by what you do for yourself, not what others do for you". Also, you have to find people you can trust at all levels.

Finally, she believes that for women to succeed in science and engineering they need to be "encouraged" to do so and getting the support from home. She perceives "there are still some biases around gender relative to what women and men are capable of doing in the workplace". She considers that English as a second language is a barrier. "That can be something that can hurt you or can slow you down a little bit, and a lot of it is just confidence and having somebody that helps you to do it better, and not everyone does that".

Horizonalization

The participant's story provides relevant terms that assisted the researcher in finding common themes that aligned with the research questions. Table 3 provides an account of the participant's experiences and expressions. In summary, Table 3 suggests that P_3 is a thriving Latina engineer that through strong communication skills, performing above expectations, managing large projects that were politically charged and being a high-performer has been able to achieve a high level position within her company. P_3 described positive mentoring experiences and is a strong believer of mentoring. She believes that the mentee is responsible for managing his or her own career.

Table 3

Horizonalization: P_3

Horizonalization of Latina Scientist and Engineers Mentoring Experiences (Direct quotes)
High performer, performing above expectations all the time, and I think my communication skills were a differentiator.
Managing very large projects that were politically charged, helping win awards for the company, being strategic.
I am still the most senior Hispanic in the firm.
So I am the one that's kind of pushing the envelope.
There weren't many before me because there weren't very many women in engineering before me.

There are still perceptions around what a Northeasterner ‘looks’ like.
People viewed the fact that I was a Hispanic as a negative.
Being a female and being Hispanic, I didn’t have a lot of people around me who were like me.
My first mentor was my dad.
I have had really strong mentors.
People who took an interest in my success, who were willing to give me coaching and advice.
Women in general don’t have enough role models, successful role models or people that they perceive to be like them who have made it to the top, and that this can be a barrier to the aspirations of women and their belief that they can get to the top and be successful.
One of the gaps was that they didn’t see a lot of people like them at the top.
A lot has to do with the chemistry between the two people and building some trust.
What we have learned is that if you force it, it doesn’t always work.
More important to provide the networking opportunity to let people find the right people.
No one mentor can do all of those thing at the same time.
I developed rapport.
Some of them happened without me even knowing.
Some of your strongest mentoring relationships are usually somebody who is more experienced than you.
And there weren’t many before me.
I probably don’t even have a women mentor at the moment.
My strongest two mentors are men.
Women have some unique issues.
Trust and the ability to coach you and advise you.
A mentor that only gives you the feedback and doesn’t give you some potential approaches to get better in that or help you find resources that can help you get better is not a very good mentor.
There is a little bit of stigma as well around having very formal mentoring program.
There aren’t enough Latinas in our industry, and there still aren’t enough women at the senior levels.
Performance is really important.
Your success or your failure is going to be largely encouraged by what you do for yourself, not what others do for you.
I think having mentors and people that you can trust to go to for advice is very important at all levels in a career.
Women in general aren’t encouraged to pursue degrees in science and engineering.
If English is your second language, this is going to make you a little bit more shy.

Participant # 4 (P_4)

Overview

P_4 is originally from Puerto Rico. She obtained her bachelor's degree in Electrical Engineering from a major university in Puerto Rico and obtained her master's degree of Science in Electrical Engineering from a private university in the United States. She currently works for a government agency.

Textural Narrative

Career Success

I would say it's a sense of hard work and responsibility. I am responsible for the work I do, which has a goal within the _____ environment, within the organization plan. It is my name, against, what I'm doing. So, in order for my name to be respected, my work has to be to par and has to be respected as well.

So, having a sense of responsibility, I think is what contributes the most to a successful career, especially here, because that means that your work is good, you comply with the requirements, you comply with what you are being asked for. People respect you for it, and then you could say you're successful.

And it doesn't necessarily mean that to be successful, you have to have a high-level position, you know. People might consider that to be successful is to be the center director or to be a division director or to be a branch head. I've been here almost 17 years, and I have selected so far -- that to be successful is to be respected in what I do here, and I am respected for being a designer of the type of work that we do in our branch.

I guess that's what I want to make the point that some people consider that being successful is to have the highest job. I have decided so far to stay in the organization that I am and doing what I am doing instead of escalating the management ladder. This is what I like to do and where I am contributing.

In my case, I consider that to be successful is to be respected in what I do and to be recognized for what I do, and I have by choice elected to stay where I am, which sometimes I call the "bottom of the totem poll" because of the way we do business and we build spacecraft in here. Meaning that to be successful in what I'm doing, because this is what I like, is to be respected and recognized for my work.

Helpful Experiences in Career Development

Growing up, parents teach you values, and that you are responsible for what you do. You are responsible for your life. Eventually, you are responsible for other people.

I am very responsible in my job, and we want to show -- I wanted to show I can do a good job. From the very beginning, I actually started working as a summer intern when I was in college, and I had the privilege of coming and working here two summers before I started as a permanent employee, and I was recognized for the job I did, and that's encouraging. People appreciated what I did, and they believed in me as a student back then, and eventually, I got a permanent job.

And it's kind of a vote of confidence when you hire somebody like that, when you hire any student for that matter.

If you can work with the student, then you have a little bit more advantage of knowing what the student can do. If you can work with the student is an advantage. In an interview you just have 15 minutes to know the person. Then it's a bargain.

So I do appreciate the people that believe in me when I came to work as a summer student, and eventually, I got a permanent job. I appreciate it even more because, at the time I started working here, economics in _____ were hard, and there was a freeze in the center about hiring people. It was very, very hard to hire, to have a new hire, and these people believed in me enough to go through the higher level and say, "We need this point." They call it "point." It's kind of weird, but "We need this extra point, so we can bring this person on board." So that opens the door. If that never happened, I wouldn't be here, 17 years later. So it was my responsibility once I got in to make sure I keep it.

That standard, to keep that standard, keep the status, keep the standard and development as a professional, and eventually be respected and eventually be the person who actually can select other people to come and work here --

Impediments to Career Success

There's about 3,000 plus employees probably here, civil servants. We have another ton, thousands of contractors. So it's a lot of people. There is some competition, you know. There is certain amount of positions, certain -- certain level, certain positions.

If you want a higher position, you compete for it, but part of competing for it is keeping that status of being respected and recognized because you do a good job and so forth and so on.

I haven't necessarily found that that's an obstacle. Some people might consider that to be an obstacle, you know, to find that you have to compete for it. I have not found discrimination either.

Not from management, I believe. I mean, there's always somebody around that has something against women or have something about Hispanic and minorities or whatever, but people that have to make the decision, I have found that they are fair so far. So I don't necessarily have found obstacles in getting where I am. I think I have learned to navigate the system.

My only obstacle right now -- and I don't necessarily consider it an obstacle -- is my choice. I have a family, and it's my choice not to pursue positions that actually requires more time than I already put in, that it requires travel. I can travel every so often, but, it's hard to travel too frequent or for too long when you have family.

It's my choice to do what I do at the level that I do, so I can balance my family with -- my personal life with my work life, and it's not an obstacle, it's a choice. To some extent... The level in which I am working...

It's not my goal to be a center director. So I don't want -- I don't need to deal with that kind of issues or that career path -- to get me there, which my view of it is that people actually sacrifice a lot for it. So I have other views. I like the technical work I do, and that's the path I have selected. And if I grow in the technical path to a higher position, then I have to weigh in what the higher position is asking for my time.

Meaning of Mentoring

It has two faces. There are two faces to mentoring: you are the mentor, your are the mentee. And I have been lucky enough to be both.

Of course, when you start working here, you are assigned a mentor, and that's the way the system works for new hires. You are assigned a mentor for a year and a half to two years, and it's just the way they have find how to deal with people coming into this place, at what level you come. If you are a new hire, then you are in the program longer, and there's a goal to this program. It's to allow you to get the first step not only in the pay scale, but in presenting your project and getting to know how business is done in here and how -- in my case in the technical area, how the designs are preferred, what are the rules.

So right when you start working, you have a mentor. So I had the privilege to work with this person, happened to be Hispanic at the time.

And both of them were Hispanic, and they were -- they were very diligent to make sure that I will learn what I needed to learn, that I would get recognition for

what I was doing and so forth. So I had the privilege to work with good people, good mentors in that regards.

A couple of years ago, probably two years ago, I entered what is -- there is a mentoring program here in the workplace, and you don't have to be a new hire. You actually -- it could be a situation, select a situation of mentoring. Maybe you are going through a problem right now or some kind of career path that you need somebody to give you counseling.

Well, there's a pool of people that you can select from, and you can be part of the program, and either -- if you cancel it, the person then from the list, they assign you based on what your needs are.

So I entered this program about two years ago, maybe slightly close, not two years. The goal of trying to explore, if that was the right time for me to do something different.

And we worked together for a year, and the program also sponsors like small workshops, if you will. Anyway, I went through the program for a year. It was fun, but I decided, okay, there's a certain path I could take, but this is not the time for me. But I appreciate it. I appreciated the time I spent doing the mentorship.

Now, I also have been a mentor to many students and to new hires on the branch. I like to have summer students because that's the way I came in. I like to have co-op [ph], and usually, new hires, I mentor formally and informal because they have to have a formal person assigned to them.

And right now, we have one new hire which she was a co-op previously to that and -- And you can come here, work for a semester, and then you go back to college and finish your degree.

As a summer student, you come through a grant, and usually, the grant is through a university. So you are not an employee from this place. You work here, but for summer. You're not an employee. A co-op is an employee for the term.

So I like to do that. I believe, new hires need that, and not only new hires. Young people need people talking to them and giving them hints, from stupid things like "don't dress that way" to, "this is a serious problem, go talk to this person". You have to be recognized for what you're doing, things like that.

In the design, of course, I mean, we have to mentor how, in my case, [Inaudible] words and so forth, but it's also mentoring of -- I find with the young people, mentoring of the social life in the workplace.

Not only balancing your life, but the social life, how -- who is who in the chain, the management chain, who they need to go and talk to when you have such and

such problem, from how to -- The other day, I had one of the students. She was on a board trying to figure out how to split her deductions for the tax, for the income tax.

And she was going, nuts about it, little things like that to the big things, this is the way you present, this is the way you talk in a presentation, and this is what you need to present, things like that.

Perceptions of Mentoring Latinas

Well, it's no secret that we're the minority. Women are the minority in these careers. And being Latina is even worse. I think there's a lot of -- in our countries, there's a lot of -- I don't want to use the word "heritage," but there's a lot of custom that's not necessarily what we do. Technical work is not necessarily what we do.

True, then, the last, probably, 20 years, things have been changing. There are more doctors. There are more women engineers. There are more women scientists, more researchers. That is changing.

But I went to school, and I could be in a whole classroom, I was the only girl there, and I'm still here. I go to meetings, and I am the only woman in the classroom -- in the -- in the meeting room. That's very common for me.

So I do believe that a young person to have somebody to look up to or to talk to or to guide them or to just encouraging, encouraging is very useful. It might be this part that made that person decide to do something different.

Just like my mother when I was a child, even, "Oh, you're going to be one of those executive secretaries." Oh, okay. Fine to what? To dress fancy? Eventually I grew up, and I said what the heck am I going to do in a --

She was a science teacher eventually too, what she was talking about. No, no. We were always encouraged to get a degree and to get challenged, of course. In Puerto Rico, electrical engineering is the people that put the electricity on the houses, but that's not true. The people don't have the full perception of what a career is.

Electrical engineer, for example, again, in Puerto Rico is very -- because we don't do a lot of research in this area in Puerto Rico, people think electrical engineers are the people that actually -- they call it "*trepa postes*" [pole climber], which is the people that go up in the -- in the poles, put the electricity. Well, that's not true.

There are many other areas that that's not what they do, like what I do here. Who are these science and computers? It's not necessarily the computer engineer.

They do the software. We have to do the hardware. That kind of stuff is not done -- is not designed there. It's built there on the -- on the fabrication plant and whatever.

But we here, that's what we do. We create. It's something that people don't understand about many careers and having a mentor or somebody to look up to talk to and to tell them, "Hey, you can do. You don't need to go up a pole. You can do this other stuff. Right?"
So I think it's very important. First of all, what is the age bracket that we are talking about? Are we talking about high schoolers or even middle schoolers? And then you have to talk about the ones that are in college.

The ones that are in college, they are already in their path to make a decision about their career. They might be already in engineering.

We have programs in here that they try to look for minorities, the summer programs.

We try to look for minorities to come here and work, and our pool most like -- most of the time is go back to the _____ because there you go specifically to the faculty of engineering, and you are going to find Latina engineers. You come -- but if you come here, there are a very small number that are from this area.

Why is that? Okay, you go to _____ but there's a pool of many other minorities. It's not necessarily Latinas. Again, it's competition, who is better -- and who do we select and so forth. I try to be balanced when the few times that I have participated on this kind of selection.

Fortunately, we have a criteria to follow, and they tell us, this is the criteria, you have to have more than this grade and so forth. Well, I believe that especially when middle school and high school, you got to give a chance to the one that doesn't necessarily make the B or doesn't make the 4.0 in their average because that's the one that needs to push, needs to decide what to do. The one that have 4-point grade, she most likely knows what she wants to do or she's in the right path.

I have participated in a high school program in here that -- actually; it's a middle school program. These girls are allowed to come here for a week and work with somebody.

And they try to work with women. It's called -- the program is called "Sisters," and I have been on the Selection Panel a few times, and I read all this. They have to write. There's certain questions, and they have to write like a paragraph for each of the questions.

And you can tell the one that already knows what she wants to do, "Oh, I want to be a pediatrician. Oh, I want to do research," and blah, blah, blah, blah, blah. But then you can also tell the ones that need a little bit of push, and when you compare to the grades, it's like she hasn't decided because she might find that she's not good enough in class and not good enough in this other class.

I think we need to target that group, that middle group as well, because this is the one that it has very bad grade, has nothing, they don't want anything to do with science. -- Maybe they're not doing well in math. So they think it's like I'm not --

Well, those on the bottom of the group, they don't even apply. Then you have the ones that apply are the middle group and the high group. The high group got the good grades. They will most likely get the chance. The ones in the middle, they have okay grades. I mean, a B or a C, there's nothing wrong with it. I mean, eventually, you have to build it up. But they need a little push, and most of these programs are not designed for that.

And I try to always like squeeze one in, at least on the waiting list, but squeeze it in. I mean, it's not that bad, but they answered the questions correctly or they answered the question with a lot of hope or, some sense to it.

So the mentoring is good, but I don't know if all these companies and all these places are actually gearing the mentored programs or these kind of opportunity programs correctly, and maybe they have done their research and I'm just an outsider that comes to read these papers and make a selection, but that's my opinion when I go and make the selection.

And higher chances. Right, because those are the ones that probably are struggling. You don't have the money to pay for a college -- college education in this country is very expensive -- and the ones that are going to get the scholarships are the ones that have the good grades, and again, it's a vicious circle. You are going back to the middle. They want to study. They don't have the money to pay for it because most of the Hispanic people here don't have, the communities around here; they don't have the money to pay for it. You don't get a scholarship. So what's going to happen? Either they don't study or they got to study something quick or it's harder for them because they have to work and study and so forth, which there is nothing wrong with work and studying, but it's harder path.

If you don't have somebody to encourage the -- and -- if you don't have somebody to encourage, just go for it, it's really hard, but in the end, whatever you can, you are going to build it up afterwards.

This is hard to do. It's hard to believe in what you can do when you look at a lot of the Latina girls, that they don't have the background in their family. Most of them never went to college. They're lucky, maybe they did a high school degree.

I'm concerned about those. Then you have the group of Latinas that the parents are professionals like you and me.

If they have middle grades, the parents are going to encourage them, and they are going to support them to keep studying. So, not to say they don't need guidance either on deciding what to study, but they have a support group behind them.

And then you have the higher grade, and again, not to say that they don't need guidance either, because I know this one in specific, she has very good grades and right now is going through a period of not really understanding what she wants to do, but she has a support group behind it because she has professional parents, and she's in a good school and so forth. So that somehow, this person is going to make it.

But the ones that don't have the support group behind it, those are the ones that we are losing, and we don't see a lot of Latinas of the area. We see a lot of minorities of the area, but none of those are really a lot of Latinas of the areas. And this program that I talked to you about is not only Latinas. It's open to everybody.

Well, historically, for many years, like I said, the place for -- for whoever was doing the recruiting, to make sure that they would find the people to fill the minority gap, they knew. I mean, you go to that school, everybody is minority. You will find the gap if you find somebody that you like there.

You have a good standard school, good students. You can pick somebody from there, and it's going to be a Hispanic, and you fulfill the other, education requirements very easy.

They also target -- for Hispanics, they go up to like _____ and _____. They try. The _____ gets help from the _____ in deciding where to go.

If the gap is in Hispanics, then, okay, these are the schools that we need to target, let's see if we can find somebody there.

What we have -- what we find less and less is Hispanics and even worst for Latinas, for women, is at the higher education. Let's say they are looking for a PhD scientist. That's very hard to find a Hispanic and, therefore, a Latina. They might find Caucasian or Asian or whatever, but it's very hard to find --

The higher the education, the higher you go in the education, or even engineer PhD, it is harder to find. Why, I don't know. I guess you first have to have a fairly big pool at the bachelor level in order to increase your chances to having a master and then later a PhD degree in any area.

And education in this country, again, is very expensive, and it's a competition to get the scholarships, and everybody competes for the scholarships. I don't know.

You have to be extremely good, to be over everybody else to get that scholarship that is going to pay full for all your studies.

Meeting Mentors

Well, when I came out of college, when I was a new hire, the mentors were in the branch.

People, they assigned me to this job, and they said, well, you can work with such person, which this person is willing to have mentee, and you can help, and they'll teach you.

So it's basically from the work group, from the small -- the many layers of the work group. So, in this case, the branch is the lower level, is the smallest group, right, and then you have the division, then the directorate, and the center. So the branch, when you come as a new hire, you are assigned somebody from the branch because you are working. You need to learn the work of the branch. So it's whoever has work, every level, the person that you are assigned. When I came, there wasn't much to choose from. I was told, basically, you work with this person.

In the last few hires that we had, I think they had two choices. I know for a fact they were given, "You can work on this or you can work on that," and depending what you select to work with, then the mentor is a person that is working in that project.

In the program that I came in that I participated two years ago, it was a pool of people I could have selected based on their background who I wanted, but I didn't care more for one or the other. So I let them suggest me, and they suggested me, a few, and then I picked from there.

Key Qualities of Mentors/Mentoring

They have to be proactive. If you don't have a mentor that is not proactive, mentorship is just useless. I've seen that, people that waste students or professionals waste their time trying to find an answer to -- to whatever the problem is. It just depends what type of mentorship you have, if it's a situational mentorship or if it's an assignment mentorship.

If the mentor is not involved and is not proactive, it's useless. It's true that you as a mentee, you need to do your work too. You need to be proactive and all that good stuff, but if the mentor is not into it -- some people here, they take the mentorship because it's a Brownie point on their -- on their yearly appraisal.

That they have been a mentor. But you got to do a good job. If you don't do a good job as a mentor, you didn't contribute anything, and I think they have to be

more willing to put more time into it. Yes, you have to -- it's a Catch 22, to tell you the truth, because everybody expects that the person coming in as a mentee for the technical work is good. And he can work by himself or herself and is in charge of asking or looking for what -- what you need to do your job, but on the other hand, you as a mentor, you need to supervise what's going on.

You can't expect an inexperienced person to make all these decisions based on common sense, which there's nothing wrong with that, but that's what you're there for, all this is how we do business here, this is not --

So I have found good mentors, and I have found bad mentors, not to me, but what I see around. So you think one of the -- that helps the most in advancing a career is the fact of being proactive and also spending time with that mentee, and --

If you have a mentor that you see -- I don't know -- once a month and for 30 minutes in the type of work that we do, I'm sorry for that mentee. You need to be learning a lot or you need to be asking a lot of questions. That's fine, but who do you ask the questions if you don't know?

Influence of Mentors

The two mentors that I had when I came in as a new hire, one of them, this guy was brilliant. They were both -- I did say that. They were both Hispanic, but this guy, like he knew it all. I kept -- I kept joking, I want to be like him when I grow up, he's like he knows it all. So it was kind of a motivation to do a good job for this person, and to learn the most that I could from this person.

On the other hand, the other one was a very smart guy, but what I got most from him, he was very hands on and very creative, and if you needed to fix a -- if he had a problem, he -- he'll find a way to fix it. He was very creative about using resources and being proactive. He was more what we call a hands-on person.

He goes and -- we do a lot of work with our hands. And he was that type of person. So I think I was lucky to learn about spectrum, the intellectual ones and the hands-on one. And people that keep you busy all the time, he being a hands-on person, it was one thing, "Now you do this. Now do this for me." He kept me busy all the time. So I had a sense of direction.

And you could be easily thrown to the dungeon here. I mean, being in the lab, day after day after day not knowing what to do is frustrating, so yeah.

Achievement

Well, they have been gone from this branch for a long time. I guess they left and they left the position open, but not -- the person that was kind of very hands on, I came already with a sense of responsibility, but it was reinforced by these people

that you have to be responsible for your actions. You have to be accountable for your designs, for your work in here, for -- we have a schedule to meet. We have a cost to keep, a budget to work within. Looking at the integrity of the work, these people were -- the integrity of their work was excellent. You know that those values of the work for the work life, which at the end are going to be your keys to be successful.

You have to be a person of integrity. You have to be a responsible person. I mean, being smart is fine, but if nobody respects you for what you do, you are not going to get too far because people then don't like you. We're all human. You go to our panel, and they are going to pick the person that they like, not only that fulfill their requirements of the position, but you have to have experience behind it, and you have to have recommendation letters behind it and so forth.

Thoughts of Mentoring Programs

I think these programs are great, but again, I question at what level. If this question about mentoring at the -- at the -- Mentoring somebody at the college degree versus at the work -- already an employee level or high school, I think in all levels that there's -- actually, yeah, mentoring on all levels is good. It depends on the goal.

I mean, if your goal is to make this professional the best professional that this person can be, of course, you want to have a mentor when you come into the workforce and make a good impression and leave a good footprint in this person and that -- not a footprint.

And with especially minorities in generally, now things are better with equal opportunity and affirmative action and all that stuff, but, you have to let them know. I mean, you can do -- you can achieve whatever position you want. It's up to you, and this place is fairly good for that. If you find obstacles, there's way to get them out of the way.

You just need somebody to let you know how to navigate the system, so you can let -- take them out of the way.

At the college level, of course, you need to keep encouraging these people to keep their studies, to keep up with their grades, to keep up with -- with finding job opportunities for the summer or anything that can actually get them to the professional level, don't quit type of -- but then you have the high school and middle school group that, like I said before, you need -- you need to encourage them.

Some of them don't even know what to study, because they don't know much of the careers outside. There's a lot to choose from, and we think one area, like I'm going to talk about electric engineering because that's what I know, we think

electric engineers, there are many areas that you can choose from. You can choose to be the one putting the cables, but you can choose the one designing all the -- being on the computer or being in the lab or creating stuff or building the rocket. That's up to you, but if you don't know it, how are you going to get there?

And, there's things that I remember being in high school, and yes, I was encouraged to pursue a technical career, but I didn't know all the details within electrical engineering. I sort of had to read on my own, and then once I got to college, I had to learn about it, to the point that I selected -- in the University of Puerto Rico, you can -- within electrical engineering, and there are four areas.

I started in the area that it was the most common for everybody to sign in, and after my first summer job here, I changed, and I said, "No, that's not what I want to do. his is what I want to do." So the job opportunities during the summer, I think are great.

In all levels... Of course, getting them for high schoolers is harder. That's when you're get into this one-week programs only that are more like a workshop than anything else, but at least that helps.

And the once you are in college, you can get a whole summer exposed to it. I am a tremendous advocate of getting that kind of job, summer job, and it opens your mind and opens your opportunities too, so --

You have to fulfill the whole range of ages. Otherwise, you are increasing the pool of -- at the end, your goals are here and here, and your end here is to have the highest level of education of a Latina to choose from, like a PhD in some kind of fancy career. But -- or any career, for that matter, because I don't think there's that many PhD. If you lump all the careers and you compare to everybody else, I don't know the number, but it is probably very low. So then when you break it up in the independent career, it's even lower.

Other Factors that Contribute to Success

Being in a workplace -- I'm trying to find the right word there. Being in a workplace that encourages everybody equally to pursue higher levels, to pursue higher level positions or to pursue inclusive higher level of education or even extra training, which is done here, I think contributes -- contributes greatly to the success because you feel that you have the door open to do more than sitting -- sitting on the desk in the lab doing your work. If I need this class, I say, well, there's this class that I think is going to help me to be a better engineer in what I am doing, and having that opportunity, I think contributes. Having the opportunity, that is what is called here a "details," that you can go off and do another job for three months or six months, whatever, and it exposes you to something different than what you do. I think that helps a lot, and actually, with a lot of bitterness, I have to say that I was denying one of those ones. And after I

was denying that opportunity, many other people told me this person that denied wasn't not right to do so.

So that opened. When everybody told me that, I was -- that that opened, my mind saying this is not happening again. I'm stepping up to my -- to what I want.

Experience is always the key. You go years of working in one place, things like that happened, and you know the next time, it's not going to happen. It contributes greatly. Of course, you don't want bad experiences on your career. Nobody wants them. But that's what makes you grow. Any, good and bad, experiences.

Structural Narrative

P_4 credits her success in her career to hard work and a sense of responsibility. She believes that her work speaks for her; if her work is respected she in turn will be respected also. Her work is a reflection of herself whether positive or negative. She feels rewarded and respected from her current position not necessarily through a top management position.

Experiences that have helped shape her career include a summer internship with her eventual agency, where she was praised and recognized for her performance. This enabled her to get a full-time position even though at the time they had a hiring freeze.

Among her career hurdles, P_4 lists the need to maintain your status as a high-performing employee. Since the competition is strong among her peers, she feels pressure to perform at high-levels in order to maintain her job as well as be respected and recognized. It is important to learn how to navigate the system in order to move ahead. She has not pursued higher positions within the agency because of the travel requirements, which will increase her time away from her family.

Another hurdle is the perception of her career, not only a cultural perception but also a technical perception. For example she jokes that when she tells people she is an electrical engineer they call her "*trepa postes"* [pole climber] assuming that she is the person that climbs to the pole to repair the electrical system.

As far as mentoring experiences, P_4 was assigned a mentor when she first started working in the agency. This particular mentor was a Hispanic male which helped her learn how things worked within the agency and in her case how to do the technical work she was going to do. This mentor was very knowledgeable and provided lots of good advice. Later she was part of a mentoring program where she could explore other career opportunities. P_4 realized that it was not for her and she stayed in her current position.

P_4 has been a mentor herself helping interns that have come in through the same door she did. For example, she has mentored a Co-op student that is still in school but is also an employee. Her mentoring is not limited to job related advice, but also involves everyday things such as social life.

She believes that mentoring programs must be geared to the appropriate education level and age bracket. For example, someone in college would have an idea of the career they want to purse as opposed to someone in middle school who may be still researching their career options. Mentoring programs need to address this age bracket.

At the agency where she works has strong summer program at the university in Puerto Rico because the university produces high quality engineers, which are considered minorities and are sought after. This offers a contrast with for example with other universities where they target minorities but not necessarily Latinos.

Qualities that have benefited P_4 include being proactive and seeking opportunities. This is an area where she believes mentors need to be involved. As a mentor she considers it is important to give quality time for the mentee so a strong relationship could be developed.

P_4 indicated mentoring has benefited her career significantly. Mentoring has reinforced a sense of responsibility, accountability and integrity. She has a positive perspective of mentoring programs, but reinforces the fact that they need to be geared for the appropriate level. In addition to mentoring, she feels lucky that she works for an agency that encourages employees to pursue high-level positions, that provides training and that has given her a good experience.

Textural-Structural Narrative

P_4 credits her success in her career to hard work and "having a sense of responsibility". She believes that her work speaks for her; if her work is respected she in turn will be respected also. Her work is a reflection of herself whether positive or negative. She "considers that to be successful is to be respected in what I do and to be recognized for what I do, and I have by choice elected to stay where I am… that to be successful in what I'm doing, because this is what I like, is to be respected and recognized for my work".

Experiences that have helped shape her career include a summer internship with her eventual agency. "I had the privilege of coming and working here two summers, before I started as a permanent employee, and I was recognized for the job I did, and that's encouraging. People appreciated what I did, and they believed in me as a student back then, and eventually, I got a permanent job".

Among her career hurdles, P_4 lists the need to maintain your status as a high-performer employee. "If you want a higher position, you compete for it, but part

of competing for it is keeping that status of being respected and recognized because you do a good job". It is important to learn how to "navigate the system" in order to move ahead. P_4's only obstacle (and she does not necessarily considers it an obstacle) is her choice "to do what I do at the level that I do, so I can balance my family with – my personal life with my work life, and it's not an obstacle, it's a choice".

Another hurdle is the perception of her career, not only a cultural perception but also a technical perception; "people don't have the full perception of what a career is". For example she jokes that when she tells people she is an electrical engineer they call her "*trepa postes"* [pole climber] assuming that she is the person that climbs to the pole to repair the electrical system.

As far as mentoring experiences, P_4 was "assigned a mentor" when she first started working in the agency. This particular mentor was a Hispanic male who was "very diligent to make sure that I will learn what I needed to learn, that I would get recognition for what I was doing and so forth. So I had the privilege to work with good people, good mentors in that regards". Later she participated in a mentoring program where she could explore other career opportunities. P_4 realized that "there's a certain path I could take, but it is not the time for me. But I appreciate it".

P_4 has been "a mentor to many students and to new hires on the branch. I like to have summer students because that's the way I came in". She has mentored formally and informal "because they have to have a formal person assigned to them". For example, she has mentored a Co-op student that is still in school but is also an employee. Her mentoring is not limited to job related advice, but also involves everyday things such as social life.

She believes that mentoring programs must be geared to the appropriate education level and age bracket. For example, someone in college might be "already in their path to make a decision about their career. Right? They might be already in engineering" compared to someone in middle school or high school. Mentoring program need to address this age bracket. P_4 believes "mentoring is good, but I don't know if all these companies and all these places are actually gearing the mentored programs or these kind of opportunity programs correctly".

The agency where she works at has strong summer program at a university in Puerto Rico because the university produces high quality engineers, which are considered minorities and are sought after. "You have a good standard school, good students. You can pick somebody from there, and you know it's going to be a Hispanic, and you fulfill the other, education requirements very easy". This offers a contrast with for example with other universities where they target minorities but not necessarily Latinos. P_4 recalls, "What we find less and less is Hispanics an even worst for Latinas, for women, is at higher education. Let's say they are looking for scientists. That's very hard to find a Hispanic and, therefore,

a Latina. They might find Caucasian or Asian or whatever, but it's very hard to find".

P_4 believes that mentors should be "proactive", a significant quality mentors should have. "If you don't have a mentor that is not proactive, mentorship is just useless". This is an area where she perceives mentors need to be involved. As a mentor she believes it is important to give quality time for the mentee so a strong relationship could be developed. "If you don't do a good job as a mentor, you didn't contribute anything, and I think they have to be more willing to put more time into it".

P_4 indicated mentoring has benefited her career significantly. Mentoring has reinforced a sense of responsibility, accountability and integrity. P_4 recalls, "I came already with a sense of responsibility, but it was reinforced by these people that you have to be responsible for your actions… You have to be a person of integrity". She has a positive perspective of mentoring programs, but reinforces "these programs are great, but again, I question at what level." In addition to mentoring, she feels lucky that she works for an agency that "encourages everybody equally to pursue higher levels, to pursue higher level positions or to pursue inclusive higher level education or extra training, which is done here, I think contributes greatly to the success because you feel that you have the door open to do more than sitting on the desk n the lab doing your work."

Horizonalization

The participant's story provides relevant terms that assisted the researcher in finding common themes that aligned with the research questions. Table 4 provides an account of the participant's experiences and expressions. In summary, Table 4 suggests that P_4 is a successful Latina engineer that strongly believes in mentoring but questions at what level the programs are being pursued or if they are being used correctly. P_4 described positive mentoring experience and mentions that her mentors have been assigned. She believes that to be successful is to be respected and recognized for her work for that reason she has chosen to stay at her current position.

Table 4

Horizonalization: P_4

Horizonalization of Latina Scientist and Engineers Mentoring Experiences (Direct quotes)
Sense of hard work and responsibility
It is my name against what I'm doing.
Having a sense of responsibility, I think is what contributes the most to a successful career.
People might consider that to be successful is to be the center director or to be a division director or to be a branch head.
To be successful is to be respected in what I do here.
I have by choice elected to stay where I am.
Summer internship.
I was recognized for the job I did, and that's encouraging.
If you want a higher position, you compete for it, but part of competing for it is keeping that status of being respected and recognized because you do a good job.
I have not found discrimination either.
I think I have learned to navigate the system.
My only obstacle, right now – and I don't necessarily consider it an obstacle – is my choice.
It's my choice to do what I do at the level that I do, so I can balance my family with – my personal life with my work life, and it's not an obstacle, it's a choice.
People sacrifice a lot for it.
You are assigned a mentor.
They were very diligent to make sure that I will learn what I needed to learn, that I would get recognition for what I was doing.
I had the privilege to work with good people, good mentors.
I do believe that a young person to have somebody to look up to or to talk to or to guide them or to just encouraging, encouraging is very useful.
People don't have the full perception of what a career is.
People think electrical engineers are the people that actually – they call it "*trepa postes"* [pole climbers].
Mentoring is good, but I don't know if all these companies and all these places are actually gearing the mentored programs or these kinds of opportunity programs correctly.
It's hard to believe in what you can do when you look at a lot of the Latina girls, that they don't have the background in their family. Most of them never went to college.
The ones that don't have the support group behind it, those are the ones that we are losing, and we don't see a lot of Latinas of the area.
The higher the education, the higher you go in the education, or even engineer , it is harder to find.
They have to be proactive.
If you don't have a mentor that is not proactive, mentorship is just useless.

If you don't do a good job as a mentor, you didn't contribute anything, and I think they have to be more willing to put more time into it.
You have to be accountable.
You have to be a person of integrity.
I think these programs are great, but again, I question at what level.
Navigate the system.
I am a tremendous advocate of getting that kind of job, summer job, and it opens your mind and opens your opportunities too.
Being in a workplace that encourages everybody equally to pursue higher levels.
Experience is always the key.

Participant # 5 (P_5)

Overview

P_5 is originally from Puerto Rico. She obtained her bachelor's degree in Physics from a university in Puerto Rico and her master's degree in Engineering and Physics from a university in the United States. P_5 currently holds a position within a government agency.

Textural Narrative

Career Success

I think what made me successful was to identify areas in which I could create impact in my organization, like take a lot of training, a lot of certifications to become a subject-matter expert in a specific subject, specific area in which I could exploit new technologies to -- that I can use in my organization, like bring new ideas to the organization.

I would like to add to this statement that what I consider made me successful in my job is the fact that I was able to diversify in many areas of the engineering field by taking training, graduate courses, and certifications. Also, by doing the tasks that typically engineers do not want to perform (for example, technical writing) I was able to make a difference in my organization and get leadership to know the quality and complexity of the job I perform.

Helpful Experiences in Career Development

I think basically what made me go to this position was to be sure both professionally and personally -- I went all those years when I was studying the master's, especially because I was living by myself. So I have to become really

independent, have a strong personality, so I could overcome the difficulties with the people.

I would like to add the fact that I always needed and still need to be perseverant, and be always ready to present 'evidence' that confirms what I am talking about in my job so people believe me.

So you have to have -- be mature and have a strong personality, so you can overcome if you have a problem with the language, if people don't understand you, and you have family so far away. So you have to be able to become independent, so you can achieve your goals.

Impediments to Career Success

Well, first, I would say I work in a very man-dominated environment. Yeah. I would say all of my team mates are men. I am the only woman on the team, and that has been a big factor because I feel like sometimes they treat me different just because I'm a woman.

And some of them are older than me. They could be my parents and my father, and they treat me differently because they look at me like I'm too young, and they don't -- sometimes when I say something, they don't take me seriously. I have to demonstrate. I mean, I feel that I have to struggle more.

And it's more difficult for me because I have to demonstrate what I'm saying is true or it works.

I think that is just basically like the main factor. Like lots of the -- I would say the culture in how the government works, I don't know if all the government agencies work the same way, but it's like the people that have been working for the government for a long time, they don't want to change, and they see change as something really bad. And when young people like us come and try to change something, implement something new, they don't want, and it's really hard.

Meaning of Mentoring

Well, I think -- I think the definition of mentoring is subjective. I think in my experience, I never had a formal mentor in my career. So I found that informal mentoring, like the one that comes from a co-worker who has more experience or a friend that is maybe going the same path as you, has been the richest way of mentoring that I received.

Instead of a formal mentor. I think that sometimes -- for example, when I started working -- I kind of looked for someone, like a role model, someone that I wanted to be at that level of someday, and that would be like someone that -- I would say like a mentor somehow because it's someone that I wanted to be

someday -- within your organization to help you out with the process of getting you used to the work environment. When for example, you're in a new organization in the company -- or someone that is supposed to help you out to achieve your goals. It's like someone that is appointed to you in your organization.

Perception of Mentoring Latinas

I think mentoring of Latinas in science and engineering, it's great. I think that it should start in various student high schools. I think some of the challenges is that -- I'm going to put it this way. It's that parents sometimes don't enforce science and engineering in girls, just because they think that they don't have a future in that or that is too difficult.

Like for example, in my case, when I said I was going to study physics, everybody was like, "Why physics? You're not going to be able to do anything with that." So it was like I had to prove then that that is what I wanted to do, and that I was going to be able to do something with that degree. So I think that mentoring coming from teachers or maybe from the parents at a young age would be really good to have more Latinas in both science and engineering because right now we don't have too many Latinas in those fields.

I think it's more like a culture thing. That would be like the challenge, like how to make people think that a woman in science and engineering can be successful and make great things, and this is not a male-dominated career field.

Meeting Mentors

Well, some of them would be the professors at the university. Some of them were people at work. Like I would say the first mentor that I had when I started working -- I started working for _____ like six years ago.

And I didn't have a formal mentor, but my supervisor was like a role model to me. I kind of tried to follow her steps. And also, I had peer-to-peer mentoring from my friends that had been working in the company, years before I got there, and now that I am working at the agency, I have been working at the _____ for six years now, and I don't have -- never had a formal mentor, but I had like peers that helped me out with my career, so supervisors.

I consider them as mentors. I think in my case, since I have been able to like create impact in most of the organizations that I have worked within the agency, I see them as mentors because they always look at me like to provide me opportunities because they want me to create a career in _____. So they are always looking for me and saying okay, here is this opportunity, take it.

Key Qualities of Mentors/Mentoring

Well, I think be outspoken at work. I would say that most of the people that I consider mentors are women, and -- when I realized that they have to be very outspoken and confident at work, so people take them seriously.

They always take care of other people, like the team members. They always look for them. They take care of them, and it's more -- it's not only professional. It's also in the personal aspect. I mean, they care not only for the work that you are doing. They also care for the issues that are going on with your life, like -- which is good because, I mean, it's like a family at the work environment.

Influence of Mentors

I would say by providing me support, supporting all the decisions that I have made. I would say mostly in the professional aspect. For example, like right now, I feel very grateful that they are supporting me and continuing my graduate degree, and they have always supported me in the things that I wanted to change within the organization. Like if I want to implement a new process or implement a new technology, they always provide support.

Thoughts of Mentoring Programs

I think I'm not too familiar with the mentoring programs that are available, but I would say the programs. But I think the people that are doing the mentoring, they have to be really committed in practice in mentoring other people because sometimes you have these groups, and the people that are doing the mentoring, they are not engaged in providing mentoring, and they just -- I mean don't communicate with the other people or they are not available.

I think the most important -- the more important thing is that people are available; the mentors are available, committed and supportive. That they do not do the mentoring just because it looks good on their resume or promotion profile, but because they really care for the objectives of the people they are mentoring.

I think they -- they have value in attracting Latinas to science and engineering, but if they are like very active groups that are continuously looking for people and having everybody involved within the team. Otherwise, the mentors will not do their job, and the mentee will not attend the meetings or look for a mentor. So they will lose interest.

Other Factors that Contribute to Success

I think training. I would say at all levels, like having formal certification to provide like in formal training in a specific area. Also, I would like to add that

training can also be ‘informal’ like on the job training or by reading a technical magazine.

Additional Information Voluntarily Provided by Participant

I would say that the best thing, the best way to become successful would be like taking advantage of all the opportunities that are available for being Latina, for being a woman. So take advantage of all the opportunities, take training, education, and try to always create impact in the organization that you are working on, and that's the way you will be -- distinguish yourself from the other team members.

I would like to add that it is important to diversify in different areas of engineering and science. Do not focus on a specific area of engineering or science and try to work on it for the duration of your career. Look for other areas that can lead to career growth. For example, it is expected that to grow in an organization people assume leadership and management roles at some point, therefore, prepare in advance to get to that position. Perform your daily technical tasks, but learn management/leadership skills and start applying them as part of the daily job.

Structural Narrative

The participant thinks she owes her success to significant training and continued education activities. She has several certifications that have made her a subject matter expert and has enabled her to diversify within the engineering field. She also acknowledges the fact that she is a confident person both professionally and personally. Her strong personality has helped her overcome obstacles. Her perseverance, she believes, has paid off.

P_5 believes that working in a male-dominated environment has been challenging. Many of her male co-workers are also older than her, so she feels pressured to prove herself constantly. She recognized this is the nature of her profession and has adapted accordingly.

P_5 considers mentoring a subjective term. She believes that informal mentoring opportunities are the most effective based on her experiences. She looks for role models that she can turn into informal mentors. P_5 has had mentors, although informal, at all levels of her professional career. She considers some professors at her university to be mentors; some with coworkers (peer mentoring).

P_5 has strong thoughts about mentoring Latinas. She thinks that it should start in high school by strengthening parental support. It is her belief that parents do not encourage girls to pursue career in science and engineering. There is the stigma that it is too difficult and perhaps not suited for girls. She considers herself an example of this. Everyone questioned her desire to study Physics and constantly had to justify that that was the career she wanted. She also believes that mentoring

is more effective at a young age where behavior could be swayed. She perceives that it is important to change the culture to make people think that women indeed can be successful in science and engineering. P_5 also considers the fact that she confident and outspoken at work an advantage. She cares for other people, so she is seen as a team member. This informal mentoring has provided her with support and has given her the ability to make better decisions.

The participant is supportive of mentoring programs. She stresses that individual's really need to commit to the program in order for it to be effective. Availability and support are critical component of any mentoring programs.

In addition to mentoring, P_5 considers training at all levels, certifications, and her ability to take advantage of opportunities to be assets. Finally, P_5 believes that she can have an impact in her organization and that it is important to diversify into other areas of science and engineering rather than focusing on just one area.

Textural-Structural Narrative

The participant believes that what made her successful was "to identify areas in which I could create an impact in my organization, like a lot of training, a lot of certifications to become a subject matter expert in a specific subject". P_5 has been able to diversify within the engineering field. She also acknowledges the fact that she is a confident person both professionally and personally. Her strong personality has helped her overcome obstacles. "I always needed and still need to be perseverant, and be always ready to present 'evidence' that confirms what I am talking about in my job so people believe me."

P_5 says that working in a "male-dominated environment" has been challenging. "I am the only woman on the team, and that has been a big factor because I feel like sometimes they treat me different just because I'm a woman." Many of her male co-workers are also older than her, so she feels pressured to prove herself constantly. "They look at me like I'm too young". She recognized this is the nature of her profession and has adapted accordingly.

P_5 considers mentoring a "subjective" term. She perceives that "informal mentoring" opportunities are the most effective based on her experiences. "I kind of looked for someone, like a role model, someone that I wanted to be at that level of someday". P_5 has had mentors, although informal, at all levels of her professional career. She considers some professors at her university to be mentors; some with coworkers (peer mentoring). This informal mentoring has provided her with support and has given her the ability to make better decisions.

P_5 has strong thoughts about the benefits of mentoring, particularly having supportive parents that provide a mentoring role to sway girls towards science and engineering studies. She states, "parents sometimes do not enforce science and engineering in girls, just because they think that they don't have a future in that or

that is too difficult". She considers herself an example of this parental bias. "When I said I was going to study Physics, everybody (including parents) was like "Why physics? You are not going to be able to do anything with that"". P_5 constantly had to justify to herself that a career in science and engineering is what she wanted and pushed herself accordingly. She believes that it is important to change the culture so women realize that they can have successful careers in science and engineering and "make great things". P_5 also considers the fact that she is "confident" and "outspoken at work" as an advantage. She cares for other people, so she is seen as a team member.

The participant is supportive of mentoring programs, and believes that, although informally, they have benefited her career. She stresses that individuals "have to be really committed in practice in mentoring other people" in order for mentoring to be effective. P_5 believes that mentors need to be "available, committed, and supportive." Mentoring should not be done just because it looks good on a resume or promotion profile, but because they really care for the objectives of the people they are mentoring.

In addition to mentoring, P_5 considers training at all levels, certifications, and her ability to take advantage of opportunities to be assets. Finally, P_5 believes that she can have an impact in her organization and that it is important to "diversify in different areas engineering and science" rather than focusing on just one area.

Horizonalization

The participant's story provides relevant terms that assisted the researcher in finding common themes that aligned with the research questions. Table 5 provides an account of the participant's experiences and expressions. In summary, Table 5 suggests that P_5 is a successful Latina engineer who believes that to be successful is to take advantage of all the opportunities that are available for Latinas. P_5 briefly described how it feels to work in a male-dominated field. She mentioned that she is the only woman in her team and the youngest. P_5 constantly has to prove to her peers that she is capable of doing the job. The participant strongly believes in peer mentoring and thinks that "mentoring" is a subjective term.

Table 5

Horizonalization: P_5

Horizonalization of Latina Scientist and Engineers Mentoring Experiences (Direct quotes)
Identify areas in which I could create impact in my organization
Take a lot of training, a lot of certifications to become a subject-matter expert.
I was able to diversify in many areas of the engineering field.
Be sure both professionally and personally.
I always needed to be perseverant, and be always ready to present 'evidence' that confirms what I am talking about in my job so people believe me.
Be mature and have a strong personality, so you can overcome if you have a problem with the language.
So you have to be able to become independent, so you can achieve your goals.
I work in a very man-dominated environment.
I am the only woman on the team, and that has been a big factor because I feel like sometimes they treat me different just because I'm a woman.
They could be my parents and my father, and they treat me differently because they look at me like I'm too young.
I feel that I have to struggle more.
I think the definition of mentoring is subjective.
So I found that informal [peer] mentoring, like the one that comes from a co-worker who has more experience or a friend that is maybe going the same path as you, has been the richest way of mentoring that I received.
I kind of looked for someone, like a role model, someone that I wanted to be at that level so someday.
I think mentoring of Latinas in science and engineering, it's great.
It's that parents sometimes don't enforce science and engineering in girls, just because they think that they don't have a future in that or that is too difficult.
So I think that mentoring coming from teachers or maybe from the parents at a young age would be really good to have more Latinas in both science and engineering because right now we don't have too many Latinas in those fields.
That would be like the challenge, like how to make people think that a woman in science and engineering can be successful and make great things.
Some of then would be the professors at the university.
Some of them were people at work
I didn't have a formal mentor, but my supervisor was like a role model to me.
I had peer-to-peer mentoring from my friends that had been working in the company, year before I got there.
Very outspoken and confident at work, so people take them seriously.
Providing me support, supporting all the decisions that I have made.
Support.
I think the people that are doing the mentoring, they have to be really committed in practice in mentoring other people because sometimes you have these groups, and the

people that are doing the mentoring, they are not engaged in providing mentoring.
I mean don't communicate with the other people or they are not available.
The mentors are available, committed, and supportive.
They do not do the mentoring just because it looks good on their resume or promotion profile, but because they really care for the objectives of the people they are mentoring.
The best way to become successful would be like taking advantage of all the opportunities that are available for being Latina, for being a woman.
It is important to diversify in different areas of engineering and science.
Perform your daily technical tasks, but learn management/leadership skills and start applying them as part of the daily job.

Participant # 6 (P_6)

Overview

P_6 is originally from Argentina. She obtained her license in meteorology in her native country and her doctorate degree from a private university in the United States. She currently holds a Distinguished Professor position at a major university. It is important to note that P_6's father was an architect and her mother did not finish high school. Her father passed away when she was only 14 years old. It was her mother who encouraged and supported P_6 until she completed her studies.

Textural Narrative

Career Success

> I had a lot of encouragement from my parents. Even my mother told me I should not get married until I got doctorate, which is quite unusual. My father died when I was 14, but my mother kept -- she was very encouraging, and my mother kept supporting me until I finished.
>
> I was very lucky to study in Argentina in _____ because not only the university was very good, but women in Argentina, professional women, have a much higher acceptance in society than, for example, in this -- in the U.S. at the time I came.
>
> For example, when I was a student in the School of Sciences, about 40 percent of the students were women. So I thought when I go to _____, which is so much more along, it will be 50 percent. Then I go to _____, and I was the only one. And the first woman to do a PhD in the Department of _____.

And I kept -- I was all the time assumed to be a secretary, and frequent -- not frequently, but I was asked like why did I study, that it didn't make sense to them.

I was going to study physics, and my father had died when I was 14. So my mother worked very hard. So she found that when I was on vacation, summer vacation, the weather service was having a competition for students in meteorology scholarships. So she just changed my major from physics to meteorology and signed me up.

It was a total shocker. It was a shock. I couldn't believe it that there was not that many. I remember a very kind fellow student who was more senior. He told me that they were all feeling sorry for me, that I was a woman and Latina from South America, but then after I started getting the best grades, they didn't feel sorry.

Helpful Experience in Career Development

I think I was lucky. First of all, I was at the right place at the right time. Going to the University _____ was a fantastic place to get a very strong background in science.

Actually, it was -- at that time, the University _____ was so good, that when I went to _____, I thought it was easier at _____ than _____.

Also, at _____, I was also lucky to have -- there were fantastic professors, and my advisor, _____, was very good. I didn't spend much time with him, but the few times that we met, maybe every three months, he would give me a jolt forward. It was amazing.

Then I -- my first husband was also the father of my son. I was also the only student that ever go pregnant there. So my first husband was really supportive also and also helped, and I went to Uruguay for a couple of years, and that was a really enlightening experience. I had a lot of time to think and work with very good students.

Then I came back to _____. I was invited by Professor _____ to come back as a research associate, and then the professor that was doing numerical teaching, numerical weather prediction, _____ was one of the most famous people doing numerical weather prediction, decided to come to work to the _____, and _____ suggested my name to teach numerical weather prediction, and then I became an assistant and associate professor. That was a big push. It was very challenging, but it -- I think that was, in my mind, the first edition of this book which is _____.

And then I went to work. When I became associate professor, another professor told me that I didn't have -- they didn't give me tenure at _____, that I might need

it in the future, but that was to be seen. So I decided to leave just before they denied me.

So I went to _____, and there I found an incredibly good mentor. His name was _____, and he was very, very supportive of me, and I was head of a group in numerical weather prediction. And that was very, very good. When she was promoted about five years later, I was chosen to become the branch chair. That was also a very strong level of experience because my branch was all very bright, aggressive male scientists, and I have to be the branch head. So I decided to -- I couldn't use this title of my predecessor, _____, who was supportive but was also aggressive.

So I decided to follow the model of a Quaker woman in _____. I was a member of a human rights group and was directed by a Quaker woman, and it was a very different group of people. Some people were famous, some were just secretaries in human rights. So this Quaker woman leader said that the Quakers did everything by consensus, and everybody's ideas were allowed to brainstorm. So I decided to follow that, and basically that worked very well. I worked by consensus, and that gave me some self-assurance.

Then the director of what is now the _____, the _____ offered me to come to the _____ and become the director of what is called _____, and that was a much larger organization with a lot of operational responsibility. So I decided to. I accepted it, and I decided also to follow the discussions and consensus and, of course. I was amazed because I was always able to push to -- not the consensus but what I am to do. So it was very good, and we -- actually, we made a lot of progress in the _____ during those years when I was director.

Then after 10 years, I decided that I should step down and become maybe obstacle some day, and when I stepped down, my successor [unclear]. It was clear that I was sort of in the way of my successor, who was my deputy before. So I decided to go back to university, and I went to University _____, where they invited me. I was there for a year and a half, but my husband, my second husband was there, and I wanted to come to _____. So there was a post, a chair open. The chair of this department was open. So I applied and came back, and then after three years, I think I also improved the department quite a lot. It is a wonderful department, and they kindly gave me the title of Distinguished University Professor. So it's basically good luck.

Impediments to Career Success

Well, being the only woman is something scary. It was not just when I was a student. For example, when I was at the _____, I remember making presentations and having discussions among senior executive service people. It was a sea of men. It's just not -- fortunately, things -- those are people from my earlier time, fortunately, and then in the U.S., the 1970s the feminist movement took place, and

one thing which is very good about the U.S. is it is able to [make] major changes, like stopping smoking or giving women -- the discrimination of women was much worse. Now at _____, they get more applications from women than from men. So this situation has changed a lot. I have had problems and conflicts occasionally with people, but I cannot say that I've had a hindrance.

I've had good professionals that cared, especially in Argentina. I had two professors that care. Their names are _____, who is also a meteorologist, and _____, and they were the dean and the vice dean of -- deputy dean of the School of Sciences, and they not only were great for the School of Sciences, which was wonderful, but even personally with me. I knew that they cared about me, and they cared about other students. So that was a very good start, and then other professors -- then at _____, _____ was -- He was a role model for me for everything because he was not only incredibly a good scientists, but also was just inspiring in every possible way.

Then when I went to _____, _____ [her mentor] was probably the biggest draw in encouraging me to be -- to take positions of responsibility, which I was kind of scared.

And after that, I guess -- yeah. At the _____ my bosses were very, very good, and this Quaker woman also. She doesn't know that, but she was a mentor for me in just dealing with a lot of disparities.

I should say also when I was at _____, we had -- within the branch that was directed by _____, we had two groups. One was numerical weather prediction, which I headed, and the other was climate which a fellow student from _____, former student from _____ whose name is _____, very famous, was heading that. I got a lot of mentoring with him because he was a very aggressive, powerful person. So I learned that I had to stand up for me, and I learned a lot from his ability to reach what you wanted to reach by pushing hard, and I learned not to be pushed. He's a very good friend of mine.

Perceptions of Mentoring Latinas

I have one -- I have a lot of women students that have come to work with me, and one of them is Latina, but I have not had too many Latina students. But I -- that makes me feel bad, but on the other hand, I have lots of women.

Women students that have -- I have about six women that got their -- or eight that got their PhD with me and only a few men.

There is no doubt that – yeah, that it has to be done, and eventually I will develop an openness with -- all my students become like children, like my sons and daughters, but with women, it's especially close. And with men too, but it's not

the same. With women, I feel like we talk really open there about life, as well as the science.

Meeting Mentors

I guess the main person that I would consider my mentor is _____ when I was working at _____. I think he gave a seminar at _____, and then I went down in an elevator and complimented him. I think that made a good impression, and later, he was very kind in offering me a job. I think I actually -- well, he was -- I have collaborated with him when he was in New York, and then he moved to Washington. Then I visit in Washington, and I told him in tears that I was getting divorced from my first husband, and he said, "Good. Then you can come here." So I felt at that point, that's so hard, but in answer, that's the best thing he could have said.

Key Qualities of Mentors/Mentoring

Well, I could see how he acted, and he also could see how I acted. I gave him a little bit of advice frequently, and he gave me a lot of advice. So we were very open about things.

And also, he just had -- he expressed confidence in me, and that made me gain confidence. That was before women basically -- that was -- he was clearly not a sexist person. He put me immediately in a position of responsibility, which is surprising for that time.

Influence of Mentors

Well, that confidence in putting me in positions of responsibility was there all the time, and after he was promoted, I was asked to take his place. That was also -- I don't know. He was -- I didn't want, but my fellow members of the branch also seemed to want me to take it. So -- and my husband, my second husband at that time also gave me -- supported me. I should say my second husband was also -- well, both my first and my second husbands were -- were both very, very supportive. So that -- and my son now.

Thoughts of Mentoring Programs

I should say I participated in two mentoring programs for undergraduate women which were called _____, one in 2002 and the other in 2004, I think, or '5, 2005 -- in this summer 2002 and 2005, and in each case, I -- it was called _____, _____. It was organized by the School of Engineering, _____, and in each case, we -- I have four undergraduate women, and then a couple of graduate students that helped. In both cases, we produced the nice papers, the scientific papers that were published and with very nice results. And the purpose of this _____

program was to encourage women to continue working in science and engineering and go to graduate school and get PhD hopefully or master's.

So I think those were very successful programs, but they were not only for Latinas. As I mentioned, a little bit sad that I have not mentored too many women Latinas, but actually, recently, I organized a two-week course in Buenos Aires for Latin-American students, and about half of them were women, to my great pleasure, and there were like a hundred students. Hopefully, I -- it was a very, very successful course, and hopefully, the -- I am like a role model for them, the same way that other people have been role models for me.

We have the Brazilian woman. A master's, my colleague, Professor _____ next door. Yeah. There were some Puerto Rican students, but overall, I don't know why because we have lots of women. We don't have enough Latinas.

Other Factors that Contributed to Success

Well, I think society is pushing. I think in Argentina, as I mentioned, for example, in _____, the School of Sciences was almost 50 percent women, and that's because society was -- despite the general convention that Latin countries are *machistas* and so on, society was very encouraging for women.

So I think -- and that has improved quite a lot in the U.S. It was really horrible when I came, and I came in 1967. I was totally shocked. The only women that I met, I was living in a married house complex. The only women that I met were women that were using the washing machines for their husbands. They used to call them PHTs, Putting Husbands Through. They worked as secretaries.

And I used to -- at the beginning, I listened to them, and I thought wow, American women must be stupid because they were talking about grandsons and babies and that was the only thing, but then I stopped talking with them, and I realized that women were incredibly oppressed at that time. It broke my heart when some secretaries, for example, would tell me, "I wanted so badly to study chemistry, but the professors didn't want to waste time with me," and at that time, the women were just not supported. There were no role models. They were not supposed to be good for math or --

I remember when my first husband, he had to go to the medical department to have some -- to see a doctor, and the woman asked him do you mind to see a woman doctor, and he thought gynecologist, that she was talking about seeing a gynecologist. No. It was a doctor that was a woman, and it was shocking for us because in Argentina, half of the doctors were women, women of character too. So things got changed for the better in this country enormously. They wouldn't have -- the jokes about women were horrible. Not any more, you don't make jokes about women, the same way you don't make jokes about blacks --

And fortunately, they improved in some ways, but there is still the same thing improving everywhere, although now with the new government, it will get better again.

Well, I feel working on something that you like, if you like, if you have any attraction for science and engineering, you should do your best to follow that because it is so rewarding to work in something which is interesting when you are doing it, making small discoveries or writing a program. A computer program is just something very, very creative and fulfilling. There is no university for -- you just have to use your mind for that, and being paid for that is worth more than getting paid for stealing money from the people in Wall Street. Sorry. Just having the job which includes some creativity and ability to grow is something that is worth having, even if it's -- if it's not highest paid.

And what I found is that when I work in -- I like money comes, and it's enough. I could live with much less than I make because I enjoy what I do, and so also it's good to interact with other people that are like that.

Structural Narrative

P_6 owes her career to early encouragement from her parents, specially her mother. She also mentions that professional women in Argentina had a higher level of acceptance in society, more so that the United States (U.S.) at the time she moved to the States. So that adapting became easier. However she was the first woman to receive a doctorate degree in _____ at a prestigious private university in the Northeast. She originally wanted to study physics but in order to join a summer competition her mom changed her major to meteorology which resulted in a scholarship.

She owes her success in her career in part to luck. She perceives she was in the right place at the right time. Also her strong background in science in Argentina has been helpful. She was fortunate to have excellent professors at the university, plus her husband has been very supportive of her. She traveled to _____ and eventually returned to the university as an associate professor. Later she moved to a major federal agency where she had good mentors. One of her informal mentors was a Quaker woman she met in ____. This women's consensus style was inspiring to her and gave her self-assurance. She had a 10-year successful career at this agency and afterwards she returned to Academia. Being the first women in her profession has always been a disadvantage in her mind.

As far as mentoring in her career, she has been fortunate to have good professionals who cared about her, especially in Argentina where she had two very good professors. At the major government agency where she worked, she also had a mentor that encourages her to seek positions of responsibility and to stand up for herself. In another occasion, she complemented a speaker at a

conference and this informal exchange resulted in a job offer. This person later became a mentor to her.

P_6 attributes her success to the fact that she is open about things and that her mentors have expressed confidence in her by putting her in positions of responsibility, which in turn resulted in a more confident person. All her mentors influenced her career by offering support.

Regarding her perceptions of mentoring Latinas, she has not had any experiences mentoring Latinas. She has mentored women, but not Latinas. As a professor, she establishes open communication with her students, which in a sense is a type of mentoring.

P_6 has participated in two mentoring programs as a mentor. She helped the students to successfully write and publish scientific papers. The purpose of both programs was to encourage women to continue working in science and engineering and to go on into graduate school to obtain master's or doctorate degree. She considers these programs very successful.

Finally she gives advised to those developing mentoring programs that it is important for society to encourage women in science and engineering careers. She adds that this encouragement is now stronger compared to when she first came to the United States. It is also important to work on something you like, enjoy what you do, interact with other people, and always do your best.

Textural-Structural Narrative

P_6 owes her career to the "encouragement" of her parents, specially her mother. "Even my mother told me I should not get married until I got doctorate, which is quite unusual… she was very encouraging, and my mother kept supporting me until I finished". She also mentions that professional women in Argentina had a "higher acceptance in society", more so than the United States (U.S.) at the time she moved to the States. So adapting became easier. However she was the first woman to receive a doctorate degree in _____ at a prestigious private university in the Northeast. She originally wanted to study physics but her mother found out "the weather service was having a competition for students in meteorology scholarships. So she just changed my major from physics to meteorology and signed me up".

She owes her success in her career in part to luck; "I think I was lucky. I was at the right place at the right time". Also her "strong background in science" in Argentina has been helpful. She was fortunate to have "fantastic professors" at the university, plus her husband has been very "supportive" of her. She traveled to Uruguay and eventually returned to the university as an associate professor. Later she moved to a major federal agency where she had "good mentors" who were "very, very supportive". One of her informal mentors was a "Quaker woman".

This women's "consensus" style was inspiring to her and gave her "some self-assurance". She had a 10-year successful career at this agency and afterwards she returned to Academia. "Being the only woman" in her profession has always been a disadvantage in her mind, to her it "is something scary".

As far as mentoring in her career, she has been fortunate to have "good professionals that cared" about her, especially in Argentina where she had two very good professors. At the major government agency where she worked, she also had a mentor that was the "biggest draw in encouraging me to be – to take positions of responsibility, which I was kind of scared… I learned that I had to stand up for me, and I learned a lot from his ability to reach what you wanted to reach by pushing hard, and I learned not to be pushed". In another occasion, she complemented a speaker at a conference and this informal exchange resulted in a job offer. This person later became a mentor to her.

Regarding her perceptions of mentoring Latinas, she has not had many experiences mentoring Latinas. "I have a lot of women students that have come to work with me, and one of them is Latina, but I have not had too many Latina students… that makes me feel bad, but on the other had, I have lots of women". As a professor, she establishes open communication with her students, which in a sense is a type of mentoring. "I will develop and openness with -- all my students become like children, like my sons and daughters, but with women, it's especially close. And with me too, but it's not the same. With women, I feel like we talk really open there about life, as well as the science".

P_6 attributes her success to the fact that she is open about things and that her mentors have "expressed confidence" in her by putting her in "positions of responsibility", which in turn resulted in a more confident person. All her mentors as well as her husband influenced her career by offering support.

P_6 has participated in "two mentoring programs" as a mentor. She helped the students to successfully write and publish scientific papers. The purpose of the program was "to encourage women to continue working in science and engineering and go to graduate school and get , hopefully or master's. She considers these programs "very successful". These programs were not only for Latinas. P_6 feels "a little but sad that I have not mentored too many women Latinas".

Finally she gives advised to those developing mentoring programs that it is important for society to encourage women in science and engineering careers. P_6 recalls that in Argentina the School of Sciences was almost 50 percent women. "Despite the general convention that Latin countries are *machistas* and so on, society was very encouraging for women". She adds that this encouragement is now stronger compared to when she first came to the United States. The participant believes it is also important to work on "something that you like, if you like, if you have any attraction for science and engineering, you should do

your best to follow that because it is so rewarding to work in something which is interesting when you are doing it…I enjoy what I do, and so also it's good to interact with other people".

Horizonalization

The participant's story provides relevant terms that assisted the researcher in finding common themes that aligned with the research questions. Table 6 provides an account of the participant's experiences and expressions. In summary, Table 6 suggests that P_6 is a successful Latina scientist that believes she was lucky and had good mentors who believed in her ability to do the job. She believes she was at the right place at the right time. She attributed her success to the encouragement of her parents, especially her mother who told her not to get married until she got her doctorate degree.

Table 6

Horizonalization: P_6

Horizonalization of Latina Scientist and Engineers Mentoring Experiences (Direct quotes)
I had a lot of encouragement from my parents.
She was very encouraging.
Women in Argentina, professional women, have a much higher acceptance in society than in the U.S. at the time I came.
First women to do a in the Department of Meteorology.
I was all the time assumed to be a secretary.
I was asked like why did I study, that it didn't make sense to them.
It was a shock.
I couldn't believe that there were not that many.
He told me that they were all feeling sorry for me, that I was a woman and Latina from South America, but then after I started getting the best grades, they didn't feel sorry.
I think I was lucky.
I was at the right place at the right time.
I was also lucky to have – there were fantastic professors.
He would give me a jolt forward.
It was amazing.
My first husband was really supportive also and also helped.
I became an assistant and associate professor. That was a big push.
I found an incredibly good mentor.
He was very, very supportive of me.

Being the only woman is something scary.
It was a sea of men.
I've had good professionals that cared.
_____ was probably the biggest draw in encouraging me to be – to take positions of responsibility, which I was kind of scared.
I got a lot of mentoring with him because he was very aggressive, powerful person.
I learned I had to stand up for me, and I learned a lot from his ability to reach what you wanted to reach by pushing hard, and I learned to not be pushed.
I have a lot of women students that have come to work with me, and one of them is Latina, but I have not had too many Latina students.
That makes me feel bad, but on the other had, I have lots of women.
I will develop an openness.
All my students become like children, like my sons and daughters, but with women, it's especially close. And with men too, but it's not the same.
With women, I feel like we talk really open there about life, as well as the science.
He expressed confidence in me, and that made me gain confidence.
He was clearly not a sexist person.
That confidence in putting me in positions of responsibility was there all the time.
A little bit sad that I have not mentored too many women Latinas.
Despite the general convention that Latin countries are *machistas* and so on, society was very encouraging for women [in Argentina].
I feel working on something that you like, if you like, if you have any attraction for science and engineering, you should do your best to follow that because it is so rewarding to work in something which is interesting when you are doing it, making small discoveries or writing a program.
I enjoy what I do, and so also it's good to interact with other people that are like that.

Participant # 7 (P_7)

Overview

P_7 is originally from Argentina. She obtained her doctorate degree in her native country and she is currently an Associate Professor at a major university. Her career is unique in the sense that she did not follow the traditional career path. She jumped from place to place until arriving at the place she is today.

Textural Narrative

Career Success

I would say somebody said that you pray. I do not remember their name. Ninety percent effort. Ten percent luck. Somebody said it's a -- I don't remember whether it was Einstein or -- maybe it wasn't that. Actually 95/5. But I think it's 90/10.

Helpful Experiences in Career Development

I mean all the chances that I had to go with different experiences from undergraduate to everything. I mean to -- I think that the thing that helped me more -- more -- was my first fellowship in England. Because that was the first time I was out of my country and stayed there, and I went to University of _____ for a year, and that was before I got my PhD, and I really enjoyed it. I mean, it really opened the way -- the way that I was thinking at the time, and I think that it was -- that was my most, most fruitful experience, in a sense. It was very hard, but then I learned a lot.

The important thing I learned, and it has nothing to do with science, is that there is no paradigms because I thought -- when I -- I never -- I was always -- and I still am very attached to my people and my country, but it -- I mean it was Europe. It was a tradition, a history. And I thought, well, maybe it's another country, why not, and then I realized that it might be better country than mine, which is very difficult, but it will also have problems, and I realized that most of the problems were common in that no matter what your country is, the things that -- But the other thing was you are not tied. So you don't want to be there, you just leave. I mean, nobody is tying you to this. You can leave.

At some stage, it was a very difficult experience for me, but then just about four months from my first year, my first four months, I thought I was feeling horrible. I didn't like anything. I knew… the weather was awful. I wasn't used to these things. I didn't like the food. I mean, the whole weather was horrible, and one day I said why is it that I am here. If I don't want to be here, then why am I staying? It's because this is important for my career, and I am afraid that going back home and saying I couldn't stand the experience, it's going to make me bad. So I come. I mean, if I'm not able to do it, if I'm not able to do it, period, so I rather face that than staying in a place that I'm not happy. And that's when I realized that I had the chance. I was choosing. That was an election. I could leave. It was my election, whether I stayed or I left, especially because my country was paying. So I was not owing anyone anything. So I said, "Oh, I see, so I can leave, I can leave. I choose to stay. Well, tough luck if I don't like it. So, if I don't like it, I leave. Here is my ticket. I can leave tomorrow." That's when I started to realize. That's when everything changed is like one minute from the other. I said, "Oh, now" -- and I think that and the first one that I told you

were the two things that really made my life different. No paradise, and second, that you're not tied. Yeah, you're free. Free to go. You don't like it. You don't like it. There are other things out there. So it's -- I think it's the freedom of choosing.

You choose for different things and not necessarily for money, for power, for position. You choose for what is best for you. I mean, the group here is a nice group. Excellent group. So we are really -- we enjoy working together, and -- and even if the money is not very good -- and I was never attracted to positions of power or how much you can manage people. I hate that. I am a typical bench scientist.

Even if -- I mean, even when the money is not very good, I really put it in the balance that I enjoy it here, and this is an incredibly good group, I mean very nice people, and we enjoy working together. So it's such a little pleasure coming. So that pays for -- for some of the money you're not getting.

I think that I would have it in any -- that same kind of experience is not particular of England. It was because it was my first. It could have been Germany or the U.S. I mean -- similar thing. On my own and in terms of working. In terms of, well, I am going to work for a whole year. It's not -- I mean, that was '81. So things were not terribly difficult, but there was no e-mail, no fax, no -- there was phone, but it was expensive. So your chances of communicating -- were less. I mean -- and I really missed my family and my friends.

On the other hand, I had friends over there that I could go and talk, and I -- sometimes I could call them over the weekend and say, "I need to go. I need to speak Spanish because I am going to forget. I'm going to forget. I'm not speaking Spanish anymore." So that -- that could have been. I mean, [unclear] was a problem of language.

Impediments to Career Success

My own personal things that -- to tell you the -- that's when I told you that I may not be the right person because I'm not middle-of-the-road. I change things for other reasons. So I do not consider myself as a straight career. I mean, I had my own laboratory in Argentina. My coming back -- coming to live here -- was like taking five steps down in my career. So, if I had stayed in _____, I would have had my own lab. I have my own lab, my own group, my own people, my own money, my -- I mean, I have a lot of things. So coming to live here, which I did because I married someone -- nothing to do and that's another story. I went -- I went to England two times, and then I came here for three years, and then -- and that was my formative years. So, after I went back to Argentina in '92, I got to be a senior investigator, to have my own -- I mean, it took me like a couple of years to get that. But -- but I had -- I mean, I was member of committees. I was a member of the National Research Council. I was member of committees. I was

member of -- I was a known person. So I never -- I never enjoyed that. I mean, I never -- I don't like politics. So I never enjoyed the [unclear]. I had to do it. I mean, that was one of the rules of the game. You reach a certain position, and then you have to do these things to get -- higher and higher, and even if you don't want to do it, well, nobody is asking you if you want. You have, and that's how the game is played.

So, actually, when I came here, I had to take steps down. I couldn't have my lab here. I couldn't have my laboratory here because I wasn't known. I mean, yeah, everybody -- I had a good track record for education. I had several postdoc experiences. I knew people, but nobody was going to give me the position I was losing, not without -- no, not here, because competition here is tough.

So I took several steps down which took me several years to get back, and I'm still not back to -- to the level I was. But when I moved from the _____ to here, I -- my actual -- the director of the department, which is my boss now, he asked me something like why do you -- I mean, having to be doing the same thing I was doing. So I knew him from work.

And although I knew him not -- I mean, like in science, when everybody else is smiling -- and I mean, everybody smiles. You can be -- and tell the [unclear] that nobody is going to show that up in a meeting.

So I knew him, but I didn't -- not much. But I thought -- I told him I have no desire. Then he said would you want your own group, and I said no because, at this time, at this age and this time of my life, I don't need the struggle. I need -- "I can stay with you as long as we have a happy relationship, you enjoy the work, and I don't need my own thing," and he understood that, and that's why we get together kind of really well because I said I know how it is.

If I never have the experience, I probably would have thought, well, why not, why not having my own, but I did that.

I had it. I said my people -- I got my PhD students, like law students. They are PhD's. I got them, send them back to -- send them to Europe and got them back, and I knew how to do all that, and I said, well, I know the experience. I can be more helpful in -- and I don't need to have it all.

So still be a professor someday, but not -- I mean, I'm more interested in having good money. That is first. That is the other thing that I don't -- everything is [unclear].

And the other thing is as long as we are happy and we are -- it is nice and we work fine together and we are successful, which is important, and we are so far. Cross your fingers.

I am happy. I don't have to be first. I can be second. I have a good track record. And there is one thing that I am happy with. It's with my career. I mean, I am happy with other things too. I have great family, but it has never failed me. Other things have, but this, never. Every effort that I put, I got back, and that is important. Everything that I put in, I got back, and I keep putting in, and I keep getting back. That's the reward because in many -- many stages in my life, the only really pleasure thing that I had was my work, and I'm not -- I don't know what to call it, you know. To be a scientist, you have to really -- You have to. There is not a chance, but it never failed me so far. Hopefully, it won't do it.

Meaning of Mentoring

I think that having been on both sides of the street, I mean as a mentor or as a mentee, I think that mentoring is about 50 percent. The other 50 percent is you because I tried to mentor people that would never do it, and you had to have it to tell them. I mean much that I regret to say this, "You are not making it, no matter how much you try. You never get it. So why don't you -- I mean let's try to choose something else for you." There is no luck to it.

It helped me a lot. It helped me a lot. I mean, my first mentor, she was from [unclear] -- was -- is a very intelligent woman, and she was the last fellow of one of our [unclear]. So she did -- she was an M.D. who had PhD with [unclear] and very -- I mean, she had a very [unclear].

And she wasn't tough, but she -- she helped me a lot, and we quarrel a lot too. I mean, we are still good -- really good friends. We quarrel sometimes. We had different ideas, but she never -- I mean, she never -- she let me say it. She never said no, no, no, no. No, no, no, this is [unclear]. Well, just try it. That was good.

So she actually helped you, advised you, I guess, in some ways. She would let you think about it and come up to your own --

And I know that it was difficult for her because she was an impatient person, more or less like I am sometimes, and it took me some restraint with my own students when I knew that they were going to get into the world, and -- but I had to tell everyone to just try. I knew they were not going to get it, but I -- I said they have to learn. If I tell them what to do, they will never learn.

So I had to step back, look how they get their head in the world, and when they come back, tell them what I think, that perhaps you should do this.

Perceptions of Mentoring Latinas

That, I don't know. I mean, I imagine you're comfortable with people, like my own background that -- than people of other backgrounds. We have a group of -- I mean, in our group, we are -- we have one American and maybe -- he's the only

one? Yeah, now he's the only one. The other one left. We are about 15, and including the director, we are foreigners. I mean [unclear], but 75 percent. Seventy-five percent.

So this to me, it's easier to mentor a Latina than mentor a Chinese, which people from China because their understanding was different. Still, that makes all the difference to -- I mean to have a good mentor is 50 percent of your career. Because hopefully he will tell you that 90 percent of it is books, read, study.

I think that is very important to have this ability. Latina to Latina, at the beginning. Then you need to go away and find other places -- and other cultures and other persons, but the first stage is -- it's like a chicken hen. You have to have -- I mean the hen, the chickens, and you -- you make them work until they can work by themselves.

So that's a short period, about two, three years. But then you have to, background. That's -- yeah, because they are from their own background, and you want them to succeed. You want them to -- yeah, you want them to succeed. I mean, seeing it from the other side, I always wanted my students to succeed. I always wanted them to meet -- I mean, to be really -- because it's your pride.

It's like being a mom, and it's your kid. You want -- yeah. You want them to succeed. You want them to -- either you want them to quarrel with you, science, because that means that they have been thinking.

That was a complete -- that was the luck you have. I was -- I was at university, and then -- I don't know. You are from Puerto Rico. I don't know how there, but in Buenos Aires, _____ is -- well, it was. I think it's still, but people change what they think. It was the best university in Argentina, and -- but it was in the same town, and actually, so I did not go out to college. I kept still living in my family's house, and I want to -- I mean it was 10 minutes away.

So it was close, and I -- and every day when I was coming back in the bus, it was this building that I look, and it was four blocks away from home, and I knew I was [unclear], but that was a new building they had. It wasn't in the corner, and I was looking at it, and so sometime -- sometime I decided, you know what, I'm going to get down from the bus here, and I'm going to walk and actually look at that.

So I got down, and I look. And I look at the windows and said, oh, they are labs. I wasn't first -- first year, anyway. Oh, these are labs. I know that. Interesting.

So I kept going. I mean coming. I was looking. The building was nice, and the labs looked nice for what I could see because the window was like that. I want -- I was like in third year, about third year.

One day, one of the girls I was studying with just by chance said, "No, I have to go back to work." "Oh, where do you work?" "Oh, near your home," and she was working in that lab. I said, "Tell me about it. I want to look at it. I was trying to find out what that was. So what is the research done there?" And the next thing I said is, "When there is position available there, you tell me." And I kept pestering her, badly. Because every two weeks, I would meet her somewhere in the school, and -- "Is there any position available?" And she said, "No, no. There is nothing."

And then one day, she came in and she said, "There is a position down there. Somebody is looking for a student, but I have to tell you, she has a horrible mood. She's a tough lady. So it's up to you, and don't tell me then that I didn't warn you."

And I looked at her, and I said, "When do we start?" And we looked at each other and said -- and I said, "When do we start? Can I start tomorrow?" And basically, before I came here this last time, I -- for the next 25 years, I worked there. I mean first as a student, then as a research assistant. I was -- I was in a -- in a project -- in a program from the National Research Council, and they would hire students.

And they would -- you -- you were working not so many hours, like six hours a day, but then when you got your first -- when you got your first degree, they would hire you for a longer time, and they would pay you more, and they were trying to -- and I think they have problems still. They were trying to get people from -- I mean get them into the system, young kids. Actually very young. So, I mean, for the next 25 years, I was there. Thanks to my friend, and she left.

I mean, how many years -- when I was in England. So, yeah. Well, that was '76. When I was in England in '91 -- so that was five years. When I was in England, she had gone. I think she went to a meeting. I don't remember. So we shared. We worked in the same institute for five years, and then when I went to England, somehow -- I don't remember exactly the story -- she found a guy, and she married this guy, and the guy was from Mexico. So she moved to Mexico. She left science.

Key Qualities of Mentors/Mentoring

The most significant quality was that she was an extremely [unclear] person in that -- she is the scientist from -- from -- I mean she had what I always called -- and it's difficult to find. Well, it's difficult to find, but not that hard, and you find it in -- I think it's in 100 percent of the people that are in science have this -- is a kind of interior fire. It's that something that is either inspiration, but I don't know. It's when you hear them talking, you say this guy has it or this guy doesn't have it.

It's something from inside. Yeah, we used to call it the "touch." You have the touch -- or you don't have the touch. And -- and the thing that could be -- I mean the downside is -- it was not in my case, but sometimes the people who has the touch also has -- and not very good mentors.

So the -- the difference, they are not very patient. The difference between having the touch and being a reasonable mentor, that's not an easy mix to find. She had both. She's still teaching, and she's still -- and I [unclear] because I had so many things to do, but I am going to retire. I say yeah, yeah. I've been hearing that for the last six, seven years.

From other mentors that I had that were not really mentors -- I mean, my mentor was good. But when I went to work somewhere else, the thing that I least appreciate was when you were -- you do this exchange, I do this with your -- with your mentor or boss at the time -- say I do this and then you do that. So he -- he -- he would say -- and that, I hated. He would say, "Well, you finish experiments, and I'll write the paper." I finish experiments. I put everything together, and he would say, "Now I think you should write the paper." Why are you doing this? No, no. And then I wrote the paper. And then he would say, "I think you should write it." But you said, "You would write it, and am I hearing things?" Five minutes later, they decided something else that they forgot to tell you.

And then one thing that I think can be -- I don't have experience, not that experience, but I don't think that one thing that can be extremely toxic -- and if you already have that, that is the behavior you should be is when you're mentor or you're boss -- and you're sincere in terms of the way you think or the way you talk.

I mean, one thing is telling people, "I don't think you should do that, or this is the protocol, and you have to follow it because otherwise it doesn't work," and explain why it wouldn't work, and the other thing is telling them that they are idiots or they don't know what they're doing.

I myself, if I were in that kind of position, I would leave the minute because that is going to kill you, every self-respect that you may have, and at that stage, you may not have a lot because you are still in your family. That is toxic. That, I would leave.

Influence of Mentors

Very much because after -- I mean, after [unclear] that I was, that I could do it, I may not be great, but I could do it. The next thing she told me was, "And you have to go. You have to go. I mean, if you want to be a scientist" -- and I was a scientist in Argentina -- "If you want to be a scientist, you have to go and be trained outside." So, if you're not prepared to do that, you will never reach it.

Thoughts of Mentoring Programs

I think that there should be more, and I would be happy to participate. Oh, no, yeah, sure, absolutely, because in our -- there are more now, but it is difficult to find. I mean, it's difficult here.

How many Latinas professors? Not many professors. How many there are? I think no more than 10. I have to go and look at the -- and look at the roster and see, but -- And you know, still, there may be more men. Women, there -- and the men, there are not that many Latinos either, but there may be more Latinos than women.

Other Factors that Contribute to Success

The other factor is the opportunities because you may have an extremely good mentor that -- an extremely good mentor is a human relationship. But it may be -- may not have the good connections, in which case -- I mean, my mentor -- did not have -- did not have any connections in that sense. I mean, she had a few but not many, but she helped me to find the place. She said, "Oh, well, we need -- I think you should go and do this," and but she told me it's not -- 50 percent is what you are going to learn, but the other 50 is not necessarily related -- it's not the technique.

So you may learn a technique, but that's not the whole. She -- she didn't know anyone in England at the time, and I mean, I had the chance to go to England. So she helped me to write a letter and tried the letters to different -- we look. At that time, it was a lot more difficult because we had to probably something that you don't know what it is. It was something called the [unclear] contest.

And it was a book, a journal this big in [unclear] paper, very thin, and it had -- it was one per week, very expensive, and it had all the index of all the journals that have published, that have been published, that book.

So that was how you did your searching at the time. So you had to go and look, and in my institute, we had -- of course, it was expensive. We had one, one journal for all of us. So you want the least, and you were given one day. So they would tell you, you have -- and that was one day was your [unclear] because --

I mean -- and I -- and I was -- I was down on the list because I was younger. I mean I was the young generation. So I -- I was down in the list. And I had one day, and that day meant your night because that was the only way to do it.

So you had to go -- I mean that taught me [unclear], and I couldn't convince my students to do it, never, because they were computer guys, and I said, "You know, I am not a computer guy."

When I start the university, I don't -- I wasn't. They were, but they did the letters, use calculators. We had either [unclear]. That I don't know how they call it in English, or -- or you were on your own. I mean and I never learned how to -- how to actually. That's more for engineers. All engineers have to actually turn on the calculators. They -- you could see who was an engineer because they had one of these here.

I never learned how to use it, and so I -- piece of paper, and I would do it. So these guys look at me like, "God, you are [unclear]."

When I was -- and they hated doing that. When I was young, it was a lot more difficult, that you learned a lot more if you read a whole lot. So what I still do, even when you have all these things, is I do the search. I do, but then sometimes I go to the medical journals, and I read the index, and I learn a lot more that way than going through a [unclear] search. Because you see the other things around.

What you were looking for. And then on this side appears something else again. I want that. So I mean it cost me a lot to convince them, and I would say the thing that really -- was when they -- they wouldn't even try. They wouldn't even [unclear]. They would look at the -- they could search the words. No, no. That drove me crazy. No, no, no, no, no. You print the abstracts, and you read them. It's your only chance to learn.

The opportunities and how much funding -- your country has, your country, your university, your whatever place, because that is important.

There are things that I'm not -- that you cannot compensate. I mean you have to be competitive. You have to have access to the choice. Otherwise, no toys, no --

Something that I consider as the minor borders that you have to be, you have to have eventually, is like location. So, if it happens to be in a horrible place, well, I mean, you just take it up. If it happens to be outside your country, tough luck.

You can -- I mean, if it happens to be -- I remember someone that wrote me one letter. When I was in Buenos Aires and she was training somewhere, she was in the middle of nowhere, and she was demanding, and she wanted back now, and I said, "Buenos Aires is a big city, a whole lot of things," and this was the middle of nowhere, really. I mean she said I have to drive a half an hour to go to university. We smoked at the time. If I get out of cigarettes, I would not smoke because I'm not going to drive for half an hour to get to this [unclear]. She was demanding. The next line was, "But the work is great."

Structural Narrative

P_7 attributes her success to hard work, in fact she says that her success is 90% effort and 10% luck. She has had a handful of experiences that helped shaped her

career. She mentions participating in a fellowship program in England for one year. This was her first time out of her country, which was very difficult for her since Argentineans are very attached to their people and country. While in England she missed her family and friends tremendously.

Moving to the United States (U.S.) in a way was a hindrance to her career. Back home she used to have her own research laboratory. But moving to the U.S. she had to take 5 backward steps. She was unable to have her own lab in the U.S. because she was not well known and also because competition was significant. It has taken her several years to the position she was in Argentina, and she still considers she is not back completely. The effort she has put in has paid dividends and she considers herself fortunate.

P_7 has had mentoring experiences both as a mentor and mentee. She believes the success of mentoring programs is 50% due to the program itself with the other 50% being the dedication of the individuals involved. For example, she has mentored individuals who were not capable or interested and advised them to pursue a different path. Her first mentor was a tough woman that helped her a lot. Sometimes they had different opinions but she was always supportive and encouraged her to try different things.

About her perceptions of mentoring Latinas she states that it is easier for a Latina to mentor another Latina. This is not only due to similar culture and language but she thinks that people from different culture learn differently. It is important to provide mentoring opportunities at every stage of a Latina's career, but especially early in her career.

P_7 met her mentors by luck and chance. She found out that a friend worked at a laboratory and asked her if there was a position to let her know when there was an opening. Her friend told her that there was a position available where she worked. The friend warned her about her supervisor-to-be and about the fact she was a difficult person to work for. She disregarded her friend's advice, went to the laboratory, introduced herself, and was given the job. This is an example of how individuals have to take chances to advance a career.

One of her mentors had a significant influence in her career. This particular mentor had the passion to inspire and push her to do better. This mentor was a major influence in her career. This mentor told her that if she wanted to be a good scientist she would have to be educated abroad and encourage her to move to the United States. She believes that for an individual to be successful, the individual should be willing to be trained abroad. Her mentor provided her with resources and advice to move ahead in her career.

The participant thinks that there should be more mentoring programs, but states that they are scarce and therefore difficult to find. She is a believer of mentoring programs.

In addition to mentoring she owes her success to many opportunities she had to choose from and funding opportunities. She is a very competitive and driven person whom she believes helps her succeed.

Textural-Structural Narrative

P_7 attributes her success to hard work; in fact she says that her success is "90% effort and 10% luck". She has had a handful of experiences that helped shaped her career. She mentions participating in a "fellowship" program in England for one year. This was her first time out of her country, which was very difficult for her since Argentineans are very attached to their people and country. While in England she missed her family and friends tremendously; "I really missed my family and friends."

Moving to the United States (U.S) in a way was a hindrance to her career. Back in Argentina she used to have her "own laboratory". But moving to the U.S. "was like taking five steps down in my career". She was unable to have her own lab in the U.S. because "I wasn't' known" and also because "competition" was significant. It has taken her "several years to get back" to the position she was in Argentina, and she still states she is "not back" completely. However, she says that there is one thing she is happy with "It's my career… every effort that I put, I got back, and that is important… many stages in my life, the only really pleasure thing that I had was my work."

P_7 has had mentoring experience, "I think that having been on both sides of the street, I mean as a mentor or as a mentee, I think that mentoring is 50 percent. The other 50 percent is you." For example, she has mentored individuals who were not capable or interested and advised them to pursue a different path. P_7 describes "I tried to mentor people that would never do it, and you had to have it to tell them. I mean much that I regret to say this, "You are not making it, no matter how much you try. You never get it. So why don't you – I mean let's try to choose something else for you." There is no luck to it."

Her first mentor was a tough woman that helped her a lot. Sometimes they had different opinions, "we quarrel a lot", but she was always supportive and encouraged her to try different things. P_7 explains, "she never said no, no, no, no. No, no, no, this is like this. Well, just try it."

About her perceptions of mentoring Latinas she describes, "it's easier to mentor a Latina than to mentor a _____, which people from _____ because their understanding was different." This is not only due to similar culture and language but she believes that people from different culture learn differently. It is important to provide mentoring opportunities at every stage of a Latina's career, but especially early in a women's career.

P_7 met her mentors by "luck" and chance. She found out that a friend worked at a laboratory and asked her if there was a position to let her know when there was an opening. Her friend told her "there is a position" available where she worked. The friend warned her about her supervisor-to-be and about the fact she was a difficult person to work for. "She's a tough lady. So it's up to you, and don't tell me then that I didn't warn you." She disregarded her friend's advice, went to the laboratory, introduced herself, and was given the job. This is an example of how individuals have to take chances to advance a career.

One of her mentors had a significant influence in her career. This particular mentor was "an extremely enthusiastic person". She had the passion to inspire and push her to do better. P_7 describes her mentor's passion as "a kind of interior fire". This mentor was a major influence in her career. This mentor told her that if she wanted to be a good scientist she would have to be educated abroad and encourage her to move to the United States. P_7 describes "And you have to go. You have to go… If you want to be a scientist, you have to go and be trained outside." She believes that for an individual to be successful, the individual should be willing to be trained abroad. P_7 recalls, "if you're not prepared to do that [go abroad], you will never reach it." Her mentor provided her with "resources" and advice to move ahead in her career.

The participant thinks that "there should be more" mentoring programs for Latinas, but states that they are scarce and therefore "difficult to find". She is a believer of mentoring programs.

In addition to mentoring she owes her success to many "opportunities" she had to choose from and "funding" opportunities. The participant describes "you may have an extremely good mentor… may not have the good connections." She is a very competitive and driven person whom she believes helps her succeed. "I mean you have to be competitive. You have to have access to the choice."

Horizonalization

The participant's story provides relevant terms that assisted the researcher in finding common themes that aligned with the research questions. Table 7 provides an account of the participant's experiences and expressions. In summary, Table 7 suggests that P_7 is a successful Latina scientist who has achieved a high-level position through unconventional means: "I change things for other reasons." The participant described how she had to take several steps down in her career when she moved to the United States. P_7 described positive mentoring experiences and strongly believes that Latinas

should be mentored by another Latina. The participant thinks that her success is due to 90% effort and 10% luck.

Table 7

Horizonalization: P_7

Horizonalization of Latina Scientist and Engineers Mentoring Experiences (Direct quotes)
Ninety percent effort. Ten percent luck.
I mean all the chances that I had to go with with different experiences from undergraduate to everything.
My first fellowship in England.
The first time I was out of my country and stayed there.
It really opened the way – the way that I was thinking at the time, and I think that it was my most, most fruitful experience, in a sense. It was very hard, but then I learned a lot.
I still am very attached to my people and my country.
I was choosing.
Freedom of choosing.
You choose for what is best for you.
I am a typical bench scientist.
I really put it in the balance, that I enjoy it here.
I really missed my family and my friends.
I mean, on the other hand, there was a problem of language.
I think that all the hindrances are mine.
I change things for other reasons. So I do not consider my self as a straight career.
My coming back – coming to live here – was like taking five steps down in my career.
If I had stayed in Buenos Aires, I would have had my own lab.
I was a known person.
You reach a certain position, and then you have to do these things to get higher and higher, and even if you don't want to do it, well, nobody is asking you if you want. You have, and that's how the game is played.
I had to take steps down. I couldn't have my lab here. I couldn't have my laboratory here because I wasn't known.
Competition here is tough.
So I took several steps down which took me several years to get back, and I'm still not back.
There is one thing that I am happy with. It's my career.
I have a great family, but it has never failed me. Other things have, but this, never. Every effort that I put, I got back, and that is important.
Many stages in my life, the only really pleasure thing that I had was my work.
I think that mentoring is about 50 percent. The other 50 percent is you.
It helped me a lot.

I imagine you're comfortable with people, like my own background than people of other backgrounds.
It's easier to mentor a Latina than mentor a _____, which people from _____ because their understanding was different.
I always wanted my students to succeed.
Luck you have.
Enthusiastic.
Interior fire.
If you want to be a scientist, you have to go and be trained outside. So if you're not prepared to do that, you will never reach it.
She gave me the resources. She told me how to do it.
I think that there should be more.
It is difficult to find.
Opportunities.
May not have the good connections.
The opportunities and how much funding.
I mean you have to be competitive.
You have to have access to the choice.
Location.

Participant # 8 (P_8)

Overview

P_8 was born in the United States from Puerto Rican parents. She obtained her doctorate degree (EdD) in a private university in the United States. She is currently a Clinical Nurse Specialist at a government agency. However, in the next few months she will be promoted to Clinical Nurse Scientist position. The participant is very passionate about mentoring.

Textural Narrative

Career Success

> I think it would have to do with believing in the work that you are doing. You have to have passion and you have to have drive. You've got to want it, and once you've gotten it, then you have to provide opportunity for others to have it too, you know, to pave the way for others.

Helpful Experiences in Career Development

In my current position, it would be -- when I -- when I was working on my dissertation, I did a pilot study -- before I did the full-blown dissertation, and as a result of that, I interviewed women, and I really felt it important to give back to the women, do something for the women, honoring their voices.

And so, at that point -- this is, oh, 10 years ago, I think it was -- I had heard of this organization called the _____, and I started looking to see -- because at that point, I was in _____ -- to see if they had a chapter in Massachusetts, and they did not. So what I did was I created the chapter in _____ as a way honoring the women, and it's been a very successful chapter. It's been doing very well, and through that, I started connecting with the people on the national level. And as a result of that, we developed a really great relationship, great networking, and when they were -- when the association was working with _____ to form a partnership -- and to create a postdoctoral fellowship; my name was the one that was unanimously submitted. I did it to honor the women in the pilot study and as a result it helped me.

So it was really about the networking with the organization and developing relationships, and that really paved the way for me to be at _____. And so, for the postdoc, I went to a permanent position to now to my next position that I'll be in a month or so.

Impediments to Career Success

I think it's typical for many Latinas. It's that you're usually the first one. You bring who you are as a person, but you also bring who you are as in my case as a Puerto Rican. I don't think should be separated. And for most of us, it isn't separated.

So I'll go into an environment and because of my Latina-ness, and I come from a very strong philosophy that you can work very hard but have a lot of fun along the way. And sometimes people will misunderstand that to mean we're partying. We're getting our work done. Do you know what I mean?

Because that's not the way mainstream does it. Being a Latina and as I'm sure most of the women you have interviewed who have been the first to pave this way, you're constantly having to educate others about not only who you are but about the culture.

For example, I do a lot of work with students, and all my students are racially diverse. And sometimes it's bringing people who look different than the people in the environment you're at.

I haven't come from a family who is highly educated. So there are things that I've probably had to learn along the way, just because those were not the experiences I had. I wouldn't have come to whether it's this position or any other position with that knowledge, and so I constantly am trying to take what I have, build upon it, but then make sure I am giving it back to those who are a lot younger in their career, you know, not necessarily age but, you know, new to the research field. Does that make sense?

Meaning of Mentoring

Mentoring is huge, both as a mentee and also a mentor. But I'm very clear that I'm at where I'm at because early on, I had mentors, and I think sometimes we sit back and think that you need one kind of mentor, the mentor has to look like you or has to speak your language, and those things are important, but you really need multiple mentors because different people will meet different needs.

It's very interesting. This past week, I was at the office, and somebody was -- we were talking, and this person happened to be a support staff. I don't know what I said to her, but I said, "mentor," and she looked at me. She said, "You still have a mentor?" I said, "Yes, I do." So the misconception that once you get to, whatever level it is, that people want to get to, that you don't still need a mentor, and that's actually not true at certain level.

But with that same vein, all my students feel, there's two mottos I have, and one of them is to who much is given, much is expected. So that whatever I've gotten, I work very hard to give to other people, and my expectation of every one of them is that everything that they get, they give to somebody else because it's not about holding onto it. It's about giving it, so that others can achieve whatever their goals and their dreams are.

I think it's because I'm Latina and maybe because I'm a woman or maybe a combination, but my style of mentoring I think is a little different than a lot of people or some people.

When I mentor people, it's not a 9:00-to-5:00 thing. It's not a Monday-through-Friday thing, and it's not you're going to have me for a month and that's it, or you're going to have me for a year and that's it. When I make a commitment to these people, it's for however long they want that commitment.

So I've actually started working with two high school students, one of them will be graduating next year from college. It's about meeting people's needs where they're at.

We have to get the work done. Okay? We have to be honest and up front about that, and I'm a researcher. I have to produce, but you can still do that and yet meet other people's needs, whether it's personal or whatever it is.

And I think that's what's so unique about the team that I've built.

I'll give you two prime examples. This past weekend, all of them couldn't be here, but a few of them were here, and we baked cookies. And we do a yearly blueberry picking day.

So every year, they all look forward to a Saturday that we go blueberry picking. This has nothing to do with work -- but it has everything to do with work. It has everything to do with mentoring and everything that has to do with relationship building because it really is about building relationships. And if people only think you care about them because of how you benefit from their hard work, the message you give is that all they are to you is work.

So, I mean, we do a lot of other things. It was just that those two things have become like annual events that everybody looks forward to.

Perceptions of Mentoring Latinas

You know, it's funny because right now I'm in a very unique position because all the people I am mentoring are stellar. They come from all sorts of different backgrounds, but they really are stellar and don't come with deficits, which is not what we typically see. Not to say that I haven't worked with folks that need a little more assistance. As I said earlier, as Latinas, relationship is huge for us. Community building is huge for us. That's how we think. That's how we're viewed.

So, if you don't meet people on that personal level, I think you miss the boat, and I think the other critical piece is that you include the families, get to know the families, form relationship with these families, and once the family believes in you and trusts you and thinks that you actually will help their children.

This past summer, I took some students with me to a national conference in Boston. For one of them, she had never traveled without her family. So this was huge. She's traveled in and out of the country with her family, but she's never gone with somebody outside a family member. I reassured her mom, "Don't worry. I will take care of her. She's going to be right next to me," and the only reason I believe that that could have happened was because they trusted me.

They trust me. So, if I say to them, "I think you need to do this leadership program. I think you need to do this health program. I think you need to do this. I think you need to write this paper," they do it.

Well, I will tell you that my undergraduates now, they started working with me right before I went to _____ for the _____ study I have. They know the protocol inside out. As graduating high school seniors beginning undergraduate or freshman, they have been involved in this whole process. So they know. They

have gone to scientific meetings with me. They have gone to the IRB with me. I have expected that they know the protocol, that they review it, that they give feedback. You name it, they've done it. And of course, you know, they've done posters for me. They've done abstracts. They've done my presentations. They know they can do that, but they couldn't do that before. You know what I mean? And then the exciting thing is to see how empowered they get. Do you know what I mean? It's confidence building. They wrote a paper. They actually developed their own connectors of what they perceive as helping them become successful and become Latina leaders, and that was their work. I mean, it's really impressive.

I think one of the challenges we have actually encountered -- and this is very hard for all of us, but I think particularly the students was that you think that if you reach out to other Latinos or Latinas, that they will be there to help you, and they've had two experiences where that has not been the case. Because naturally, you think one of your own is going to want to help you. And that was not the case. I won't give the details, but one situation, I was actually traveling across the country, and they called because the situation got so bad. And I left a Hispanic person in charge of helping them, and it was a disaster, and I was, needless to say, very irate, but that was -- that was totally unexpected because, you know, Latinos tend to be helpful. You know what I mean? All the things that you believe that being Latino is about, and it didn't play out.

And there was another situation with another person, also Latina, who, you know, was also supposed to be a mentor, but yet the behavior didn't reflect that at all, and that was very hard for them. And I had to really work with them because it really caught them off guard.

Sometimes I think they have such a good experience where they're at in this internship. You know what I mean? I know sometimes it is not the real world for them. But I feel that my responsibility is to give them the best that I possibly can, and then after challenges along the way, then I am there to help them navigate them. Do you know what I mean?

I don't believe that I have to set up challenges in order for them to have a learning experience. It's just not the way -- I just don't do it that way. If a challenge comes, of course, we'll work through it.

During the school year, I'm very sensitive to their school schedule. So I am very flexible and negotiate with them, the schedule, because I don't want this experience to interfere with the schooling. I can tell when they're feeling like, "Oh, no, I need to be at" -- you know, "I'm being overwhelmed," then I, you know, help them with that and just take it -- you know, take it off their plate. And now, though, they're really comfortable saying I know I'm supposed to be there next week, but I can't because of such and such, I'll make it up another day." So they've also learned how to negotiate some of these challenges for themselves.

Meeting Mentors

It's actually interesting. One mentor, in particular, I have had, I have had since I was a child. And she's actually, in essence, become like my second mom, and that's a lifelong relationship. Other mentors -- because I do make a clear distinction between a role model and a mentor, sometimes mentors you find in the oddest ways. Some of the mentors that I've had, I've actually found because I went to a meeting or to a conference, and afterwards, I talked to this person and really connected. And we developed a mentoring relationship that way. Sometimes, you know, it's somebody says, "Oh, I think you need to meet this person because I think you and this person have a lot in common," and I followed up on it. So I think it's identifying a potential relationship -- and then following through on it. Like if somebody says, "I think this might be good for you," taking the initiative to follow up.

Key Qualities of Mentors/Mentoring

I think it's that they believe in me, that they believe in what I'm capable of doing, and that's really important because sometimes, you know -- we're not great at everything. And I know what my weaknesses and my strengths are, but I need people who are able to encourage me when I am struggling with one thing that I'm finding hard to do, but that they can see the bigger picture and know that I can accomplish this.

I think being -- being honest -- and truthful and persistent. I think those things are really important for me in a mentor because I need to know that I can go to that person at any time, and I think those qualities support that.

I tend to see the world is positive. I always try to take any situation and figure out the good in it, and so I need people like that around me. I can't be around people who are constantly looking at the negative or say, "Oh, this is too hard," or people who just don't strive to do their best. Because it's so against how I believe, it couldn't work. I couldn't have a mentor who operated like that.

Influence of Mentors

By providing opportunities, by saying, "You may be interested in this, and I just heard of this, and what do you think?" ultimately having me make the decision or letting me make the decision but gently encouraging me because they could see something that maybe just because I didn't know -- I wouldn't have necessarily explored it. Do you know what I mean?

Seeing opportunities -- and because remember I told you I don't come from an educated family. It's not like those opportunities would have been natural. Or like for my kids now and my nieces and nephews, of course, it is natural because I have done it. So now I can direct them in that way, but because that wasn't my

experience growing up and early on in my career, those mentors would say, "Have you thought about this? Well, this is a great opportunity. Think about this," and so I got exposed to different experiences and opportunities, and then, I had to just make the decision whether or not I was going to go for it or not.

Achievement

Through the organization I was mentioning. It was working with them, and them seeing the work that I could do and they nominated me for the fellowship. So that when I went first into the fellowship, I actually had four mentors, each with different experiences and each with a different world view, if you will, but I could pick on all of them to help me progress in my career.

Thoughts of Mentoring Programs

I think they are excellent, but they have to be done well, and I think the word "mentoring" just gets thrown around so loosely, and people's idea of mentoring varies. You meet somebody once a year, and you just stand up and give them a talk, and I don't think that's mentoring. I think that's the distinction, as I mentioned earlier, between role modeling and effective mentoring.

Mentoring, when it's done well, is a lot of work, and that's why I would never say I'm going to mentor 100 kids. You can't do it. But if all of us take several, then, we can make a huge difference.

So do I think they're successful? Yes, if they're done well. They obviously have to take in some of the things I've already mentioned, cultural background, educational background, family involvement, and also the siblings because there may be siblings involved who, you know, also are watching this, and you don't know how those -- those siblings are mentored indirectly. I think one of the things that I think we do well is that we also have the mentees mentor each other. And I think that that's something that's really important.

Other Factors that Contribute to Success

I think you have to be true to who you are. But the thought that came to my mind was that it's about teaching women, young women, teaching people to be true to themselves, that if you do what you think is the right thing to do and the best thing to do, then at the end of the day, you can look at yourself in the mirror and say I did the best I could do, and -- and sometimes that means -- well, okay.

Very strong family support system. Well, this may be mentoring too. I was thinking relationship with faculty members, but I guess -- with teachers, but I guess that's mentoring. So I guess it would be strong family support and strong community support and *ganas* [desire].

It's not uncommon to have families who don't come from educated backgrounds -- well, formally educated, I should say, backgrounds, but yet they can encourage children to become successful. I grew up with that. You know, I mean, didn't know the mechanics of it, but you knew you had to get an education. So the key was you had to become educated. Not sure how this can happen or not sure what the process is, but it has to happen.

Additional Information Voluntarily Provided by Participant

The work you are doing is so important because our young kids need it so badly. It's so heartbreaking that we've made great strides, but we also are so far behind. And one other thing I was thinking is I was just reading -- it actually came out of -- it was _____, just last week, how Latinas were now number one in terms of pregnancy in the country. So we have got to somehow get to our young kids, so that they see that they have other options, because if they don't see they have no other options, all they are going to do is keep repeating these cycles. And it's so hard, but we have got to get to the kids younger and younger.

You know, I recently was telling somebody this story that, you know, our kids, you know, both parents college educated, and yet he actually spent -- my five-year-old spent a weekend, an overnight at the university with one of my interns. He did an overnight.

And all week, he talked about, "I'm going to college. I'm going to college." He was so happy. He packed his backpack, and he was off to college, and I thought, now, this is a child that all he's known is college-educated parents, and most of our social circles, that's what he's most exposed to. And yet the excitement for him to be able to do this, so imagine what it's like for children who have never even had the thought of college and being able to provide them that experience, Sometimes we take these things for granted that we really shouldn't because so many children do not have the same opportunity. So I think that a lot of work that needs to be done to reach out to Latino kids and, in particular girls, before we start losing them, and as I've said, we've made great strides.

Structural Narrative

The participant owes her successful career to the fact that she believes in the work she does, she has a passion and a drive, and a desire to succeed. She has had several experiences that have shaped her career. She did a pilot study while working for her dissertation. As part of the study she interviewed women and realized that she wanted to give back women and society. Through this pilot study she heard about an association, which did not have a chapter in her state. She decided to create a chapter and through this activity she started making national contacts, developing great relationships, and networking. It was through this activity that her name was chosen for a postdoctoral fellowship.

As a hindrance she mentions that being the first one at everything she has done and it has been difficult. She was the first one to go to college in her family. She thinks that being the first one, she has to lead by example and be a trailblazer for others whether in her family, her country, or her career. Being a Latina is also a hindrance to her. She constantly has to educate people about her culture and about what being a Latina is all about. She says that Latinas are considered party people and not necessarily hard workers. This is the perception she is trying to change.

P_8 is a strong believer of mentoring programs, since it has helped her career. She believes she is where she is because of the mentor she had early on. In her case, she needed multiple mentors to meet multiple needs. She believes mentoring is a commitment and that it can built relationships that can last a life time.

Mentoring Latinas, she believes, starts with community building. It is important to include the family and to form a relationship not only with the mentee but also his of her family. She gave an example of a bad mentoring experience where she left a Latina peer in charge of supervising a group of students while she was on travel. The person did not live up to the expectation and she received numerous complaints upon her return.

About her own mentors, P_8 has had mentors from the time she was a child. She considers this early mentor as a second mom. She found some of her mentors through networking: just by talking to the potential mentor and connecting. It is important to be able to identify people you can develop relationships with that have similar interests and eventually can become a mentor. Her mentors always believed in her and in what she was capable of doing. Being honest, truthful and persistent are qualities that she attributes to her success.

In her career, she has been given many opportunities and was exposed to a plethora of experiences. All these experiences have influenced her career at every level. Some of her success she attributes to her professional association, which she has been involved both at the local and national level.

She supports mentoring programs, but stresses they have to be properly done, that mentoring programs are not as simple as they appear to be. P_8 believes that the word mentoring is used loosely. But, when mentoring programs are well-done, they can be successful. In addition to mentoring, P_8 stresses that to be successful you have to be true to who you are and must have a strong family and support system. Finally, she stresses that mentoring can be a great tool to help children do better in life; that great progress has been made, but there is a lot of work to be done.

Textural-Structural Narrative

The participant describes her successful career to "believing in the work that you are doing. You have to have passion and you have to have drive." She has had

several experiences that have shaped her career. She did a "pilot study" while working for her dissertation. As part of the study she interviewed women and realized that she wanted to give back women and society. Through this "pilot study" she heard about an association, which did not have a chapter in her state. She decided to create a chapter and through this activity she started "connecting with the people on the national level", developing great relationships, and networking. "So it was really about the networking with the organization and developing relationships." It was through this activity that her name was chosen for a postdoctoral fellowship. P_8 describes her experience as follows, "I did it to honor the women in the pilot study and as a result it helped me."

As a hindrance she describes that being "the first one" at everything she has done has been difficult. She was the first one to go to college in her family. She perceives that being "the first one", she has to lead by example and be a trailblazer for others whether in her family, her country, or her career. Being a Latina is also a hindrance to her. She constantly has to "educate others about not only who you are but about the culture". She says that Latinas are considered party people and not necessarily hard workers, "And sometimes people will misunderstand that to mean we're partying. We're just joking, but we're getting our work done. Because that's not the way mainstream does it." This is the perception she is trying to change.

P_8 describes mentoring as "huge". She is clear that "I'm at where I'm at because early on, I had mentors, and I think sometimes we sit back and think that you need one kind of mentor, the mentor has to look like you or has to speak your language, and those things are important, but you really need multiple mentors because different people will meet different needs." She believes mentoring is a commitment and that it can build relationships that can last a life time. P_8 is a strong believer of mentoring programs, since it has helped her career.

Mentoring Latinas, she believes, starts with "community building" and "confidence building". It is important to include the "family" and to form a relationship not only with the mentee but also his of her family. P_8 describes it as "get to know the families, from relationship with these families, and once the family believes in you and trusts you and thinks that you actually will help their children… you're it." P_8 describes the experience of one of her students. This student had traveled in and out of the country with her family, "but she's never gone with somebody outside a family member. I reassured her mom, "Don't worry. I will take care of her. She's going to be right next to me."" She believes that could only have happened because "they trusted me".

The participant described a bad mentoring experience, a challenge, where she left a Latina peer in charge of supervising a group of students while she was on travel. The person did not live up to the expectation and she received numerous complains upon her return. "I was, needless to say, very irate, but that was -- that was totally unexpected because, you know, Latinos tend to be helpful."

About her own mentors, P_8 describes one mentor in particular, "One mentor, in particular, I have had, I have since I was a child." She considers this early mentor as a "second mom". The participant further describes she has found other mentors "in the oddest ways. I've actually found because I went to a meeting or to a conference, and afterwards, I talked to this person and really connected." Her mentors always "believed" in her and in what she was "capable" of doing. Being "honest, truthful and persistent" are qualities that she attribute to her success. The participant describes these qualities, "I think those things are really important for me in a mentor because I need to know that I can go to that person at any time, and I think those qualities support that."

In her career, she has been given many "opportunities" and was exposed to a plethora of experiences. P_8 describes the experience as "I got exposed to different experiences and opportunities, and then, I had to just make the decision whether or not I was going to go for it or not."All these experiences have influence her career at every level. Some of her success she attributes to her professional "organization", which she has been involved both at the local and national level.

She supports mentoring programs, but stresses, "they have to be done well". P_8 believes that the word mentoring is used loosely, "I think the word "mentoring" just gets thrown around so loosely, and people's ideas of mentoring varies." But, when mentoring programs are well done, they can be successful. In addition to mentoring, P_8 stresses that to be successful you have to be "true to who you are" and must have a "strong family" and "strong community support". Finally, she stresses that mentoring can be a great tool to help kids do better in life. "We've made great strides. But we've got a long way to go."

Horizonalization

The participant's story provides relevant terms that assisted the researcher in finding common themes that aligned with the research questions. Table 8 provides an account of the participant's experiences and expressions. In summary, Table 8 suggests that P_8 is a successful Latina scientist who, through networking, has been able to achieve a successful career and a high-level position within the organization she works for. P_8 described positive mentoring experience and believes strongly in mentoring.

Table 8

Horizonalization: P_8

Horizonalization of Latina Scientist and Engineers Mentoring Experiences (Direct quotes)
Believing in the work that you are doing.
You have to have passion and you have to have drive.
You've got to want it, and once you've gotten it, then you have to provide opportunity for others to have it too, you know, to pave the way for others.
I did it to honor the women in the pilot study and as a result it helped me.
I started connecting with the people on the national level.
Networking with the organization and developing relationships.
It's that you're usually the first one.
Because that's not the way mainstream does it.
You're constantly having to educate others about not only who you are but about the culture.
I haven't come from a family who is highly educated. So there are thing that I've probably had to learn along the way just because those were not the experiences I had.
I constantly am trying to take what I have, build upon it, but then make sure I am giving it back to those who are a lot younger in their career.
Mentoring is huge.
I'm at where I'm at because early on, I had mentors.
You really need multiple mentors because different people will meet different needs.
To who much is given, much is expected.
It's about giving it, so that others can achieve whatever their goals and their dreams are.
When I mentor people, it's not a 9:00-to-5:00 thing.
When I make a commitment to these people, it's for however long they want that commitment.
It's about mentoring people's need where they're at.
It has everything to do with mentoring and everything to do with relationship building.
Community building.
If you don't meet people on that personal level, I think you miss the boat.
You include the families, get to know the families, form relationship with these families.
They trust me.
See how empowered they get.
Confidence building.
You think that if you reach out to other Latinos or Latinas, that they will be there to help you… that has not been the case.
Latinos tend to be helpful.
I am very flexible.
I do make a clear distinction between a role model and a mentor.
Sometimes mentors you find in the oddest ways.

I went to a meeting to a conference, and afterwards, I talked to this person and really connected.
It's identifying a potential relationship.
They believe in me.
They believe in what I'm capable of doing.
I know what my weaknesses and my strengths are, but I need people who are able to encourage me when I am struggling with one thing that I'm finding hard to do, but that they can see the bigger picture and know that I can accomplish this.
Being honest, and truthful and persistent.
I can't be around people who are constantly looking at the negative… or people who just don't strive to do their best.
Providing opportunities.
I got exposed to different experiences and opportunities.
People's idea of mentoring varies.
Mentoring, when it's done well, is a lot of work.
So do I think they're [mentoring programs] successful? Yes, if they're done well.
You have to be true to who you are.
Very strong family support system.
Strong family support and strong community support and *ganas* [desire].
So I think that a lot of work that needs to be done to reach out to Latino kids and, in particular girls, before we start losing them, and as I've said, we've made great strides, but we've got a long, long way to go.

Summary of Interviews

This concludes the textural, structural, and textural-structural narratives as well as the horizonalization of the eight participants. The tables in the next section summarize and identify the participants' *lived experiences* and perception within the context of the emerging themes. Tables 9, 10, and 11 represent the most common responses from the collected raw data. The data presented in these tables was derived from the process of horizonalization and reduction. The interviews were coded and cross-referenced with the four research questions. The participants' *lived experiences* and perceptions follow.

This study answered the following research questions:

1. What are the challenges that successful Latinas experience in advancing their careers?

2. What do Latinas perceive as facilitating their career advancement?
3. How did mentoring experiences of Latina scientists or engineers influence their career success or advancement?
4. How do Latinas perceive the effectiveness of mentoring as a viable mechanism in achieving a successful career in science and engineering?

Table 9 provides a summary of the participants' responses aligned with the four research questions. It also provides an overview of the participants' responses regarding the challenges they experienced in advancing their career, the participants' perceptions about facilitating their career advancement, the influence of mentoring experiences in their career success and advancement, and their perception about the effectiveness of mentoring as a viable mechanism in achieving a successful career in science and engineering. This table also indicates affirmative responses (✓), some experience with the phenomenon (~), and no experience with the phenomenon (☒) of mentoring Latina scientists and engineers.

Table 9.1

Raw Data Cross-Referenced by Research Question

Common Terms: Question #1: What are the challenges that successful Latinas experience in advancing their careers?	**P_1**	**P_2**	**P_3**	**P_4**	**P_5**	**P_6**	**P_7**	**P_8**
Trailblazer	✓	✓	✓	✓	✓	✓	✓	✓
Stereotypes (i.e., race and ethnicity)	✓	✓	✓	☒	✓	✓	~	✓
Personal decisions (i.e., choice)	✓	✓	✓	✓	~	~	✓	✓
Competition	~	✓	✓	✓	~	☒	✓	☒
Man-dominated environment	☒	~	✓	☒	✓	✓	☒	☒
Bureaucracy	~	✓	☒	~	✓	☒	~	☒
Lack of experience	~	☒	✓	☒	☒	☒	☒	☒
Unsupportive environment (i.e., boss)	✓	☒	☒	☒	☒	☒	☒	☒

Table 9.1 shows the common terms that emerged from the interview, cross-referenced with the research question. Three major themes emerged from the raw data: (a) trailblazer; (b) stereotypes; and (c) personal decisions. All the participants (100%) revealed to be a trailblazer in some aspects of their careers. Some were trailblazers within their families, that is, they were the first person to obtain a higher education degree. Others were the first Latinas to obtain a high-level position within their field of expertise. This is a significant finding because as a trailblazer, a pioneer in their field of expertise, all of these participants developed without a role model. P_3 revealed that what she hears from women in general is that they do not have enough successful role models or people they perceive to be like them who have made it to top positions within the company. This can be a barrier to the aspirations of women and their belief that they can get to the top and be successful. Being a trailblazer requires a certain degree of self-motivation and the desire to excel and surpass any obstacles.

The stereotype theme is also a significant challenge that successful Latinas experience in advancing their careers. Six of the eight participants revealed that their ethnic background was representing a challenge. There are some stereotypes associated with Latin culture. These stereotypes were revealed to be significant when applying for positions. Some of the stereotypes mentioned were the perception that Latino(a)s are "party people" and perhaps are not as committed to their work as are others. The participants revealed the need to prove themselves to their superiors. There are also stereotypes associated with age. The youngest participant revealed that young professionals are not as respected as their older counterparts, so moving up the career ladder is more difficult.

Within the personal decisions theme, some salient findings emerged. The participants revealed the challenge of family versus career. Latinas are expected to run the household. This expectation, whether valid or not, represents a challenge to their careers. Six of the eight participants revealed that personal decisions at some time or other affected their careers. For example, P_4 has chosen to remain in her current position rather than pursue a management position within her agency. She considers acquiring a management position to require more time away from her family. The participant thinks her current position already consumes a lot of quality time from her family. This is not a sacrifice she is willing to make right now.

Data also revealed that having a supportive environment is critical to success. Seven of the eight participants experienced a positive environment in the workplace, whether in the form of a mentor or supportive management. It is worth noting that, for these particular participants, "lack of experience" and having an "unsupportive environment" in the workplace was not a challenge. This is not to say that they would not be challenges for others. The one participant who revealed a negative experience was unwilling to share her story. It is important to acknowledge that despite being the first ones and the need to balance their personal lives with their careers; all participants were able to surpass these challenges and advanced their careers.

Table 9.2

Common Terms: Question #2: What do Latinas perceive as facilitating their career advancement?	**P_1**	**P_2**	**P_3**	**P_4**	**P_5**	**P_6**	**P_7**	**P_8**
Passion	✓	✓	✓	✓	~	✓	✓	✓
Persistence and Confidence	✓	✓	✓	✓	✓	~	~	✓
Goal-oriented	✓	✓	✓	~	✓	~	✓	✓
Believing	✓	✓	✓	~	~	✓	✓	✓
Networking	✓	✓	✓	~	~	✓	✓	✓
Support system (i.e. family, spouse)	✓	✓	~	~	✓	✓	✓	✓
Opportunities	~	✓	✓	~	✓	~	✓	✓
Ambitious	✓	~	✓	~	~	~	✓	✓
Respected	~	~	~	✓	✓	✓	~	✓
Responsibility	~	~	~	✓	~	✓	~	~
High-performer	~	~	✓	✓	✓	~	☒	✓
Training	✓	~	☒	✓	✓	☒	✓	~
Luck	☒	✓	☒	☒	☒	✓	✓	☒
Internship and Fellowship	✓	☒	☒	✓	☒	☒	✓	☒

Table 9.2 shows the common terms that emerged from the interview and cross-referenced with research question #2. Six major themes emerge from the raw data: (a) passion; (b) persistence and confidence; (c) goal-oriented; (d) believing; (e) networking; and (f) support system. Seven of the eight participants revealed having passion for what they do. Two of the participants believed that they knew from the beginning what they wanted to achieve as a scientist. The participants also believed that persistence and confidence helped them in facilitating their career advancement. Another important theme that emerged was being goal-oriented. The data revealed that the participants were goal-oriented and knew what they wanted to accomplish in their academic and professional journey. It is imperative for these participants to have a goal and work toward achieving that goal with the support and encouragement of their families and mentors.

These first four common themes can be grouped into a single common theme: Hard work is essential to success. There is no substitute for hard work. Working hard combined with a passion and a desire to succeed leads to successful careers.

Networking is also critical in facilitating Latinas' career and success. Networking creates opportunities for Latinas to meet individual within their respective fields who can, for example, assist them in pursuing future opportunities. It is important for the participants to interact both with people inside and people outside their field of expertise. Networking also provides access to new opportunities and future mentors. Some of the participants expressed that, through networking, they found individuals who later became their mentors in their careers.

The data revealed that having a support system, for example family support, is also critical to success. Six of the eight participants experienced having support from their family and/or husband. One of the participants revealed that her father passed away when she was 14 years old and it was her mother who encouraged her to pursue a higher education degree. Her mother even discouraged her from marriage until she completed her doctorate degree. Other participants revealed that their husbands were very supportive of them and their careers.

The two latter themes shed some light on an important consideration: Even if you work hard and are passionate about your career, help from others is essential, whether in the form of peer support (networking) or a support system.

Table 9.3

Common Terms: Question #3: How did mentoring experiences of Latina scientists and engineers influence their career success or advancement?	**P_1**	**P_2**	**P_3**	**P_4**	**P_5**	**P_6**	**P_7**	**P_8**
Encouragement	✓	✓	✓	✓	✓	✓	✓	✓
Important (i.e. crucial)	✓	✓	✓	✓	✓	✓	✓	✓
Mentoring	✓	✓	✓	✓	✓	✓	✓	✓
Outspoken	✓	✓	✓	~	✓	✓	~	✓
Support	✓	✓	✓	~	✓	✓	~	✓
Opportunities	✓	~	✓	✓	✓	✓	~	✓
Goal-oriented	✓	✓	✓	✓	✓	~	~	✓
Networking	✓	✓	✓	~	~	✓	~	✓
Role model	✓	~	✓	✓	✓	~	~	~
Commitment	~	✓	✓	✓	~	~	~	✓
Time investment and Availability	~	✓	✓	✓	~	~	~	✓
Assertive	✓	~	~	~	✓	~	~	✓
Ambitious	✓	~	~	~	~	~	✓	~
Internal drive	~	☒	✓	✓	~	~	✓	✓
Developing rapport	~	☒	✓	~	~	✓	~	✓

Table 9.3 shows the common terms that emerged from the interview and cross-referenced with the research question. Eight major themes emerge from the raw data: (a) encouragement; (b) important (i.e., crucial); (c) mentoring; (d) outspoken; (e) support; (f) opportunities; (g) goal-oriented; and (h) networking.

All the participants revealed that their mentoring experiences encouraged them to pursue their careers. For example, P_3 related that her mentor's encouragement was key to her company's decision to allow her to manage a large project at an early age in her career. All the participants also revealed that their formal mentoring experience directly contributed to their success and advancement as scientists and/or engineers. Their mentors provided them with both the encouragement and the support they needed to be

successful, and with opportunities that opened doors for career advancement. For example, P_3 revealed that at an early stage in her career, she managed a large, controversial project. Her mentor supported and encouraged her throughout the difficult times and she was able to complete the project successfully. This experience resulted in future opportunities and helped her advance her career more quickly.

The data revealed that all the participants had some type of mentoring (formal or peer mentoring) experiences throughout their careers. Seven of the participants had formal mentoring relationships. P_5 was the only participant without a formal mentoring experience. These mentoring relationships were not forced. In other words, both the participant and the mentor agreed to the mentoring relationship and expressed a sincere desire to help each other. These participants revealed that mentoring should not be forced, but rather a mutual and voluntary relationship between mentor and protégé. During the informal mentoring experiences, the participants developed rapport with the potential mentor and later realized that a mentoring relationship was developing.

Some of the participants further revealed that having multiple mentors is beneficial. A single mentor cannot do everything at the same time. Multiple mentors provide different perspectives and points of view; they target different needs.

Interestingly, only one of the participants has participated in E-mentoring. This may be because most participants pursed their college degrees before computers became essential. E-mentoring is a fairly new phenomenon.

Table 9.4

Common Terms: Question #4: How do Latinas perceive the effectiveness of mentoring as a viable mechanism in achieving a successful career in science and engineering?	**P_1**	**P_2**	**P_3**	**P_4**	**P_5**	**P_6**	**P_7**	**P_8**
Instrumental (critical)	✓	✓	✓	✓	✓	✓	✓	✓
Networking	✓	✓	✓	✓	✓	✓	✓	✓
Support system	✓	✓	✓	✓	✓	✓	✓	✓
Opportunities	✓	✓	✓	✓	✓	✓	✓	✓
Empowering	✓	✓	✓	~	✓	✓	~	✓

Table 9.4 shows the common terms that emerged from the interview and cross-referenced with the subject research question. Four major themes emerge from the raw data: (a) instrumental (critical); (b) networking; (c) support system; and (d) opportunities. All the participants revealed that mentoring has been a viable mechanism in achieving a successful career in science and engineering. $P_{2,}$ $P_{3,}$ and P_8 went further by indicating that individuals need multiple mentors so that they can meet different needs. Networking—having a support system and opportunities, as previously displayed in Tables 9.2 and 9.3—is also an important and viable mechanism in achieving a successful career. Although empowering did not emerge as a major theme, some participants felt that it was an important contributor to their careers. The empowerment came from their mentors, parents, husbands, and support systems. The most important conclusion derived from this table was that mentoring had been a critical factor in their success.

After analyzing the emerging themes, it was important to summarize them in order to further aggregate them. This aggregate data is presented in Table 10. The major themes have been discussed in Tables 9.1 through 9.4.

It is important to note that aggregated data are *lived experiences* associated with the phenomenon of mentoring Latina scientists and engineers as reported by all eight participants.

Table 10

Aggregated Data on Mentoring Latina Scientists and Engineers

Common Terms, Categories, and Patterns	**P_1**	**P_2**	**P_3**	**P_4**	**P_5**	**P_6**	**P_7**	**P_8**
Having goals	✓	✓	✓	✓	✓	✓	✓	✓
Relationship of trust	✓	✓	✓	✓	✓	✓	✓	✓
Mentoring important (critical)	✓	✓	✓	✓	✓	✓	✓	✓
Vehicle for Networking	✓	✓	✓	✓	✓	✓	✓	✓
Support system: parents, husband, community	✓	✓	✓	✓	✓	✓	✓	✓
Stereotypes (i.e. race and ethnicity)	✓	✓	✓	☒	✓	✓	~	✓
Deliberate choice	✓	✓	✓	✓	✓	✓	✓	✓
Opportunities	✓	✓	✓	✓	✓	✓	✓	✓
Developing relationships	✓	✓	✓	✓	✓	✓	✓	✓
Being vocal and assertive	✓	~	✓	✓	✓	✓	✓	✓
Knowing and Loving it	✓	~	✓	✓	~	✓	✓	✓
Persistence	✓	✓	✓	~	✓	✓	~	✓
Role model (type of mentor)	✓	~	✓	✓	✓	✓	✓	~
Internal force	✓	✓	✓	~	~	✓	✓	✓
Advice/Coaching	✓	~	✓	✓	✓	~	~	✓
Honesty	✓	~	✓	✓	~	~	~	✓
Being the first one: Trailblazer	~	✓	✓	~	~	✓	~	✓
Time and dedication	~	~	✓	~	✓	~	~	✓

Based on the patterns identified in Table 10, it is now possible to combine the major themes and present an aggregate table of the eight main themes resulting from this study. These eight major themes are presented in Table 11. The major themes (most relevant) revealed the importance of mentoring Latinas in science and engineering. These eight major themes are a compilation of over 45 of the categories and patterns that emerged from the study, cross-referenced with the research questions. All eight

participants in the study responded positively to the eight major themes: (a) Trailblazer; (b) Passion and Belief; (c) Support and Encouragement; (d) Networking; (e) Luck and Opportunities; (f) Goal-Oriented; (g) Mentoring Type; and (h) Criticality of Mentoring. The table indicates that all eight participants responded in the affirmative (✓), that is, all were positively affected by the themes. These eight themes will be discussed in detail in Chapter 5.

Table 11

Aggregated Table of Eight Main Themes

Themes	**P_1**	**P_2**	**P_3**	**P_4**	**P_5**	**P_6**	**P_7**	**P_8**
Trailblazer	✓	✓	✓	✓	✓	✓	✓	✓
Passion and Belief	✓	✓	✓	✓	✓	✓	✓	✓
Support and Encouragement	✓	✓	✓	✓	✓	✓	✓	✓
Networking	✓	✓	✓	✓	✓	✓	✓	✓
Luck and Opportunities	✓	✓	✓	✓	✓	✓	✓	✓
Goal-Oriented	✓	✓	✓	✓	✓	✓	✓	✓
Mentoring Type (Grooming, Networking or E-mentoring)	✓	✓	✓	✓	✓	✓	✓	✓
Criticality of Mentoring	✓	✓	✓	✓	✓	✓	✓	✓

This chapter provided an overview of the purpose of the study, research questions, data collection process and analysis, and the participants' demographic data. The study findings were identified, analyzed, and discussed according to the phenomenological process of data analysis. Textural, structural, and textural-structural narratives were presented for each participant, as well as horizonalization of the raw data that was cross-referenced with the four research questions and presented as tables. The analysis of these tables resulted in eight major themes. The last section of Chapter 4 provides a thematic analysis of the eight major themes. Chapter 5 provides a discussion of these findings, recommendations, and final conclusions.

Thematic Analysis

Eight themes emerged from the analysis of the data. The major common themes that emerged from the analyzed data were (a) Trailblazer; (b) Passion and Belief; (c) Support and Encouragement; (d) Networking, (e) Goal-Oriented; (f) Mentoring Type; (g) Criticality of Mentoring; and (h) Luck and Opportunities. These themes represent key characteristics and traits that helped Latina scientists and engineers achieve high-level positions within their organizations and the impediments they encountered along their professional journey. Although the eight themes overlap somewhat (i.e., being goal-oriented is related to passion and belief), they are sufficiently strong to be treated and studied independently. For example, mentors provide support and encouragement, and access to opportunities and networking. Nevertheless, mentoring, depending on its type, also provides technical knowledge and intangibles that lead to self-confidence and therefore the ability to succeed.

The thematic analysis derived from cross-referencing the themes with the research questions demonstrates the alignment between the mentoring phenomenon of Latinas in science and engineering and the purpose of the study. The research questions were cross-referenced with the interview questions prior to cross-referencing the themes with the research questions. This analysis demonstrated a clear alignment between the research questions and the interview questions. Further discussion of the eight themes, along with a review of the literature can be found in Chapter 5.

Overview of Major Common Themes

Trailblazer

This theme represented being a pioneer, or marking paths, in science or engineering, male-dominated fields, as a woman and a Latina. All participants expressed that they were "trailblazers," meaning they paved the way for other Latinas, but from different perspectives. Two types of trailblazers were distinguished from the data: (a) female trailblazer; and (b) Latina trailblazer. It is difficult to assess which type represented a larger impediment. The participants were trailblazers for others, both Latinas and non-Latina females. The participants revealed that being Latino and female represented a more difficult challenge to overcome than being a female. Men are more accustomed to females in the workplace than they are to Latinas. Being a Latina represented a larger barrier to success, perhaps due to cultural differences, language barriers, and stereotyping. The participants revealed this reality in their interviews. For example, P_3 expressed that, as one of the senior most females in her company, she opened doors for other women in engineering as well as in management. She felt that she had to excel and be an example to other women and minorities who wanted to achieve management positions within her company: "He [her boss] told me it was very important for him to make sure that I would be successful because everybody else was looking up to me, and I was the only visible role model that was Hispanic."

P_8 indicated the following with regard to being a Latina trailblazer:

> I think it's typical for many Latinas [being the first one]. It's that you're usually the first one. You bring who you are as a person, but also bring who you are as in my case a_____, I don't think should be separated. And for most of us, it isn't separated. Being a Latina, you are constantly having to educate others about not only who you are but about the culture.

P_5 expressed that being a female trailblazer was a challenge because first she had to prove that she was capable of doing the work and succeeding. P_5 stated:

> I work in a very man-dominated environment. I would say all of my teammates are men. I am the only woman [Latina] on the team, and that has been a big factor because I feel like sometimes they treat me different just because I'm a woman [Latina] … Sometimes when I say something, they don't take me seriously. I feel that I have to struggle more. And it's more difficult for me because I have to demonstrate what I'm saying is true or it works.

P_6 was the first female and Latina to obtain a doctorate degree from a private university in the Northeast, in the late 1960s. She said, "Being the only woman [Latina] is something scary. It was not just when I was a student … I remember making presentations and having discussions among senior executive service people. It was a sea of men.…" P_2 described educating others as "understanding where we come from and our culture and how our culture is imprinted in our personality." This ongoing education is part of the trailblazer process.

The textural data obtained from these participants demonstrated how being a trailblazer as a Latina in a male-dominated (and non-Latino) field was a challenge that they were able to overcome. However, P_1's story differed from that of all the other participants. P_1 stated that it was difficult for her to determine if there were differences between being a Latina and being a non-Latina.

> If you ask me as a woman, a Latin woman versus other tenure track person, what is the difference, it's just the numbers. We are recruiting women that go into science. What difference does it mean being a Latino? I suppose we could argue that there are differences in personalities, culturally. That's a tough question because there's really not enough numbers for me to say … if you tell me if I was a woman … African-American woman, or a Latin woman, or an Asian woman, how different would it be… I don't know … It's the few women Latino that I know that are in successful places, the one thing I can tell you is that they are very assertive … Being a woman and Latino, what difference does it make? – nothing.

P_1 believed that the differences between being a female and a Latino are in the numbers, meaning that Latinos represent a smaller proportion of the total work force. The last sentence of this quote is particularly revealing since P_1 strongly believed that the fact that you belong to a special group, in this case Latina, does not represent either an advantage or a disadvantage. She felt that hard work and commitment are the traits that are important; that the ethnic and cultural group to which the individual belongs is irrelevant. She also related that women are being recruited into science and engineering careers, but the challenge is how to retain them. She felt that recruiting was not the problem; instead it was for them to continue their careers in science and engineering. In a way, this revelation highlights the importance of mentoring programs because they (the programs) help the mentees to address personal and professional issues that may lead them into other career paths. For P_1, being a Latina did not represent an impediment. She considered herself equal to her peers. In other words, P_1 considered that being a Latina was merely a cultural difference, not a difference that would have any bearing on the professional setting.

The experiences of these participants revealed the challenge they faced when paving the way for other Latinas. These women not only had the challenge of being trailblazers, but they had to educate those around them about their culture. The findings suggest that the very few Latinas who achieved high-level positions in science and engineering within their organizations were sometimes the only visible role model within the organization. This was the case of P_3: “I am still the most senior Hispanic in the firm. So I am the one that’s kind of pushing the envelope.” Being a trailblazer is one of the

challenges that Latinas in science and engineering face as they gain higher positions within their organizations.

Passion and Belief

The study's findings suggest that *passion* and *belief* in what you are doing were factored into what the Latina participants perceived as facilitating their career advancement. All eight participants expressed that having a passion and believing in themselves was an important factor that leads to success in their careers. For example, P_1 stated it came down to "knowing what you want from the very beginning and really loving it." She also revealed that she knew from the start what she wanted to achieve as a scientist. She passionately expressed that she loves her work and truly believes in the work she does. P_2 expressed, "I think it's basically the enthusiasm … the convictions, believing in myself, and pursuing ideas." She stated that the aforementioned characteristics allowed her to achieve a successful career as a scientist. Along the same lines, P_6 described how rewarding it is to work on something you like. She described how she felt:

> I feel working on something that you like, if you like, if you have any attraction for science and engineering, you should do your best to follow that because it is so rewarding to work in something, which is interesting, when you are doing it.

P_8 revealed:

> I think it would have to do with believing in the work that you are doing. You have to have passion and you have to have drive. You've got to want it, and once you've gotten it, then you have to provide opportunity for others to have it too, to pave the way for others.

The participants enthusiastically described their passion for the work they performed. All the participants had a desire to succeed professionally. This desire pushed them to surpass any impediments that may have come their way and to be able to pull

through against all odds. Their strong passion and belief is what they all attributed to their success. It was clear from their stories that all the participants had to have a deep passion for their work and the ability to succeed in a rigorous field like science and engineering.

Support and Encouragement

Support and *encouragement* provided self-esteem to the participants and allowed these individuals to aspire to greater roles and responsibilities in their careers. All eight participants revealed that having a support system, which provided them with encouragement, was critical to their success. This support could come from two sources: family support (parental and spousal) and/or mentoring support. Both appeared equally important. For example, all participants indicated that they had a strong support system within their family environment. Such support was evident where a parent provided the necessary support to foster their child's professional development. Without a doubt, having this support and encouragement was a crucial factor in their success, whether the support was at home, from a spouse, or from the work environment. P_1 provided an example of family and spouse support: "I think it takes lots of the support—the family support and the spouse support for sure to be able to succeed in a career, whatever it may be."

P_6 stated her mother's and husband's support helped her achieve a successful career while one of her mentors encouraged her to take positions of responsibility:

> I had a lot of encouragement from my parents. Even my mother told me I should not get married until I got doctorate, which is quite unusual. My father died when I was 14, but my mother kept – she was encouraging, and my mother kept supporting me until I finished.… My first husband was really supportive also and also helped.

P_8 believed "Strong family support and strong community support.… It's not uncommon to have families who don't come from educated backgrounds—well, formally educated, I should say, but yet they can encourage children to become successful." She believed that (formally) noneducated parents are capable of encouraging their children to achieve an education and become successful professionals.

Other participants highlighted the support and encouragement they received from their mentors. P_1 stated, "My mentor was extremely supportive of me in saying, Well, these are some projects that you basically developed on your own, why don't you just continue pursuing them." The support P_1 obtained from her mentor was crucial because she was able to move quickly within the scientific field. She indicated that:

> I do believe that having good mentors or mentoring is essential for you to be able to succeed.… Having the support, in whatever the setting you are, be it a lab chief, a chairman, or a group leader, whatever the setting it is.… it's essential – having somebody that is supportive at all level.

P_3 revealed, "They [mentors] were there to support me, to make sure that I would be successful as well." P_4 believed that:

> For a young person to have somebody to look up to or to talk to or to guide them or to just encouraging, encouraging is very useful. It might be this part that made that person decide to do something different.

P_5 described how her mentors had supported all her decisions and have supported her in pursuing her graduate degree:

> I would say by providing me support, supporting all the decisions that I have made. I would say mostly in the professional aspect. For example, like right now, I feel very grateful that they are supporting me and continuing my graduate degree, and they have always supported me in the things that I wanted to change within the organization. Like if I want to implement a new process or implement a new technology, they always provide support.

P_6 stated, "_____ [her mentor] was probably the biggest draw in encouraging me to be—to take positions of responsibility, which I was kind of scared."

All eight participants' stories and experiences aligned with the major theme of support and encouragement, which were key to their success, both from their families and from their mentors. Without this support and encouragement, their path to a successful career in science and engineering would have been a much more difficult endeavor. All participants were very outspoken about their ability to attain support and encouragement, which was a factor in their personal successes.

Networking

Networking refers to having a system of sharing information and services among peers having a common interest, where opportunities are created through networks of like-minded professionals. All eight participants strongly believed that informal networking facilitated their career advancement by accelerating their path to success. This was evident in the following textural data.

P_2 highlighted the importance of networking by "knowing people, shaking the right hands, listening, observing what they have to say, and learning what their interests are. You cannot do science and be isolated.… [Networking is] probably more important than mentoring." Upon arriving in the United States, through networking, P_2 learned not only the language and a new culture but also the working style of her peers. She learned how to operate in a new environment through networking. For her, it was critical to learn from other people and learn how to interact with them in a more successful and efficient way. Networking also gave her self-confidence by allowing her to interact with her peers.

P_8 described how networking helped her land her current job when she said:

> So what I did was I created the chapter in _____ as a way of … honoring the women, and it has been a very successful chapter. It's been doing very well, and through that, I started connecting with the people on the national level. And as a result of that, we developed a really great relationship, great networking, and when they were – when the association was working with – to form a partnership and to create a postdoctoral fellowship, my name was the on that was unanimously submitted. So it was really about the networking with the organization and developing relationships, and that really paved the way for me to be at.

Although all the participants benefited from this informal networking, one of the participants described how she experienced a more formal networking activity. P_3 revealed that in her company there was a networking program for women where female professionals got together to share experience and ideas. The program, which had been in place for 5 years, was designed to accelerate the path of females, including Latinas, to higher management positions. This more formal program, according to $P_{3,}$ was key to her success. The fact that there are a limited number of successful female role models is often discussed as "a barrier to the aspirations of women and their belief that they can get to the top and be successful." In addition to this more formal networking program, P_3 further revealed that in her company there is also an informal networking program, which "provides the networking opportunity to let people find the right people for them or the right group of people for them."

Formal networking programs have the advantage of continuity and depth. Participants usually work within the same group of professionals and hence develop relationships that are deeper and longer lasting. These programs offer individuals the opportunity to interact and build informal relationships with experienced professionals and peers. Informal programs are more casual and require more of an assertive

personality to make them successful. Informal networks seek to achieve a reciprocal exchange of information and to share advice freely, with no rules (Wierzgac, 2005). These programs can help individuals motivate each other, assist them in achieving personal goals, and enable everyone to help each other obtain career opportunities. The emphasis is on a one-to-one or small-group networking.

For all the participants, networking and developing relationships were crucial in opening the doors and succeeding at their current position. Networking, whether formal or informal, also allowed the participants to meet people that could eventually become their mentors. All the participants revealed that knowing other individuals within their field of expertise and outside their field as well was important in achieving their success.

Goal-Oriented

The sixth theme resulting from the analysis was being "goal-oriented," or "goal-driven," which implied having a purpose and motivation to succeed. Being goal-oriented allowed the participants to set a clear path to diligently pursue success, regardless of obstacles and impediments. The data revealed that the participants were committed to their goal and worked hard in order to achieve them. They were also willing to work within their surroundings and circumstances in order to achieve their goals. These individuals were willing to exert more effort and thus achieve higher levels of success. All participants had this motivation in common and considered it an important factor in their career advancement.

P_1 stated the following regarding being goal-oriented:

> I think that knowing that this is what you really want is important. Right, but I don't know if that isn't already instinctive in anybody that it is really ambitious in

> a good way … to be able to succeed… It's just getting the plan and knowing exactly what you have to do… So you have to have your plan and your goals.

P_1 highlighted the importance of having a plan. Having the ambition and desire to succeed is important but that ambition has to follow a flexible plan.

P_3 described her experiences about being goal-oriented as wanting her job and career:

> It wasn't perfect. I mean, I made mistakes along the way too, but you do what you have to do, I didn't have the luxury of saying "Well, no, I can't do a particular project or task," I needed the job. I wanted it. I was appreciative of the opportunities.…

P_3 described the importance of being flexible. Mistakes and poor career moves are inevitable, but the individual must be capable of adjusting and be persistent in order to be successful.

P_5 revealed: "You have to be mature and have a strong personality, so you can overcome if you have a problem with the language, if people don't understand you, and you have family so far away … so you can achieve your goals." For P_5, the need to be mature and assertive are key traits to help individuals achieve their goals.

Being goal-oriented is a significant trait of the study participants and a major theme from this study. The participants indicated that to achieve goals and become successful, individuals needed to have a flexible plan, have the ability to overcome mistakes, be mature, and be assertive. These traits were critical to the participants' success.

Mentoring Type

All the participants revealed that they had access to some type of mentoring, (formal or peer mentoring) throughout their careers. Seven of the participants revealed

that they had various experiences with mentoring, such as formal and/or informal mentoring relationships, multiple mentors, and male or female mentors, with various degrees of success. Several other themes appeared to be embedded within this theme. Three types of mentoring were revealed: (a) formal mentoring, (b) peer mentoring, and (c) E-mentoring. A more detailed discussion of these types of mentoring can be found in Chapter 2. It is noted that peer, informal, and networking mentoring are different terms for the same concept.

Various participants revealed formal mentoring experiences. For example, P_4 revealed that, for 2 years, she was assigned a formal mentor when she was first hired. She described having the privilege of working with two Hispanic mentors, who were "very diligent to make sure that I learned what I needed to learn." In her case, a formal mentoring program was available and she benefited from it.

On the other hand, P_1 made the case for the importance of peer mentoring as a win-win approach to mentoring. She stated,

> You have to choose, and it has to be that both (mentor and yourself) that agree to the situation. The mentor agrees to take this responsibility.… I think that forcing mentorship is probably not going to work.

P_2 highlighted how beneficial peer mentoring can be. She stated,

> And I don't think you have to have one mentor that is your supervisor. You can have multiple mentors. Some of them, they might not even know they are mentoring you, but they mentor you by the example.

P_5 also had peer mentoring opportunities that helped advance her career. She revealed,

> I found that informal [peer] mentoring, like the one that comes from a co-worker who has more experience or a friend…, has been the richest way [type] of mentoring that I have received.

Other types of peer mentors are enduring, like a life-long relationship. P_8 revealed she had had a mentor since she was a child: "And she's actually, in essence, become like my second mom, and that's a lifelong relationship." She revealed that sometimes these mentoring relationships evolve by pure chance:

> Some of the mentors that I've had I've actually found because I went to a meeting or to a conference, and afterwards, I talked to this person and really connected. And we develop a mentoring relationship that way… So I think it's identifying a potential relationship and then following through it.

Various participants experienced peer mentoring through multiple mentors. For example, P_3 described the significance of having multiple informal peer mentors. She stated,

> You can get mentored by a junior person or a peer, but some of your strongest mentoring relationships are usually somebody who is more experienced than you. And there weren't very many before me. So there weren't really other women for me to ask to help me, and most of the role models that I had, especially in the first 15 years of my career, were men. So those were my mentors.

P_3 did not have access to female mentors during the first 15 years of her career. She took advantage of the mentoring opportunities that presented themselves to her, even if these were through male mentors. This statement revealed that mentors and mentees do not have to be from the same gender for the mentoring experience to be successful. The experience of the mentor is more important than gender.

P_7 also described how having multiple [peer] mentors helped her throughout her career. She revealed the following:

> But I'm very clear that I'm at where I'm at because early on, I had mentors, and I think sometimes we sit back and think that you need one kind of mentor, the mentor has to look like you or has to speak your language, and those things are important, but you really need multiple mentors because different people will meet different needs.

P_7 also downplayed the importance of the mentor and the mentee being of the same gender. For her, having [multiple] mentors who met her different needs was more important than gender. P_6 reiterated that having access to good professionals was a significant factor to her success. These professionals became her [peer] mentors.

It is apparent that both formal and informal mentoring relationships can be effective. All participants had access to one or the other, and to varying degrees. The participants revealed that they must make deliberate choices as to who would mentor them. The same mentoring programs may not be effective for everyone. For example, P_3 explained that she made a deliberate choice of choosing a particular mentor:

> I wanted to learn more about financial analysis. So I went to a woman [female] CFO in our company, and I said "this is an area where I don't think I am strong enough, would you be willing to help me, and can I come to you with questions…?

This revealed that informal peer mentoring allowed the flexibility to choose a mentor based on area of expertise. Formal mentoring, although effective, may be less flexible in this regard.

One of the participants experienced a third type of mentoring: *E-mentoring*. This type of mentoring utilizes technology (emails and/or chats) to promote the mentoring relationship, making face-to-face contact unnecessary. In this study, P_3 used E-mentoring to mentor young Latinas in her company, some of whom she did not know personally. P_3 expressed,

> I have a woman, a young woman [Latina] who is a _____ in our _____ offices, and we have now been doing these mentoring/coaching sessions for about nine months, and I have never met her face to face, but I, I think she considers me one of her best mentors right now.… It has been a lot easier for her to ask me the questions she wants to ask me… So I think it's an asset to have somebody like that in your mentoring circle, but how much of it do you use and when do you tap

> that resource? It depends on what experiences you have and what you have to deal with and what opportunities are available to you.

P_3 clearly expressed support of E-mentoring programs. The ability to mentor someone remotely, without ever meeting them personally, may be seen by some as an advantage (less time commitment and travel), but may also be seen as a disadvantage because it tends to be less personal, more detached.

To summarize, all the participants experienced various types of mentoring. Whether formal/informal, peer, or E-mentoring, they all had positive experiences with the mentoring concept and considered it a contributing factor to their success. Taking advantage of mentoring opportunities was not a coincidence, but rather something the participants sought, and it became a positive factor in their success.

Criticality of Mentoring

The seventh theme resulting from the analysis was "Criticality of Mentoring," or how essential (or critical) mentoring was to their careers. *Criticality of Mentoring* as a main theme validates the importance of mentoring in a person's career. All the participants' stories align with the criticality theme. Mentoring was crucial (critical) to the participants' success and achieving high-level positions within their organizations.

All participants believed that mentoring was of the utmost importance and an indispensable contributor to their success. In other words, mentoring was a decisive and crucial factor. This decisiveness was described in the following textural data.

For example, P_1 believed that "having good mentors or mentoring is essential for you to be able to succeed.… For me it's undisputable, having people, good mentors that back you up was essential for me to really say, okay, I can go through this." P_2 revealed, "Mentoring is very, very crucial, not only being a mentee, but also being a mentor … it's

critical for anybody in any career, I would say, and I believe very strongly about mentorship." P_3 also described mentoring as being very important to her career success: "It has been [mentoring] very important because—especially because of being a female and being Hispanic, I didn't have a lot of people around me who were like me." P_3 further described the criticality of having mentorship as a very important tool and resource.

P_4 told how important it was to mentor the new generation of professionals that is in the workforce. She believed…

> Now you have people close to retire age and younger people… and if those people with experience retire and don't pass that knowledge to the younger folks…we end up reinventing the wheel, and that's why I consider mentorship to be important.

P_7 believed that mentoring was critical to her career. She believed, "[H]aving been on both sides of the street, I mean as a mentor or as a mentee, I think that mentoring is 50 percent. The other 50 percent is you." P_8 stated, "Mentoring is huge, both as a mentee and mentor.… But I'm very clear that I'm at where I'm at because early on, I had mentors." Without a doubt, mentoring was crucial (critical) to the participants' success and a major theme of this study.

Luck and Opportunities

The last theme that emerged was "luck and opportunities." Since these are not really "traits," they represented an unexpected finding. The analysis revealed that luck and opportunities facilitated the participants' career advancement by putting them in a good position for success. The participants perceived having luck as a contributor to their success.

The participants referred to having a combination of events and circumstances that were favorable for goal attainment. Opportunities noted by the participants included

availability of summer jobs, scholarships, internships, fellowships, financial and family support, and general access to education. None of the participants expressed experiencing opportunities directly related to gender and ethnicity, although the subject was not approached directly. However, all participants spoke fluent English, which led to opportunities related to their fluent knowledge of their language.

The following excerpts from textural data support the theme of "luck and opportunity" when the participants discussed their perceptions. P_1 believed that the opportunity she had to conduct a basic project when she was an undergraduate student helped her to achieve her current position. This opportunity eventually led to her postdoctoral degree and to her current path as a scientist.

P_2 revealed that she was at the right place at the right time, and considered luck as a factor that helped her achieve a successful career:

> That was the idea, just as a passenger here, but at the time that I was going to move or at the time I should be considering leaving and coming back to ---, a new position was offered to the lab, and I fulfilled it. So that was luck. I always say I was in the right place at the right moment, most likely.

P_4 described herself as a "tremendous advocate" for summer jobs because they lead to opportunities for future jobs. She indicated that summer jobs "open your mind and opens [*sic*] your opportunities too." She revealed that her first summer job as an intern in college allowed her to obtain a permanent job in a completely different area. In other words, her summer job gave her insight into a different area that she liked better and led to a permanent job and a career change. She expressed, "they believed in me as a student back then, and eventually, I got a permanent job."

P_5 described how her supervisors provide opportunities:

> I see them [supervisors] as mentors because they always look at me to provide me opportunities because they want me to create a career at ---. So they are always looking for me and saying okay, here is this opportunity, take it.

P_5 also believed that to become successful a woman has to take advantage of all the opportunities (e.g., training) that are available to her. P_6 believed she was lucky to have achieved a successful career and position within her organization. She stated, "I think I was lucky. First of all, I was at the right place at the right time. Also, at ---, I was lucky to have fantastic professors." P_6 was also fortunate to have had strong mentors who helped provide positive guidance to her career path. She strongly believed that the combination of good luck and good mentors allowed her to succeed and achieve high-level positions in her career.

Luck and opportunities are an important and unexpected finding. This finding revealed that access to opportunities is important in succeeding, but that being lucky helps. For example, two participants (P_2 and P_6) used a phrase that brought this finding to light when they said "being at the right place at the right time." Access to mentoring represents one of the opportunities that, if taken advantage of, may represent a significant step in a Latina's career.

It should be noted that while luck was a perceived contributor, all the participants were competent women who prepared for their occupations through advanced degree obtainment, who studied hard, and who worked diligently to achieve their success. Professionally, educationally, and personally, they were alert and capable scientists and engineers, each of whom simply took advantage of serendipitous situations and opportunities by responding with the proper reaction and pursuit. The participants do not owe their success to luck, as someone who achieves wealth by winning the lottery; rather,

they worked hard to develop the proper skills so that when an opportunity presented itself, they could embrace it. In other words, they did not win the lottery but they won their "wealth." Already having the requisite exceptional skills and abilities, to which their success attested, these women were consequently able to take advantage of opportunities. The mentors who took these women under their wings had to realize that they had the potential and the necessary skills to be successful. Luck by itself is not sufficient. These women did not wait for opportunities to present themselves, but rather put themselves in position to access them.

In summary, eight major themes resulted from the analysis of the data. Other themes also surfaced (for example, stereotype and personal decisions), but these particular themes were consistent throughout the analysis and elevated as a common thread that helped to provide a clear understanding of the traits and characteristics these participants shared. Without question, these themes had a major impact on the participants' careers and influenced their paths to success. These themes provided me with an understanding and context to discover the lived experiences of Latinas in science and engineering.

This chapter provided an overview of the purpose of the study, research questions, data collection process and analysis, and the participants' demographic data. The study findings were identified, analyzed, and discussed according to the phenomenological process of data analysis. Textural, structural, and textural-structural narratives were presented for each participant, as well as horizonalization of the raw data that was cross-referenced with the four research questions and presented as tables. The analysis of these tables resulted in eight major themes. The last section of Chapter 4 provides a thematic

analysis of the eight major themes. Chapter 5 provides a discussion of these findings, recommendations, implications for future study, and final conclusions.

CHAPTER V

DISCUSSION, RECOMMENDATIONS, AND CONCLUSIONS

The purpose of this phenomenological study was to reveal the lived mentoring experiences of Latinas in science and engineering. The study sought to understand how Latina scientists and engineers achieved high-level positions within their organizations, and the obstacles they encountered along their professional journey. The phenomenological research approach allowed me to obtain rich descriptive data on the participants' experiences and perceptions about mentoring and to reveal the salient themes common to the phenomenon.

This chapter provides an overview of the following topics: (a) discussion of the findings, (b) limitations, (c) recommendations, (d) implications for future study, and (e) conclusions.

Discussion of the Findings

A total of eight common themes emerged from the analyzed data: (a) Trailblazer; (b) Passion and Belief; (c) Support and Encouragement; (d) Networking; (e) Luck and Opportunities; (f) Goal-Oriented; (g) Mentoring Type; and (h) Criticality of Mentoring. The themes were cross-referenced with the research questions to demonstrate the alignment between the mentoring phenomenon and the purpose of the study. A review of the findings follows, and each research question presents the themes with a discussion to include assumptions and alignment or nonalignment with the literature.

Research Question # 1: What are the challenges that successful Latinas experience in advancing their careers?

Trailblazer

The main theme that emerged from the aforementioned research question was being a *trailblazer*. All eight participants expressed that they were "trailblazers." This theme suggested that being a trailblazer "paved the way" for other Latinas, but from different perspectives. For example, P_3 expressed that she, "as one of the most senior women [Latina] in her company," opened the doors for other women in engineering as well as in management. She believed that she had to excel and be an example to other women and minorities who wanted to achieve management positions within her company. Other participants expressed that being a trailblazer was a challenge because first they had to prove that they were capable of doing the work and succeeding. In other words, they had to prove themselves before they could become leaders and then lead by example.

Various other participants addressed their experiences as trailblazers specifically. For example, P_2 encountered many situations in which she was a trailblazer. She was the first one to be given the position of associate scientist within her organization. Being the "first one," without any footsteps to follow, was a challenging position for her. She believed she had to prove to others that she had what it took to excel at this important position, and thus silence those who thought she was not the person for the job. Similarly, P_3 revealed she was the seniormost female in her company and the first minority promoted to her current position. Being a female pursuing an engineering career was always a trailblazer proposition, as there were not many females in her engineering

school. From her school days, she was used to being one of the first ones and having to prove herself. When she became the most senior female in her company, she believed she had to prove herself all over again. These thoughts were exacerbated when her mentor specifically mentioned the importance of her excelling at her position because she was the only visible Latino role model at a high-level position within her company.

The trailblazing experiences of P_6 were described as "scary" and intimidating since she was always among a "sea of men." She thought that her success within her organization had yielded positive results since her organization now gets more job applications from females than from males. Particularly for the 1970s, P_6 was a trailblazing woman, even if her contemporaries did not realize it. It should be noted that P_6 believed that changes in society, particularly the feminist movement in the United States, have boosted the number of females in the work force. It is also more common now for females to pursue an education and a professional career than it was in the 1970s.

P_8 thought that it was typical for Latinas to be the first ones simply because of the small number of Latinas involved in science and engineering. She believed that she could not, and should not, separate being a female from being a Latino—that these could not be separated. Her trailblazing experiences pertained not only to proving herself and opening the door to others, but were also about "constantly" educating coworkers regarding Latin culture, which she felt was misunderstood.

The participants' stories made apparent the importance of being a trailblazer, whether as a Latin person or a female, and how that trait leads to success. Rosser and Lane (2002) reported that the low number of women in science and engineering made it difficult for women to gain the credibility and respectability enjoyed by their peers. This

problem reported by Rosser and Lane (2002) was experienced by $P_{5,}$ who indicated that it was difficult for her to gain credibility within her agency because she was the lone Latina. This finding highlights the difficulty that trailblazers have in leading the way. They have to open the door to others through leading by example and establishing credibility. Only via this credibility will it be possible for others to follow their lead.

For some of the participants being a trailblazer implied that they had to prove themselves among their male and non-Latino peers in the workplace. For others, it implied educating their coworkers about Latin culture, stereotypes, and perceptions about their countries of origin. These women not only had the challenge of being the first visible role model within their organizations, but they also had to educate those around them about their culture. P_2 described educating others as "understanding where do we come from and our culture, and how our culture is imprinted in our personalities."

Because of the small number of Latina scientists and engineers, those who have been successful stand out. They become a model to other Latinas pursuing similar careers, sometimes unknowingly. It is suggested that these women are usually under the microscope; more is demanded from them and any errors they make appear to be magnified (Rosser & Lane, 2002). Because of their small numbers, most of the Latinas in these fields *are* trailblazers since few had role models to follow. Being a trailblazer was an important trait for all participants and a significant attribute to their success. The findings suggest that Latina women are breaking barriers in their careers in order to open the door for other Latinas pursuing careers in science and engineering. This finding aligned with the literature, which suggested that Latinas are in high demand as scientists and engineers, but the male-dominated environment is not a welcoming environment to

them (Gasbarra & Johnson, 2008). The finding also aligned with the literature on the dearth of Latina scientists and engineers in high-level positions (NSF, 2003). The demand for science and engineering talent is increasing; however, very few Latinos are encouraged to pursue careers in science and engineering (Gasbarra & Johnson, 2008; Taningco, 2008). It is for this reason that it is important to understand how the few Latinas having achieved high-level positions within their organizations were able to be so successful.

Research Question # 2: What do Latinas perceive as facilitating their career advancement?

This research question yielded five themes, which are discussed below.

Passion and Belief

The study's findings suggest that *passion* and *belief* in themselves were factors that these Latina participants perceived as facilitating their career advancement. Internal motivation is an important theme. The desire to succeed, enthusiasm, and fervor are all encompassed within this theme. All eight participants expressed that having a passion and believing in themselves were important factors that lead to success in their careers: in other words, a burning desire to succeed. For example, P_1 stated that, "knowing what you want from the very beginning and really loving it" was key to her success. She knew what she wanted to do from early on and what she wanted to achieve as a scientist. She passionately expressed that she loved her work and truly believed in the work she was doing. P_2 stated that her enthusiasm, her convictions, and believing in herself allowed her to achieve a successful career as a scientist. Along the same lines, P_6 described how rewarding it was for her to work on something interesting and enjoyable. She referred to

this as a rewarding experience. Similarly, P_8 stated the importance of believing in the work one is doing. She expressed that a person should have passion for their work and a strong drive to succeed. She further believes that once you become successful, opportunities must be provided for others.

The participants avidly described their passion for the work they do and a drive to succeed. This suggests that "desire" pushed them to surpass any obstacles that might come their way and made them able to succeed against adversity. It was clear that this strong belief and enthusiasm were important traits that led to their success.

Researchers (Burke, 2007; Burke & Mattis, 2005; Gasbarra & Johnson, 2008; Millett & Nettles, 2006; Taningco, 2008) suggested that passion and belief were indeed important factors that led to the success of Latinas in science and engineering. P_2 summarized it: To succeed, you must "have passion and have … drive" to succeed. The literature (Burke & Mattis, 2005; Dean & Fleckenstein, 2007; Michie & Nelson, 2006) suggests that passion substantially improves the outcomes and self-confidence of women. The possession of passion and belief aligned with the findings and represented an important factor in the success of the study participants. This theme also confirmed common threads of successful individuals, not necessarily limited to Latina scientists and engineers: Hard work is rewarding and anything is possible if the person sets his/her mind to achieve a goal.

Support and Encouragement

According to the findings, all eight participants indicated that having a support system that provided them with encouragement was critical to their success. The participants had a strong support system within their family environments. In some cases,

this encouragement was seen as a type of mentoring; for example, the participants suggested that a parent provided the necessary support to foster their adult child's professional development. Indeed, having this support and encouragement suggests that whether the support was at home, from a spouse, or from the work environment, it was a crucial factor in the participants' success.

P_3 revealed that mentors (her father and work mentor) were always present to support her and make sure she would be successful. P_4 believed that young professionals need encouragement and guidance, someone to help them make important decisions. P_5 described how her mentors supported her decisions and have supported her in pursuing her graduate degree. She felt grateful that she had had professional support and people who supported her decisions. This support gave her the confidence to make sometimes controversial decisions, implement a new technology, or make program changes. P_6 stated that both her mother and her husband provided critical support to help her achieve a successful career. Her mother encouraged her to complete her doctorate degree before marrying. One of her mentors also encouraged her to take positions of responsibility even though she was "kind of scared" about doing it. P_8 believed that strong family support and strong community support were important. She indicated that it was common for parents without a formal education to encourage their children to achieve a higher level of education than their own and to support their children's education. For her, it was understood that not getting a formal education was not an option.

The findings in this study suggest that the importance of having a support system is aligned with the literature. Researchers (Huber, Huidor, Malagón, Sánchez, & Solórzano, 2006; Taningco, 2008) stated that it is crucial for women to have the support

and assistance of a mentor or role model during their academic and professional careers. Other researchers (Johnson, 2000; Kosoko-Lasaki, Sonnino, & Voytko, 2006; Kram, 1983; Kram & Isabella, 1985; Wanberg, Welsh, & Hezlett, 2003) found that having a support system, in this case mentoring, was beneficial to the success and empowerment of individuals. The literature also suggested that mentoring does provide the support and encouragement Latina women need to achieve a successful career in science and engineering. Brown's (2002) study revealed that familial support was important and made a lasting difference among the Hispanic students who participated in the study.

One factor that influences the underrepresentation of Latinos in higher education is the low level of parental education (Chapa & De La Rosa, 2004; Rothe, 2004; Stanton-Salazar, 1997; Suarez-Orozco & Suarez-Orozco, 2001; Villegas & Vincent, 2005), as well as Latinos being the least educated ethnic group (Rothe; Suarez-Orozco & Suarez-Orozco; Villegas & Vincent). However, this study found that the low level of parental education was not a factor in their children achieving a successful career in science or engineering. The participants' parents supported and encouraged their daughters to excel academically and professionally regardless of their own educational level. This was true for both the participants with highly educated parents and for those with non–highly educated parents. Only two of the study participants (P_1, P_8) were the first ones in their families to achieve higher education. For others, only one of the parents had higher education. P_6 is an interesting case because even though her father was an architect, he had passed away when she was 14 and she was raised by her mother, who had only a high school diploma. Despite losing her father, her mother kept encouraging and supporting her until she succeeded. P_6's experience demonstrates the importance of

support and encouragement from the mother. Smith and Hausafus (1998) reported that a mother's attitude toward a career in science and mathematics has a major impact on the success of her child in school. Her involvement in the education of her child also has a major impact on success of her child. The results of Smith and Hausafus align with P_6's experience.

P_8's mother had less than a high school education. She was able to acquire a doctorate degree and is currently a successful Latina within her organization and field of work. One can conclude that the level of parental education, although a salient factor, is not the determining factor in producing successful Latinas in science and engineering. Brown (2002) reported, "feeling socially supported by a family at home seems to increase students' academic adaptability and encourages positive educational outcomes" (p. 128). The finding also suggests that, for specific participants, even though they were the first generation to have the opportunity to achieve higher education, their parents' level of education was not an impediment.

It should be noted that the study participants do not reflect the fact that most Latinos enrolled in science and engineering programs have a tendency to be the first generation in their family to pursue a higher education degree (Gasbarra & Johnson, 2008). According to Gasbarra and Johnson (2008), Hispanics who complete high school and plan to attend college are often the first ones in their families to do so. Hispanic families are often struggling financially and find themselves torn between spending money for college and beginning work immediately to help their parents and family (Gasbarra & Johnson, 2008; Taningco, 2008).

The literature and the findings of the study align and suggest that parental support and encouragement are important in fostering Latinas career advancement.

Networking

Networking was the third theme resulting from research question two. All participants believed that networking facilitated their career advancement. In this regard, networking refers to having a supportive system of sharing information and services among peers having a common interest. P_2 relates the importance of "knowing people, shaking the right hands, listening, observing what they have to say, and learning what their interests are. You cannot do science and be isolated." She also expressed that networking is "probably more important than mentoring," that networking is comparable to an informal peer-mentoring system.

In some instances, networking peers can become successful mentors. Upon arriving in the United States, P_2, through networking, learned not only the language and new culture but also the working style of her peers. In other words, she learned how to operate in a new environment through networking. For her, it was critical to learn from other people and to interact with them in a more successful way. P_3 indicated that her company created a network that focused on women. This network allowed young female professionals to interact with more senior staff within the company. This network provided visibility to the younger professionals just by the interaction. They were able to learn and receive advice from senior females, thus accelerating their professional development. Johnson (2000) suggested the benefits of networking. Johnson reported that establishing more relationships with women promoted an interest in science and engineering careers.

P_8 described how networking helped her land her current job. Through networking, in this case through a chapter she created for a national association, she was able to meet and share experiences with peers. From these contacts developed a series of professional relationships that eventually matured and helped her become successful. She developed these professional relationships at the national level when she created a chapter in an organization. For $P_{8,}$ networking and developing relationships were crucial in opening the doors and succeeding at her current position.

The participants' networking experiences align with the literature on peer mentoring and the Networking-Mentoring model suggested by Swoboda and Miller (1986). The literature suggests that peer mentoring and networking provide support to underrepresented women and increase the retention and academic success of women (Grant-Vallone & Ensher, 2000; Ibarra, 1993). Researchers further agree that "programs that foster peer mentoring and community building may be more likely to meet the needs for women faculty than traditional, hierarchical mentoring relationships" (Chesler, Single, & Mikic, 2003, p. 257). Informal peer-mentoring activities, such as networking, may be as beneficial, or even more so, than formal mentoring programs. This finding is documented in the literature and demonstrated by this study. The literature also suggests the Networking-Mentoring model requires a more flexible and mutually interdependent pattern of training, information sharing, and support than the Grooming Mentoring model (Swoboda & Miller, 1986). This assessment is corroborated by this study.

Luck and Opportunities

The fourth theme emerging from this research question was *luck and opportunities*. The findings of the study revealed that luck and opportunities facilitated

the participants' employment opportunities; the two are viewed as an ancillary characteristic to success. In this context, "luck" and "opportunity" are treated as having the same connotation, since they are directly related. The two are different, however. "Luck," according to *Dictionary.com*, refers to "having good fortune; taking advantage or success, and considered as the result of chance" (Luck, n.d.). "Opportunity," according to the same source, refers to a "being in good position, chance, or prospect, as for advancement or success" (Opportunity, n.d.). Taking advantage of an opportunity that presented itself can be seen as a matter of "luck" or "chance." The word "chance" is presented in both definitions. Therefore, the definitions of luck and opportunities complement each other.

Having luck is inconsequential if the individual does not have the other traits revealed in the study. The individual must be able to take advantage of the opportunities presented to them to reach their potential (Ibarra, 1993; Peery & Grady, 1998; Ragins & Scandura, 1997; Gasbarra & Johnson, 2008; Taningco, 2008). The desire to succeed and having the necessary support are essential traits, but so are being fortunate and having mentors available, whether formal or informal. It is plausible from the study's findings to suggest that where mentoring was not available, Latinas may not have been able to excel to their full potential.

This theme is supported by the literature. Sonnert and Holton (1996) discussed in their study that "any analysis of the factors that impinge on science careers must emphasize the role of luck" (p. 71). They revealed that most of the individuals interviewed in their study had benefited from luck and serendipity at some point in their careers. Eighty-nine percent of men and 85% of women in their study acknowledge that

good luck had affected their careers (Sonnert & Holton, 1996). “Good luck may be being in the right place at the right time, for instance, in a research program or a field that is “hot” (p. 71).

The theme of luck and opportunities is further aligned with this study finding by other researchers (Bar-Tal & Frieze, 1977; Deaux, 1979; Deaux & Farris, 1977), who revealed that females view or credit their success to luck while males tend to view or credit their success to ability. Bar-Tal and Frieze (1977) discussed how a person might perceive different factors as cause for their achievement. The factors perceived as cause for achievement are “ability, trying hard, good luck, the ease of the task, and/or the help of other people” (p. 302). Whereas females viewed success as good fortune, this was not the case for males.

Further studies conducted by Bar-Tal and Frieze (1975) suggested that women who are high achievers will avoid using the word ability as an explanation for success. However, these women prefer to use the word effort instead of luck (Bar-Tal & Frieze). In this instance, the literature on “luck” does not align with the findings of this study. The literature perceives luck as a cause of success or achievement (Bar-Tal & Frieze, 1975; Deaux & Emswiller, 1974; Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, 1970), while the participants in this study did not reveal “being lucky” as a cause for success.

In a CNBC Town Hall meeting at Columbia University School of Business, Bill Gates, Microsoft icon, credited part of his success to luck (Crippen, 2009). He believes that timing, having the necessary skills, and the people he was lucky enough to meet played a role in his successful career. He also believes that it is unusual to have so much luck in one’s life, “but it's been a major factor in what I have been able to do” (Crippen,

2009, p. 3). While it is evident that Mr. Gates was prepared intellectually and had a vision, he also perceived his success as part of luck and opportunities. It appears that the same luck and opportunities presented to an entrepreneurial icon was shared by the Latinas scientists and engineers who participated in this study.

Goal-Oriented

The fifth theme resulting from this research question was that of being "*goal-oriented*." Goal orientation was revealed as another key factor that facilitated the participants' career advancement. The participants' goal orientation describes the goals they chose and the methods used to pursue those goals. Participants were willing to work hard to achieve their goals; they had a purpose. They were also willing to adjust to their surroundings and circumstances in order to achieve their goals and succeed. This is an important characteristic of protégés (Hunt & Michael, 1983; Kram, 1983; University of Texas at Austin, 2006). All participants had this desire in common and considered it an important factor to their success and career advancement. For example, P_1 stated that being ambitious and goal-oriented were important traits. She revealed that being successful is a matter of "just getting the plan and knowing exactly what you have to do: to have your plan and your goals." P_3 described her experienced with being goal-oriented as wanting a job and career. She was willing to do whatever it took to keep her job because she "didn't have the luxury of saying, 'No, I can't do a particular project or task.'" She needed the job and worked hard to keep it. She was appreciative of the opportunities and took advantage of them.

Being goal-oriented is a salient trait of these particular participants. Some of the characteristics exhibited by them included being driven and having a purpose. These are significant aspects of the participants' motivation to succeed.

Research Question # 3: How did mentoring experiences of Latina scientists and engineers influence their career success or advancement?

Mentoring Type

Mentoring type emerged as the only theme related to research question three. The type of mentoring, while a common theme, was viewed and expressed from different perspectives. All the participants in the study revealed that they had some type of mentoring (formal or peer mentoring) throughout their careers. Seven of the participants revealed that they had formal mentoring relationships and for most participants their mentors were not assigned.

P_1 made the case for the importance of peer mentoring as a win-win approach to mentoring. She stated that an individual has to choose his or her mentor and both need to agree on the mentoring relationship. She believed that forcing mentorship does not work. Both the mentor and the mentee must want the mentoring relationship. These eight themes can be exploited by implementing the study recommendations. For example, educating the student population on the benefits of mentoring would bring mentoring to the forefront and will lead more individuals to pursue mentoring. Undoubtedly, some of these individuals would have the traits identified in the study and would benefit from the exposure to mentoring. Also benefiting from the aforementioned recommendation would be Latinas themselves. Formalizing these mentoring relationships would have positive

implications on the Latina population, which may lead them to pursue careers in science and engineering.

P_2 highlighted how beneficial informal mentoring could be. She thought it possible for multiple mentors to be more beneficial than one. This would appear obvious, that multiple mentors can serve multiple needs and meet different aspects. She also stressed that individuals can be mentored leading by example, even if they do it unknowingly. P_3 described the significance of having multiple informal mentors. Most of her mentors were male simply because there are more men in the engineering field than women. As it turns out, her father was also an engineer and became her first mentor, both encouraging her and teaching her about engineering. P_4 revealed that, for 2 years, she was assigned a formal mentor when she was first hired. She described having the opportunity to work with two Hispanic mentors, who were "very diligent to make sure that I learned what I needed to learn." In her case, a formal mentoring program was available and she benefitted from it.

P_5 had informal mentoring opportunities that helped advance her career. She revealed that she considers informal mentoring to be the most beneficial. She referred to more experienced coworkers as her mentors. Also, she had friends who had similar careers and interests advise her, and considered them informal mentors. P_6 indicated that having access to good, caring professionals was a significant factor. These professionals, such as coworkers, colleagues, and peers, were her informal mentors. P_7 described how having multiple mentors benefited her significantly through her career. She does not believe that mentors have to be Latin or female. A person can benefit from mentors who can provide support and guidance regardless of their ethnicity or gender. P_8 revealed that

peer mentoring has been beneficial to her career. She found some of her mentors by attending conferences and networking with her peers. Sometimes just by pure chance she found a person with whom she connected and that person became her mentor. She stressed the fact that if you find a person who can help you in your career, you should pursue the relationship.

The participants' experiences align with the literature on mentoring. They all revealed that both formal and informal mentoring could be effective and even critical. Swoboda and Millar (1986) described two theoretical models of mentoring that offer different perspectives for women to advance their careers as well as plan for future career strategies. The first model is the Grooming-Mentoring model, which is utilized in formal mentoring (Swoboda & Millar, 1986). In this type of mentoring, the mentor is more experienced and usually older than the protégé. For example, in P_3's case, "some of the strongest mentoring relationships are usually somebody who is more experienced than you."

The second model described by Swoboda and Millar is the Networking model, or Peer-Mentoring model (Kram & Isabella, 1985). This model requires a more flexible and mutually interdependent pattern of training, information sharing, and support (Swoboda & Millar). This model further relies on the protégé taking an active role in the relationship and networking through his or her circle of colleagues. For example, P_1 revealed, "It should not be assigned. You really have to be able to choose mentors and it has to be mutual." Both the protégé and the mentor should willingly and enthusiastically agree on the mentoring relationship.

Another type of mentoring that resulted from the study was E-mentoring. This type of mentoring, or model, utilizes technology (emails or chats) to promote the mentoring relationship, making face-to-face contact unnecessary. E-mentoring has increased any individual's access to mentoring opportunities, and has expanded the possibilities of who can mentor and be mentored (Packard, 2003). In this study, only one participant (P_3) had experienced E-mentoring. In her case, she was using E-mentoring to mentor young Latinas in her company. Some of her mentees did not even know her personally.

E-mentoring provides mentors increased flexibility to establish contact at times suitable for the protégé's schedule regardless of his or her geographical location (Packard, 2003). In contrast to the Grooming-Mentoring model and Networking-Mentoring model, the E-mentoring model allows mentor and protégé to communicate more frequently without the need of a personal meeting, as described by P_3.

To summarize, of the three mentoring types (Haring-Hidore, 1987; Kram & Isabella, 1985; Packard, 2003; Swoboda & Millar, 1986), the Networking-Mentoring model was the most prevalent among the study participants. All participants benefited from the type of mentoring available to them, whether formal or informal. They all saw mentoring as a useful tool to help them achieve success in their careers.

Research Question # 4: How do Latinas perceive the effectiveness of mentoring as a viable mechanism in achieving a successful career in science and engineering?

Criticality of Mentoring

One main theme, *criticality of mentoring,* emerged from research question four. *Criticality* refers to how critical mentoring was to the participants' success. All

participants had positive experiences with mentoring whether formal, informal, parental, or spousal. The study revealed that these particular participants perceived mentoring as a vital and indispensable tool that helped them achieve a successful career in science and engineering.

For example, P_1 believed, "having good mentors (or mentoring) is critical for you to be able to succeed." P_2 revealed, "Mentoring is very, very crucial, not only being a mentee, but also being a mentor … it is critical for anybody in any career. I believe [in mentorship] very strongly." P_3 described mentoring as being very important to her career success because it gave her access to knowledge and support that she would not have had otherwise: "It [mentoring] has been very important because, especially being a female and being Hispanic, I didn't have a lot of people around me who were like me."

This finding is consistent with the literature where mentoring is considered as an indispensable tool in the upward academic and professional progression of individuals. It is crucial for a woman to have the support and assistance of a mentor or role model during her academic and professional career (Huber, Huidor, Malgón, Sánchez, & Solórzano, 2006). The Department of Labor [DOL] identified the lack of mentoring as one of the "organizational or attitudinal barriers" that prevent career advancement for working professionals, especially women (DOL, 1991; Gasbarra & Johnson, 2008; Lee & Nolan, 1998). Another study conducted by Bagati (2008) found that women perceived the lack of mentors as a bigger challenge and barrier to professional advancement than family or personal commitments.

Without a doubt, all participants perceived mentoring to be a vital and critical factor in their success. The support these participants received from their mentors was a critical factor in their professional development and level of success.

Limitations

Three limitations were identified during the course of this study. First, recruiting Latina participants from different countries was challenging. The underrepresentation of Latinas in science and engineering made it difficult for me to recruit participants from different countries. Most of the study participants were from Puerto Rico and Argentina. An attempt was made to diversify the sample population but this proved to be difficult. For example, two potential participants declined to participate in the study because of their busy schedule and prior commitments. These participants were from Colombia and Uruguay, and would have diversified the study population. A more diverse geographical representation might have yielded different findings. These finding represent only the individuals in this study.

Second, the findings of the study were based on a small number (eight) of participants from the private sector, academia, and government. These findings may not be representative in a larger sample. It should be noted that the phenomenological methodology recommends between 8 and 10 participants, so in this regard the findings of the study are valid.

Third, the study did not attempt to distinguish between a native Latina and nonnative Latina. A native Latina is one who was born and raised in her native country. A nonnative Latina is one who was born and raised in the United States (U.S.) to Latin parents. It can be assumed that these two separate groups of Latinas would have different

issues. For example, a nonnative Latina may have a better command of the English language and a better understanding of U.S. culture. Succeeding in this environment may be easier for a nonnative Latina. A native Latina would have to address cultural adaptation and language proficiency. It is impossible to know if separating these two populations would have affected the findings of the study. This may be the subject of a future study.

These limitations, although at a first glance they may appear to be flaws in the methodology, are not significant. Phenomenology gathers a small number of participants and studies their experiences in depth. This phenomenological approach accounts for these limitations and makes the findings valid.

Recommendations

The analysis conducted in this study has yielded important findings related to the importance of mentoring opportunities available to Latina scientists and engineers. Although the findings are significant and can stand on their own, it is important to derive recommendations to advance this research area further.

Four recommendations are offered. The first recommendation is for educational institutions to establish mentoring programs, especially for Latina students. Educators (teachers, professors, advisors, and counselors) from high schools and institutions of higher education should be educated on the benefits of mentoring programs. These programs should be available to all, but should target student populations that are more likely to benefit from these programs, such as Latino students. Postsecondary and higher education institutions should encourage Latinas, through mentoring, to pursue careers in science and engineering. It is important for Latinas to learn the significance and

importance of mentoring and how mentoring can be a guiding force in their professional development. Often Latinos do not know about mentoring and its potential benefits. Students should be exposed to mentoring programs and opportunities so they can benefit from them and learn how mentoring can have positive implications in their personal, academic, and professional lives. This would have policy implications because programs would have to be developed and implemented in schools and institutions of higher education. Developing and implementing mentoring programs also involves commitment from the schools and educators. Also, educators (teachers, professors, advisors, counselors) would have to be trained in the importance and benefits of mentoring, and more importantly, on how to implement mentoring programs. Only if they themselves believe in these programs can they pass their benefits to their students.

The second recommendation is to attract more Latinas to careers in science and engineering by creating awareness of these fields of study and actively recruiting Latinas for these programs. Creating awareness of what scientists and engineers do on a daily basis would make these careers more attractive and enticing to young women, including Latinas. This could perhaps be achieved by developing recruitment career fairs, face-to-face interviews, and other activities specifically targeted to Latinas so that they become aware that these careers are a possibility for them. Policies to develop these recruiting activities would have to be adopted, perhaps by the schools or institutions of higher education.

The third recommendation is the formalization of mentoring relationships in the workforce so that employees can identify the right mentor for them (regardless of gender or ethnicity). Although this study found that informal mentoring can be just as effective,

formalizing the mentor/mentee relationship can yield enhanced benefits for the mentor and/or mentee. This formalization would ensure that employees could find a mentor they can trust and establish a relationship. This can be achieved developing guidelines for the mentor/mentee relationship to flourish. These guidelines would define the type of mentoring program, activities, responsibilities, time commitment, and other aspects of the mentoring relationship. By formalizing this relationship, both the mentor and the mentee would have a clear understanding of their commitment and expectations. Formal mentoring programs would have to be developed which would have policy implications. One such policy implication is funding. Funds would have to be made available not only to develop mentoring programs themselves, but also to conduct further research on its benefits and implications. Traditionally, securing funding for developing and implementing mentoring programs is challenging. Establishing policies, such as earmarks, would minimize this challenge. Another policy implication may be the appearance that mentoring programs are being developed for specific populations, in this case Latinos. It may be more beneficial to develop and implement mentoring programs to benefit all populations regardless of race, gender, and/or ethnicity. Regardless, policies would have to be instituted to make this possible.

A final recommendation addresses the need for further research. The review of the literature on mentoring Latinos or Latina scientists and engineers is very limited and needs to be strengthened. To conduct more scholarly research in this area would make the first three recommendations justifiable.

Implications for Future Studies

While this study yielded useful results, some additional questions, worthy of future study, remain. As such, the implications for future research lay in future researchers exploring additional research questions. These questions are (a) How do Latinas perceive formal mentoring programs? (b) Are mentoring programs equally successful for all Latinas regardless of their country of origin? (c) Do Latinas benefit more from mentoring programs than do nonLatinas? (d) Should mentors mentoring Latinas be Latin themselves? (e) Are the findings equally valid for native and nonnative Latinas? (f) Are there socioeconomic indicators that influence Latina scientists and engineers in their quest for mentoring and higher education? (g) As the Latin population in the U.S. grows, how can mentoring programs serve as a catalyst to accelerate the professional advancement of Latinas? and (h) How does the level of parental education influence Latinas' propensity to seek higher education?

Answering these questions through additional research might fill current gaps in the literature and advance the entrance of Latina scientists and engineers in the U.S. Therefore, one possible research project could study the documented benefits of mentoring programs among successful Latinas in fields other than science and engineering, such as liberal arts and the humanities.

It is the researcher's hope that the textural data provided here may serve educators and scholars to pursue further research on this topic so that the state of the art in mentoring can be advanced. It is also hoped that more individuals, particularly Latinas, discover the benefits of mentoring and how mentoring can help in their professional careers.

Conclusions

The purpose of this phenomenological study was to reveal the lived mentoring experiences of Latinas in science and engineering. The study sought to understand how (underrepresented) Latina scientists and engineers achieved high-level positions within their organizations, and the obstacles they encountered along their professional journey. Utilizing a phenomenological approach, rich descriptive data were collected to obtain a better understanding of how the experiences of eight study participants helped them achieve successful careers in science and engineering and whether mentoring was a contributing factor to their success. The collected data provided different perspectives and stories about their lived mentoring experiences. All of the participants had a strong desire to succeed. This desire, along with other traits, allowed them to surpass obstacles and become successful. They all utilized their mentoring experiences in a very positive way and considered mentoring a vital factor to their success.

The in-depth interviews, coding, analysis, and careful interpretation resulted in eight major themes: (a) Trailblazer; (b) Passion and Belief; (c) Support and Encouragement; (d) Networking; (e) Goal-Oriented; (f) Mentoring Type (Grooming, Networking, and E-mentoring); (g) Criticality of Mentoring; and (h) Luck and Opportunities. These particular themes were consistent throughout the analysis and elevated as a common thread that helped provide a clear picture of the traits and characteristics these participants shared that made them successful.

These eight themes were key factors that contributed to the participants' success, and can be applied by implementing the study's recommendations. The implementation of the recommendations will allow others to benefit from these experiences and achieve

successful careers for themselves. Educating the student population (i.e., middle school and high school students) on the benefits of mentoring would bring mentoring to the forefront and lead more individuals, including Latinas, to pursue careers in science and engineering.

Undoubtedly, some of these individuals would have the traits identified in the study and would benefit from their exposure to mentoring. From this study, individuals will know that (a) it is important to have multiple mentors at all levels; (b) the various types of mentoring can be equally effective and mentoring can be critical to an individual's success; (c) the support and encouragement of mentors is essential, both personally and professionally; and (d) mentoring relationships should not be forced, that they should be a mutual agreement in which both the mentor and the mentee willingly and enthusiastically participate. The findings also suggest that implementing mentoring programs would have positive implications on Latinas' career success, which may encourage them to pursue careers in science and engineering.

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APPENDIX A: LETTER TO PARTICIPANTS

(IRB # 070801)

Date_____
Dear_____

I am a doctoral candidate of Higher Education Administration Program (HEA) at the George Washington University, and I am conducting *a research study exploring the lived experiences of Latina scientists and engineers and their perceptions about mentoring*. The study seeks to understand how Latina scientists and engineers achieve high-level positions within their organizations and the impediments they encounter along their professional journey.

You are a potential candidate for the study, and I am truly honored to invite you to participate in the research. Your participation will add to the limited professional body of knowledge regarding this subject and pave the way for others. This project is part of the research phase of my study using a Qualitative research method. The study constitutes partial fulfillment of the requirements for the Doctor of Education degree at the George Washington University within the Higher Education Administration Program.

The requirements of the study include a one-time face-to-face interview of one hour, and a follow-up interview that will last approximately 30 minutes. Your response to the interview questions will be audio-recorded and later transcribed for analysis and comparison. The transcript will be sent to you for your revision or additional comments. I will be taking handwritten notes during the interview in order to enhance the accuracy of the data collected.

The study complies with the protection requirements for ethical research. Your participation in the study is voluntary. If you choose to participate, you can withdraw from the study at any time without any penalty. All records will remain confidential.

Your personal experiences as a Latina scientist or engineer makes you a wonderful source of information. Your personal insights as a co-researcher will help me better understand the essence of your experiences as it emerges through our discussions on mentoring Latina scientists and engineers. Your feelings and lived experiences are most important to the study.

If you have any questions or concerns related to the study, I can be reached at (703) 340-0439 or via e-mail, sanmigua@gwmail.gwu.edu. You may also contact my dissertation

chair, Dr. Mikyong Minsun Kim, Associate Professor, at 202-994-3205 or via e-mail kimmi@gwu.edu.

I value your input and participation. Thank you for your participation and support with this study.

Best regards,

Anitza M. San Miguel, M.S.
The George Washington University
Doctoral Candidate

Appendix B: Data Collection Instrument: Interview Questions

(IRB # 070801)

Demographic data will be collected prior to the interview with the participant. The demographic data will allow the researcher to comprehend the depth and breadth of the research questions. This data will help in the interpretation of the results. The following demographic data will be collected: (1) country of origin; (2) college degree obtained and name of college; (3) occupation; and (4) parental level of education.

Interview Questions

1. What do you think made you successful in your career?
2. What experiences do you consider helped you in achieving your current position?
3. What experiences do you consider a hindrance in achieving your current position?
4. What does mentoring mean to your career?
5. What are your perceptions about mentoring Latinas in science and engineering careers? What are the benefits? What are the challenges?
6. How did you meet your mentor?
7. What is the significant quality of your mentor(s) that helped your career advancement the most? Helped the least?
8. How did your mentor(s) influence your career path?

9. How did mentors help you achieve the position you have achieved?
10. How do you feel about mentoring programs as a viable way to help Latinas achieve their academic and professional goals?
11. What others factors do you consider to be more or less important than mentoring?

Appendix C: Participant Consent Form

TITLE:
LIVED EXPERIENCES AND PERCEPTIONS ON MENTORING LATINA SCIENTISTS AND ENGINEERS

GW IRB number: 070801

Principal Investigator: **MIKYONG MINSUN KIM** Telephone number: [redacted]

Sub-Investigator: **Anitza M. San Miguel** Telephone number: [redacted]

Sponsor: *NA*

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1) INTRODUCTION

You are invited to participate in a research study under the direction of Dr. MIKYONG MINSUN KIM, of the Department of Education Leadership, Higher Education Administration Program at the George Washington University (GWU). Taking part in this research is entirely voluntary.

2) WHY IS THIS STUDY BEING DONE?

You are being asked to take part in this study because your *lived experiences* as a successful Latina in science and engineering will assist me in conducting my dissertation research to determine how Latinas in science and engineering careers have achieved a high-level position with their organization. Your participation in this study will add to the current body of professional knowledge regarding this subject. This project is part of the research phase of my study using a Phenomenological research method.

This research constitutes partial fulfillment of the requirements for the Doctor of Education degree at the George Washington University, Higher Education Administration Program. Additionally, you are invited to participate in this study because your personal insights as a participant will help me better understand the essence of your experiences as it emerges through our discussions as to whether or not mentoring could assist Latinas achieve a high-level position within their own organization. Your feelings and lived experiences are most important to the study. Your personal experiences as a professional Latina in science and engineering make you a wonderful source of information.

The purpose of this study is to understand the lived mentoring experiences of Latina scientists and/or engineers. This study also seeks to understand how Latina

scientists and engineers achieved a high-level position within their organization and impediments they encountered along their journey.

The research will be conducted at the following location(s):
In-person, one-on-one interview will take place at your office or at a convenient location where we can both meet.

A total of 8-10 participants from the private sector, government, and academia will be asked to take part in this study. You will be one of the 8-10 participants to be asked to take part.

3) <u>WHAT IS INVOLVED IN THIS STUDY?</u>

If you choose to take part in this study, the following will be requested of you:

- You will be asked a series of 11 questions that surround the issues of your *lived experiences* and perceptions of how you as a Latina achieved a high-level position within your organization.
- Furthermore, I would like to understand the impediments you encountered along your professional journey.
- During the interviews, I will be tape recording all of your responses as well as taking notes.
- After the interviews, I will have the tapes transcribed.
- Once the tapes have been transcribed, I will arrange a second meeting with you to review the transcripts for accuracy and any other comments you may have.

The following activities are specifically research related (the activities are required on-site):
1) Recruitment: Recruiting professional Latinas by contacting different Latino as well as science and engineering organizations. Latina scientists and engineers will be identified. Recruitment will also take place through snowball sampling, which means asking one participant to recommend others in the same area of expertise for interviewing.
2) Interaction: The interaction for this study will consist of in-depth interviews.
3) Follow-up: As a phenomenological researcher, I will conduct a brief follow-up interview with each participant allowing the participants to review interview transcripts for accuracy and or to allow them to provide any additional information.

The total amount of time you will spend in connection with this study is 1 hour and 30 minutes to complete an initial interview and a follow-up interview.

4) <u>WHAT ARE THE RISKS OF PARTICIPATING IN THIS STUDY?</u>

Minimal Risk Statement:
There are no physical risks associated with this study. There is, however, the possible risk of loss of confidentiality. Every effort will be made to keep your information

confidential; however, this cannot be guaranteed. Some of the questions we will ask you as part of this study may make you feel uncomfortable. You may refuse to answer any of the questions and you may take a break at any time during the study. You may stop your participation in this study at any time.

5) ARE THERE BENEFITS TO TAKING PART IN THIS STUDY?

You will not benefit directly from your participation in the study. The benefit to science and humankind that might result from this study is that

- Young Latina girls in high school will be empowered and encouraged to pursue and successfully achieve a career in science or engineering.

6) WHAT ARE MY OPTIONS?

You do not have to participate in this study if you do not want to**.** Should you decide to participate and later change your mind, you can do so at anytime. However, should you need a reasonable accommodation to fully participate in this study, please notify me of the type of accommodation you may need. Note: This is in accordance with the Americans With Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973.

7) WILL I RECEIVE PAYMENT FOR BEING IN THIS STUDY?

You **will not** be paid for taking part in this study.

8) CAN I BE TAKEN OFF THE STUDY?

The investigator can decide to withdraw you from the study at any time. You could be taken off the study for reasons related solely to you (for example, not following study-related directions from the Investigator) or because the entire study is stopped.

9) HOW WILL MY PRIVACY BE PROTECTED?

If results of this research study are reported in journals or at scientific meetings, the people who participated in this study will not be named or identified. GWU will not release any information about your research involvement without your written permission, unless required by law.

10) PROBLEMS OR QUESTIONS

The Office of Human Research of George Washington University, at telephone number (202) 994-2715, can provide further information about your rights as a research participant. If you think you have been harmed in this study, you may report this to the Principal Investigator of this study. You may obtain further information regarding this study by contacting Dr. Mikyong Minsun Kim (the principal investigator and dissertation

chair), at [redacted]. For problems arising on evenings or weekends, you may call Anitza M. San Miguel at [redacted] (student researcher).

* Please keep a copy of this document in case you want to read it again.

If you agree to participate in this study, please sign below:

To ensure anonymity, your signature is not required in this document unless you prefer to sign it. Your willingness to participate in this research study is implied if you proceed with completing the survey/interview.

Please keep a copy of this document in case you want to read it again.

Appendix D: Epoché (Bracketing)

(IRB # 070801)

The study has invalidated, inhibited, and disqualified all reference to prior knowledge and experience (Moustakas, 1994). The transcendental "adheres to what can be discovered through reflection on subjective acts and their objective correlates" (Moustakas, 1994, p. 45), while phenomenology "utilizes *only* the data available to consciousness" (p. 45). As such, the problem this researcher sought to examine is a challenge in understanding the participants' own experiences and personal connection to the phenomena, mentoring. As a Latina researcher whose background is in Biology and Biotechnology, I have experienced mentoring throughout my academic and professional career. My mentoring experiences have been mostly positive. My first mentor motivated and encouraged me to apply to a predoctoral program at the _____. Through his support and guidance, I applied to the program and was accepted. Unfortunately, he passed away two months before I received the acceptance letter. Once at _____, my supervisor and mentor encouraged me to pursue my master's degree, which I successfully completed. I worked at _____ for nine years and can recall only one negative experience, a frustrating one. I worked at a laboratory that was at the cutting edge of _____ research. I was hired to be in charge of their _____ and to conduct my own research project within a couple of months. Two years passed and I was still in charge of the _____, but not conducting any

research project. I discussed with my supervisor several times the possibility of either conducting my own research or assisting one of the postdoctorate students in their research. It never happened. I was stagnant in my position, and felt as if I was not utilizing my experience and education to its maximum. This negative experience did not hurt or inhibit my career advancement—on the contrary, it gave me the courage to move forward and seek another job, one where I did not allow myself to be stagnant in a work environment that would not enhance my career.

Throughout my career, I have received adequate mentoring and strongly believe mentoring was beneficial to my advancement. At the beginning of my career, I experienced a barrier that I believe did not hurt my career but rather it enhanced it. I applied for a master's degree program at the _____ after working for a year at the _____ and I was not accepted. It was frustrating not to be accepted at a master's degree program in my homeland. I discussed my situation with my supervisor and mentor and he suggested and encouraged me to look into part-time graduate programs. I was accepted to an evening Biotechnology master's degree program at The Johns Hopkins University. I was the only Latina in my class, and successfully completed my degree in two years. Being rejected did not define me, nor did it deter me from my goals. Quite the opposite, it opened a whole new world of opportunities.

When I think of these experiences, the only one that is emotionally laden is the master's degree program experience. To this day, I cannot believe that I was not accepted to a master's degree program in _____. However, without this experience I would probably have not applied to a master's program at The Johns Hopkins University and

would not have pursued a doctorate degree. As such, mentoring served as a foundational catalyst for me to continue on with my academic pursuits and life's work.

For these reasons, my biases and personal perceptions about mentoring as well as my personal perceptions of the Latino culture within the United Stated were set aside. I reflected on those biases and perceptions in a personal reflective journal. Thus, I was mindful to step back and be conscious in analyzing my own experiences of mentoring as they relate to this study.

Finally, I separated my mentoring experiences, as a protégé who worked in different scientific research laboratories for nine years, from that of a researcher. There is a predisposition for me to relate with the mentoring experiences of the Latina participants in this study as I have experienced mentoring at different levels as a protégé. For this reason, my biases were observed closely and documented in my journal as well as in the delimitations of the study. I made journal entries, as needed, on personal experiences with the phenomena of mentoring as well as the Latino culture, and used reflection to maintain objectivity in conducting the study.

Appendix E: Personal Reflection

The aim of phenomenology is to gain a deeper understanding of the everyday experiences while gaining insightful descriptions of the way individuals experience the world. As I went through the phenomenological approach, I was hoping to gain a deeper understanding of how eight Latinas achieved their successful careers in science and engineering. I wanted an insight about what drives certain individuals, regardless of their particular situations, to succeed. In retrospect, I think I gained much more.

We all have challenges. Some individuals see these challenges as insurmountable obstacles that cannot be overcome, and they give up easily. Others, like the study participants, have the drive to succeed and surpass whatever challenges they are faced with, whether family background, upbringing, social class, lack of support, stereotyping, or others.

This study identified the traits that made these individuals successful. They all had *something* that they used as a tool to achieve success. Understanding that *something* can be key to the success of others that may follow, so they can also be successful.

Because I am a Latina myself, the study took a special meaning for me, as I had (and still do) experienced the same challenges. I found myself asking whether I possessed the traits that I was studying. I found myself answering my own questions, rediscovering the traits that got me to the point where I am today. During each of the interviews I saw

how each of the participants' experiences connected and how their stories were in some cases related. It was very rewarding for me to meet these successful Latinas who participated in the study. In one instance, I felt that I was interviewing a legend in the scientific field. In learning about their personal and professional experiences, maybe unknowingly, these individuals became role models to me. And I am thankful for it.