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WOMEN C-SUITE EXECUTIVES IN CYBERSECURITY: TRANSFORMATIONAL
EXPERIENCES AND GENDER BARRIERS ON THEIR LEADERSHIP JOURNEYS

by

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EXPERIENCES AND GENDER BARRIERS ON THEIR LEADERSHIP JOURNEYS

ABSTRACT

Cybersecurity is one of the fastest growing industries with a critical role in protecting businesses and people from attacks that continue to grow and affect our nation. There is an increasing gap between the demand to fill jobs in the field and the skilled professionals available. Women currently fill less than 17% of those skilled positions. Understanding the paths of success and the barriers experienced by women cybersecurity leaders is key to determining how to fill the skill gap in the industry. This study uses a qualitative methodology with a descriptive phenomenological design to answer the research questions from the perspective of sixteen women C-Suite executives in the cybersecurity industry. The study focused on the human experience and behavior through descriptions of transformational experiences on a journey toward leadership. Exploring the concepts of mentorship, sponsorship, and trusted advisor in relation to the experiences of these women executives in cybersecurity provides insight into how organizations can replicate similar situations to overcome gender bias and encourage career growth for women in the industry. Participants described organic and informal instances of mentorship and other significant relationships as crucial to their success. Sponsorship was described as the most influential contribution to pivotal moments in their careers. The barriers the participants described were a variety of instances related to gender bias and discrimination with clear examples of both the glass ceiling and the glass cliff.

Findings from this study provide organizations a framework by which to shift the organizational mindset away from marginalizing women and toward attracting and retaining them through support, sponsorship, and continued career and leadership development. Some recommendations from the study are: 1. Make it an organizational strategy to define, recognize, and deconstruct microaggressions in practices and processes that perpetuate unconscious bias. 2. Develop sponsorship for women at all levels of the organization. 3. Develop job descriptions in cybersecurity that create pathways for women. 4. Educate women to navigate various aspects of an organization and how to develop relationships that can support their growth.

Keywords: women executives, women c-suite, sponsorship, mentorship, trusted advisor, gender bias, gender discrimination, the glass cliff, the glass ceiling, gender microaggressions, cybersecurity.

University of New England

Doctor of Education
Educational Leadership

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CHAPTER 1: INTRODUCTION

Women currently make up 11% of the world's information security workforce, contributing to the underrepresentation of women in executive leadership for cybersecurity as well as the overall industry (Burrell & Nobles, 2018; Cobb, 2018; Franklin, 2017; Reed, Zhong, Terwoerds, & Brocaglia, 2017). Women in the United States have a slightly higher rate with 14-17% working in cybersecurity (Reed, et al., 2017; U.S. Bureau of Labor Statistics, 2019). The proportion of women working in information technology is low, and it is even lower for cybersecurity (Tang, 2017). Considering that women make up almost 50% of the workforce in the United States, 14-17% is disproportionate and shows an underrepresentation of women in the industry (Tang, 2017). This scarcity of women in cybersecurity directly contributes to the shortage of skilled professionals in the industry (Burrell & Nobles, 2018).

Women in security positions are more likely to hold non-managerial roles, as men are nine times more likely to hold managerial roles, and four times more likely to hold corporate-level, or C-level, and executive-level positions (Frost & Sullivan, 2017; Myers, 2017; Tang, 2017). According to a 2017 report from the International Information System Security Certification Consortium, or (ISC)², cybersecurity industries around the world will experience a shortage of 1.8 million professionals by 2022. Women are unable to fill the gap as they are severely underrepresented among professionals with the necessary skills (Cobb, 2018; Franklin, 2017; Tang, 2017).

The 2017 Global Information Security Workforce Study (GISWS) included close to 20,000 respondents from 170 countries making it possibly the largest study of its kind in the cybersecurity industry. Although women only make up 11% of the industry's workforce, they reported higher levels of education. Findings also showed that 51% of women surveyed had

indicated experiencing some form of discrimination. The GISWS report showed that companies need to take action on engaging and developing women in the industry in order to retain them or the gap in the global workforce will continue to increase each year (Frost & Sullivan, 2017, p. 17). The industry has had difficulty with scarcity in talent and skills available to fill open positions. If 50% of the workforce in the United States consists of women yet only 14% are working in an industry that cannot meet the demand for talent, some attention should be given to developing, attracting and retaining skilled women professionals.

Statement of the Problem

Cybersecurity is one of the fastest growing industries with a very critical role in protecting businesses and nations from being compromised by hackers and attacks that continue to grow in variability and sophistication (Burrell & Noble, 2018; Cobb, 2018; Franklin, 2017). A shortage of skilled professionals creates an obligation to fill this gap with female professionals (Cobb, 2018; Franklin, 2017; Myers, 2017). The findings from the most recent Global Information Security Workforce Study of 2017 (GISWS) showed that underrepresentation, wage gap, and discrimination, whether conscious or unconscious, all prevent career growth for women in the information security or cybersecurity industry. The study determined that women who receive sponsorship and mentorship are more likely to be successful, and women in the industry who received training, mentorship, sponsorship and leadership development felt valued and had greater job satisfaction. A large proportion of women who felt valued in their roles also reported higher levels of access to sponsorship (Frost & Sullivan, 2017). The study determined that women in cybersecurity who have been mentored, sponsored, and offered participation in leadership development have higher levels of job satisfaction (Frost & Sullivan, 2017).

Bringing more women into cybersecurity requires the existence of a clear pathway, or pipeline, from education to the organization where currently gender stereotypes are still barriers (Burrell & Nobles, 2018; Franklin, 2017). Underrepresentation of women in STEM (Science, Technology, Engineering and Math) fields can be attributed to a variety of educational and social factors affecting women including inadequate academic preparation, curricula and teaching practices that do not relate well to females (Harris, 2015; Johnson, 2013). A lack of positive experiences with science and a lack of role models and mentors also adversely affect women in STEM fields (Harris, 2015; Johnson, 2013). Additionally, there are societal stereotypes and callous environments that are not friendly to female interests (Burrell & Nobles, 2018; Harris, 2015; Johnson, 2013). According to Maurer (2017), fixing the gender gap requires businesses to work with schools to educate and market the cybersecurity industry to girls while also promoting women within the industry to high-level positions in order to provide role models for potential female employees. This suggests a proactive part for organizations to build a pathway for women from early education to promotion and leadership roles within the organization.

Organizational biases need to be recognized and reframed to allow for change to occur within companies (Bolman & Deal, 2017). More information is needed about the experiences of women who have succeeded in the cybersecurity industry, including what obstacles and barriers they encountered and what relationships contributed to their successes, in order to understand how to help create a successful career pathway within organizations and customize an approach for professional development (Burrell & Nobles, 2018; Littlejohn, 2016). This information could help organizations create career development programs internally that contribute to the leadership development and retention of women in the industry. Additionally, planning for the

success of women in the organization can help fill the growing skill gap in the industry (Burrell & Nobles, 2018; Cobb, 2018; Franklin, 2017).

Purpose of the Study

The purpose of this qualitative, phenomenological study was to explore the professional, lived experiences of women executives in the cybersecurity industry within the United States. It explored the pivotal experiences that women executives in cybersecurity perceived have led them to their current role, and how relationships such as mentorship, sponsorship, or trusted advisors have been influential to their success. Through a better understanding about how they became C-level executives in the industry, what made them successful, and what experiences they had on the way, development plans can be created for future executives. Organizations can use these findings to adjust their practices in order to provide support for women executives who struggle with being successful in the changing environment. Exploring the concepts of mentorship, sponsorship and trusted advisor in relation to the experiences of women executives in cybersecurity provided insight into how organizations can replicate similar situations to encourage career growth for women in the industry.

Research Questions

The focus of this study was to explore the lived experiences leading to the advancement of women to C-level executive positions in information security or cybersecurity organizations located in the United States. Understanding the lived experiences of these women could provide insight into relationships and other social and organizational constructs that allowed the participants to enter a male-dominated field, overcome gender bias and organizational barriers, and achieve a leadership position. This study focused on the perceptions and lived experiences of some of the few women who have achieved C-level executive status.

Qualitative research usually has a central question with surrounding sub-questions (Creswell, 2015). This study aimed to address the overarching research question; what is the lived experience of women executives in the cybersecurity industry regarding relationships that influenced their successful career trajectory? The goal of the study was to discover the social and organizational barriers and influences that these women have encountered on the path to becoming leaders in the cybersecurity industry. The following research questions guided this research and addressed the problem statement:

- RQ1: How do women executives in the cybersecurity industry describe their perception of the pivotal lived experiences in their career where a relationship such as a mentor, sponsor, or trusted advisor, was transformational to their development as a leader?
- RQ2: What do women executives in the cybersecurity industry perceive as the crucial aspects of their leadership?
- RQ3: What barriers do women executives in the cybersecurity industry perceive they encountered in a predominantly male field?

The central research questions contributed to the interview questions that were used with each participant. Interviews with open-ended questions were used to gather data describing their experiences. This data was then transcribed and coded to identify emergent themes, narratives, and quotes that provided insight into this phenomenon.

Conceptual Framework

The theoretical foundations provided a lens by which the research could be studied, and the conceptual framework provided broad ideas that contributed a structure for the study.

Theoretical foundations explain present understandings of natural phenomena, and a conceptual framework is a group of related ideas that explain the natural phenomena (Giorgi, 2009). The theoretical foundations and conceptual framework provided an understanding about the lived experiences of women executives in cybersecurity, especially relationships that were pivotal and crucial aspects of their leadership that contributed to their success. Also explored were social and organizational barriers they overcame. There are few women going into the field of cybersecurity, resulting in even fewer female executives. According to the Global Information Security Workforce Study (GISWS), conducted by the Center for Cyber Safety and Education and (ISC)², women are severely underrepresented in cybersecurity, holding eleven percent of the cybersecurity jobs globally (Reed, Zhong, Terwoerds, & Brocaglia, 2017). However, cybersecurity is a growing field, and the demand to fill positions is relentless (Burrell & Nobles, 2018; Morgan, 2016b).

There is evidence of gender disparity in cybersecurity as is the case with many male-dominated industries (Johnson, 2013; Wynn & Correll, 2017). Women comprise a large portion of our workforce but are mostly underrepresented in the C-level executives of innovative organizations such as IT or cybersecurity (Burrell & Nobles, 2018; Cobb, 2018; Franklin, 2017; Reed, Zhong, Terwoerds, & Brocaglia, 2017; Tang, 2017). The “glass ceiling” is the terminology phrased by Marilyn Loden when she spoke on a panel at the 1978 Women’s Exposition in New York, and it describes the experience women can face in the corporate world when it is obvious that the upper echelon of an organization is not available to them (Vargas, 2018). The glass

ceiling is a metaphor for discrimination due to gender-based biases as well as lack of opportunity due to low numbers of women in the field, but the term refers to the barriers that exist specifically for women (Bendl & Schmidt, 2010; Buckalew, Konstantinopoulos, Russell, & El-Sherbini, 2012; Dahlvig & Longman, 2010; Delmont, 2016; Weidenfeller, 2012; Woszczyński & Shade, 2010).

Social Role Theory

There are two main theories to consider when studying the social implications surrounding the career path of women executives in a male-dominated industry such as cybersecurity. One is the social role theory that was developed by Alice Eagly (1987). Social role theory is based on the idea that individual beliefs and expectations create gender stereotypes. Women leaders run into gender bias because they do not fit the perceived expectations from a gender stereotype (Buckalew, et al., 2012). The social role theory argued that there are traits of a leader that society attributes to the qualities of men. This perception could interfere with promotion of women to executive roles (Buckalew, et al., 2012). Social role theory applies to the glass ceiling effects which prevent the advancement of women to executive leadership within corporations, and for this study, specifically to the cybersecurity, or information security, industry (Buckalew, et al., 2012).

Role Congruity Theory

The second theory about gender stereotypes influencing the glass ceiling effect is the role congruity theory. Eagly and Karau's (2002) role congruity theory is the prejudiced perception that female roles are not congruent with leadership roles. Role congruity refers to behaviors being aligned with gender roles that are socially acceptable (Buckalew, et al., 2012). This theory is similar to the social role theory. The main premise of role congruity is that "individuals are

punished when they fail to conform to societal expectations” (Skelly & Johnson, 2011, p. 60). The role congruity theory suggests that underrepresentation of women in senior leadership has more to do with the expectation for women in their family roles and the tendency to not display the traits expected of leaders, including risk adversity (Franklin, 2017). Men are also more likely to believe they are more suitable to the skill and culture of a technology position than women are to believe themselves the same (Wynn & Correll, 2017).

These two theories are lenses that were used for seeing the social implications that exist in addition to organizational barriers when studying the development of women executives in cybersecurity. Social role theory research focused on male and female roles and how their behaviors differ based on gender stereotypes (Eagly, 1987). The role congruity theory focused on the perception of women being less capable of leadership than men due to the prejudiced beliefs that sex predetermines certain roles (Eagly & Karau, 2002). It is assumed that women who have succeeded to executive leadership in the cybersecurity industry have most likely encountered gender bias from individuals, the organization or even their own assumptions since both technology and leadership tend to be categorized as relating more to men.

As gender stereotypes are not always explicit, a comprehensive view of underlying or implicit bias was necessary in review of the career pathways of women who have succeeded in becoming a C-level executive in cybersecurity. Organizations are risk-adverse toward hiring women into executive roles due to social structures, culture and beliefs about leadership in that organization. The role congruity theory helped explain how discriminating beliefs could exist within the very beliefs and social structures of the organization, creating circumstances that prevent women from accessing leadership roles within these organizations (Eagly & Carli, 2007). If the decision-makers of an organization do not believe women fit the role of a

technology leader, then women will not be chosen for those positions. Additionally, if women do not identify with the skills and culture of a tech position, they are less inclined to choose that field (Wynn & Correll, 2017).

Microaggressions Theory

The theory of Microaggressions (Sue, 2010) was added to the conceptual framework during the data analysis. There were so many varying instances of gender bias and discrimination that it felt necessary to define them more clearly by identifying the hidden or invisible aspect that executive participants kept referring to when describing their experiences. Microaggressions are verbal and nonverbal behaviors that communicate negative, hostile, and derogatory messages to people who belong to marginalized groups based on gender, race, sexuality, and others. These microaggressions are an attempt to label and define unacceptable discriminatory behaviors that may be intentional or unintentional and are often unconsciously rooted in hidden societal norms (Sue, 2010). Three forms of microaggressions are: 1. Microassaults, which are the conscious, deliberate behaviors of discrimination, 2. Microinsults, which are usually unconscious, subtle rudeness that communicates a covert insulting message that conveys stereotypical, demeaning messages based on the person's identity, and 3. Microinvalidations, which are disconfirming messages that exclude, negate or dismiss the thoughts, feelings or experiences of certain groups (Sue, 2010).

The research of microaggression lead to uncovering microaggressions specific to gender. These include: 1. Sexual objectification, 2. Second-class citizenship, 3. Use of sexist language, 4. Assumption of inferiority, 5. Restrictive gender roles, 6. Denial of the reality of sexism, 7. Denial of individual sexism, 8. Invisibility, 9. Sexist humor and jokes, and 10. Environmental invalidations which include macrolevel aggressions that are systemic in nature (Gartner,

Sterzing, Fisher, Woodford, Kinney, & Victor, 2020). According to Sue (2010), the steps to eliminating microaggressions involve defining them, recognizing them, and then deconstructing the hidden meaning of them. This theory became a framework by which to define the barriers from gender discrimination described by the participants.

Reframing Organizations Theory

There are some recent studies regarding the experience of women in cybersecurity. One is a narrative of women leaders in cybersecurity companies (Littlejohn, 2016) and another is research about women studying to get into cybersecurity (Pifer, 2017). Isolation is the experience of many women in cybersecurity, and mentorship is a potential response to that barrier (Bagchisen, Rao & Upadhyaya, 2010; Littlejohn, 2016; Woszczyński & Shade, 2010). There is not a lot of research about women C-level executives in cybersecurity, especially from an organizational perspective, including how to build mentorship and sponsorship to combat isolation in an organizational culture and what a career trajectory would be for a woman executive in the cybersecurity industry.

The audience for more recent studies was geared mainly for higher education to determine how to develop pathways for women into cybersecurity and how to develop women in cybersecurity programs at a college or university or in STEM programs. This study aimed to understand the lived experiences of current C-level women executives in cybersecurity to replicate successful leadership development for other women in the industry by taking an organizational perspective congruent with a corporate culture rather than a perspective aligned with an institutional culture of higher education.

Bolman and Deal (2017) described four frames, or perspectives, by which leaders should view organizational issues: structural, human resources, political, and symbolic. Considering

leadership development for women executives through these frames provided a more complete understanding about how an organization could better support, develop, and retain women leaders. It also provided a structure by which to begin development of a higher education curriculum that prepares women to enter a male-dominated field successfully by understanding how to adapt to different and changing organizational cultures. Studying the career paths and support experienced by C-level women executives in the cybersecurity industry provided a better understanding about how to develop future pathways for women in a newer industry that is currently experiencing simultaneously both tremendous growth in industry and a skill gap in the workforce. A clear path for women in this industry requires a better understanding of both the social barriers of inequity and the organizational implications of these barriers.

Social Cognitive Theory

Social cognitive theory explained how people who observe a model performing a behavior and the consequences of that behavior, will remember the sequence of events and use it to guide their own behaviors (Bandura, 1997). Some participants expressed how they engaged in behavior they learned by replicating the actions of others. Bandura (1997) contended that successful behavior increases feelings of accomplishment associated with self-efficacy and leads to reinforcement of the behavior. Social cognitive theory was one frame examined to help explain the experiences these women executives perceived as pivotal moments in their careers with mentors, sponsors or trusted advisors as well as pivotal moments of passive learning through observation.

Assumptions, Limitations, and Scope

There was an assumption with consideration to this study that the participants would contribute some part of their success in the industry to relationships that have provided guidance

or assistance somewhere along their career paths. There was also an inherent assumption that the participants would want to participate, that they would be helpful, honest and forthcoming in their conversations with me, and have no expectations of remuneration for their participation. The participants opened up to me for the most part due to the research protocol that was communicated clearly, stating that confidentiality was ensured. Also, the use of video conference allowed the participants to become comfortable with me through my use of non-verbal cues of nods, smiles, and attentiveness that was intended to validate everything they contributed to the interview.

Having previously been a part of the executive team in a cybersecurity firm, I have an inherent bias based on my personal experience facing gender discrimination and bias so there was an assumption that I would acknowledge my own experience but remained objective as possible in my review of the data.

Limitations included the timing of this study and the specificity of the group. Executives were very busy, and availability was limited. This study was limited to a small number of candidates as the goal was to interview C-level women leaders. Considering women are underrepresented in the cybersecurity industry, it was initially a challenge to identify many executives. However, the snowball method of attaining participants helped contribute to the 16 executives that participated.

The scope of the study included women in C-level positions in the cybersecurity industry within the United States. The recruitment for participants included those who identified with a mentor, a sponsor, or a trusted advisor as a pivotal experience that contributed to their career. The recruitment of women CEOs in cybersecurity did not provide enough participants, so other C-level leadership roles such as Chief Operational Officer (COO), Chief Strategy Officer (CSO),

Chief Information Officer (CIO), Chief Information Security Officer (CISO), and Chief Technology Officer (CTO) were included in the search for participants.

Rationale and Significance

Women in information security who have achieved C-level leadership can help guide younger women entering the industry by acting as mentors or sponsors within an organization or even as a trusted advisor within or outside of the organization (Mitchell, 2012; Wasylyshyn, 2015). Women are currently underrepresented in the industry, and few have advanced to the middle management levels, with even fewer to top management. Based on their survey of 7,280 business leaders in 2011, Zenger and Folkman (2012) found that women are rated more highly than men as leaders at every level, and the higher the management level, the greater this gap grows. Women CEOs of Fortune 500 companies make up only 5.2 per cent of the total CEOs in 2015 (Catalyst, 2015). The percentage of women CEOs remains almost the same when CEOs of Fortune 1000 companies were considered (Parker, Horowitz, & Rohal, 2015). Even though women may be “shattering the glass ceiling”, the uphill battle they face from these various challenges may be setting them up for failure, pushing them over the edge into what Ryan and Haslam’s (2009) termed the “glass cliff” (Sabharwal, 2013).

The data gathered from participants in this study provided information to help organizations understand how to remove existing barriers and encourage successful career trajectories for women. Information security corporations need to remain competitive in the marketplace, so continuous innovation is necessary. Innovation relies on an environment in which diversity is encouraged, and women are part of changing the homogeneity of the industry. The outcome of this study also serves as a model for young women who are interested in the field or interested in leadership.

Definition of Terms

The following terms defined are used throughout this study.

C-level executive. A C-level executive is a high-ranking leader that is part of the executive team of a company and makes company-wide decisions. The “C” stands for “chief” in corporate executive titles that make up the C-Suite, or group of C-level executives. Some C-level titles for executives considered for this study include the Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Operating Officer (COO), Chief Information Officer (CIO), and Chief Information Security Officer (CISO) (Sonnenfeld, n.d.).

Continuous innovation. Continuous innovation was used to explain the ability to change and renew an organization through new products and business models (Steiber & Alänge, 2013). This is a term used when referring to industries that need to adjust quickly to changing markets.

Cybersecurity. Cybersecurity is also known as information security and is concerned with protecting data that is found in electronic form or in the cloud. This is a newer term that stems out of the information security industry as more data has moved off hardware and into the cloud (Irwin, 2018).

Glass ceiling. The glass ceiling described the phenomenon of an invisible barrier based on attitudinal or organizational biases that prevents women from advancing their careers or reaching the upper echelons of leadership in an organization (Buckalew, et al., 2012).

Glass cliff. The glass cliff is a term by Ryan and Haslam (2009) that described risky leadership roles where women are overrepresented in organizations in risk of failure due to organizational circumstances or systemic disadvantages (Ryan & Haslam, 2009).

Microaggressions. Microaggressions are verbal and nonverbal behaviors that communicate negative, hostile, and derogatory messages to people of marginalized groups. They

can be conscious or unconscious ideas derived from society and delivered as hidden messages that are damaging. Defining and recognizing the various microaggressions are the first steps to deconstructing these hidden messages through awareness (Sue, 2010).

Information security. Information security is another way of saying data security. Information security professionals are concerned about the confidentiality, integrity, and availability of data in an organization. Cybersecurity is a form of information security (Irwin, 2018).

Innovation. Innovation is the process of identifying new solutions that create new value for an organization. Innovating is a rigorous process. Innovation is also considered an outcome (Quintane, Casselman, Reiche, & Nylund, 2011).

Mentorship. Mentorship involves working closely with a mentee on skills and strategies for career development by providing advice, passing on information, or helping acclimate the mentee to the industry or the organization (Helms, Arfken, & Bellar, 2016).

Formal mentorship. Formal mentorship is in a structured environment where a third party pairs a mentor with a mentee. Normally there are certain requirements to accomplish for a scheduled time (Rosser, 2005).

Informal mentorship. Informal mentorship is unstructured, voluntary, flexible, and spontaneously formed. This is a mutual relationship formed by the two people (Holt, Markova, Dhaenens, Marler, & Heilmann, 2016).

Sponsorship. Sponsorship is another term used to explain the help of a more powerful individual in relation to the career development of a professional in a field. A sponsor goes beyond providing feedback and advice of a mentor and uses power to advance the protégé by leveraging influence with senior executives. Sponsors may advocate for the protégés, introducing

them to important people, pushing for assignments to get them promoted, and protecting them from those who will work against them (Helms, et al., 2016; Ibarra, et al., 2010).

Trusted advisor. A trusted advisor is a mentor, executive coach, consultant, sponsor, or other business advisor that is a trusted person in a dyadic relationship with the female executive (Allen & Finkelstein, 2003; Wasylyshyn, 2015).

Conclusion

Chapter 1 has identified the research problem, the purpose of the study, the main research questions, the conceptual framework consisting of the theoretical concepts that helped inform the study, the assumptions and limitations of the study, and the significance of the study. The overall intent of Chapter 1 was to introduce the topic of executive leadership specific to the career trajectory of women in the male-dominated industry of cybersecurity.

Social role theory, role congruity theory, and microaggressions theory were introduced to explain the challenges women face with gender bias, gender discrimination, the phenomenon of the glass ceiling, and the glass cliff. Additionally, Bolman and Deal's theory (2017) for reframing organizations was introduced to consider the perspective and responsibility of the organization in breaking down social and organizational barriers for women in the cybersecurity industry.

Chapter 2 will take a closer look at the literature that addressed the current skill gap of the cybersecurity industry, the underrepresentation of women in the industry, and the challenges and barriers that women encounter on their career path toward senior leadership. It also explored mentorship, sponsorship and the trusted advisor as potential areas for further study regarding the development and success of executive women in cybersecurity.

CHAPTER 2: LITERATURE REVIEW

The purpose of this qualitative, phenomenological study was to explore the professional, lived experiences of women C-level executives in the cybersecurity industry within the United States. What experiences did women executives in cybersecurity perceive have contributed to their career trajectory that lead them to their current role? Also, during their career, what mentorship, sponsorship or a trusted advisor, relationships have been influential to their success? This literature review provided an account of the scholarly work regarding the development of women executives in an organization, especially within a male-dominated industry where women are underrepresented, and specifically the cybersecurity industry. The main topic areas that contributed to the research to address the problem consisted of the most current work addressing the skills gap and talent deficiency in cybersecurity, early pathways and gender stereotypes with STEM (Science, Technology, Engineering and Mathematics) into cybersecurity, gender bias, the glass ceiling phenomenon, the glass cliff phenomenon, and how organizational success depends on the diverse influence of women. Additionally, the difference between mentorship, sponsorship, and trusted advisor roles were explored in the literature in relation to how they contributed to leadership development and identifying women executives for their potential contribution toward breaking down the barriers that cause underrepresentation of women in cybersecurity and in leadership roles.

Cybersecurity Skills Gap

The lack of women and minority workforce in cybersecurity directly contributes to the shortage of professionals and leaders in information security organizations (Burrell & Nobles, 2018). Cybersecurity is a sector of the information technology (IT) industry, and there is a similar shortage of individuals who are skilled with the expertise. According to the 2017 report

by the Executive Women's Forum, Frost and Sullivan and (ISC)², the information security field will experience a 1.8 million deficit in professionals by 2022. Women make up a small percentage of the information technology (IT) workforce with a specialization in cybersecurity. Only 14-17 percent of the cybersecurity workforce in the U.S. were women (Reed, et al., 2017; U.S. Bureau of Labor Statistics, 2019), and 11 percent globally are women (Burrell & Nobles, 2018; Morgan, 2016b).

This study did not intend to underemphasize the importance of females and males of color or various races or ethnicities. The field is male dominated and white. With the industry growing and the skill gap growing wider, it is imperative to look at the lack of diversity in the field. The United States Bureau of Labor Statistics (BLS) reported close to 83% of information security analysts were male and close to 75% were white. There seems to be little success with recruiting and retaining talent of people of color or different gender. But for the purpose of this study, the focus was limited primarily to gender.

Technology companies are innovative companies that compete to stay ahead of the latest changes in the market. Exposure to cybersecurity has increased through the media and personal experience of loss. The average person has become more aware of information security as people increasingly experience data that has been compromised through hospitals, banks, government, retail, and huge data breaches from big organizations are reported on the news. As breaches in private data become more evident, the demand for professionals with information security skills is increasing. However, there is a shortage of cybersecurity talent, and many jobs are currently vacant (Burrell & Nobles, 2018; Morgan, 2016b). Considering the complexity of building the technical and engineering talent necessary for the industry, it is evident that strategic organizational initiatives to hire more women are inadequate (Burrell & Nobles, 2018). The

research described some of the reasons that women and people of color are disproportionately under-represented in cybersecurity. Those who have prevailed helped provide information that is crucial to solving the significant information security skills gap that the industry is currently facing (Burrell & Nobles, 2018; Myers, 2017).

Cybersecurity is one of the fastest growing industries with a very critical role in protecting businesses and nations from attacks and hacks that continue to grow in variability and sophistication (Frost & Sullivan, 2017). Due to a shortage of skilled professionals, there is an obligation for organizations to fill this gap with female professionals (Cobb, 2018).

Understanding the paths of success and the barriers experienced for the existing female cybersecurity professionals is key to determining how to increase the number of women entering the industry and help prepare them for success.

Gender Bias in Technology

The scarcity of women in science was well documented with the potential to negatively impact the United States' workforce and competitive position amongst other countries if efforts do not result in increasing the number of female STEM (Science, Technology, Engineering and Mathematics) students, resulting in more women professionals in STEM fields (Holdren & Lander, 2012). Researchers have been working to identify why there has been a significant underrepresentation of women in STEM fields (Harris, 2015). These include insufficient academic preparation, lack of consideration of teaching practices and curriculum that appeal to females, poor experiences with science as a learner, lack of role models and mentors, gender stereotypes about who can be scientists, and STEM environments that are harsh or insensitive spaces for learning (Burrell & Nobles, 2018; Harris, 2015). STEM disciplines and programs have made more progress to increasing representation of females into the information technology (IT)

industry by acknowledging these barriers and providing a better pathway for females to enter IT. As critical stakeholders to this progress, government, industry, and academia have implemented strategies and programs to increase enrollment and graduation of women and other minorities from STEM programs (Burrell & Nobles, 2018).

Gender bias is both descriptive, stereotypical based on expectations of what women are like, and prescriptive, based on expectations about how women behave (Heilman, 2002; Heilman, 2015). These social concepts have contributed to the slow progress in advancing the representation of females in STEM studies and in organizations within STEM fields as gender bias can result in “devaluation of their performance, denial of credit to them for their successes, or their penalization for being competent” (Heilman, 2002, p. 657).

Based on a study by Williams, Phillips, and Hall (2016) of 557 women scientists regarding their perceived experiences, prescriptive gender bias was most common (76.3% of women interviewed reported it), followed by descriptive gender bias (66.7%) and gender bias triggered by motherhood (64.0%) (p. 11). Because of gender bias, it is argued that being competent does not ensure that a woman will advance to the same organizational level as an equivalently performing man (Williams, et al., 2016). The implications of societal expectations that cause gender bias in the workplace does not make it easy to shift away from the same bias in STEM education.

Surveys conducted by the National Center for Science and Engineering Statistics (NCSES) at the National Science Foundation provided data for a 2017 report titled *Women, Minorities, and Persons with Disabilities in Science and Engineering*. This NCSES reported that women have earned 57% of all bachelor's degrees and about half of all science and engineering bachelor's degrees since the late 1990s. However, in the computer sciences, women are

underrepresented. Although graduate degrees for women are up slightly in the past 20 years, bachelor's degrees are declining from 28.5% in 1995, to 25.1% in 2004 and down to 18.1% in 2014 (National Science Foundation, 2017).

Whatever progress has been made over the past couple decades in STEM-related careers, is not translating into computer science, and does not extend into cybersecurity. Female students studying STEM-related subjects are yet to be informed about cybersecurity as an option (Cobb, 2018). Women make up 50% of the labor force in the U.S., but only 14-17% within the cybersecurity industry in the U.S. Globally that percentage drops to 11% (BLS, 2019; Frost & Sullivan, 2017). Women entering the cybersecurity industry are coming in with higher levels of education than men with 51% of women having a master's degree or higher compared to 45% of men, and yet there is still a wage gap and underrepresentation of women in the field (Cobb, 2018; Myers, 2017; Tang, 2017). The inability to produce enough graduates from STEM programs to support cybersecurity constitutes a serious problem for the U.S. national security as well as the continuous innovation of technology to support the nation's continued ability to stay ahead of the threat of security breaches (Burrell & Nobles, 2018). As stakeholders become aware of the increasingly growing need for cybersecurity professionals, the skills gap that prevents critical positions from being filled, and the underrepresentation of women in the industry that could fill that gap, it is possible that more attention could be given to correcting these same barriers that prevent more women entering the field.

The Glass Ceiling

Male-dominated industries are ones characterized by female underrepresentation or by aggressive, engineering-intensive, competitive, 'up-or-out' corporate cultures (Dworkin, Maurer, & Schipani, 2012). Glass ceiling describes the phenomenon of an invisible barrier based on

attitudinal or organizational biases that prevents women from advancing their careers or reaching the upper echelons of leadership in an organization (Buckalew, et al., 2012; Dahlvig & Longman, 2010; Delmont, 2016; Weidenfeller, 2012; Woszczyński & Shade, 2010). Likewise, the literature also identified the existence of glass walls, lateral barriers that also limit women's advancement. Title II of the Civil Rights Act of 1991 created a bipartisan Federal Glass Ceiling Commission consisting of 21 members. The Commission was created to uncover the barriers that kept minorities and women from career advancement. The final report from the Glass Ceiling Commission was issued November 1995.

Four main reasons for the glass ceiling, reported by The Federal Glass Ceiling Commission of the U.S. Department of Labor include societal patterns of stereotyping and prejudice, governmental lack of information and enforcement, internal business, like loss of control by white male middle managers, and business structural barriers such as recruitment and outreach limitations (Hurley & Choudhary, 2016). The Commission has not released any other findings since 1995, but the glass ceiling is still a familiar problem. Awareness of the barriers that exist in organizations and the demands of the competitive corporate world could both contribute toward building company cultures that break down the glass ceiling in acknowledgement of the value of women leadership, increasing the hiring of more female CEOs over time (Buckalew, et al., 2012; Melancon, 2016).

There is also a relatively newer term by Ryan and Haslam (2009), the "glass cliff," that described risky leadership roles in organizations that are at risk of failure where women are overrepresented (Baker & Cangemi, 2016; Hurley & Choudhary, 2016; Sabharwal, 2013). These are the businesses where there is a high chance of failing due to organizational circumstances or systemic disadvantages (Buckalew, et al., 2012; Hurley & Choudhary, 2016; Melancon, 2016).

The glass cliff may be responsible for many women managers leaving their organizations prior to even reaching the top (Hurley & Choudhury, 2016). Women are more likely to be appointed to lead companies “in situation of crisis”, as they are often thought to possess “soft skills” or competence in handling situations involving other people” (Hurley & Choudhary, 2016, p. 253).

Women leadership style and characteristics may be better suited for challenging management or crisis situations, as proposed by glass cliff researchers like Ryan and Haslam (2009) (Bruckmüller & Branscombe, 2012; Bruckmüller, Ryan, Rink, & Haslam, 2014; Hurley & Choudhary, 2016). The belief that women leadership characteristics differ from that of men is stereotypical, but women leaders may be considered “transformational”, which is “characterized by consideration, motivation, stimulation and trust” (Bruckmüller et al., 2014, p. 210). Women are generally also considered relational with an interactive style (Hurley & Choudhary, 2016). Women with transformational and interactive leadership styles perform best with diverse teams in large organizations where development of collaboration and communication across departments and teams would benefit the organization (Hurley & Choudhary, 2016).

The Federal Glass Ceiling Commission issued several reports in 1995 where the findings and recommendations contained thorough discussions about mentoring. Women face barriers to career trajectories into senior positions because they lack access to information and networking, and they receive little visibility to corporate decision makers. The commission recommended the implementation of formal mentorship programs into businesses to remove the barrier on advancement. Increasing access to resources for women would allow them the opportunity to advance at a rate comparable to men (Dworkin, et al., 2012).

Women and Diversity in Cybersecurity

Fixing the problem of underrepresentation of women in cybersecurity could have an impact on breaking down gender biases and stereotypes and allowing an equitable path for women to advance to C-level positions, but it could also fill the skill gap that currently exists that puts the safety of individuals, organizations and our nation at risk of vulnerabilities and security breaches. Problems in cybersecurity persist due to a lack of diversity in thought, expertise, and technical discussion necessary to deal with the constant change in complexity from threats and vulnerabilities (Burrell & Noble, 2018). Increasing the representation of women in cybersecurity would also contribute to bringing diversity to the industry. As businesses are pressured to make security a strategic initiative because information security threats are becoming more invasive and threatening to the organization, it is becoming more evident that developing a diverse workforce capable of protecting company assets and customer data is crucial for organizational success (Schwab, Werbel, Hofmann, & Henriques, 2016; Woszczyński & Shade, 2010).

Cybersecurity organizations, much like other technology companies, also rely on continuous innovation to survive in a competitive market. As the market changes rapidly, technology companies must be agile and capable of adjusting quickly to changes. This requires a skillset not easily attained by a homogenous group. It requires a diverse group that allows for a variety ideas and skills (Cobb, 2018; Steiber & Alänge, 2013).

Homogenous groups are not as capable at solving complex problems where the landscape is constantly shifting and changing. Such work requires socially diverse groups of people with various specialties and perspectives. Diversity can increase the intellectual capacity of an organization and encourage innovation by inciting new ideas from those different perspectives (Burrell & Nobles, 2018).

Diversity is not just an issue of equity and fairness, it is a necessity for an innovative organization (Schwab, et al., 2016). The cybersecurity industry, whether private, public or government, needs to recruit, retain, and promote the best candidates in the industry to maintain a competitive ground with other companies, or in some cases other countries. Women need to be a part of this group, or the lack of workforce in the industry will only deplete the nation's overall intelligence and force and have organizations and institutions fighting with each other for limited talent to fill empty positions (Dworkin, et al., 2012).

Building a diverse team is important for an innovative, technology organization because it takes a multitude of perspectives to solve complex problems. A team of people with the same experiences and perspectives is not helpful and could possibly be detrimental to continued success. Cybersecurity professionals must be agile, critical thinkers who can plan, solve problems, and communicate effectively (Bologa, Lupu, Boja, & Georgescu, 2017). A diverse team increases the probability that the team will have all the necessary skills to be successful, and a diverse team is more likely to be able to solve complex problems (Cobb, 2018; Woszczyński & Shade, 2010). An equal mix of men and women better emulates the workforce and supports the ability to defeat cyberthreats by contributing to a diversity of skills (Cobb, 2018). It is becoming evident in other industries that women bring a difference to the organization that can address the diversity of customers and impact the success of the organization (Melancon, 2016; Weidenfeller, 2012).

Public companies in the top quartile for gender diversity were 15% more likely to have returns above the industry average (Cobb, 2018), and organizations that employed women to high executive levels earned significant financial benefits (Dworkin et al., 2012). An organization's financial performance is improved by including more women in top management

(Dworkin et al., 2012; Melancon, 2016). The underrepresentation of women in executive roles in general could be considered surprising as studies showed that women possess 60% of bachelor's degrees, they make up half of the total workforce, and have proven significantly improved organizational and financial performance as executive leaders (Colaco, Myers & Nitkin, 2010; Dworkin et al., 2012; Melancon, 2016).

Too many organizations overlook the value of women and other minorities in cybersecurity, especially at the executive and senior management levels (Burrell & Nobles, 2018). Since there is little research on the experience of successful women C-level executives in general, there is even less about women executives who have achieved executive roles in cybersecurity organizations to better understand their contributions to their organizations and the barriers they encountered. Organizational barriers can be surpassed by implementing targeted mentoring programs (Dworkin, et al., 2012). Corporations can benefit by providing women intern opportunities to gain real work experience and to showcase the invaluable qualities and capabilities of women who are interested in cybersecurity careers (Burrell & Nobles, 2018). A lack of a mentor, especially a same-sex mentor, can impede progress toward career advancement for women (Hurley & Choudhary, 2016). Creating and implementing leadership and mentorship programs and encouraging building a network internally and external of the organization are ways to help women overcome the glass ceiling barrier and progress their careers toward leadership (Baker & Cangemi, 2016).

Relationships and Guidance

Cybersecurity is a male-dominated industry where there are few women in the workforce, and even fewer in leadership positions who can be role models or mentors to those entering the field (Urrico, 2016; Woszczyński & Shade, 2010). Mentorship or sponsorship was recommended

from the 2017 Global Information Security Workforce Study to allow women a pathway to leadership in the industry. Organizations are encouraged to identify high potential women and provide them opportunities for advancement through mentorship and leadership development programs.

Mentoring

Mentoring is a teaching-learning relationship where the outcome is to develop skills and competencies on a career path through close feedback and guidance from a superior (Manning, 2005). Mentoring involves “a relationship between someone experienced in a career setting and someone inexperienced, with the purpose of guiding the latter person toward confident success” (Helms, Arfken, & Beller, 2016, p. 9). Mentors can help make connections for their mentees within the organization.

Women who are in the information security industry may also experience extreme isolation. “In the workplace, more women than men claim to experience institutional barriers. Many blame IT’s ‘hacker culture’ and social expectations for isolating women from IT” (Bagchisen, et al., 2010, p. 25). Mentors are a key to organizational success because they can provide a way to combat this experience with isolation in the workplace and minimize its effects on the few women who chose this career path (Woszczyński & Shade, 2010).

Research shows that the impact of mentoring is greatest for women in male-dominated professions and industries, especially if they have a powerful male mentor (Ramaswami, Dreher, Bretz, & Weithoff, 2010). Male-dominated industries are ones “characterized by female underrepresentation or by aggressive, engineering-intensive, competitive, ‘up-or-out’ corporate cultures” and “in this genre of industries are well served by developing mentoring relationships with senior-male mentors” (Ramaswami, et al., 2010, p. 389). Dworkin (2012) supported this

same assertion, adding that women in male-dominated workplaces need sponsorship and legitimacy, two key attributes of powerful, visible, and connected mentors. Many times, these mentors, or sponsors, are men.

The underrepresentation of women in the industry results in women having no choice but to accept male mentors instead as there are few, if any, women mentors to help provide guidance (Woszczyński & Shade, 2010). According to Bagchi-sen, et al., (2010), women often take a passive role in initiating relationships with a mentor and they have less opportunity than men to build a relationship with a mentor. They state that social identity plays a role into how mentorships are formed, meaning whether a person identifies with another person based on their perceived identification with the shared social group. There is a lack of mentorship that has caused a disadvantage for women to advance to leadership positions in the IT industry (Reddy, Adhikari, & Chitranshi, 2017). If there are few female mentors, it may place females in the organization at a disadvantage toward advancement (Reddy, et.al, 2017). When possible, women with a high potential for advancement in the organizations should be matched with someone who is at least powerful in that organization if they are not female (Dworkin, et al., 2012). Leadership positions equate to organizational power, and most senior leaders are male (Dworkin, et al., 2012). It is difficult to find enough of these powerful roles willing to be a mentor and ensure that women are in equal alignment with their male counterparts to be mentees to these powerful mentors (Dworkin, et al., 2012).

Mentor relationships contribute to career growth in an organization, and organizations fare better financially with the diversity of women (Kruger, 2016). The advancement of women into executive positions provides many advantages to an organization including improvement of organizational performance (Schwab, et.al, 2016). Organizations can help ensure women

representation by developing mentoring programs (Reddy, et.al., 2017). Cobb (2018) studied the vital role women play in filling the skill gap in cybersecurity firms and recommends that these organizations encourage their female workforce to increase their visibility within the organization and across the industry. It opens the door for mentorships between successful and aspiring female cyber-security professionals and shows that companies are supporting the effort (Cobb, 2018).

Formal mentoring programs tend not to work as well for women as they do for men as women are rarely connected to a female mentor (Dworkin, et al., 2012). There tends to be a natural rapport between the mentor and mentee that is more common with individual choice so often informal mentors are sought out (Dworkin, et al., 2012; Holt, et al., 2016). This informal mentorship feeds into the issue of not having enough women mentors for women entering a male-dominated field. And unless a mentor has power within the organization, women are not going to be advantaged (Dworkin, et al., 2012). In terms of advancement, individuals with extensive mentoring relationships reported receiving more promotions, higher incomes, and more satisfaction with their pay and benefits (Dworkin, et al., 2012; Holt et al., 2016).

Women are often classified as outsiders by those on the top rung of corporate leadership, so research suggested integrating mentoring programs between those at the top and those a few steps down in order to bridge the gap between the values, beliefs, and assumptions of both parties (Dworkin, Schipani, Milliken, & Kneeland, 2018). Research showed for example, that women receive less mentoring than men as first-time board members and are less likely to be named to other boards possibly due to this circumstance (Dworkin, et al., 2018). Effective mentoring programs is one strategic approach suggested by the research as a proposed solution to increase gender diversity in the C-Suite and (Dworkin, et al., 2018).

Mentorship may be recognized as the phenomenon experienced during certain times on the career path of professionals, but a study of CEOs showed that many did not relate to the terminology of mentor or mentee (Rosser, 2005). When asked questions with these terms, they understood what this represented in their own career but did not self-identify as mentor or mentee, which led to a search through the literature to other ways executives self-identify with similar roles within an organization (Rosser, 2005). The literature shows how it is not only mentorship that will help women advance to executive roles in an organization, but the visibility and support of sponsorship (Helms, et al., 2016; Ibarra, Carter, and Silva, 2010).

Sponsorship

Sponsorship is another term used to explain the help of a more powerful individual in relation to the career development of a professional in a field. A sponsor goes beyond providing feedback and advice of a mentor and uses power to advance the protégé by leveraging influence with senior executives (Helms, et al., 2016). Sponsors may advocate for the protégés, introducing them to important people, pushing for assignments to get them promoted, and protecting them from those who will work against them (Helms, et al., 2016; Ibarra, et al., 2010).

A *mentor* works closely with a *mentee* on skills and strategies for career development, while a *sponsor* positions the *protégé* for career opportunities and advancement (Dworkin, 2012; Helms, et al., 2016; Kruger, 2017). A *mentor* provides advice, passes on information, or helps acclimate the *mentee* whereas a *sponsor* helps get promotions or placements with developmental assignments that gives the *protégé* visibility to others in higher placement in the organization (Dworkin, 2012; Helms, et al., 2016; Kruger, 2017). A mentoring relationship may develop into a sponsoring relationship, but they are two different roles and may not be experienced by the same person (Helms, et al., 2016). Sponsorship may connect the protégé with influential people

and develop the protégé's network, displaying similarities to a mentoring relationship. The role of the sponsor, at a more advanced level, is to place the protégé in an advanced position (Helms, et al., 2016; Ibarra, et al., 2010; Sexton, Arbor, Lemak, & Wainio, 2014).

The organization can benefit from increased performance by developing mentoring and sponsorship, affecting the identity and purpose of the employees, and motivating both sponsors and protégés to perform well to succeed (Helms, et al., 2016). Given the difference between mentoring and sponsoring and the importance that sponsorship has on determining career advancement to executive roles, sponsorship should be an intentional process aimed by the organization to increase women's success (Helms, et al., 2016). Compared to male counterparts, high-potential women professionals receive mostly mentorship and not enough sponsorship for advancing in their organizations. Women are less likely to be appointed to senior leadership roles without sponsorship and are less likely to pursue them (Ibarra, et al., 2010). A significant proportion of women who claim to feel valued within their organization acknowledge having received leadership training or have benefited from sponsorship (Myers, 2017). Successful executive women pursue leadership training and build strong relationships with sponsors and mentors (Melancon, 2016; Price & Howard, 2012).

Mentorship and sponsorship have been studied in relation to the career trajectory of healthcare executives of women (Sexton, Arbor, Lemak, & Wainio, 2014). Their studies differentiated mentorship and sponsorship experiences of senior executives based on their roles in the healthcare organization and when in their career they experienced these phenomena. Findings showed that twenty percent of the clinical and administration support executives experienced early mentoring during their graduate education or professional training, but few of them attributed any influence on their career advancement from these mentors early in their

careers (Sexton, et al., 2014). However, healthcare management executives claimed that mentorship and sponsorship by a C-level executive at the hospital during their residency or fellowship influenced their career trajectory (Sexton, et al., 2014). Both are instances of different experiences with career paths based on the role the professionals had within the organization. Seventy percent of the executives claimed to have a mentor during the early and middle parts of their career path (Sexton, et al., 2014). Sixty percent of the executives claimed that they had been promoted to a higher position or had their graduate education paid by a sponsor who was usually a senior leader in the executive's primary functional area (Sexton, et al., 2014). They also discovered that a few executives found sponsors outside of the organization by reaching out to influential healthcare leaders, often women (Sexton, et al., 2014). These sponsors then mentioned their name to colleagues to get them hired into the labor market where they were not well known. The sponsorship activity was not limited to functional background and usually occurred in the middle and senior career stages.

What is significant about this study is the differentiation of experiences that executives have had with mentorship and sponsorship at different times in their careers. There is a disparity that exists in healthcare organizations between different functional roles within the organization (Sexton, et al., 2014). Understanding this aspect is pertinent in relation to any other disparities in executive development, such as the underrepresentation of women. The concept of exploring the career timeline in relation to the mentorship and sponsorship experiences provided some insight into how and when they contributed to the development of women executives in cybersecurity.

Trusted Advisor

In addition to the roles of mentor and sponsor that can impact leadership development, there is also the role of *trusted advisor*. Relative to the leadership development of female

executives, a *trusted advisor* is a mentor, executive coach, consultant, sponsor, or other business advisor that is a trusted person in a dyadic relationship with the female executive. (Allen & Finkelstein, 2003; Wasylyshyn, 2015). There is not a lot of literature about the trusted advisor role in comparison to the mentor or sponsor roles. According to Wasylyshyn (2015), the trusted advisor relationship surpasses that of mentor or the sponsor as a long-term advisory relationship that will eventually become indispensable to organizations. However, key driving factors to trusted advisor relationships, the impact of gender on these relationships, and the extent to which these trusted relationships benefit the organization, are largely unexplored (Wasylyshyn, 2015). A better understanding about how the mentor, sponsor and trusted advisor roles contribute to the leadership development of women executives could help organizations in developing more women senior leaders.

Conceptual Framework

The demand for more cybersecurity professionals is expected to rise to 6 million globally by 2019, with a projected shortfall of 1.5 million cybersecurity professionals (Morgan, 2016a). There is evidence of gender disparity in cybersecurity as is the case with many male-dominated industries (Johnson, 2013). Women comprise a large portion of the workforce but are mostly underrepresented in the C-level executives of innovative organizations such as IT or cybersecurity (Burrell & Nobles, 2018; Harris, 2015). There are aspects of the technology sector that do not relate well to women as the culture can be more abrasive, and educational programs do not design curriculum to attract females who may be interested (Burrell & Nobles, 2018; Harris, 2015). There are a variety of educational and social factors affecting women including inadequate academic preparation, curricula and teaching practices that do not relate well to females (Burrell & Nobles, 2018; Harris, 2015). Socially accepted norms about male and female

roles and traits can extend to organizational cultures to cause barriers for women. Also, women may have their own perceptions about whether they are as capable as a man to either work in technology or become a leader. Women also still have the societal role of full-time caregiver for their families, causing some career paths to be less desirable. The glass ceiling is the terminology that describes the experience women can face in the corporate world when it is obvious that the upper echelon of an organization is not available to them (Buckalew, et al., 2012). The glass ceiling can be due to gender-based biases as well as lack of opportunity due to low numbers of women in the field, but the term refers to the barriers that exist for women that do not exist for men (Buckalew, et al., 2012; Dahlvig & Longman, 2010; Delmont, 2016; Weidenfeller, 2012; Woszczyński & Shade, 2010).

This study followed the theoretical foundation of Giorgi's (2011) theory of pivotal moments. Giorgi (2011) defined pivotal moments as notable events that occur within the lived experience that generate an everlasting change, a crucial improvement in the participant's overall life experience. Giorgi's (2011) theory is derived from Husserl's approach to understanding the phenomenology of the lived experience. According to Husserl (1900), a section of experience cannot exist separately from the entirety of the whole human experience. Even though the pivotal moment stands out significantly from the rest of the experience, it is not separate from the whole, according to Husserl (1900). Pivotal experiences give insight into transformative experiences and contain aspects unique to the phenomenon, including outcomes such as increased confidence and self-efficacy (Giorgi, 2011). The overall experience in this study referred to the entire career of the women executive participants, and the pivotal experiences were the crucial, meaningful moments with influential relationships that stood out as transformational within that journey.

Social Role Theory

There were two main theories to consider when studying the social implications surrounding the career path of women executives in a male-dominated industry such as cybersecurity. One was the social role theory that was developed by Alice Eagly (1987). Social role theory is based on the idea that individual beliefs and expectations create gender stereotypes. Women leaders run into gender bias because they do not fit the perceived expectations from a gender stereotype (Buckalew, et al., 2012). The social role theory argued that there are traits of a leader that society attributes to the qualities of men. This perception could interfere with promotion of women to executive roles (Buckalew, et al., 2012). Social role theory applies to the glass ceiling outcomes that prevent the advancement of women to executive leadership within corporations, and for this study, specifically to the cybersecurity, or information security, industry (Buckalew, et al., 2012).

Role Congruity Theory

The second theory about gender stereotypes influencing the glass ceiling effect was the role congruity theory. Eagly and Karau's (2002) role congruity theory is the prejudiced perception that female roles are not congruent with leadership roles (Eagly & Karau, 2002). Role congruity refers to behaviors being aligned with gender roles that are socially acceptable (Buckalew, et al., 2012). This theory is similar to the social role theory, except it has the idea that "individuals are punished when they fail to conform to societal expectations" (Skelly & Johnson, 2011, p. 60). The role congruity theory suggested that underrepresentation of women in senior leadership has more to do with the expectation for women in their family roles and the tendency to not display the traits expected of leaders, including risk adversity (Franklin, 2017). Men are

also more likely to believe they are more suitable to the skill and culture of a technology position than women are to believe themselves the same (Wynn & Correll, 2017).

These two theories were lenses for seeing the social implications that could exist in addition to organizational barriers when studying the development of women executives in cybersecurity. Social role theory research focused on male and female roles and how their behaviors differ based on gender stereotypes (Eagly, 1987). The role congruity theory focused on the perception of women being less capable of leadership than men due to the prejudiced beliefs that sex predetermines certain roles (Eagly & Karau, 2002). It was assumed that women who have succeeded to executive leadership in the cybersecurity industry have most likely encountered gender bias from individuals, the organization or even their own assumptions since both technology and leadership tend to be categorized as relating more to men.

As gender stereotypes are not always explicit, a comprehensive view of underlying or implicit bias was necessary in review of the career pathways of women who have succeeded in becoming a C-level executive in cybersecurity. Organizations can be risk-adverse toward hiring women into executive roles due to social structures, culture and beliefs about leadership in that organization. The role congruity theory explained how discriminating beliefs can exist within the very beliefs and social structures of the organization, creating circumstances that prevent women from accessing leadership roles within these organizations (Eagly & Carli, 2007, p.137). If the decision-makers of an organization do not believe women fit the role of a technology leader, then women will not be chosen for those positions. Additionally, if women do not identify with the skills and culture of a tech position, they are less inclined to choose that field (Wynn & Correll, 2017).

Microaggressions Theory

In addition to the social role and role congruity theories, the theory of microaggressions (Sue, 2010) was employed to define the variations of behaviors that the women executives described when sharing their encounters with barriers related to their gender. The stories and situations were many and the lens helped provide a way to describe the hidden or invisible content that the participants referred to in their descriptions. Also, by attempting to identify the microaggressions they described, the analysis can help others who have been in similar situations on either side recognize such behaviors in the future and start to break down the existence of the microaggressions.

Reframing Organizations Theory

There were some recent studies regarding the experience of women in cybersecurity. One was a narrative of women leaders in cybersecurity companies (Littlejohn, 2016) and another was research about women studying to get into cybersecurity (Pifer, 2017). Isolation is the experience of many women in cybersecurity, and mentorship is a potential response to that barrier (Bagchisen, et al., 2010; Littlejohn, 2016; Woszczyński & Shade, 2010). There was not a lot of research about women C-level executives in cybersecurity from an organizational perspective, including how to build a program of mentorship and sponsorship to combat isolation in an organizational culture and what a career trajectory for a woman executive in the cybersecurity industry would be.

The audience for more recent studies is mainly for higher education to determine how to develop pathways for women into cybersecurity and how to develop women in cybersecurity programs. This study took an organizational perspective congruent with a corporate culture rather than a perspective aligned with an institutional culture of higher education. This approach

was to better understand the lived experiences of current C-level women executives in cybersecurity in order to replicate successful leadership development for other women in the industry.

Bolman and Deal (2017) described four frames, or perspectives, by which leaders should view organizational issues: structural, human resources, political, and symbolic. Considering leadership development for women executives through these frames could provide a more complete understanding about how an organization can better support, develop, and retain women leaders. It can also potentially provide a structure by which to develop a higher education curriculum that prepares women to enter a male-dominated field successfully by understanding how to adapt to different and changing organizational cultures. Studying the career paths and support experienced by C-level women executives in the cybersecurity industry provided a better understanding about how to develop future pathways for women in a new industry that is currently experiencing simultaneously both tremendous growth in industry and a skill gap in the workforce. A clear path for women in this industry requires a better understanding of both the social barriers of inequity and the organizational implications to these barriers.

Social Cognitive Theory

Social cognitive theory involved knowledge acquisition through observation of others in the context of social interactions, experiences, and modeling from others. This theory was advanced by Albert Bandura (1986) as an extension of his social learning theory (Bandura, 1997). The theory stated that people that observe a model performing a behavior and the consequences of that behavior, will remember the sequence of events and use it to guide their own behaviors. Observing a model can also prompt the participant to engage in behavior they already learned by replicating the actions of others. Bandura (1997) contended that successful

behavior increases feelings of accomplishment associated with self-efficacy and leads to reinforcement of the behavior. Self-efficacy (Bandura, 1997), as a belief in one's own personal ability to succeed, and observing and modeling behavior had some relevance in this study as the executive women identified mentors and passive learning through observation as both pivotal to their development.

Conclusion

There are few women going into the field of cybersecurity, resulting in even fewer female executives. According to the Global Information Security Workforce Study (GISWS), conducted by the Center for Cyber Safety and Education and (ISC)², women are severely underrepresented in cybersecurity at 11% (Reed, Zhong, Terwoerds, & Brocaglia, 2017). However, cybersecurity is a growing field and the demand to fill positions is relentless. Better recruiting and retention strategies, development of mentors and sponsors, and adjustments to the description or perception of the information security field could improve the representation of women in cybersecurity (Woszczyński & Shade, 2010).

The framework for this study was built on Giorgi's pivotal theory (2011) and included the social role theory (Eagly, 1987), the role congruity theory (Eagly & Karau, 2002), and the microaggressions theory (Sue, 2010). This conceptual framework provided one perspective for organizational leaders and researchers alike to comprehend the current state of women executives in the cybersecurity industry and how they defined the experiences and relationships that were pivotal to their success in becoming leaders. This included the role of mentorship, sponsorship and trusted advisor and addressing the barriers that research has already shown to exist for women in the corporate world. Giorgi's pivotal theory (2011) was used to explore the lived experiences of women executives in the cybersecurity industry to discover the crucial

moments involving a mentor, sponsor or trusted advisor that were the impetus for change in their careers. These pivotal moments described provide insight for organizations to work internally and with education institutions to develop career trajectories for women in the industry and combat the growing skill gap in the industry.

This study aimed to explore the career paths and experiences of women executives in the cybersecurity industry. By understanding the obstacles they faced and what help they received, and exploring mentorship, sponsorship, and trusted advisor experiences along their career timeline, this study provided substantive data about how information security organizations can develop programs to both increase representation of women in the industry, but also replicate key factors that assist women in advancing their careers to senior leadership positions.

CHAPTER 3: METHODOLOGY

The purpose of this qualitative descriptive phenomenological study was to explore the professional lived experiences of women C-level executives in the cybersecurity industry within the United States and determine the crucial aspects that they believe contributed to their career advancement. The findings from this study can help provide a framework for developing women within the cybersecurity organizations. By gaining an understanding as to what circumstances successful women leaders have experienced along their career paths, this data can be used to replicate situations within organizations that could attract and retain women to organizations within the industry and avoid practices that deter them. Increasing the likelihood of women professionals and leaders in these organizations could provide relief from the growing talent shortage the cybersecurity industry currently faces.

Chapter 3 provides a description of the methodology and design, the setting and conduct of the study, and the process for identifying participants for the study. Also included is information about how data was collected, the instrumentation used, who collected the data, and how these decisions impacted the study. Additionally, this chapter provides a summary about how the collected data was analyzed and how participants' rights of anonymity were protected. Finally, potential limitations to the study were explored including any biases or conflicts of interest.

Purpose of the Proposed Study

There is an underrepresentation of women in the cybersecurity industry at a time when talent is scarce. According to the Global Information Security Workforce Study (GISWS), there will be a shortage of 1.8 million positions in the industry by 2020. According to a study by ESG research in 2016, 46 percent of organizations claim a problematic shortage of cybersecurity skills

compared to 28 percent the year prior. Women are underrepresented in STEM (Science, Technology, Engineering and Mathematics) careers resulting in some progress toward opening pathways for females, but little is known about pathways within the cybersecurity industry (Burrell & Nobles, 2018; Cobb, 2018; Myers, 2017; Reuben, Sapienza, & Zingales, 2014; Tang, 2017). Organizational success depends on the diverse influence of women in the workplace (Burrell & Noble, 2018), and yet women are still facing social issues of gender bias that lead to such concepts as Ryan and Haslam's (2009) glass cliff and the more referenced glass ceiling (Delmont, 2016; Weidenfeller, 2012). Little is known about how women succeed in the male-dominated industry of cybersecurity. A study by GISWS in 2017 determined that women who received sponsorship and mentorship were more likely to be successful, and women in the industry who received training, mentorship, sponsorship and leadership development felt valued and had greater job satisfaction (Burrell & Noble, 2018; Myers, 2017). But what was still needed was a better understanding about what crucial aspects or lived experiences with these relationships contributed to the successful journey toward leadership for women in this industry. This data could provide insight for cybersecurity organizations, human resource professionals, and educational programs about how to replicate experiences that help women succeed, discontinue practices that deter women, and develop programs to provide pathways to recruit and retain women in the cybersecurity industry.

Research Questions and Design

Phenomenological research is a design of inquiry derived from philosophy and psychology where data consists of descriptions of individuals' lived experiences about a specific phenomenon (Creswell, 2015). These descriptions culminate in producing the essence of the phenomenon these individuals experienced (Creswell, 2015; Giorgi, 2009). This design has

strong philosophical underpinnings and typically involves conducting interviews (Giorgi, 2009; Moustakas, 1994). The process for descriptive phenomenological research begins with the realization that a need exists to understand a phenomenon by discovering the essence or true meaning of a specific lived experience (Giorgi, 2009, Moustakas, 1994). The research question is shaped by the need to understand a specific lived experience (Giorgi, 2012). The purpose of this qualitative descriptive phenomenological study was to explore the professional lived experiences of women executives in the cybersecurity industry within the United States and determine the crucial relationships that they believe contributed to their career advancement. The problem statement for this research study was that women are underrepresented in cybersecurity, contributing to a growing skill gap in the industry so there is need to understand what organizations can do to attract and retain women and provide them opportunities for leadership development. The significance for researching this problem was to better understand how women leaders do succeed in the cybersecurity industry, a field where women are severely underrepresented, and a persistent gap exists in talent with the skills to fill a growing number of open positions (Burrell & Nobles, 2018; Cobb, 2018; Franklin, 2017; Reed, Zhong, Terwoerds, & Brocaglia, 2017). The following research questions guided this research and addressed the problem statement:

- RQ1: How do women executives in the cybersecurity industry describe their perception of the pivotal lived experiences in their career where a relationship such as a mentor, sponsor, or trusted advisor, was transformational to their development as a leader?
- RQ2: What do women executives in the cybersecurity industry perceive as the crucial aspects of their leadership?

RQ3: What barriers do women executives in the cybersecurity industry perceive they encountered in a predominantly male field?

The subject matter for this research was human experience and relationships rather than things and processes so the natural scientific approach was avoided in order to gain more understanding of human experience. Exploring the human experiential and behavioral phenomena is the key to the phenomenological approach. The problem, purpose and research questions all aligned with the research methodology and design of a qualitative descriptive phenomenological study (Giorgi, 2009). The phenomenon for the study was the pivotal lived experience of women and the relationships that influenced their journey to becoming executives in the cybersecurity industry.

Research Methodology

Qualitative research was the best methodology for this study as the approach addressed the research questions. Qualitative research creates a foundation for developing a deeper understanding of a phenomenon through future research (Giorgi, 2012). The focus was on the human experience through exploration of the experiences of women executives in the cybersecurity industry. Qualitative research allowed for the connection of the individual to the situation, so it was the ideal methodology to use for this study. The phenomenological design allowed for the study of human experience rather than things or processes (Giorgi, 2012). This study used a qualitative methodology and took a phenomenological approach to design in order to answer the research questions from the perspective of the participants' own described experiences.

Research Design

The qualitative phenomenological research method is widely used to explore and understand the meanings people assign to their experiences (Bloomberg & Volpe, 2016; Creswell, 2013; Giorgi, 2009; Merriam, 2009). Phenomenology is an inductive research method based on the philosophies of Edmund Husserl and Martin Heidegger. Husserl's approach (1859 – 1938) was mainly descriptive whereas Heidegger (1889-1976) employed an interpretive approach. Exploring women C-level executives to understand how they attained their roles in the industry required an in-depth understanding of their real-life experiences. Using a phenomenological design, the researcher can gain insight from the perspectives of the participants to gain a deep understanding of their lived experiences.

The process for this phenomenological study involved identifying the phenomenon of becoming a woman executive in the cybersecurity industry. Interviews were used to collect data from a sample of participants who have experienced the phenomenon. The researcher first assumed the attitude of phenomenological reduction by epoché or connecting away any pre-conceived notions (Creswell & Poth, 2018; Giorgi, 2012). Once data was collected, the researcher took a holistic review of the data by first reading through the entire text for the full context of the data provided (Giorgi, 2012). Next, the researcher began reading the text again, making marks where there was a transition in meaning (Giorgi, 2012). This was the process of constituting parts or meaning units. The next step involved the researcher translating the text into expressions that revealed the importance of what the participant said (Giorgi, 2012). This process involved the use of free imaginative variation, which helped in determining the essential structure of the experience (Giorgi, 2012). The essential structure was then used to interpret the data of the research (Giorgi, 2009; Giorgi, 2012). Descriptive phenomenological psychological

research provided an understanding of the general structure of the experience and the constituents of the structure (Giorgi, 2009).

It was important in this process to practice Husserl's epoché, or phenomenological reduction. Epoché occurred when the researcher suspended any preconceived notions or judgment regarding the phenomenon, but rather used the descriptions to analyze the participants' experiences (Giorgi, 2009). The researcher set aside assumptions to get to the essence of the phenomenon from others' experiences (Giorgi, 2009). Bracketing understandings and reflecting allowed the researcher an openness with regard to the phenomenon (Giorgi, 2009). This process allowed the researcher to view the participants' experiences based on their essential consciousness, and acknowledge the existence based on how that participant experienced the phenomenon (Giorgi, 2009). Assuming an attitude of phenomenological reduction allows one to be open enough to let unexpected meanings to emerge (Giorgi, 2012).

Site Information and Population

A description of the research setting involves details such as where the study takes place, including anything unique, unusual, or noteworthy (Bloomberg & Volpe, 2012). The setting for this study was not exclusive to one site. The study relied on the involvement of a very specific role in an organization within the cybersecurity industry in the United States. Participants were drawn from these organizations. It was assumed that access to C-level executives was limited, and access to women executives within an industry where women are underrepresented was even more challenging. Women executives in information security organizations in various locations in the United States were interviewed via GoToMeeting, a web conference platform used to engage with the participants face-to-face.

Women executives in the cybersecurity or information security industry were contacted through the researcher's LinkedIn contacts and through various connections' contacts. The goal was to identify at least ten to twelve women to interview, which is enough for a qualitative, phenomenological study if participants are articulate and have relevant knowledge to participate in the study and was enough to reach saturation (O'Reilly & Parker, 2012). The final group of participants numbered 16, which was more than expected would agree to participate. The sampling size did not need to be huge, but a sufficient amount of variations was necessary to determine an essence (Giorgi, 2009). A small number of participants were necessary, and the researcher made sure all data was thoroughly assessed (Gill, 2014).

Due to the researcher's position in a cybersecurity company, connections to executives in the industry were more readily available through contacts and the LinkedIn social media business platform. Some possible participants were already in the researcher's network of over 1,000 connections. Other participants were connected to those connections. Identifying participants for this specific study was easier for this researcher due to the common industry connections. However, the researcher chose not to use male connections to reach participants in order to see if enough participants could be gathered through women. It is difficult to determine whether there would have been more or less participants had the researcher used the male connections to reach women executives. Many of the women who were referred to the study by other women were quick to respond and copy the woman who referred them. The underlying meaning from this gesture was a show of respect to the woman who referred them.

Participants

The focus of this study was on the pivotal lived experiences of female executives in cybersecurity and their journey to leadership. Participants were female and currently in CEO or

other C-level executive positions for an organization within the cybersecurity industry. The purpose of this qualitative phenomenological study was to explore the pivotal lived experience of women executives in the cybersecurity industry and relationships that were influential on their journey to leadership. Potential participants who were C-level executives currently in cybersecurity were asked if they identify with a person such as a mentor, sponsor or trusted advisor, and they were chosen for this study based on that criteria. The study involved understanding human experience and behavior through descriptions of transformational experiences on a journey toward leadership. Age, race, marital status, and educational levels may vary.

Sampling Method

Study participants were selected using a purposive, criterion-based sampling method, and all participants were women executives in cybersecurity organizations who could identify with having some sort of mentor or influential relationship during a pivotal time on their journey toward leadership (Bloomberg & Volpe, 2012). Both purposive and snowball sampling were used to recruit the executive participants for this study. Purposive, or criterion-based sampling, is a sampling strategy that is often used for qualitative research (Creswell & Poth, 2018). Snowball sampling is a type of purposive sampling where identified potential participants within a network of contacts are asked to refer others who meet the selection criteria (Bloomberg & Volpe, 2012; Creswell & Poth, 2018; Merriam, 2009). Since the initial sampling method did not produce enough participants, snowball sampling was used to reach and exceed the sample size proposed. The business social media website, LinkedIn was used to contact potential participants for the study. Due to this researcher's own extensive and relevant connections in the field and access to an add-on recruitment tool in LinkedIn, being able to connect and communicate with the right

candidates to participate in the study was made easier. My prior executive status in a Series A funded cybersecurity company gave me credibility and made those connections more easily accessible. Once a participant was identified, they also suggested other participants through their LinkedIn connections or sent their own messages to make introductions. Social media is an emerging tool used by researchers. Advantages included the speed of recruitment of participants, the cost efficiency for access, the positive outcome from snowballing effects, and the easy accessibility to participants (Stokes, Vandyk, Squires, Jacob, & Gifford, 2019). However, there was an awareness about the limitations of participants based on sociodynamics as suggested by recent research, and it was determined this aspect would not affect the sampling for this specific study (Stokes, et al.; 2019). For the purpose of this study, LinkedIn was an effective tool for identifying and connecting to executive participants.

Sixteen C-level women professionals in the cybersecurity industry were identified and interviewed. Private or public industry background were accepted as long as the participants are in a C-level executive position. Interviews with women executives describing their perceptions about how they achieved their successes as leaders in the industry was beneficial to understanding the essence of their transformational experiences. Findings were then used to determine what common factors lead to success and whether these constituents can be replicated in organizations through certain practices or relationships. Interviews were semi-structured, and questions were open-ended and prepared in advance. Open-ended questions have the value of allowing the researcher to explore the participant's beliefs, perspectives, and the way they make meaning as they describe their lived experiences (Seidman, 2013). Open-ended questions provided the opportunity for participants to explain their understanding of the subject and respond freely.

Instrumentation and Data Collection Procedures

All interviews took place via the video conference tool called GoToMeeting. They were recorded and transcribed through the GoToMeeting application. They were also run through a password-protected tool called otter.ai and both transcripts were compared to attain accuracy. Transcribed interviews were exported to Word documents for review and housed on a secure cloud-based network owned by the researcher. Per Giorgi's methodology, transcribed interviews were reviewed in their entirety first to get a sense of the whole (Giorgi, 2012). Then the researcher re-read the documents, taking note of any transitions in meaning. These were indicated with a mark and represented meaning units. The researcher then used free imaginative variation and transformed the data into words that expressed the meaning of what the subject said (Giorgi, 2012). Free imaginative variation was a step in the methodology that followed bracketing and reduction (Eddles-Hirsch, 2015). It allowed the researcher to take the descriptions and identify themes (Eddles-Hirsch, 2015). Imaginative variation required the researcher to use a variety of perspectives by which to view the phenomenon to understand the essence of the participants' experiences (Eddles-Hirsch, 2015). For this study, any descriptions of mentorship, sponsorship and trusted advisor relationships in the findings were of interest. Also, descriptions of barriers encountered and qualities that were crucial to their success were of interest.

Once participants were identified through communications and connections via LinkedIn and other networking connections, dates and times for interviews were scheduled. An online web conference software called GoToMeeting was used to conduct live interviews synchronously via video with individual participants across the United States. These were scheduled individually. Synchronous refers to live rather than recorded online. Allowing the respondents space to explain their experiences, the tool was a semi-structured interview with questions that helped

guide the schedule, not dictate it. The semi-structured interview was open, allowing new ideas to be brought up during the interview, and the interview generally had a framework of themes to be explored (Merriam, 2009). This design allowed for trust to build between the researcher and participant, and the flexibility allowed the researcher to ask questions pertaining to the responses that provided a new direction than the original question.

Upon IRB approval, an informed consent letter was emailed to the potential participants. Individual interviews were scheduled via LinkedIn for a video conference via GoToMeeting using video and transcription of the interview. An individual interview was scheduled for each of the sixteen participants. Each interview took 45-60 minutes. Each interview was recorded in GoToMeeting and transcribed through the software, and then the transcription was checked again for accuracy through the software otter.ai.

Beginning each interview, the researcher asked for permission to record the interview. Next, the purpose of the study was reviewed, and the researcher took on the phenomenological psychological attitude. The first question was asked while the researcher provided non-verbal cues to validate the contribution of the participant while taking some notes. Follow-up questions were asked as needed. The interviews collected first-person accounts as lived and understood by the participants about their pivotal experience. Although member check is not required for a descriptive phenomenological study (Giorgi, 2012), participants were asked if they would be willing to meet again for a follow-up interview if additional data is needed.

Good interview questions are open-ended and provide descriptive data including stories about the phenomenon (Merriam, 2009). Although an instrument of open-ended questions specific to the study was necessary, it was also important to allow for probing questions as follow-up questions can be difficult to anticipate when one does not know all possible answers to

the original question. Since the interview questions were the primary instrument for data collection, it was easier to allow for adjusting the questions to additional, probing questions (Merriam, 2009). The interviewer's role in this semi-structured interview was to facilitate and guide rather than dictate exactly what will happen in the interview. Open-ended questions provided the opportunity for participants to explain their understanding of the subject and respond freely (Seidman, 2013). A descriptive phenomenological method allowed the researcher to analyze how participants perceived and made sense of their experiences. It helped to have a flexible tool in order to allow the participant room to express this fully.

Data Analysis

The essence of the pivotal experience was examined through a qualitative lens analyzing descriptive data to understand what the lived experiences were like for participants. This study focused on the overarching question about the lived experience of women executives in the cybersecurity industry regarding their successful career trajectory. Interviews with open-ended questions were conducted to gather descriptive data that was analyzed using the descriptive phenomenological method (Giorgi, 2009) that is based on the philosophical phenomenology of Husserl from the 1900s. Husserl's phenomenology supposed that the participant's perspective at the time was initiated by reality. Participants described an experience, and the researcher converted that experience into an overall meaning to discover the events as if he or she experienced it (Giorgi, 2012).

The pivotal experience was a change that was experienced that overcame a problem or a change that resulted in improvement or progress from the participant's perspective (Giorgi, 2011). A pivotal experience was an event that stood out against the overall experience of a longer process (Giorgi, 2011). It was an experience that could transform previous thoughts and

behaviors. Examining an experience that was pivotal needed to include questions that allowed for follow-up questions for understanding the context of the pivotal experience. Exploring a pivotal experience provided descriptive data that gave insight to what constituents contributed to a certain change.

Descriptive Phenomenological Method

The data analysis of this qualitative descriptive phenomenological study employed Giorgi's five-step descriptive phenomenological psychological method (Giorgi, 2009). Interviews containing the descriptions of the participants' lived experiences were recorded and transcribed through the video web-conference tool, GoToMeeting. The transcription tool was one that was included in the GoToMeeting upgraded account acquired. The texts from these interviews were downloaded into Word documents and the data was analyzed in this study. Giorgi's five steps were not only actionable steps for the researcher to follow (Giorgi, 2012), they also contained instructions for attitudes and other mental constructs the researcher considered when conducting the descriptive phenomenological study.

Assume the phenomenological psychological attitude. According to Giorgi (2012), the researcher must first accept an attitude that focuses on phenomenological reduction by reflecting on any assumptions, preconceived notions, or interpretations that are not evidenced in the data. By doing this, the researcher took on a psychological perspective and a sensitivity to the phenomenon. The researcher then viewed the experiences of the participants through their consciousness. Through the process of bracketing, which was derived from Husserl's epoché, the researcher viewed the data without any assumptions and with an objective perspective. The reason for bracketing was to allow the researcher to analyze the participant's experience from a first-person perspective (Creswell & Poth, 2018; Giorgi, 2012; Moustaka, 1994). This practice of

epoché, or bracketing, was necessary for the researcher to adopt a phenomenological attitude. The ability to shift toward this attitude allowed the researcher to access the phenomenon, and the earlier the researcher could practice bracketing, the more validation it provided to the study (Chan, Z.C., Fung, Y, and Chien, W., 2013). Table one merged Giorgi's five steps for analysis of the data with the steps of collecting the data to show how this bracketing was used earlier in the research design.

Sense of the whole. The researcher first read all the data from the transcripts to attain a complete picture of the full description (Giorgi, 2009; Giorgi, 2012). The researcher had to read the transcripts as a whole in order to attempt to understand the perspective of the participants (Giorgi, 2012). Through a holistic approach, the researcher was able to be inclusive of the full experience from beginning to end in order to best understand the description of the experience (Giorgi, 2012).

Delineate the meaning units. For the third step, the researcher reread the experiences and broke down the description into meaning units. When the researcher detected a change in attitude or meaning, it was an indication to separate two meaning units. This was done with through different colored highlights and comments in the documents. The researcher used these units to provide an analysis of what had been expressed in the description. This analysis was in third person while still reflecting on the participants' expressions. The researcher was able to remain in the phenomenological perspective through this process.

Transform meaning units. The fourth step consisted of the researcher transforming the data into expressions that revealed important information related to the phenomenon being studied (Giorgi, 2012). The method this required was free imaginative variation, Husserl's technique to transform the meaning units through phenomenological reduction and analysis of

the pivotal experience within the meaning unit. Descriptions were rewritten in third person. The more sensitive expressions were reviewed, and an essential structure of the experience was written (Giorgi, 2012). This step was critical for determining the essence of the experience.

Table 1.

Descriptive Phenomenological Methodology

Steps	Applied
1. Assume the phenomenological psychological attitude.	Practice reduction, bracketing or epoché throughout the process to get to the essence of the phenomenon. Suspend preconceived notions or judgment regarding the phenomenon. Revisit each step.
2. Identify participants who have experienced the phenomena	Use social networking and recruiting tool, LinkedIn and snowball sampling
3. Collect data through open-ended interviews with participants	Record interview and transcribe through application. Download data to documents that can be electronically edited
4. Sense of the whole	Read through all the data of the transcripts fully first to get a holistic view and grasp the full context of the data before coding
5. Delineate the meaning units	Read through the text again, breaking down description into meaning units by marking changes in meaning or attitude from the participant
6. Transform meaning units	Translate text into expressions that explain the importance of what was said. This involves using free imaginative variation to help determine the structure of the experience
7. Synthesize meaning units	Essential structure is then used to interpret the data from the research

Synthesize meaning units. The fifth step consisted of the essential structure being used to analyze and interpret the data from the study (Giorgi, 2012). The synthesis came from the structure that was built from the constituents. The purpose of synthesizing the meaning units was to uncover the essence of the pivotal lived experiences from a psychological lens. Ultimately, the researcher synthesized and integrated the meaning units into a structure of the phenomenon which explained its essence (Gill, 2014; Giorgi, 2012).

Participant Rights

Participants in this study were given confidentiality pertaining to names, organizations, and other identifiable data. All data collection, analysis, interpretation, and communication was

checked by the researcher to ensure there was no identifiable information. Recorded interviews are saved to a secure electronic file that is part of a secure network, inaccessible to anyone but the researcher. Transcribed interviews are also securely kept as electronic files on the secured cloud network. Both sets of files will only be kept accessible to the researcher for as long as necessary to complete the study and will not be printed on paper. Files will be deleted within five years after completion of the study. Executives who shared information about their experiences had concerns about the protection of their own personal privacy and any confidential information about their organization shared or inadvertently provided. The researcher ensured the executive participants that data shared will not break any confidentiality as pseudonyms were used to protect the identity of the participants, other relationships named, and her organizations. The key is kept on a password-protected, encrypted file on the secured network. Data has been checked by the researcher to make sure there were no identifying data. The study was explained to the participants, signed informed consents were collected electronically from all participants ahead of the scheduled interview, and each participant was allowed to leave the study if they changed their minds about participating (Bloomberg & Volpe, 2012). Due to careful collection of data and strict adherence to confidentiality, there were no high potential risks involved in participating in this study.

Limitations of the Research Design

Phenomenological research design allowed for the researcher to explore the lived experiences of women executives in the cybersecurity industry and their journeys to leadership. The methodology allowed for insight into commonly shared contextual experiences and provided the essence the relationships and social and organizational aspects that were transformation to their ability to achieve executive roles in an industry where women are severely

underrepresented (Giorgi, 2012). The questions were geared toward understanding the pivotal lived experiences of influential relationships that were transformational to their leadership development and success.

According to Ellis and Levy (2010), limitations of the study are things that the researcher cannot control. One limitation was that the data was dependent on the memories of the participants, which can be altered over time (Giorgi, 2009). Another limitation may be that the sample was dependent on the participants who respond via the social networking tool, LinkedIn.

According to Ellis and Levy (2010), delimitations are limitations that are deliberate choices made by the researcher and components that the researcher has some control over (Ellis & Levy, 2010). One delimitation was that the study was limited to women who have succeeded in their careers in cybersecurity so it may not capture barriers or experiences that keep other women from success. The study was also designed to include only those women executives in the cybersecurity industry who identify having had a mentor, sponsor or trusted advisor. Also, the study was purposefully limited to the experiences of women C-level executives in cybersecurity. It did not cover other successful career pathways for women in the industry.

There was concern that it would be difficult to secure enough women CEO or C-level executives for interviews who also identified with having a mentor, sponsor or trusted advisor sometime in their career. However, the researcher's access to a wide network of CEOs and cybersecurity professionals via the LinkedIn social networking platform created an advantage for this study. Although the data provided much insight into how these female executives succeeded on their career paths and the barriers they encountered, the study does not provide data regarding barriers for other women in cybersecurity who are not aiming toward leadership roles. Insights into experiences women executives perceived as contributing to their career trajectory could

provide researchers some insight into what could contribute to success in other male-dominated fields. There may be other factors that do not translate into other industries. A possible limitation to the study was the researcher's own personal bias, as a prior executive member in a Series A startup company in the cybersecurity industry. My primary responsibilities were finding, building, and retaining talent and helping the organization grow strategically. My own experiences provided certain expectations. Bracketing is a practice for researchers to suspend judgment when analyzing the experiences, and it was important to not let my personal expectations interfere with the process. As a researcher, it was important to recognize my own personal bias and experience and maintain objectivity in the process. Just as the findings relied on the researcher's ability to remain objective, it also was limited by the subjectivity and memory of each of the participants.

Issues of Trustworthiness

Qualitative research is based on different assumptions and world views about reality and should consider validity and reliability from a perspective of trustworthiness. Credibility, transferability, dependability, and confirmability were all components of validating trustworthiness in this qualitative study (Lincoln & Guba, 1985; Merriam & Tisdell, 2016).

To establish academic rigor with descriptive phenomenological research, certain criteria were considered and acknowledged in the study in order to provide trustworthiness to the results of research (Collier-Reed, Ingerman, & Berglund, 2009). For phenomenological descriptive studies to gain credibility, there are guidelines to follow to gain trustworthiness (Merriam & Tisdell, 2016). These concepts of trustworthiness were used to assess the validity of the research (Lincoln & Guba, 1985; Merriam & Tisdell, 2016).

Credibility. Credibility is the evaluation for how truthful the study is as it determines whether the actual perceptions of the participants in a study align with the way the researcher portrays their experiences (Collier-Reed, Ingerman, & Berglund, 2009; Lincoln & Guba, 1985). It was the goal of the researcher to establish a true depiction of the phenomenon being studied (Merriam & Tisdell, 2016). When responding to credibility, the qualitative researcher asked how compatible the findings were with reality (Merriam & Tisdell, 2016). Credibility of the content was supported when the researcher showed comprehension of the phenomenon being studied and the ability to bracket, or suspend, one's own understanding or bias of the topic (Collier-Reed, Ingerman, & Berglund, 2009). Adoption of recognized, appropriate research methods also provided credibility (Shenton, 2004). Credibility of method was supported when the researcher was able to ensure that the content and structure of the interviews were richly reported in a study, allowing the readers the ability to examine the actual situations and the contexts surrounding them to determine whether the data collected is complete (Collier-Reed, Ingerman, & Berglund, 2009; Shenton, 2004). Credibility in phenomenological studies is established when the phenomenon can be recognized through the analyses of a participants lived experience (Giorgi, 2002).

Member Follow-up. Member checking is one way to validate data collected in qualitative research to establish credibility (Merriam & Tisdell, 2016; Shenton, 2004). Member checking is the method of sharing the collected data with participants of the study. This allows the participants to view the representations or interpretations of their responses by the researcher (Merriam & Tisdell, 2016). According to Giorgi (2012), member checking is not required for a descriptive phenomenological study because participants and researchers have different perspectives. Member checking is one of the more widely accepted actions to build credibility

however it is not always used in phenomenological studies and was not used in this one (Shenton, 2004). In its absence, awareness of other aspects that build credibility was important. Instead, participants were asked if they would be willing to meet again for a follow-up interview if additional data or clarification was needed, and there were some follow up questions for clarification (Shenton, 2004).

Transferability. To establish transferability, the researcher should provide adequate details of the phenomenon researched (Lincoln & Guba, 1986). Transferability was determined by the researcher's ability to demonstrate that the results can be applied to a wider population (Merriam, 2009). Researchers can gauge if their studies were conducted rigorously by determining if the findings align with reality (Merriam & Tisdell, 2016). With sufficient details of the data collection, the readers should be able to determine if there are similarities to other situations familiar to the reader and discover if the findings apply (Schwandt, Lincoln, & Guba, 2007). Transferability encompasses internal and external validity to create an environment for the credibility of a research study (Merriam & Tisdell, 2016). Transferability occurs when sufficient background data has been provided to understand the context of the study and the phenomenon has been described with enough detail to allow comparisons to be made (Shenton, 2004).

Validity or Dependability. Data validation helps provide credibility to a study as a qualitative researcher is not able to produce a fully objective account of the data (Merriam & Tisdell, 2016). Pursuit of objectivity is accomplished by the researcher through epoché, bracketing, or reduction (Creswell & Poth, 2018; Giorgi, 2012; Moustakas, 1994). Bracketing is the method of attempting to remove the researcher's own opinion or bias throughout a study.

Data or information is derived from the participant, but the data or information is not valid until proven credible (Merriam & Tisdell, 2016).

Confirmability. Confirmability is a way to for the qualitative researcher to strive toward objectivity. It is important that the findings are the result of the expressions and experiences of the participants in the study and not a reflection of the preferences of the researcher (Shenton, 2004). Researchers should provide an audit trail, which allows the research to be retraced based on the decisions made as explained by the researcher. This can be represented by a diagram of the steps taken throughout the research process (Shenton, 2004). To address confirmability, the researcher must ensure that the data findings were formed by the participants and not influenced by the researcher's background or position (Shenton, 2004).

Pilot Test. A pilot test of the interview questions was conducted using two pilot participants. The purpose of the pilot test was to test the use of the questions as well as the use of the technological tool to ensure the questions were clear and comprehensible and the tool worked properly for the data collection plan (Merriam & Tisdell, 2016). The pilot allowed for small corrections and testing of the technology to make sure there were no issues. Interviews for the actual study with C-level woman executives were limited in availability so anticipating any problems in advance helped to get full use of the time allotted for the interviews. The two pilot participants did not meet the criteria for the study due to the limitation of those who qualify to participant. However, the two pilot participants were able to provide helpful feedback and validate the questions prior to the study. One participant of the test pilot was a male CEO in cybersecurity and the other was a female educator. Feedback was used to add probing questions and adjust settings in the web conferencing tool.

Ethical Issues in the Proposed Study

The willingness of the participants to be involved in the study, sharing their personal experiences, perspectives, understanding, and knowledge required fair and respectful treatment (Resnik, 2015). The major ethical considerations when conducting a qualitative study such as this one involved informed consent, the safety of participants, anonymity, confidentiality, and privacy. The researcher was well informed of the various aspects of their role, and practical guidelines and protocols were followed and implemented in all stages to ensure protection of the participants (Resnik, 2015).

There was little risk for any anticipated ethical issues in this study. However, it was important to factor in any details necessary to protect the rights of the participants. It was the responsibility of the researcher to protect the privacy and anonymity of each participant. In this study, executives were being interviewed. Pseudonyms were used for the participants, for others named in the interviews, and for any affiliated organizations. This was clearly stated prior to the interviews and a consent form was shared ahead of time, reviewed, and signed before any scheduled interviews. Following this protocol helped most of the participants trust and share openly instead of monitor or censor their answers to avoid potential backlash from key shareholders of their organization if data shared became public. This researcher understood the importance of that confidentiality in their roles and was careful to follow protocols for confidentiality. Anonymity was important to protect the participants and the organizations without interfering with the expression of the shared experiences. Participants were given plenty of time to review a copy of an informed consent which let them know that participation was voluntary. It also explained the data collection process and that they were welcome to withdraw from the study at any time or refuse to answer any questions without any repercussions.

Conclusion and Summary

This chapter presented the research questions, design and the research method. It also presented information about the population, sampling method, instrumentation, data collection procedures, and data analysis. Potential limitations of the research design were also explored along with what criteria contributed to trustworthiness of the study including credibility, member checking procedures, transferability, dependability, and confirmability. Finally, any ethical issues for the proposed study were also presented. The research method was qualitative descriptive phenomenology with the intent to explore the pivotal lived experience of women executives in the cybersecurity industry on their journey to leadership. Chapter 4 will contain a comprehensive discussion of data analysis and a presentation of the findings.

CHAPTER 4: FINDINGS

The cybersecurity industry is a growing field that currently has positions that are not being filled, and few women are entering the field or taking on leadership roles (Burrell & Nobles, 2018; Cobb, 2018; Franklin, 2017; Reed, Zhong, Terwoerds, & Brocaglia, 2017). The purpose of this qualitative descriptive phenomenological study was to explore the professional lived experiences of women executives in the cybersecurity industry within the United States and determine the relationships that they believe contributed to their career advancement and the crucial aspects that contributed to their development. This chapter provides an overview of the methodology used for this study, a description of the participants, and an analysis of the data.

Brief Review of Methodology

The process for this phenomenological study involved identifying the phenomenon of becoming a woman executive in the cybersecurity industry and relationships and barriers that contributed to their success. This qualitative descriptive phenomenological study followed Giorgi's five-step descriptive phenomenological psychological method (Giorgi, 2012) to conduct the data analysis. Data was collected through open-ended interviews that were used to attain the descriptions of the participants' lived experiences. These interviews were recorded and transcribed through the video web-conferencing software, GoToMeeting. The transcription tool is included in the GoToMeeting upgraded account. Once transcribed interviews were downloaded into Word documents, the transcribed interviews were read through entirely first to get a sense of the full context before beginning coding. The second round of reading involved marking meaning units. The marked text was then translated and interpreted into expressions to explain the importance of what the interviewee was saying.

Giorgi's five-step process was used to analyze the data (Giorgi, 2012), including the attitudes and other mental constructs the researcher had to consider when conducting a descriptive phenomenological study. During data collection and analysis, the researcher practiced assuming the phenomenological psychological attitude, separating any preconceived notions and being sensitive to what the emerging data.

Research Questions and Findings

This study aimed to address the overarching research question; what is the lived experience of women executives in the cybersecurity industry regarding the pivotal moments with relationships that were influential to their career in cybersecurity and their development as a leader? The following research questions guided this research:

RQ1: How do women executives in the cybersecurity industry describe their perception of the pivotal lived experiences in their career where a relationship such as a mentor, sponsor, or trusted advisor, was transformational to their development as a leader?

RQ2: What do women executives in the cybersecurity industry perceive as the crucial aspects of their leadership?

RQ3: What barriers do women executives in the cybersecurity industry perceive they encountered in a predominantly male field?

Demographic Findings of the Executive Participants

A total of 16 executive participants were interviewed for this study. Initially, the aim was for at least ten participants due to the anticipated busy schedules of top C-level executive women and the limited numbers and access. However, the use of snowball sampling helped increase responses from potential candidates through their networks (Bloomberg & Volpe, 2012;

Creswell & Poth, 2018; Merriam, 2009). Criteria for participants were that they were: 1. a woman currently holding a C-level position with a company in the cybersecurity industry, 2. able to identify one or more instances in their career where a relationship, like a mentor, influenced their development as a leader, and 3. Willing to be interviewed for at least 45 minutes via video conference.

After using the networking tool, LinkedIn, to identify connections or potential candidates, potential candidates were contacted in groups of 10-12 over the course of a month. Follow-up messages were sent within a week or two for each person contacted if the first message did not receive a response. Each participant who agreed to the study was sent a calendar invite with a link to the video conference. They were also sent a copy of the consent form to review and sign electronically before the scheduled interview. Sixty potential participants were identified during the process, 30 through the researcher's own contacts and searches and another 30 from the networks of other connections. Of the participants that identified with the criteria and agreed to participate, six were from the researcher's own search and ten were from the snowball sampling. The locations of the participants spanned across eight states and the nation's capital.

The researcher made a personal goal to connect to as many participants through her own connections or through other women. Of note, there was one male connection in the researcher's network who it was discovered was linked to most of the potential participants. It was a conscious choice to not request his help to connect to the potential participants identified. The goal was to make the connections to these women entirely from the researcher's own direct contact or the connections of other women. It may have been a quicker process to include the prominent male connection as an introduction to many of the participants, but other participants from the snowball sampling may not have emerged and it could have affected the diversity of the

participants that were included in the study. Participants were asked a few demographic questions at the beginning of the interview that provided both personal and professional background information.

- Question 1: Please state your location, age, ethnicity, marital status, and whether you have children.
- Question 2: Can you please state the title of your current position or leadership role and who you report to?
- Question 3: Can you please give a brief overview of your educational background and career path and when you entered this industry?

Table 2 presents the responses to the first question with demographic of participants including titles, location in the U.S., age, ethnicity, marital status, and children. Participants were not required to provide any of this information if they chose not to do so. Regarding ethnicity, participants could report how they self-identified rather than pre-ascribed choices.

Table 2.

Demographic of Participants

Participant Code	Title	Location	Age	Ethnicity	Marital Status	Children
A	Co-Founder / CPO	California	34 years	White	Married	No
B	Founder / CEO	Tennessee	48 years	Caucasian	Domestic Partnership	No
C	Founder / CEO	Massachusetts	49 years	50% English/German / 50% Palestinian	Single	No
D	Co-Founder / CEO	California	49 years	White	Married	Yes
E	Founder / CEO	Massachusetts	52 years	White	Married	Yes
F	CSO	Oregon	37 years	Chinese American	Married	Yes
G	CEO / President	Washington DC	45 years	Caucasian	Divorced, Remarried	Yes
H	COO	California	43 years	Caucasian	Separated	Yes
I	CTO / CPO	California	54 years	Caucasian	Married	Yes

J	CISO	New Jersey	43 years	White	Married	Yes
K	CISO	Indiana	49 years	Black	Married	No
L	CISO	New York	62 years	Caucasian	Married	Yes
M	CISO	New York	Unknown	Indian American	Married	Yes
N	CISO	Pennsylvania	48 years	Hispanic	Married	No
O	President and CEO	California	Unknown	Caucasian	Married	Yes
P	SVP and CISO	Rhode Island	50-54 yrs.	Caucasian	Married	Yes

Table 3 presents the responses to demographics questions two and three, including participants' full title and who they report to if they are not the CEO of the company, how many years they have been in the industry and their career, the type of organization they work in, and their education. It is helpful to note that different C-level participants may have different experiences and work environments. Organizational charts for bigger companies, such as healthcare or huge corporations, can have several levels of executives. Smaller startups may have a smaller executive team with fewer layers of executives. This background information about the executive participants help with understanding the level of authenticity of the perceptions or viewpoints made in this study.

Table 3.

Experience of Participants

Participant Code	Title / Reports to	Career Years	Industry Specializations	Education
A	Co-Founder / Chief Product Officer (CPO)	11 years	Cybersecurity	BS, Computer Security
B	Founder / Chief Executive Officer (CEO)	17 years	Cybersecurity, Sales	BS, Human and Organizational Development
C	Founder / Chief Executive Officer (CEO)	26 years	Cybersecurity, Sales	BS, Sociology and Criminal Justice
D	Co-Founder / Chief Executive Officer (CEO)	25 years	Cybersecurity, Product Marketing	PhD, Computer Science MS, Computer Science
E	Founder and Chief Executive Officer (CEO)	10 years	Cybersecurity, Marketing	PhD, Information Security and Communications; MBA, Business Admin and Marketing; BA, Marketing Management

F	Chief Strategy Officer (CSO); reports to the CEO	15 years	Cybersecurity	BS, Electrical Engineering and Computer Science
G	Chief Executive Officer (CEO) / President	19 years	Government, Cybersecurity, Sales	BS, Government and International Affairs
H	Chief Operations Officer (COO); reports to CEO	20 years	Cybersecurity for Healthcare	BS, Information Systems and Operations Management
I	Chief Technology and People Officer (CTO/CPO); reports to CEO	30 years	Cybersecurity and IT, Sales and Marketing	BS, Finance
J	Chief Information Security Officer (CISO); reports to Chief Information Officer (CIO)	21 years	Information Security, Healthcare	BS, Integrated Science and Technology
K	Chief Information Security Officer (CISO); reports to SVP, Chief Information & Digital Officer (CIDO)	44 years	Information Security, Healthcare	Masters of Jurisprudence; MHSA, Health Services; BS, Computer Information Systems
L	Chief Information Security Officer (CISO); reports to Chief Information Officer (CIO)	34 years	Healthcare, Info Security, Law enforcement	BS, Engineering
M	Chief Information Security Officer (CISO)	18 years	Information Security, Healthcare	Masters in Information Systems, BS, Mechanical Engineering
N	Chief Information Security Officer (CISO); reports to Chief Digital Officer (CDO)	20 years	Information Security, Healthcare	Executive MBA; BS, Electrical and Computer Engineering
O	President and Chief Executive Officer (CEO)	25 years	Cybersecurity	MS, Management; BA, Business and Psychology
P	Senior Vice President (SVP) and Chief Information Security Officer (CISO)	21 years	Information Security, IT, Healthcare	MS, Engineering Science; BS, Industrial Engineering,

Responses to Experiential Interview Questions

The purpose of this qualitative descriptive phenomenological study was to explore the professional lived experiences of women C-level executives in the cybersecurity industry within the United States and determine the pivotal moments with mentors, sponsors or trusted advisors and the crucial aspects they encountered that contributed to their development as a leader. Part of exploring the crucial aspects involved not only the opportunities they encountered but also the barriers. The experiences of these C-level women executives were captured through interviews,

transcribed, and coded into emergent themes which were grouped further into more specific sub-themes.

The responses for each interview question were analyzed and categorized with headers when different meanings were identified. These headers helped develop the common themes. They are often descriptive or characteristic of the shared idea or sentiment. The data is presented in Table 4 and described using excerpts from the interviews. Some excerpts contain more of the narrative as to not lose the full meaning of the participant's description. Some key terms and ideas are italicized to show the common threads among the descriptions. These findings were used to determine five main themes; 1. Transformative experiences in career and development. 2. Significant transformative relationships. 3. Crucial aspects to her leadership. 4. Bias and discrimination. 5. Risk of failure. The findings also helped identify several sub-themes for each theme as well. Questions 4 through 9 during the interviews are open-ended questions with lengthy responses. Significant findings from each of the questions are reported in the following pages.

Question 4: Take a moment and try to recall a pivotal experience anytime during your career where a relationship such as a mentor, sponsor, or trusted advisor, was transformational to your development as a leader. In as much detail as possible, describe that experience.

New positions. Many of the transitions involved breaking through the glass ceiling or leveling up in positions. Executives discussed the relationships that helped make those transitions in their career possible. Executive A explained a courageous pivotal time in her career was when she applied for a new position that did not exist. She said she was encouraged by a sponsor to create her own opportunity and to talk to the CISO of the company. Executive G explained the significance of getting a breakthrough opportunity with the help of someone taking

a chance on her. She also talked about chemistry, finding a connection, and having transferrable skills. Executive K sought a better situation for her development when she asked to be moved from reporting to the male COO to reporting to the female CIO of the company. Executive P described how her mentor invested the time in her because she saw potential in her.

Table 4.

New Positions Comments

Participant	Comments
Executive A	This is what I'm really good at. This is a problem I know you have in your organization, and this is how I want to solve it. I'd like you to create a role for me, which is so wildly absurd...that if it weren't for my sponsor at the time...I don't think I would have had the <i>courage</i> to have that conversation, or even like the clarity. (Executive A)
Executive G	Those interesting pivot points of going to a role where you're like, I'm not entirely like, on paper, the logical candidate to get this job, but for any number of reasons, you know, that person or that team, like, was like, she can do it.
Executive K	She really embraced me and said, "Yes, she can come over, she can work for me." And it was probably the best decision that I could have made at the time. What's interesting is I shared that I only worked for men for the first 20 years of my career. She was the first woman I ever worked for. I've only worked for women since then. (Executive K)
Executive P	She didn't hesitate to put me into an assignment where I might have not been the one with the most experience. But I had a set of skills that would be valuable in the role. And then I was able to learn in that role and continue to grow.

Breaking through to executive positions. Many of the executives shared that the pivotal moments in their careers aligned with relationships related to transitioning to their first executive or C-level position. Executive L described a major transition in her career was when she was sponsored into her first role out of law enforcement into an executive role. Executive I also had a sponsor approach her to move into her first C-level position. Her sponsor was the

Chairman/CEO of the company recruiting her into the position as their first Chief Information Officer (CIO). The significance of the role and the advocacy to take on the role was what she identified as pivotal to her success. Executive H relayed the pivotal times in her career was when she transitioned into her Chief Information Security Officer (CISO) position. Executive O explained how one of her pivotal moments was moving from one prominent cybersecurity company to another. She was referred in through someone she had worked with previously, and the CEO of the next company was also a sponsor. She said the initial idea was for her to come in as the Head of Marketing, but they elevated her to COO, her first C-level position.

Table 5.

Breaking Through to Executive Positions Comments

Participant	Comments
Executive L	They decided that <i>they wanted a woman Head of Security</i> . And they came up with the requirements that they wanted a woman, West Point grad who had law enforcement experience, and I'd be the one. And so I <i>got the job against all odds</i> at 33 years old, became a...VP of a \$10 billion...company in 1992.
Executive H	There were a few key things that he said that really <i>pushed me over the edge</i> . And one was that, "...just <i>having the title puts you in a different sphere of peers</i> . You're going to get <i>invited to events that you don't get invited to without the title</i> ...they're not going to question did you have experience in that one technical thing."
Executive I	I could get that kind of <i>next level up experience</i> . That was <i>pivotal</i> because it was my <i>first C-level title</i> , and the exposure, the experience, the leadership skills I was able to develop, the trust that he put in me to do what needed to be done.
Executive O	That was <i>pivotal</i> for me, partly because he <i>let me be myself</i> ...I was COO and I...ran the business on a day-to-day basis...for good or for bad, he <i>trusted me to run the business and we were very successful</i> . And we sold at a very strong multiple.

Breaking through to CEO positions. Executives C and G connected relationships with mentors/sponsors with the major transition into their roles as CEOs. Executive C worked with the same two founders across companies for 21 years. She attributed part of her success to them

for providing her opportunities throughout her career, including her current role as CEO. In the third organization she followed them in, a software company, they had her take on her first CEO role. Executive G was contacted by a former board member from a previous company who expressed an interest in helping her land her first CEO role. This person was someone she had worked with previously and who sponsored her by making the connections for her to move into a CEO role.

Table 6.

Breaking Through to CEO Positions Comments

Participant	Comments
Executive C	I am super conscious that <i>I walked into a really rare, unique story</i> that these gentlemen were creating. And a woman being the recipient of this opportunity is <i>not the usual story</i> .
Executive G	I had gotten a call from one of my <i>former board members...</i> "it's time for you to get a <i>CEO opportunity</i> . You did a really good job at [name of company], you have the potential. Here's four companies in my portfolio I want you to look at."

New path created for her. There were also a couple situations where executives accepted another position and a sponsor stepped in to keep them in the company or current location. The transition was still a level up, but on a different path than the executive had planned. In these situations, the sponsor knew more about the situation than the executive and used leverage to redirect them in a new career path that they thought was better. Executive N had a mentor who advocated for her. When she accepted a position within the company in another country, she had a few people working to create positions to keep her. Her mentor helped create a path for her to stay and so she took one of the positions created for her. Not only was he involved with the transition that did not happen to another country, but to a different role, but he was also crucial to the transition she would inevitably take out of the company.

Executive K was recruited away by a different company to become their new Chief Compliance Officer about six years ago, but the Chief Diversity Officer of her organization at the time approached her to ask if she would consider a different decision. He said that in the 30 years he worked there, he had never seen the board attempt to keep a senior executive choosing to leave the organization. Executive K's sponsor helped her imagine what she would want to stay, helped negotiate possible terms, and then helped her learn how to negotiate with the CEO herself. For Executive K, she was able to use the advice from her sponsor to negotiate a position that was everything she asked for.

Table 7.

New Path Created for Her Comments

Participant	Comments
Executive N	This particular mentor was <i>not only concerned about pulling me away from the headquarters</i> , but also saw that the company wasn't headed in the right direction and was afraid that if I now was local to [different country], that <i>I would be really lost within with an uncertain future for the organization</i> .
Executive K	He was like, "so we have to broker this in a way and structure this in a way that it gives you all the things that you feel like you would have gotten if you left and went to this other organization."
Executive K	So I think the confidence level that I had around pushing the envelope really came from that experience and holding people's feet to the fire <i>to create equity in spaces where people like me are sitting, where we traditionally don't get the equity as it relates to our male counterparts</i> . That was <i>pivotal</i> for me, honestly.

Mentors share their networks. The executive participants described *networking* and making connections as pivotal to their careers. Executive H explained how one of her mentors is a long running CISO in the healthcare industry who mentors a lot of people. She explained the importance of making connections at the CISO level and how he was one of the early people that introduced her to other CISOs within healthcare, making it a pivotal time in her career. Once

Executive I started her CIO role, she realized her network was full of connections for sales and go-to-market and not any CIOs, especially women CIOs. As she started her new career as the first CIO of a cybersecurity company, she met a female mentor who invited her to industry events that would extend her network to other peers, especially women CIOs. Executive F described a female mentor who runs an executive women's group and conference. Other executives are also members of this group. Executive F saw this woman as a mentor, and she was introduced to her through her first mentor's network. Executive O also described her mentor as someone who provided her the opportunity to meet people.

Table 8.

Mentors Share Their Networks Comments

Participant	Comments
Executive H	He <i>introduced me to a lot of other people</i> and just brought me into that fold of that peer group...and so he helped really <i>advocate for me and bring me immediately into that peer group</i> . I made a ton of friends that way.
Executive I	I realized that my network were a bunch of go-to-market people, not a bunch of CIOs. And somebody had given me her name and said, <i>she's going to introduce you to a bunch of CIOs, more importantly, women CIOs, and you can build a community around it</i> .
Executive F	[She]... <i>runs an executive women's conference</i> for women who work in cybersecurity and risk management and in privacy. And actually, [male mentor] <i>introduced me</i> to [female mentor]. So that was interesting how it was kind of like <i>from one mentor to another</i> .
Executive O	One of the most important benefits was just that she helped me <i>meet other people in the industry...to see how she interacted with people</i> , and that she was always so open, and <i>willing to help</i> and <i>willing to connect people</i> .

Influential connections at industry events and conferences. There are many mentions of meeting key mentors, sponsors or trusted advisors at *industry events and conferences*.

Executive A described how she *networked at industry events*, once where she shared that she was pursuing a new job and another time she shared her interest in starting her own company. Both

were met favorably with *sponsors* who helped her. She described how *networking at these conferences were pivotal moments in her career*. Executive E described the first time she met her mentor, before she even entered the cybersecurity industry. A friend of hers invited her to join her at RSA, an *industry-related conference* where she attended a dinner with *women in security*. Executive F was approached by a publisher while *speaking at an event*. Executive H described her perception of how men include *networking more* into their practice as a leader than women.

Table 9.

Influential Connections at Industry Events and Conferences Comments

Participant	Comments
Executive A	I remember I was <i>walking the conference floor</i> of RSA, and I bumped into him and I said, "Hey, I'm thinking about doing like switching jobs." And he said, " <i>let me connect you with some people in my network.</i> "
Executive A	One of my mentors, sponsors, and a good friend, is the CEO of his own company, security company. And I remember I was at Black Hat, the <i>conference</i> , and <i>I was networking</i> . You can see that <i>being at conferences and meeting people has been pretty fundamental to my career progression</i> .
Executive E	We were <i>speaking at the same conference</i> ...I think, from then on, it was just a series of conscious connections to say, " <i>Let's build this relationship.</i> "
Executive F	He said, "Why don't you do this conference panel instead of me?"...I do the panel, and afterwards, I'm <i>approached by a woman who's an editor with the publisher</i> ...and that book was published in 2011. And I dedicated the book to [her mentor].
Executive H	<i>One of the big differences between how I see female and male leaders, what makes a huge difference, is the networking</i> . He's keeping up with his network and his connections...talking to people...hearing what challenges they're having in their environment and how that might be relatable to his environment...and I think <i>women are more focused on "How do I take the weight of the world onto my shoulders and solve all these internal organizational problems?"</i>

Investors for company. Executive A used her networking skills at another major industry event to seek out advice from a good friend who is a male CEO of his own security company. She wanted to start her own business and asked him what he thought about it and what

sort of problem she could solve. She described this moment of his response as pivotal to her starting her own business, and she brought him on as a business advisor. Executive B met a female CEO at an industry event, seeking to extend her network for potential investors. She identified two sponsors who introduced her to potential investors, but this woman also helped with investing. She introduced her to the investor and advised the negotiation of the terms.

Table 10.

Investors for Company Comments

Participant	Comments
Executive A	He said, " <i>If you start a company, I would like to invest in it.</i> " And for me, that was enough sponsorship, for me to realize. There's a light bulb moment that I have things worth contributing and worth building, if someone is interested in putting their money behind it.
Executive B	I mean, we're both CEOs. And she's been in her business probably 10 years longer. She respects me, her company does business with me... <i>she sees the value in what I've built.</i> And so a lot of what we talked about is... <i>investment type of things, and how to structure deals.</i>

Seeing something in me I did not see in myself. Many of the executive participants described pivotal moments with their mentors or sponsors as their ability to see something in them that they did not see, changing their view of what they were capable of doing or being.

Table 11.

Seeing Something in Me Comments

Participant	Comments
Executive A	His recommendation around what I could do, and what I could be, <i>helped me see myself in a different way.</i> His sponsorship for my application into the work actually landed me the job.
Executive H	He pushed me and he challenged me because he <i>knew I was ready before I knew I was ready.</i>
Executive F	He was <i>able to see the potential in me that I was not even able to see in myself,</i> because he had a lot more experience than I did. I simply didn't have the experience, to know what it might look like. But he <i>saw the potential in me.</i> And he saw how, by teaching me, by supporting me, I would actually help him a great deal.

- Executive P She is, I think, individually responsible for some of the success I've had not that it wasn't hard work on my part. But she *invested the time, she saw potential*.
- Executive I I think he just absolutely *believed and understood what my strengths were, and knew that I was a strong leader, as a builder*. I was strong on execution. But I really understood the business and the business strategy. And I just think he *always just saw something in me that I'm not even sure I ever saw myself*.
- Executive I She's just somebody that is able to take all the work that you've done and help you see it as the value that you add...and just really *helps you to see yourself in an entirely different light*. And so she's somebody that I now go to, anytime I'm making a really hard decision about what's next.
- Executive K I can't say that I did anything in terms of reaching out to him to say, here's the kind of assistance or support that I needed. I think he *saw the value in terms of the skill set that I was bringing to the table*. And then he started to put himself in position to *help and assist me*.

Imposter syndrome. Many of the executives described situations of facing the imposter syndrome. The imposter syndrome explains the feeling of not belonging, that somehow everyone else knows better than you, leaving one feeling inferior. Executive I expressed this feeling of inferiority when she was asked to step into the CIO role, and how it was a pivotal time in her career that changed how she saw herself. Executive G had several transitions upward throughout her career before she became a CEO. She said that her first pivotal moment in her career was landing a position with top national government, and it happened because she connected well with her first mentor and boss and their team at the interview. This moment set in motion how she continuously dealt with similar situations and how she saw herself. Executive H explained how her mentor introduced her to a whole new network of peers when she moved into the CISO role and how this helped her overcome her feelings of not belonging in the new leadership role she stepped into. Executive J described a pivotal moment with her mentor when she was being

considered for a big project and faced unwarranted feelings of inadequacy. Her mentor's perspective that she was a technical cybersecurity expert changed how she portrayed herself.

Table 12.

Imposter Syndrome Comments

Participant	Comments
Executive I	"You don't want to do that. Why would you make me the CIO? I've never been a CIO. Look at your executive team. <i>They're all experts in what they do. I'm an expert in something else.</i> " And he was like, "Because you are a leader, you're an executer. And you understand the business."
Executive G	I think we <i>sell ourselves short</i> often, where women will often say, "oh, gosh, but I've never done that, so I'm not qualified." I don't think I've ever heard a man say that, like, ever, but you often find women almost <i>qualifying themselves out of things</i> . At any point of time any human being, man or woman, hasn't done something until they've done it.
Executive H	He helped really advocate for me and bring me immediately into that peer group...So it was kind of me getting over this confidence hump of that <i>imposter syndrome</i> , right, of <i>believing that I deserved a seat at the table, that I was worthy that I was a leader that should be there.</i>
Executive J	I remember saying, "Well, I guess <i>I'm not that technical.</i> " The response was very swift. "Don't you ever say that again...you are a technical cybersecurity expert. Everybody has different technical experience." I was <i>selling myself short. I think that was a really pivotal experience in terms of how I portray myself to others and the brand that I'm going to have, and that imposter syndrome</i> that impacts so many of us in fields of technology.

Question 5: In as much detail as possible, please describe that relationship.

Male and female mentors. Executive participants appreciated both male and female mentors. The top qualities that were expressed the most for female mentors were: 1. giving advice, 2. care and empathy, and 3. connecting with influential people. For male mentors, the top three qualities expressed were: 1. giving advice, 2. influential connections, and 3. care and empathy. It appears that the participants appreciated similar qualities in both male and female mentors. Below in Table 13 are some of the excerpts of descriptions for all three of the top reported qualities of male and female mentors.

Table 13.

Top Reported Qualities of Male and Female Mentor Relationships

Categories	Male	Female
1. Giving advice	<ul style="list-style-type: none"> • He gave me honest feedback about the options on the table and the pros and cons, like, that's my relationship with him. (Executive G) • He popped in and out and gave me different pieces of advice. But he was very responsive. (Executive H) • And he said, "You know what, you're not going to say any of that. I need you to get a piece of paper out. And I need you to write down exactly what I say." (Executive K) • He was, and he still is, very pivotal to the trajectory of my career. He gives realistic advice, and things that are achievable. (Executive M) • I could throw ideas and bounce things off of him. Really in an informal fashion, whenever I have questions, or needed to just share with somebody outside of my organization. (Executive N) 	<ul style="list-style-type: none"> • "I'm thinking about this, or I got this problem, or, yeah, what do you think?" (Executive G) • She is able to give good constructive feedback and advice and not just, you know, not just listen and also not just sort of pump you up. (Executive I) • I have reached out to her for advice since then. (Executive J) • She has also taught me certain things that I should consider or be aware of being a woman in the cybersecurity industry. (Executive M) • She retired and is now doing Board work, but it was just a phenomenal person to go to, to get the coaching, and the real hard feedback. And the support that that I still, you know, ask her for, "hey, look, I'm thinking about these things, what do you think?" (Executive I)
2. Care and empathy	<ul style="list-style-type: none"> • They taught me that. You must take care of people that work for you. Because they took care of me. (Executive C) • If I were to use the words cybersecurity and caring together, I would almost say that's an oxymoron. But he just was. And I think that was really refreshing for me. (Executive D) • He understands. He also has family and he has kids and his wife also has a very high profile job. So he understands all the things that come with that. (Executive M) • Ah, he's definitely a nurturing soul. Very kind, paternal almost. Because he was definitely far older than I am. He was a lifelong individual in that organization. (Executive N) 	<ul style="list-style-type: none"> • They instill in you, compassion, and memories and love and empowerment, that make you say I can do that. And I can do that because I have them behind me. You know, um, and so that was really powerful. (Executive E) • I think we had a very special relationship in that it was it was one that felt like friendship, it was work, but it felt like friendship, it was one that was incredibly supportive. I could say things that I was feeling and not worry about the repercussions. (Executive J) • The way that she infused caring and concern, and just the the gentle leadership that she had. (Executive K) • I think for her, yes, there's definitely that nurturing quality. (Executive N)
3. Influential connections network	<ul style="list-style-type: none"> • He has had a long, successful career. He has a great network. People think very highly of him. (Executive F) • And it, you know, and he's like, "hey, if I hear anything interesting, like, you'll be the first to know." (Executive G) 	<ul style="list-style-type: none"> • And a couple of those people that I met, introduced me to others, and one of the most amazing people I met. (Executive E) • She just is amazing at identifying peoples' superpowers, and just really connecting great

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- But he was one of the early people that brought me into the fold of groups of other CISOs within healthcare. And started saying, “Hey, [she] is this other great health care, CISO. She's my friend. Get to know her.” (Executive H)
 - I think shared perspectives, it was helpful to have mentors who knew all of the players. (Executive J)
-

Mentors and sponsors. The executives described a *mentor* as someone who imparts an advanced ability, with certain skillsets they need to attain that may not be learned from formal education, but rather from understanding and emulating someone with direct experience. The term was also used loosely to describe those relationships which were mentors and sponsors or just sponsors.

Mentors. Executive A described mentors as those whose superpowers you want to learn. Executive L described mentors as providing guidance for expertise that you need for a specific event or space. Executive D described her experience emulating her mentor, who was the CEO she chose to bring into the company she co-founded. Executive O described how she learned about being an entrepreneur from her mentor who was CEO when she was COO of a cybersecurity company. Eventually she would also go on to be a CEO.

Table 14.

Mentors Comments

Participant	Comments
Executive A	<i>A mentor is someone who helps me with day-to-day challenges, a professional, who helps me develop a certain skill set. When I work with a mentor, I really like to ask, what are your superpowers so I can understand what I can learn from them.</i>
Executive L	<i>Mentorship is more around an event. I'm doing something in a space, and I now need somebody who has expertise, so I asked somebody in that space, “Can you provide me guidance here, or knowledge or expertise?”</i>
Executive D	<i>One of the issues when you're a founder is, it feels like everything is a catastrophe...and everything is so critical in that moment. And he was really good at kind of just coalescing of</i>

thinking...for me, it was just very much these little things about business...and then the key is to see somebody who knows how to do it well.

Executive O He had been a successful entrepreneur before...he believed in capital efficiency and judged success by how many millionaires he created from his team. He was there to really make sure that his shareholders benefited, but also that his team and co-founders really benefited. That *really resonated with me and stayed with me. And that is the way I manage as well.*

Sponsors. When the executive participants referred to *sponsors*, they often meant someone who advocated for them for a specific position internally or for someone who opened doors for them and made connections for them that were not previously available, either inside or outside of the organization. Sponsors were also referred to when the situation was political. Sometimes *mentors* provided *sponsorship* as well, so the term *mentor* sometimes referred to a relationship where a role model was both *mentor* and *sponsor* roles to the participants. Executive A juggled back and forth with the terms *mentor* and *sponsor* and what they meant to her as a co-founder of her own company. Ultimately, she felt *sponsorship* was more prominent in her career. Executive L stated she also had more *sponsors* throughout her career. She reflected on the *mentors* she had encountered and expressed that *sponsors* were more influential in supporting her career than *mentors*. Executive L described a major transition in her career coming from someone who offered her a position she had no idea she would even be qualified to do.

Table 15.

Sponsors Comments.

Participant	Comments
Executive A	Someone who helps me get to a <i>new job</i> , start a <i>new opportunity</i> , <i>vouch for me</i> , get me a <i>seat at the table</i> that I can't get to, <i>open doors</i> for me. I have had much more experience with <i>sponsorship</i> in my work, in my life, than I have <i>mentorship</i> .

Executive L I think *sponsors give you opportunities...that you could never conceive yourself or be able to put yourself in...that makes the difference*. A sponsor is going to have *power, knowledge that the person who sponsored may never know*.

Sponsorship: Advocate in political arena. Executive J described a *mentor* of hers that through examples, was someone she learned a lot from, but she also described this same person as a *sponsor* by providing her opportunities. As mentioned earlier, Executive K had an example of a *mentor/sponsor* who *advocated* for her when she had decided to leave the organization she worked for at the time. She mentioned her *mentor's* involvement included helping her *navigate the politics* and she also referred to how his connections helped her in a sense of *leveraging power*. The way Executive K described this relationship was one of both *mentorship* and *sponsorship*, and she acknowledged this in the interview. In the story she had shared about the board wanting to keep her at the organization, and the support this *mentor/sponsor* gave her to help broker the situation, she said she had not been fully aware of the full story at the time. As a *sponsor*, he understood the full picture, so he was in the best position to be an *advocate* for her.

Table 16.

Sponsorship: Advocate in Political Arena Comments.

Participant	Comments
Executive J	She was the <i>sponsor</i> of many of the tough projects. One was a particularly <i>politically charged</i> , tough project. I got to see her under the pressure of <i>politics</i> , which was quite interesting to <i>see how that was handled</i> . She saw me not just as a skip level direct, but as somebody that she <i>mentored</i> , and I have reached out to her for <i>advice</i> since then.
Executive K	I needed him to help me <i>navigate the politics</i> of the health plan in order for me to get this done in five months.
Executive K	I started <i>leveraging him more for the relationships</i> that he had....having to <i>influence</i> and be able to transform major parts of our business, major parts of our behavior without the <i>relationships</i> there to help me. He <i>allowed me to leverage him</i> ...and to tap <i>his network</i> to be able to broker some of the transformations that I needed to do early on.

Executive K *I didn't know the story at the time. But he went to the CEO and said, "You all are about to make a mistake here, you cannot let this woman leave this organization." And he gave all the reasons why he felt that would be a bad move for the company. He was *advocating* and *opening up doors* for me in spaces that I never even had access to.*

Sponsorship: Reciprocation. Executive participants described shared immediate and gradual reciprocated value in the relationships with mentors/sponsors. This description of reciprocation in the relationship or a shared experience, suggests these relationships were not exclusively on the receiving end of the mentee or protégé.

Immediate reciprocation. Executive M and Executive N described situations of *mutual success* shared with their mentors/sponsors. Executive F and Executive H described how their *mentors/sponsors* depended on her skills to compliment his. He provided her opportunity, and in return, she provided him great value.

Table 17.

Sponsorship: Immediate Reciprocation Comments.

Participant	Comments
Executive N	She wanted to make sure that the role was really successful and had an <i>invested interest</i> in making sure that she <i>opened doors up for me</i> , so that there could be <i>mutual success</i> in the field, to also protect...the information, you know, she was the head of medical records. So definitely <i>mutual success</i> was important in that capacity.
Executive M	He gives <i>realistic advice</i> and things that are achievable...it's more of a <i>mutual understanding</i> ...he might not even know he's my <i>mentor</i> ...but I <i>think this person is pivotal to everything that I am today</i> . Starting with that one CISSP certification.
Executive F	<i>He saw the potential in me</i> . And he saw how, by teaching me, by supporting me, I would actually <i>help him a great deal</i> . He recognized his own weaknesses. And he recognized that even though in this relationship, he's the <i>mentor</i> , and I'm the mentee, he <i>sought me out for my complimentary skills</i> . He knew that we <i>as a team could do things that neither I alone nor he alone could accomplish</i> .
Executive H	He was in the CISO role, but <i>he sought my advice a lot</i> ...we were a <i>good team as a deputy and a CISO</i> ...he was doing a lot of the public speaking while I was back at the ranch, running

things. We had a *tight relationship*...so I think it's not so much that he acted more as a formal *mentor*, but the relationship...*he trusted my opinion so much and he sought that out from me*.

Gradual reciprocation. Two of the CEO executive participants described a shared or reciprocated relationship over time. Executive E described a *mentorship* relationship where her *mentor* was someone she saw as elevated in relation to her, and she felt good about reciprocating the support she received by *offering her own power over time*. Executive O shared the same long-term mentor/sponsor. She was someone who helped her get her start, helped her extend her network and her understanding of the industry and technology. She said that the relationship was not entirely just mentor to mentee as she eventually became a *compensated advisor*.

Table 18.

Sponsorship: Gradual Reciprocation Comments.

Participant	Comments
Executive E	I was just drawn in by the fact that she was <i>willing to see in me what I was trying to accomplish</i> ...and in return, I always said to her, " <i>if there's anything I can ever do to support you or to help you</i> ..." and there were occasions over our relationship where <i>she did call on me for help</i> . And it meant the world to me.
Executive O	She was <i>always so open, and willing to help and willing to connect people</i> . And so then <i>in turn</i> , she became an <i>advisor to me and some of my companies</i> , and then she <i>made money</i> through those advisor shares...so it wasn't purely a mentor/mentee relationship...and this made me feel good, too.

Informal mentorship. Only a few mentioned they had *mentors* early on who were formally assigned by their companies, but most of the participants described both *mentors* and *sponsors* as organic, both developed from inside the company and externally. One way that *mentorship* relationships transpired was by executives seeking out their own *mentors*, especially as they became more senior in their roles. Executive J used the term "spot *mentoring*" to explain

her practice for seeking *mentorship*. She used this practice when she was seeking advice on an area or skill to develop. She explained her process of spot mentoring as a concept of identifying a problem or skill that needed work and then finding the best person to address it.

Table 19.

Informal Mentorship Comments.

Participant	Comments
Executive J	I always found it challenging to, you know, <i>seek out that mentorship unless</i> it was assigned for me, I think in most cases of, of <i>mentoring</i> . It was an <i>organic</i> thing that happened versus formal programs with just a couple of exceptions.
Executive A	I don't have a really shining star of <i>mentorship</i> . What I do right now is when I have an individual problem...I find someone in my network who is an excellent manager that I respect, and I will ask to get on a call with them. So my <i>mentorships</i> are sort of hour long conversations with different people. I have 1000 <i>mentors</i> , each for an hour.
Executive A	I look for people who have gone through an experience that I'm seeking counseling in, or <i>mentorship</i> in at least twice. So ideally, three times so they can start seeing patterns. Either they have broad experience, or they have the humility to appreciate that their experience is not the absolute.
Executive J	I basically go and <i>pick their brain on that particular thing</i> . For that, level doesn't matter to me. It's who's good at this, and <i>who can help me</i> . But I think it is less daunting to the mentee and the <i>mentor</i> if, I'm not asking you for a one-year commitment or more, I'm asking for a <i>couple of sessions or maybe even just one session</i> to really help me tackle this challenge that I have.

Women mentors. Executives who had women mentors who they identified as transformational to their development described them as amazing, heroic role models and attributed them to being nurturing, compassionate, caring and often overlapping their professional and personal lives. Executive B explained that her *mentors* were more recent, and they were women. As a CEO, she especially appreciated their willingness to help with issues of *raising money* and sharing connections for *potential investors* in her company. Executive I shared information about two different female *mentors* she had at different times in her career.

One was a formal mentor she had attained internally at the company she worked with at the time. Although she moved on from the organization where this relationship was developed, she still sought her *advice*. Executive J talked about a female mentor she had at a time when she had a male boss who she felt she had outgrown. Her description of this female mentor showed the impact this person had on her. Executive F shared how her relationship with the woman mentor in her life was a different relationship than with the male mentor. She described it as more *personal* and crossing over to her *personal life*. And she described how the *shared experience* of being women was significant for her.

Through the data collection, it was uncovered that Executive O shared the same mentor as Executive E. It is uncertain whether the two executive participants know each other however as they live in different parts of the U.S., they have no common shared organizations, and they are not connected to each other on the business social network, LinkedIn. Executive O described her as “*the security den mother for a number of young professionals.*” Executive E described her as “*one of the mothers of computer science and intrusion detection.*” They both described this mentor in such a way that expressed how *nurturing* and important this relationship was to them.

Table 20.

Women Mentors' Comments.

Participant	Comments
Executive B	I think my <i>mentors</i> would be more recent, other <i>women I've met in cyber [security]</i> ...they're not many, obviously. But two specifically who have reached out to me and <i>asked me if there's anything I need</i> ...they have <i>raised money</i> and <i>been in similar positions</i> and are just a little further down the road. I'm always open to hearing their experiences.
Executive I	She was sort of a <i>level above me</i> , but in a different function at [the cybersecurity company]. But we had a <i>real connection</i> . And so, she was kind of my formal mentor. I would meet with her at least monthly. And then when I left there, it became a little more informal, but she's still <i>somebody that I would reach out to</i> .

- Executive J She was somebody who I *looked up to immensely*. I loved the way she operated...*seeing her command a very large organization*. She was, at certain times, *the only women on the IT leadership team*. And she would stand on the stage in front of the thousands of people who were on her team and *talk with such a confidence*. I think we had a very *special relationship*...it was one that was *incredibly supportive*.
- Executive F She would give me *personal advice*. I think part of that, perhaps, is because *we're both women*...and because of that we have some *shared experiences* that [the male mentor] and I simply will never have.
- Executive E This *amazing woman*, a leader in her own right and a mentor to many, and truly someone who wanted to *advance everyone*, who had a *passion for this field*...*saying to me, I can do this*. And so I did. They...instill in you *compassion and memories and love and empowerment*.
- Executive O She kind of *took me under her wing*. She would *introduce me to people*, and...helped me to enter and be a strong part of the community. Because she was a *connector of people*, and she was a very good person, and she believed what goes around comes around. She was always *open and willing to help other people*.

Prominence of male mentors. Eleven of the 16 executive participants identified male mentors/sponsors first when describing significant relationships during pivotal moments in their careers, with six of them having identified all male mentors/sponsors. Executive H expressed that she did not favor female bosses and expressed that she preferred the approach of her male mentors. She felt that her female bosses focused on what to do first to succeed whereas her male bosses gave her more space to take a chance, making it acceptable to fail and learn from it. Executive G described an amazing career with several male mentors/sponsors at very pivotal moments on her career path. She also shared descriptions of female peers and trusted advisors there were not always able to relate to her challenges as a CEO in the industry. Executive A shared her thoughts about the importance of having both male and female mentors, her perception being that the majority of power still belongs to men.

Table 21.

Prominence of Male Mentors Comments.

Participant	Comments
Executive H	The guy whose team I moved towards, he was like... <i>"I just need somebody to take care of it. I don't care that you haven't done this, I'm just going to shove you off the deep end, and you're going to sink or swim."</i> And <i>I learned so fast, because he wasn't itemizing all the things I needed to work on.</i>
Executive G	And I was like, look at my story. There were <i>not many women that were sponsors of mine. Most of them were men.</i> So, you know, for the women who always are like, "Hey, you know, we women have to support women" and like, no, it's a man's job, too.
Executive A	I actually think it's important to have both [male and female mentors] for different reasons. I think women uniquely appreciate the difficulty of being one of a kind in a room and a token hire. But I think <i>only focusing mentorship on women actually limits your career progression and how much you can move up in the world, because men own the majority of positions of power in our reality today...</i> and to be frank, <i>most of my mentors and sponsors are men.</i>

Loneliness as a woman CEO. A few of the executive CEOs and founders described the difficulty in finding women mentors who could relate to their issues, have had similar experiences they could share, and the struggle of loneliness in their situations. Executive A expressed her challenge finding women entrepreneurs in the industry. Executive G further explained this dilemma that other women connections she had were not able to relate to her challenges because they had not experienced being a CEO. Executive D described her feelings of loneliness going through a major acquisition and not having anyone she could turn to who could relate to her experience.

Table 22.

Loneliness as a Women CEO Comments.

Participant	Comments
Executive A	But because one of my challenges that I have found is, at least from where I am at, <i>paving a new path</i> , like there aren't a lot of female cybersecurity entrepreneurs, even leaders. So I <i>haven't found someone who can actually guide me in this space really effectively</i>
Executive G	Neither of them have been CEOs. It is <i>extremely lonely</i> at the top as a CEO, <i>lonelier</i> than I ever thought it would be. It's hard to understand until you're in it. And there's just <i>so much pressure</i> because so many lives depend on your decisions.
Executive D	We were going through the acquisition...I really did feel kind of <i>alone</i> ... I mostly just <i>needed reassurances</i> ... it was a <i>really, really tough time</i> ...to be honest, at the time, there <i>weren't that many women CEOs in cybersecurity</i> , I knew...maybe two others... had never been through an acquisition like mine... it's tough when you're talking about a quarter billion dollars.

Trusted advisors, peers, shared experiences. Many of the executives discussed groups of *peers*, also using the terms *cohort* and *colleagues* who help provide guidance, share ideas and common goals, and support each other both *professionally* and *personally*. Executives G, K, and P described the peers or colleagues that provided both professional and personal support. Executive E described a female acquaintance in the industry that she met over the phone but did not connect with in person until five years later where they become friends. Over time, she became a *trusted advisor* for her and now sits on the Board of Directors as a CTO in one of her nonprofit cybersecurity company. She described other women connections she had who were not able to relate to her challenges because they had not experienced being a CEO. She explained the advisor relationship as more attainable later in one's career. Executive B explained how she was part of a support network for entrepreneurs. She saw this as a resource to have access to many *advisors*, who she described as *peers*, that can share their experiences when she needed advice.

CISOs shared a common goal of fighting off cyber threats to their organizations. Connecting for this shared purpose also allows them the opportunity to support one another with other *shared experiences*. Executive M described the close *community* of her CISO colleagues ensured she was not doing things alone. Executive J, a CISO from a large healthcare organization, described the impetus of coming together against the bad guys as a necessity for having other CISO *peers*.

Table 23.

Trusted Advisors, Peers, Shared Experiences Comments.

Participant	Comments
Executive G	There are women like that in my life, <i>peers</i> of mine that, as we've changed jobs over the course of time, we lean on each other as a <i>senior counsel</i> . There are women, still in cyber, that as we've grown together and developed together... a <i>close cohort</i> of people that just lean on each other, not only just for <i>professional</i> reasons, but [name of peer] was...struggling with something in her life, <i>personally</i> .
Executive K	I have people that I've created these <i>professional</i> relationships with along the way, some <i>personal</i> relationships along the way where I trust their judgment on things. I've built relationships with over the over the years...maybe <i>10 or 15 people</i> , depending on the situation, who I will tap at any given moment, to have conversations.
Executive P	For the past, I would say 15 years or more. I've had a <i>personal Board of Directors</i> . It is a set of individuals that come from different walks of life with different experiences, that I value their inputs and opinions. They know me well, they know my <i>personal</i> values, and what I want to do <i>professionally</i> ...I <i>leveraged them in terms of career planning, career growth, personal things</i> .
Executive E	She is a person that I go to quite often to...it's like, people who you will go sit on their sofa, and put your feet up, and say, "Can we <i>talk through this problem</i> of the world, of the company, of business?"
Executive E	<i>Maturity</i> in these mentor/mentee, advisor/advisee relationships shift as you gain experience in your career. It feels more like a <i>dialogue and a discovery together</i> than it does early in your career.
Executive B	We have the whole premise of... <i>learn from other people's experiences</i> so you don't make mistakes yourself...we have <i>advisors</i> , that are <i>peers</i> , <i>other founders</i> . And so I kind of have a lot

of little mentors, not like full time mentors, but a lot of people who I've had the opportunity to call on...I get very *unfiltered experience sharing*.

Executive M I have made a lot of friends, colleagues, who are pivotal to my career, because *we bounce up ideas amongst each other*. It's a very *close-knit community* of cybersecurity executives. So I'm not doing it all on my own, you know.

Executive J I really turn to a lot of *peers* for *advice*. So the thing that I love about this particular industry is, there's no benefit that comes from any of us having an attack. And so it is incredibly *collaborative*.

Executive coaches. Mention of coaches by the executive participants were related to executive coaches that were provided by the organization when they became an executive or moved to a new company as an executive. The executive coaches were hired from outside of the organization, and executives reported having some involvement in choosing them. Executives J, K, and G described their experiences with being given an executive coach.

Table 24.

Executive Coaches Comments.

Participant	Comments
Executive J	I was promoted to Vice President, which was an executive at the company I was at. And <i>when you are an executive, you are paired with a coach</i> , you get to interview a few different coaches, you figure out which one works for you. The conversations were just between us, I believe, and the <i>advice I got was fantastic</i> .
Executive K	[My company] has <i>afforded me a professional coach</i> , as well. So for most of their executives, they do offer that especially when you're new coming into [the company]. The culture is very strong here. And for experienced hires, the <i>retention</i> has not been that great. So I think this is a new way of them looking at this.
Executive G	The other thing that I really benefited from was that <i>my board</i> at [cybersecurity company] was a <i>huge supporter of me getting an executive coach</i> , which was <i>fantastic</i> . I had the <i>ability to choose</i> whom I wanted. I ended up choosing a male. We just gelled really well together. I would recommend for any CEO, regardless of man or woman, especially if you're a first time CEO, an executive coach is worth every penny.

Learning through observation. Executive B explained how she learned so much from her first boss who she described as “the epitome of an entrepreneur.” She said she did not see it so much as a mentorship as much as an “amazing experience”. And she described how observing others’ mistakes also helped her to avoid making her own. Executive M also described learning to be a leader through observation of other leaders’ behaviors, both good and poor. Executives I and J both described learning what they did not want to do in their own leadership through observation of poor leaders.

Table 25.

Learning Through Observation Comments.

Participant	Comments
Executive B	Everything is kind of monkey see, monkey do. It's not really a, it's not necessarily a person. But it's <i>watching what people can do</i> , and being like, "Oh, I can do that. I can do anything." And people ask me, they're like, how did you know how to do whatever, and I'm like, <i>you're not born knowing anything, you figure it out.</i>
Executive B	I <i>watched him a lot</i> like I would actually ask him, I would go in his office, and I would just listen to the calls he was on...and that's how I learned. And, you know, I just always wanted to <i>understand the context of everything that was going on in the business.</i>
Executive B	Well, learning from other people's experiences instead of making my own, which is a lot more efficient when you can learn from other people instead of making your own mistakes.
Executive M	You can always <i>observe somebody and learn</i> from them, right? Either you learn, “I don't think you should be doing that”, or you can learn “yes, this is why you should be doing that.” So that is active and passive learning. And when I see good leaders, I always <i>watch how they behave, what they talk about, and I tried to learn from them.</i>
Executive I	For the first part of my career, I spent more time <i>observing what I didn't want to be as a leader</i> than, that's the leader I want to be. So I think I learned a lot more from some of the poor leaders and executives that I worked with, than the good ones.
Executive J	I think that there were <i>people who were pivotal</i> , but sometimes for the fact that I realized that I <i>didn't want to emulate their leadership style.</i> There's as much that you can learn from people that you really end up respecting and learning a lot from as from people who are <i>not exactly who you want to emulate.</i>

Mothers as first role models. Some of the executive participants described their mothers as pivotal to their success. Some were raised with mothers who were professionals that were role models for the executives to follow. Executive B said she was raised to be able to do anything and that her mother never held her back. Executive N expressed how her parents could not afford college and so went part-time. She described her mother as influential to her leadership development. Executive H described her mom as someone who majored in computer science at a time when women did not do that. She described her entire family as computer geeks. As a VP of a software company, Executive H's mother would talk to her about things she encountered and how she solved issues. In all of these cases, their mothers were models they could observe and emulate. Executives H and N credited this experience as pivotal to their ability to start their executive roles relatively early in their careers.

Table 26.

Mothers as Role Models Comments.

Participant	Comments
Executive B	I was really raised to be able to do anything. And my mother was a professional, and I just had her as a role model.
Executive N	My mother certainly has <i>played a huge role in shaping who I am</i> . In terms of, you know, she was a super, super smart, motivated leader. And I think I just <i>took on those qualities</i> .
Executive H	It was <i>like having an executive coach when I was in high school</i> . And I think just in my whole life, thinking about problems and how to digest data and be prepared and think structurally. That was just all kind of how I was raised...she certainly nurtured that in me.

Question 6: How do you describe your leadership style?

Strategic direction, vision, mission, ideas. One of the most described crucial aspects of leadership style reported was that of strategy, ideas, and setting the vision or mission of the organization. Below are descriptive excerpts from the executive participants.

Table 27.

Leadership Style 1: Strategic Direction, Vision, Mission, Ideas

Participant	Comments
Executive A	I expect the people who work for me are focusing on what's important now. It is on me to <i>understand what is going to be important next</i> . And so I'm <i>focusing on strategic initiatives</i> , trying to look around corners, build, understand that the direction of the whole train is moving in the right place. And the only way to do that is taking a step back and making sure you're <i>focusing on the bigger picture</i> .
Executive E	And because I feel like I'm a <i>leader of ideas, and missions</i> , I guess I don't even see myself as a leader of people. Because I feel like people are just kind of around me, we're <i>all locked arms together</i> .
Executive F	I work very carefully with my teams to say, <i>here are the priorities</i> . And here are the items that are not a priority, here are the items that you should not do. And I try and work with my team members to do that.
Executive H	I am very clear about <i>setting the strategic direction</i> , and getting people inspired around a <i>vision</i> , like, what are we doing? And why does it matter? Why are you getting out of bed to do your job in the morning? And so it's <i>setting a very clear rationale and justification for what we're going to do</i> . But saying, this is <i>where we're headed</i> . And so for me, it's <i>setting that vision</i> .
Executive K	My job is to make sure that they are <i>aligned to the strategic direction and vision</i> ...I think that we lead as a team. And it's not good enough for [me] just to say, here's the direction we have to go in. But all of us have to be pointing in the right direction and say that's where we're <i>going together</i> .
Executive L	<i>I'm direct. Okay, ah, and I'm visionary. I dream the impossible.</i>

Collaborate, listen to different ideas. Then make the decision. Collaboration was expressed by many of the executive participants as a crucial aspect of their leadership style.

Below are excerpts from many of the executive participants.

Table 28.

Leadership Style 2: Collaborate, Listen to Different Ideas, Make Decision.

Participant	Comments
Executive G	I like being challenged. You know, that brings out the best in <i>all perspectives</i> , right? And so that we can come up with <i>the best possible decision</i> . However, when I make a final decision, after hearing everybody's input, then get on the train, right? I'm a huge <i>collaborator</i> , though. I never make a decision in a vacuum. Because I think that half of the journey is in the <i>discussion before the decision</i> is even made. In any organization.
Executive H	My leadership style has evolved over time. I like to be very <i>collaborative</i> ...I do think it's setting that <i>vision</i> and making sure that the <i>team is working together</i> holistically, and as a solid unit.
Executive L	And I try to get very <i>collaborative</i> , trying to get people involved...I will always <i>listen to the feedback</i> I get, but I might have things that they're not aware of, from the situational awareness in the organization, or things that I can't even say to them, because of the nature of it. But I'm very <i>collaborative</i> and have a great team..
Executive M	I need someone who can go above and beyond, think for themselves and take responsibility. And who can <i>come up with ideas</i> . I'm <i>open to suggestions</i> . I'm open to someone having a <i>different point of view</i> . As long as you know how to come across and not make it an argument.
Executive N	I often say to my team, I have ideas. But I want to hear yours first and I have opinions. But if I say them out loud, then they're going to quiet the ones that you have. And so I often <i>let the team be the ones to contribute</i> . I always say I <i>reserve the right to veto</i> .
Executive O	I would call it very <i>collegial</i> and very <i>collaborative</i> . I believe in bringing a group of people together and <i>listening to everyone's views</i> , and evoking decisions based on everyone, or most everyone, agreeing to those, as opposed to, this is what we're going to do.

Give them space and ownership. Help remove obstacles. Adapt style and be flexible.

Phrases such as giving them space, ownership, getting out of the way, making their jobs easier, and being flexible were conveyed by executive participants.

Table 29.

Leadership Style 3: Give Them Space and Ownership. Help Remove Obstacles. Adapt Style and Be Flexible

Participant	Comments
Executive C	So my style is that I'm involved, when it's a new project for them, and I'm not involved, if it's not, and I <i>give them their space to perform</i> .
Executive D	As a leader, you have to be super <i>flexible and adapt your style</i> to what your people need. It doesn't go the other way...it's <i>my job to make your life easier</i> ...which is a way of making you perform, but it's a different way of looking at it.
Executive F	I really think that <i>flexibility is important</i> . I really think that <i>supporting flexibility for people is important</i> .
Executive K	I try to stay in my lane. I don't try to play in other people's spaces...my job is to remove obstacles so they could do their jobs.
Executive M	I like to <i>give people ownership</i> and they can run with it. I like to do that. I don't like to dictate or direct people on certain, on things. <i>I'm there at every step to help them out</i> .
Executive N	I try to be a very authentic leader. My perspective is that when it comes to my team, my role is to <i>enable them</i> and to give them the tools for them to be successful, and to <i>get out of their way</i> , and to be a <i>guiding factor</i> for them, not a dictating factor for them.

Be inclusive. Instill a sense of belonging. Embrace diversity. Some executive participants described inclusiveness as crucial to their leadership. Sharing, different perspectives, feeling included, and diversity were also terms and phrases they used. Excerpts from the executive participants are below.

Table 30.

Leadership Style 4: Be Inclusive. Instill a Sense of Belonging. Embrace Diversity.

Participant	Comments
Executive E	If we really want to take advantage of a <i>diverse</i> culture, we actually do work better when we are <i>diverse</i> . And that's just been my experience. Many women solution differently. We do.
Executive G	So any one of my teammates for many of my companies will tell you that I'm always about more <i>inclusiveness</i> ...when <i>collaborating</i> , when <i>sharing</i> , getting <i>different perspectives</i> , etc.

- Executive J I'm always going to make, to try to help somebody *feel included and that they belong*. So *sense of belonging* is really, really important to me. I love the way that just the concepts of *diversity and inclusion* are evolving to really talk about *diversity, inclusion and belonging*.
- Executive L It's the *diversity* of the team that matters. So what I talk to people about is, not everybody has to be in the vision of one persona, where even though most of us may have come through engineering of some type, *these other areas, provide us great skills, and great opportunity for the entire organization*.
- Executive N There's not a lot of talk about *inclusion and diversity* in corporate culture and conversations. I happen to work for an organization that I think is a leader in this space. And so I think organizations need to recognize that this is a problem, not pretend that it's not there.

Create a safe space. Executive E mentioned the crucial aspect of creating a *space that is healthy*. Other executives described the importance of also *creating space* that includes an *open environment, psychological safety and mental safety*. Below are descriptive excerpts from executive participants.

Table 31.

Leadership Style 5: Create a Safe Space.

Participant	Comments
Executive E	If you're a leader of a mission that people believe in, and that you <i>create space for them that is healthy</i> , and <i>empowering</i> , and fun and humble. And you can create that <i>space where they want to be there</i> . That is my leadership style. <i>I create that space</i> , and I help drive that <i>mission</i> , and do my best to be welcoming.
Executive A	I think of myself occasionally, or often, as an umbrella of all the bull**** and the noise that might come down and help them focus on doing what they do best in the most <i>psychologically safe</i> way they can do that.
Executive C	And I have an <i>open-door communication and mental safety</i> within the organization, because when I do interact with people, I'm always about making sure they have <i>mental safety</i> .
Executive N	I think it's really important to create an <i>open and safe environment</i> for the team to grow.

Transparent and open. Some of the executive participants described transparency and openness as crucial aspects to their leadership. Below are excerpts from executive participants.

Table 32.

Leadership Style 6: Transparent and Open.

Participant	Comments
Executive B	And so I'm very <i>open</i> . Sometimes I'm accused of being too <i>open book</i> of telling my employees why we may or may not do a merger, or something like that, like stuff that some people would keep behind closed doors. But I like people to <i>understand the whole context of things</i> , not just what their job is.
Executive F	So my leadership style is what I call <i>people first</i> and <i>radically transparent</i> ...to me, it's all part of just being on the same page and <i>having the same information so that we can hopefully take the best actions moving forward</i> .
Executive G	And so it goes back to like, my philosophies that I share, which is like, here are the things that I expect of myself. When I say I'm going to do something, I do it. I'm honest. I'm <i>transparent</i> .
Executive K	I'm a huge <i>communicator</i> . I am quite <i>transparent</i> with my team, quite. I live in a space of <i>candor</i> all the time...because we have to <i>trust</i> each other, we have to <i>trust</i> each other's judgments, our instincts and everything. So I have to be <i>transparent</i> with this team.

Empower others. Be a servant leader. Executive participants A, G, and I described empowering others and being a servant leader as crucial aspects to their leadership style.

Table 33.

Leadership Style 7: Empower Others. Be a Servant Leader.

Participant	Comments
Executive A	I am interested in <i>empowering everybody around me to show up as their best selves</i> and get out of their way of doing it. I don't know if you've ever heard of the term <i>servant leader</i> , but that's one of my leadership development goals and directions.
Executive G	I'm very much a <i>servant leader</i> . I believe leaders come from all places in the organization, it's not just about the role, or the title that you have...and I help make people understand that they're completely <i>empowered to be the best possible version of themselves that they can</i> .

Executive I I think that it's about being a *servant leader*. It's about being an *empathetic* leader, but it's also about having high expectations for your team. I think it's *about investing in the soft skills and the intangibles* that make teams function, not just technical skills and execution.

Hire great talent. Executives F, G, and K emphasized how hiring talent that is complementary, smarter, and skilled is crucial as a leader.

Table 34.

Leadership Style 8: Hire Great Talent.

Participant	Comments
Executive F	As a leader, <i>I always seek out people that are better than me, that are more specialized than me, that are complimentary to me.</i> I figure if I hire someone that's way better than me that I would happily work for, then that just makes me and the whole team that much stronger.
Executive G	I knew enough to be dangerous, but I also knew I needed to <i>hire talent that were smarter than me and worked for me</i> that could manage that function well and also teach me. And there are things that I knew I could teach them.
Executive K	So I am not a micromanager by no stretch of the imagination. I think that I <i>hire skilled professionals to do their jobs.</i>

Accountability. Executives B, G, and H described accountability as crucial, including relationships with the business and aligning people to that and how accountability brings trust.

Table 35.

Leadership Style 9: Accountability.

Participant	Comments
Executive B	I always want people functioning in their highest and best use, and understanding the reason we do everything, and why we exist. <i>So then their decisions will align with that path.</i>
Executive G	I care deeply about <i>accountability</i> for both myself and for my teams, and I put out a leadership letter at every company I go to...I think there's a level of <i>empowerment</i> around that for people because they also know they can hold me <i>accountable.</i>

Executive H We're not there to tell the business 'no', but to *advise them* of the risks and the potential impact if that risk was realized. And so really holding the team *accountable* for adhering to that and to doing their job. And executing against the plan.

Develop people. Executives H and K described one of the crucial aspects of their leadership to develop people.

Table 36.

Leadership Style 10: Develop People.

Participant	Comments
Executive H	I always want people functioning in their highest and best use, and understanding the reason we do everything, and why we exist. <i>Then their decisions will align with that path.</i>
Executive K	We're not there to tell the business 'no', but to <i>advise them</i> of the risks and the potential impact if that risk was realized. And so really holding the team <i>accountable</i> for adhering to that and to doing their job. And executing against the plan.

Define roles and responsibilities. Executives C and H both described the importance to them for clearly defined roles and responsibilities. Other terms related to this crucial aspect included situational leadership, tasks and projects, priorities, and how they fit in.

Table 37.

Leadership Style 11: Define Roles and Responsibilities.

Participant	Comments
Executive C	I subscribe to situational leadership. I really manage people based on <i>tasks and projects</i> versus what I think of them or their personality...having <i>clearly defined roles and responsibilities</i> and <i>mental safety culture</i> , with an <i>open-door policy</i> .
Executive H	I think it's important because otherwise people are confused about the <i>priority</i> , confused about what actually matters and what they're doing there and what their <i>role is and how they fit in</i> .

Question 7: What do you think are your greatest strengths as a woman leader?

Empathy, compassion, care, nurture. The executive participants overwhelmingly described crucial aspects of their leadership in terms of care. Below are the descriptive excerpts from many of the executive participants.

Table 38.

Leadership Strength 1: Empathy, Compassion, Care, Nurture.

Participant	Comments
Executive C	So I think those two things; <i>empathy</i> and <i>problem solving</i> are what my people enjoy the most...I solve problems. Fast. I also really come from a space of <i>caring for my people</i> , and knowing that I'm responsible for them, and that I'm there to help them.
Executive D	My leadership style is very much that I treat everyone that's in my organization as if they're <i>part of my family</i> . And so every decision that I make is based on is this <i>how I would treat my family?</i>
Executive E	I will not apologize for being a <i>kind and soft and loving and huggable</i> woman, but I am also fierce for the things that I'm passionate about.
Executive I	It's about being an <i>empathetic</i> leader... I don't know, I just think I really <i>care</i> about the people. But again, that doesn't mean that I am soft, or that I don't expect strong execution.
Executive K	I believe that I am a quite <i>nurturing</i> leader. I'm an ordained Deacon. So I have this perspective of <i>care</i> and <i>wellbeing</i> . I can see myself being quite <i>nurturing</i> with my team.
Executive L	<i>Compassion, and caring, and being willing to express it...caring about people</i> , their lives, their livelihood, their knowledge, their advancement as imperative, because they will <i>care about you and help the organization</i> more than you could ever ask them too, because they know <i>you care</i> .
Executive M	I would say the strength that I have is to be <i>compassionate</i> ...by being <i>compassionate</i> and being able to <i>give people their space</i> is something my team has always said that they like about me.

Communication. Many of the executive participants described how communication is a crucial part of their leadership. The skill of communication was described in ways of being able to communicate effectively, being able to listen, negotiate, articulate, have difficult conversations, and getting a message across.

Table 39.

Leadership Strength 2: Communication.

Participant	Comments
Executive A	I have a lot of courage, a lot of strength, and I am <i>willing to have hard conversations</i> . I'm going to make hard decisions. I'm willing to say I don't know. This is all founded on courage. And I'm an <i>excellent communicator</i> .
Executive E	While I am good at creating space, I'm great at <i>communicating</i> , you know, encouragement and positivity and <i>creating mission and moving us towards a higher goal</i> .
Executive F	I think that my biggest strength is an ability to <i>communicate effectively</i> with a lot of different kinds of people... the things that people appreciate is that I'm a <i>consensus driver</i> , and that I like to <i>collaborate</i> .
Executive H	I've felt like I've done a good job of helping to <i>bring that message to people</i> who didn't want to hear the message about security, because that's about <i>listening</i> , and <i>understanding what the business is trying to achieve</i> .
Executive N	I think the <i>soft communication skills</i> help, so in cybersecurity, you have to be a really good <i>negotiator</i> . Because everything that you're doing is probably preventing somebody from doing something else. And so, those soft skills around <i>negotiation</i> are really important.
Executive N	Cybersecurity is a very complicated thing, and to be able to <i>articulate it in a way that people understand it</i> . In business terms, in clinical terms, in translating the threat landscape into risk for an organization are also skills that require really <i>strong communication skills</i> .

Crisis Management. Some of the executive participants described managing crises as a strength and the concept of remaining calm in the face of a crisis was considered a crucial aspect.

Table 40.

Leadership Strength 3: Crisis Management.

Participant	Comments
Executive J	I think I am very <i>calm</i> under pressure, which is really needed in cybersecurity. And the emotion was not a big piece for me, which is kind of funny because people say women are so emotional, but I find myself to be very <i>calm in the face of a crisis</i> .
Executive K	So we're either <i>fighting against the business</i> , because we're feeling like we're stopping them from being innovative and doing the things that they want to do. Or <i>we're fighting against the bad guys</i> ...we can have chaos happening all around, and I'm just <i>calm</i> as, cool as a cucumber.

Executive P I'm an *exceptional crisis manager*...I would say that when I was faced with that [large company] breach, I mean, literally, I was the leader leading the company through that.

Driven. Executive N described crucial aspects that contributed to her success were being driven, hungry, willing to grow, and having strong social skills. Executives K and O also shared the crucial aspect of driving things forward.

Table 41.

Leadership Strength 4: Driven.

Participant	Comments
Executive K	And I do consider myself to be a <i>driver</i> of a certain sort. Because again, a lot of things that are <i>driving what we do in our space</i> , are either <i>driven</i> by regulation, law, best practice, and...so I think there's a certain <i>drive</i> that goes with my leadership style.
Executive N	I'm a very <i>driven person</i> . I am <i>hungry</i> , I like to learn. I've always been very focused on self-investment. And just self-growth. And I've been like that my entire career, which is the great thing about being in cybersecurity. You have to be <i>hungry</i> . You have to be <i>willing to grow</i> otherwise you fall behind.
Executive O	I'm just, you know, kind of the buck stops here, person. So I think that works very well. But I know when to <i>drive</i> toward a solution or <i>drive</i> to an end, <i>drive</i> to a conclusion, <i>drive</i> goals.

Intuitive. Some of the executive participants described being able to intuitively understand or read people well was crucial. They related this to having a good sense of social, emotional, and political skills.

Table 42.

Leadership Strength 5: Intuitive.

Participant	Comments
Executive A	I have a very high EQ. I can <i>read the room</i> , and I have it, which helps me <i>intuitively understand</i> where I need to drive that conversation, where I'm getting alignment and not alignment.
Executive N	<i>I read people really well</i> , I read situations really well and also know how to make the most out of my skills in being able to <i>manage social situations and political situations</i> .

Executive O I'm an *intuitive thinker*...I'm someone that *understands people's motivations*. And I have a *good sense for people* and how they'll react and how to incent them. And I believe in *following my gut*, even when sometimes it interferes with my head. So I think that that is a strength.

Risk-taker. Being able to take risks was described as crucial by Executive O and Executive P. Executive P described her career path as unusual as she had never led in an organization that she worked in before but rather took calculated risks supported by sponsors and mentors. Executive O gave a concrete example about how being a risk-taker was crucial as it propelled her success as a CEO.

Table 43.

Leadership Strength 6: Risk-taker.

Participant	Comments
Executive O	I don't know how unique it is, but I am a <i>risk taker</i> . I invest. I think that is another reason in <i>taking those risks</i> . I've been successful, and then you can <i>build on that success</i> .
Executive P	I didn't move up in a single org vertically...I have a very diverse set of experiences. And some of them have been a result of mentors encouraging me to take on challenging different assignments, and also <i>take some risks</i> .

Question 8: What barriers have you perceived or encountered as a woman in a predominantly male field?

Her voice not being heard. When describing barriers, there were a lot of accounts from executive participants about not being heard, being left out, not being the loudest and most demanding, spoken over, silenced, not being a loud-mouth, being talked over, and needing to be extra prepared. Excerpts below are from many of the executive participants.

Table 44.

Barrier 1: Her Voice Not Being Heard.

Participant	Comments
Executive A	I am not the <i>loudest</i> person in the room, I do not like to interrupt people. I found myself often <i>spoken over, interrupted</i> . The environment was not conducive for me to <i>speak up</i> , for a variety of reasons, partially being the only woman, partially for me not being very aggressive... <i>And when you're the voice that's being silenced, it's really hard. That's when you really need a champion.</i>
Executive E	You know, so I think for me, it's been a challenge, because I've come into the field late in my career, I'm a woman, I came in through very nontraditional channels. And <i>I am not a loud-mouth, in-your-face, f-bombing type of person.</i>
Executive G	If you've got something to say, <i>speak up</i> . It's only on you if you don't say something. If you're not outspoken and stand up for yourself or articulate something that needs to be said...you can often <i>stand out because you are the only woman in a room</i> . So make sure what you say is important.
Executive H	There are the occasional people that will, you know, <i>talk over</i> , but I think a lot of that has changed drastically. I think also people are better about if you <i>call it out</i> , realizing that they're doing it, but again, some of this is just that I've also made a point of going into environments that aren't going to tolerate that.
Executive J	The small talk that is before a meeting...it's more male dominated...I don't have anything to say to this. And, you know, you're just <i>left out of the conversation</i> for a bit. But to me, that's just <i>typical</i> . It's just the way it is.
Executive L	I still talk to the women who taught in technical roles that they <i>can't be heard, nobody's hearing what they're saying</i> . And I give them tactics on what to do with that and how to manage it.
Executive N	Sometimes <i>women don't feel like they can voice those concerns</i> ...I hear other people's stories, <i>where men won't acknowledge women, where they'll discount the opinions, where a woman will voice an opinion in the meeting, and it will be discarded, and then a man will voice the same opinion, and it will be adopted as a great idea</i> . I have heard of <i>women just completely being ignored in meetings</i> , where a peer has had to step in.
Executive P	Female CISOs in fortune 100 companies, they're starting to be more, but there are very few of us. And so some of the challenges that have existed have been <i>finding ways to be able to be heard, and to have your ideas be listened to</i> , especially if you're out in industry...there aren't many of us. A lot of the industry work and stuff is heavily male dominated.

Compensation gap. Executive participants confirmed and described inequities in compensation in the workplace. Executive C described how normally women in the types of roles she's been in do not get the big compensation to go along with it. Executive M confirmed from her experience that the pay gap is still real. Executive K shared her thoughts about the lack of equity in payment based on her own experience and observations. Negotiating salary is a barrier many women face along with compensation gaps. Executive A described how she turned to her mentors for help on negotiating salary and how she now helps other women to communicate what they should be paid. Executive K described the story about how her mentor/sponsor taught her to negotiate her worth. She pointed out that this is something women struggle doing.

Table 45.

Barrier 2: Compensation Gap.

Participant	Comments
Executive A	I've turned to [mentors] for help on <i>negotiating salary</i> . And when I mentor, that's one of the areas I focus on a lot; understanding how someone <i>communicates their value</i> and <i>stands their ground</i> on what they should be paid. So in <i>negotiations</i> , it's incredibly valuable.
Executive C	And again, another reason why I represent sort of the 1% is that they [the two co-founders] gave me financial opportunities like <i>traditionally men get</i> in these leadership roles. <i>Big comp plans</i> , as I should have gotten for the work I've done, and yet you <i>don't see women in those roles very often with the type of comp plans I've had</i> .
Executive K	There's one area where I think that we have absolutely not been loud enough about and that's as it relates to <i>equity in compensation</i> . The fact that women are still making 60 plus cents on \$1 for every male...And what do we justify in our heads? That women are not valuable, and they're not as valued as men?
Executive K	We are always having to justify our work, but how do we <i>get our companies to align to what they know they should be compensating us</i> for, just like they would do with our male counterparts?
Executive K	He said, "men do not <i>negotiate</i> like this. You are thinking too much about how you're going to be perceived during the negotiations, then what should really be in the negotiations."...really

pushing the idea of me being *compensated for what I'm worth*, and not only in the industry, but also to [the company].

Executive M I definitely still see the *pay gap*. It's very, very real. It's everywhere.

Promotions and sponsorship. Executive participants described their perceptions about how promotions and sponsorships were not as readily available to women as to men. Executive C described how she grew up as a privileged child with great parents. "I didn't even know the women weren't promoted equally." She had observed how women do not usually get to be in the positions she has attained through her career. Executive D described a male colleague receiving a promotion over her. Executive J described not getting opportunities she felt she would have had as an older male. She felt her female mentor was hardworking, and her male boss was not. Executive K expressed her perception that women are leaving corporate America because they are not getting the same support in sponsorship as white male peers.

Table 46.

Barrier 3: Promotions and Sponsorship.

Participant	Comments
Executive C	<i>Traditionally women don't get to be [promoted to] Vice Presidents of Sales at startups and tech companies where you get paid the big bucks and the big stock option plan.</i>
Executive D	The feedback I got was "You need <i>more executive presence</i> ." There was me, and there was this guy, and he was never getting that feedback. And yet he needed it. He had no executive presence, but I think he had a Harvard MBA. And so <i>he was seen as the golden child type</i> .
Executive J	There was also this challenging situation that in many ways, I had gotten to the point that I kind of <i>outgrown my boss</i> , and that I was no longer learning from my boss...I felt like I was being somewhat <i>penalized for my age, and my gender and not having the same opportunities that I felt like I would have had had I been older or male</i> .
Executive K	I watch companies <i>consistently wrap the right level of support around white males, some of them not even deserving of the of the support that they get from a sponsorship perspective, and not give that same level of support to women leaders and minority leaders</i> . And from that perspective, I hope that at some point in time we change that.

Hiring practices. Executive B described the unconscious bias associated with women applying for jobs in cybersecurity. Executive N described what she has perceived as the problem in hiring practices starts with taking the gender bias out of the job descriptions.

Table 47.

Barrier 4: Hiring Practices.

Participant	Comments
Executive B	But there's a major challenge in cyber security of people not getting jobs because the job description requires a four-year education, for example, even though somebody's ability to do that job, has nothing to do with a four-year education. And there's an <i>unconscious bias, about a woman applying for a cybersecurity job.</i>
Executive N	When a woman looks at a job description, she feels like she has to meet 100% of the qualifications in order to apply, where a man maybe needs to fit 50% of them. And our <i>job descriptions have traditionally been gender biased.</i> And so we as leaders need to look at those job descriptions, and <i>think through the lens of women</i> and write them accordingly.

Resource allocation. Executives A and H described issues with getting the budget or the resources they needed.

Table 48.

Barrier 5: Resource Allocation.

Participant	Comments
Executive A	I've been part of leadership teams, where I'm the only woman at the table. And what happens is, <i>the person who is loudest and most demanding is the person who tends to get more budget and face time with leader, with the senior management...</i> And over the course of five years, I saw my peers' programs grow, where mine grew a fraction of the amount that theirs' did.
Executive H	I think there were times in government, in particular, where they <i>weren't as necessarily as inclined to see me as a peer.</i> And I don't think that I always got the <i>budget</i> that I needed.

Expectations based on gender. Executive participants described gender bias expressed by expectations of others imposed on them based on assumptions they made related to their gender. Executive B described a demeaning statement made to her by a board member.

Executive H described the expectation of her to be more nurturing compared to her male colleagues. Executive O described a situation where she broke the glass ceiling in a company early on in her career as the first female analyst. It was a male sponsor that got her the job.

Table 49.

Barrier 6: Expectations Based on Gender.

Participant	Comments
Executive B	They're one of the members of the board of directors. I was standing in an office. And there was a vacuum cleaner in the corner. And he says, "Oh, <i>don't you belong over there, with the vacuum cleaner?</i> "
Executive H	I actually had a few men that worked for me, that <i>expected me to kind of mother them</i> . And it was very weird...It was in a " <i>I'm expecting you to nurture me in some way.</i> " And I'm like, that is <i>not my role</i> .
Executive O	I was the first woman associate that they brought into the firm. And we were really analysts, the bottom of the bottom of the pyramid. They almost didn't hire me because <i>the chairman didn't think women could do the job</i> . And then I came on board. And I was very highly respected within the organization. So that changed their perspective on that.

Sexual objectification and sexual language. The executive participants described accounts of behavior imposed on them by men that were sexual in nature, unwanted, and based on their looks or perceived sexuality. Executives B, G and E described sexual objectification based on how they looked. Executive F described the realized confusion an encounter of sexual objectification had on her about how much her looks and sexuality affected her professional role. Executive O described the sexist behavior of two co-founders who acquired a company she was in and how the board allowed this behavior toward two women at a board meeting. Executive participants also expressed how sexist language has been used to discriminate against them and demean their position. Executive K expressed how others thought it was okay to talk to her condescendingly with pet names, even when she was the senior person in the situation. Executive

H described a situation of a male peer using sexist language to insinuate that he did not see her as a peer CISO.

Table 50.

Barrier 7: Sexual Objectification and Sexual Language.

Participant	Comments
Executive E	I was working at [Fortune 500 Company]. And [it] was <i>incredibly sexist</i> . And one of the senior executives said to me, " <i>I like you better in skirts than I do in jeans.</i> "
Executive F	In another company, when I announced that I was leaving... <i>two married male executives propositioned</i> me basically as I was on my way out the door. One of them... gives me a hug in which he puts his arms inside my blazer. I mean...that for me as a woman, was very confusing. <i>What are all the implications of my looks, and whatever my sexuality, whatever my femininity may be bringing to the table?</i>
Executive H	It can be tricky, especially in a male dominated environment, especially in like sales, where you're going to conferences, a lot of men, you still have <i>women marketers that are dressing up in short skirts</i> ...and, you know, <i>guys ogling, or after hour parties</i> , like thinking it's totally acceptable to go back to that old-world...mentality.
Executive K	And then <i>he told me to wear a shorter skirt</i> at a conference. And he was just a jackass. Like, he was a <i>board member</i> . And he was <i>part of the investor group</i> . So he just was this old, old, ignorant Southern man. And just, you know, it was so bad.
Executive O	When we got acquired, they had two co-founders that were just <i>blatantly sexist</i> ...but because these founders still owned a large percentage of the company, they kind of <i>let them be inappropriate at the board meetings</i> .
Executive K	<i>Oh, you just take the notes or call me honey and sweetie</i> on the call because I'm <i>the only woman</i> on the call. I've had to check men across the board for stuff like that. I'm the senior leader on this call. You <i>don't call me honey and sweetie</i> during a meeting. We're not friends like that. But they felt like they wanted to do that.
Executive H	<i>Oh, do you need me to do something for you, little lady?</i> I could help you out with that if I decide. Maybe I could get you an invite to this," and just very much <i>making it clear that I am not his peer</i> . And maybe he <i>sees me as a threat to job opportunities</i> . So it could be that...but he definitely is a little <i>demeaning</i> .

Inappropriate behavior. Sexism and alcohol. Executive I moved between IT and cybersecurity. She said she experienced being one of a few women in sales and was used to it. But she said she found more instances of inappropriate behavior related to gender in cybersecurity companies where there were fewer women. Her experiences that she described at the cybersecurity company included inappropriate discussion about women in front of her by the leadership and what she described as too much emphasis on drinking alcohol. Executive I also described another example of inappropriate behavior toward her as a woman and involving an emphasis on alcohol. Executive F shared her experience of being a recovering alcoholic, related to being in the industry. She explained how she started in cybersecurity at a young age and that the real conversations where decisions got made happened while having drinks. She also expressed that having a drink was a coping mechanism for uncomfortable situations. Executive N has experience teaching and expressed a question that comes up about dealing with the inappropriate behavior toward women, and her perception is that there is not an easy answer.

Table 51.

Barrier 8: Inappropriate Behavior. Sexism and Alcohol.

Participant	Comments
Executive F	Working in technology, I was so surprised in my 20s, how <i>everything was just alcohol infused</i> ...happy hours were <i>where the real conversations and the real decisions got made</i> ...what that meant for me personally, and perhaps what it means for many women is that <i>if I encountered a situation that I thought was weird, or made me feel uncomfortable, I would simply drink a glass of wine and forget about it...it also made me fun.</i>
Executive I	The culture and dynamic...felt like a <i>boys' club</i> ... <i>I felt like I was uncomfortable in the way the men were behaving and operating</i> ... way too much <i>emphasis on fun and drinking</i> and...the discussion of the stories or what came out of it... <i>something about a girl or another employee, or a woman, and it was just super inappropriate.</i>
Executive I	We had a band perform at the prior kickoff and [they]...obviously had been <i>drinking or doing drugs</i> ...and when planning for the next year, I said, "Look, the feedback on the surveys was

clear. Most people left..." So he looks at me and finally goes, "*You should have had a couple more drinks and had a little more fun.*" He made it about me. Somehow, I was the problem.

Executive N One of the questions that was posed to us as faculty was, "*What do you do when a male counterpart just continuously breaks you down? And, and just disrespects you blatantly? And oh, by the way, leadership sees it and ignores it and allows it to happen?*" And those are hard questions to answer.

Assumptions of inferiority. Executive candidates described being mistaken for a role inferior to the much higher roles they were in. Executive E described a recent encounter where there was an assumption that the male reporting to her was the one in charge. Executive F described being assigned assistant duties because she was a female. Executive I described being mistaken for an assistant when she was in a well-established VP executive role. Executive K is an African American woman CISO. She was a keynote speaker at an event where she was asked to serve coffee by a white male attending the event. She described this as an example of discrimination based on both racial and gender bias.

Table 52.

Barrier 9: Assumptions of Inferiority.

Participant	Comments
Executive E	The sales guy sends it over and says, "[Male employee name], here's the contract. When you're ready to sign it, send it over." Even though I did the site visit, and I've been on all the threads, and I was like, <i>you wouldn't do that to a guy.</i>
Executive F	<i>Woman assistant syndrome.</i> So there's so many times when it's like, "Oh, could you just like set up this event?" Or like "Could you go get the coffee?"...and that is <i>certainly because I'm female.</i>
Executive I	[The company] was acquired by an East-coast based company, very white, male centric. And when I went to my very first meeting, after they acquired us, somebody <i>assumed</i> that I was the <i>executive assistant</i> ...I'd never been in a situation where just based on the fact that I was a woman, somebody would <i>assume</i> that [was] the best job that I could get.
Executive K	I'm being <i>mistaken for the person who's coming to serve coffee</i> and to take care of the meeting...all they saw was this <i>African American woman in this space where we're not used to</i>

seeing folks who look like you. So when you're here, I have to assume that you're here for something else. You can't be here for anything related to security...and afterwards he came and apologized...I said, "but you have to ask yourself the question, 'why did you ask me?'"

Assumptions about her experience. The executive participants expressed encountering biases against their technical abilities and other experience. This bias sometimes had them questioning themselves. Executive P expressed that there is this *assumption* that cybersecurity is entirely *technical*, but she provided a viewpoint of concern that there is not enough focus on all of the other roles that need to be filled in these organizations that require other skills as well. Executive F described a moment with a female mentor early in her career who explained a situation when a male was putting her down because he made the *assumption* that she did not have enough *technical* background.

Executives C and G are CEOs in cybersecurity who gained their experience through sales. They both expressed having their *technical abilities challenged*. Executive C found that some men have biases against her because she has more of a sales background instead of a technical background. She expressed that she does not let that be a barrier for her and provided an example of a famous non-technical male executive in tech whose position was not questioned. Executive G also described having teams of men who judge her as having less knowledge than them, but she also described not allowing that bias become a barrier for her.

Executives H, J and L are CISOs who described the *assumptions* and *unconscious bias* they experienced about others' perceptions of their abilities. Executive H ran into more bias in mid-level management regarding the *technical skills* of women. Executive J described that even after 19 years at same company, there are still those who make *assumptions* about her and

question if she's good at what she does. Executive L shared that people attribute the idea that she does not have the expertise that her experience shows she does.

Table 53.

Barrier 10: Assumptions About Her Experience.

Participant	Comments
Executive C	Because I don't have the <i>technical background</i> ...it can take a man a bit longer to take me seriously. It is a barrier for women that are in business today that may be more on the <i>sales</i> side. Whereas if it was a man, like <i>Steve Jobs</i> , nobody really talks about that he <i>wasn't technical</i> . But <i>for women, it's a totally different game in running tech businesses</i> .
Executive F	I didn't have the <i>experience</i> to understand that he was putting me down. And [female mentor] explained to me afterwards that what the guy was trying to do...was to <i>insult me</i> by making the subtle point that...if you were on the security team, you ought to have had a lot of <i>practitioner experience</i> in a lot of different <i>technical fields</i> , which I did not.
Executive G	There have been times where I've managed a team...where I was rather new. They're like, "oh, here she is coming in <i>knowing less than we do, less experience</i> than we have. <i>And being a woman</i> ." And these are guys who may have also been former military...and in <i>sales</i> on top of that. So it's like a double whammy, but for me, it's continuing to <i>persevere through that</i> .
Executive H	I do think I encountered some expecting women to <i>not be technical</i> or <i>not have the capacity to be technical</i> . So that's still something that I'm always <i>second guessing myself</i> on and then having to do that internal, not relevant talk.
Executive J	I do think that there's " <i>Well, does she know how to do that? Is she good at that? I haven't seen her do that</i> ." And the <i>judgment on what they've seen and what they assume</i> .
Executive L	<i>Unconscious bias, they think I'm stupid, they think I'm fluff</i> . [They] have <i>no idea that I would have the experiences in my background</i> , that when I'm in a room, the person with military experience and a West Point graduate is likely me.
Executive P	My big concern right now is that <i>everybody thinks cybersecurity is extremely technology focused</i> , but we have a lot of roles that are risk management, that require technology understanding, even cyber policy roles, like in the government, like <i>there are a lot of roles that aren't necessarily a bit and byte monitoring for a Security Operations Center</i> .

Attempts to invalidate her. Executive D described an experience she perceived as discrimination earlier in her career and that was an attempt to invalidate her. A male colleague, who she described as a “train wreck and “spaz” was allowed to move into an executive role while she was told she did not have enough “executive presence”. She said she was meeting all the metrics provided, even more so than this male. The only differences she could perceive was that he was male and had a Harvard MBA. She explained the “executive presence” barrier that existed as a glass ceiling at that company. Executive E shared a recent experience where two men attempted to invalidate her experience by being patronizing. Executive F also described a situation where two male colleagues attempted to invalidate the value she brought to the company by invalidating her professional skills.

Table 54.

Barrier 11: Attempts to Invalidate Her.

Participant	Comments
Executive D	There's probably a whole bunch of people in Silicon Valley who are giving women coaching on the better executive presence, which is just a [expletive] way of saying, " <i>You don't look like us. And we're threatened</i> by that." And I'll be honest, it really upsets me...And I was very frustrated because nobody could define it...and that was why it worked. Because they can say, " <i>Oh, we know it when we see it.</i> "
Executive E	I was on a call with a potential partner...these two men were just are like, " <i>Oh, she's a woman. She's a nonprofit. She's been victimized...</i> " And by the end of the call, I was sort of like, " <i>Don't do me any favors.</i> " Right? Because it sort of got <i>patronizing</i> ...and then I had to sort of unpack it for myself...maybe I shouldn't have told them my history...how I got into security...the fact that [this] is a nonprofit
Executive F	There were two other members of the management team. Males. And they did not like my approach. <i>They actually set me up to look like a fool in a meeting.</i> When I'm in a work environment where people appreciate what I bring to the table, the things that people appreciate is that I'm a consensus driver, and that I like to collaborate. <i>But these folks saw that in me, and they saw it as a negative.</i>
Executive G	I've had to deal with <i>women</i> that have been really <i>negative</i> , and <i>toxic</i> , and even, in some cases <i>negative to other women</i> , which is really weird, but I don't understand it. But I have seen it in a

number of organizations, where it's like *women don't think they can make room for other women*. It's just really strange.

Women invalidating women. There were instances in the descriptions from Executives E, F, and G about the experiences of the executive participants where the barriers they encountered were invalidation from other women. Executive H had shared that her mother was a professional, and that she had learned a lot about being an executive by growing up with her. She also shared that she felt that the women of her mom's generation could be harder on other women due to the difficulties they had encountered and overcome, laying the groundwork for the next generation.

Table 55.

Barrier 12: Women invalidating women.

Participant	Comments
Executive E	It was incredible because all the men I spoke to supported me coming [into the PhD program]. And the <i>one woman</i> faculty that I talked to flat out said <i>she would not support it</i> , that "we don't do distance learning...you can't do a part time... <i>I will not support you.</i> "
Executive F	So when my daughter was born, as a breastfeeding mother, I would travel for work. And I would need to organize my workday such that I could take breaks to pump...it happened to be a <i>female manager</i> who said, "I've got to book these meetings. And I don't care if you need to take pump breaks... <i>we'll just do the meetings without you.</i> "
Executive G	I've had to deal with <i>women</i> that have been really <i>negative</i> , and <i>toxic</i> , and even, in some cases <i>negative to other women</i> , which is really weird, but I don't understand it. But I have seen it in a number of organizations, where it's like <i>women don't think they can make room for other women</i> . It's just really strange.
Executive H	She kind of had an attitude that <i>women were the problem</i> . She was having a hard time getting respect in the workplace because <i>women are just too emotional</i> ...and that's why <i>men don't respect women</i> , and her life would be easier if <i>women would just stop being irrational</i> ...but I think <i>she made it harder on other women than she did on men</i> .

Being a mother. Some of the executive participants also described the challenges of becoming a mother and both the barriers and support a woman can face from their own experience and the observation of other women. Executive J described being in a situation where assumptions were being made about another woman and her choice to take on an opportunity upon return from maternity leave. Executive L described being a sponsor for another woman for a great leadership opportunity that had opened up when she was pregnant with her fifth child. She told the hiring committee that she was the best candidate and that they were just going to have to support her through her leave. She explained that the woman did so well that she was considered for a senior role soon after. Early on in Executive P's career, the woman who became her mentor offered her a job in software management even though she was pregnant, and then promoted her when she returned from leave. She defined it as a pivotal assignment in her career.

Executive M described the importance of her personal life working out if her career was going to work out. She also explained how she felt her mentor was understanding of the birth of her first child because she felt he was in a similar situation. Executive M also described coming back from maternity leave with her second child and the lack of understanding she encountered from a male colleague.

Not every woman chooses to have a family. As mentioned earlier, there are instances women will be discriminated against for not having families. Executive K had mentioned how the idea of the male being the "breadwinner" for the family was a long-time excuse for men getting higher pay. Her argument had been that there were many women who were also in that situation and so their pay should be equal. But then there are the women who are not married or do not have children. Executive C described her encounter with this discrimination at a time when she was negotiating a separation package with a company.

Table 56.

Barrier 13: Being a Mother.

Participant	Comments
Executive C	<i>Not having a family, is an unconscious bias that they used against me in hard times...it's not going to hurt her that much. She doesn't have a family. Just because I don't have children, and at the time, a husband, doesn't mean that I don't have family obligations.</i>
Executive J	<i>I've made the mistake of, and I realized it later, making assumptions on other people's behalf. Let's not make that decision for them. Let's ask them, give them the safe space to say no, but not assume we know what they are willing or unwilling to do.</i>
Executive L	<i>Just give the person the opportunity. Give them the chance...and I have been amazed time and time again. When you give people a big back, give them an opportunity, what they can do.</i>
Executive M	<i>My personal situation is very important, my family situation, all of that needs to fall in place for me to be at a certain place in my career. He understands. He also has family, and he has kids and his wife also has a very high profile job. So he understands all the things that come with that because my husband also travels a lot and everything...he understands, being in a similar situation as I am.</i>
Executive M	<i>One of my colleagues asked me, how was my vacation... I was on maternity leave. He knew that I had a second child...he was my colleague, my peer. We reported to the same person, but they just don't get it. Those things...definitely can be avoided, whether it's intentional or not. Certain preconceived notions are there about women.</i>
Executive P	<i>I said, "Thank you for the offer. I'm very interested. But...I am going to have to go out on maternity leave for a couple months." And she said, I still want you to come take the job...and when I came back to work for her, she made me her deputy. And I worked across her whole organization. So that I think was a pivotal assignment for me.</i>

Challenges of family, industry, and pandemic. Some of the executives expressed the challenge of being a mother and a professional in the industry. They described the industry as stressful and hard, requiring support internally and externally. And specific to this year, they described the additional impetus on women to care and teach children at home during a pandemic. Many of the executives discussed the stress of the industry and the challenge of being

a mother at the same time. Below are some excerpts from executive participants that refer to these challenges during the pandemic specific to 2020.

Table 57.

Barrier 14: Challenges of Family, Industry, and Pandemic.

Participant	Comments
Executive F	And it's a <i>weird pandemic year</i> , I've got <i>kids at home, remote learning</i> , you know, Ruth Bader Ginsburg has died. Trump is a horrible person. I don't know. I mean...so all of these things are just kind of <i>building up</i> .
Executive L	[With] <i>COVID</i> , there's been a <i>big impact on women</i> , because they're <i>taking a bigger responsibility</i> , teaching children at home, elderly care, all of those things. <i>Security's a rough place</i> ...I was able to have a hugely <i>supportive</i> husband...there's so many things that are <i>demanding on women to be 100% successful in the space</i> , that it's <i>difficult</i> .
Executive M	It's a very <i>stressful career</i> . If you don't have the <i>support, internally, externally, at work every day</i> , it's very hard. So a woman has <i>several different roles</i> . I'm a mom, I'm a wife, I'm a daughter, and I have a career....I have talked about how you manage <i>stress in this industry</i> . And now...in this industry with <i>COVID-19</i> on top.

Racial and gender bias. There were three executive participants who described racial bias and discrimination along with gender bias. Executive F is a Chinese American woman COO, and she described an encounter of both racial and gender discrimination that she had experienced. Executive K is an African American woman CISO. She shared her experiences with assumptions of her as a leader based on her race and gender. Executive M is an Indian American woman CISO who described her experience with gender bias, but it included an aspect of her racial identity as well. She described being the only woman, and only woman of color on a panel, and a colleague made an assumption about her based on her gender. Executive K also described an incident earlier in her career where she encountered *intentional and aggressive racism and sexism* from the all-white, all-male team she managed.

Table 58.

Barrier 15: Racial and Gender Bias.

Participant	Comments
Executive F	I was the lead on this...project for a company that's based in Japan...they would really <i>prefer if it wasn't [me]</i> doing the readout report. They would really prefer [white male boss] instead...older white American man...these male Japanese executives are <i>not going to take to it particularly well if it's a young, Chinese American female coming in and telling them what they're doing wrong and telling them what they need to change.</i>
Executive K	And there's <i>judgments and preconceived notions and assumptions</i> made about us as leaders, you know. I can't be passionate because...I'm seen as the <i>angry black woman</i> . And I keep telling people...I'm being <i>just as passionate as my white male colleague</i> . And you would never say anything like that to him. So why do we get those kinds of things placed upon us?
Executive M	People do sometimes <i>underestimate</i> , or they think that you are not capable of certain things. Sometimes it's <i>intentional</i> , sometimes it's actually <i>not intentional</i> ...I was speaking at a really big event on a panel, and I was <i>the only brown woman</i> , so you kill two birds in one stone, and three white men, which is normal in cybersecurity...it was a huge success...one of my executives asked me..." <i>weren't you intimidated by all these men around you on the panel?</i> " No, I wasn't...it was just something he thought was a normal question to ask.
Executive K	I remember probably in the late 90s was the first time I led an all-white male team, and I was living in Georgia...and I was the manager of this group...and this man stopped and... <i>threw the assignment back across the table at me</i> . I gave it back to him again, and he <i>pushed back</i> and he said, " <i>You know, I don't take too kindly to taking orders from women, especially black women.</i> "

Adding diversity to boards. Executive participants described the challenges to bringing diversity, females and people of color, to their boards. When advocating for diversity on a board, Executive H described her experience with a *board* member who had a *perspective* that suggested females or people of color may “*compromise quality*”. Executive H also explained her perception that the leadership needs to *change the culture* to bring in the *diversity* and fill the jobs, not bring in that one diverse person to change the culture. Executive I described her company’s efforts to increase *diversity dropped once they were acquired by private equity*. Executive L described her experience of a male colleague’s misguided question to her at a board

meeting about not being able to find *qualified women* CISOs. She also described her own actions toward increasing *diversity on the board* she was on, how her own sponsorship of candidates brought more diversity by removing barriers.

Examples of board positions as glass ceiling. Executive I said her major barrier exists now, in her goal to get board positions. She described how a male sponsor who had been an advocate for key positions over her career, no longer offered to advocate for her when she wanted to attain positions on boards. She explained how she realized he was good at sponsoring her when he received value for her being in the new role. After several attempts to get support to get board positions, she said he made it clear that this was not something he would help her do. She expressed her disappointment in someone who was once encouraging of her growth, now deciding to put a limit on her experience.

Executive I also had a male acquaintance who she had known as a previous board member. She described her request to advocate for her for a board position and how it was ignored. This VC is a common connection to a few of the executive participants. According to his LinkedIn profile, he is on 11-13 boards, showing his tremendous influence in the industry. Executive I questioned whether some of those board seats could be filled by competent women leaders. Some of the executives mentioned the new California laws that now exist to help women from being excluded from these positions. Executive I also described how it is still a problem with tech startups. Executive O described her perception of women attaining board positions. She said that she is on the boards for her companies and the ones she has invested in, but that she has not sought out other board positions. She said that there are those attempting to profit from connecting women to board positions for companies.

Table 59.

Barrier 16: Adding Diversity to Boards.

Participant	Comments
Executive H	We were...trying to advocate for <i>more diversity on our board</i> . One board member said, "But we don't want to <i>compromise quality</i> , and we need to make sure people are <i>qualified to be on the board</i> ." Oh, whoa, who was talking about compromising quality? Clearly, you have a <i>perspective that females or people of color are not going to be qualified</i> .
Executive H	But one of the things we were trying to get across to those two <i>board members</i> ...people may not be applying to your jobs because...the <i>environment isn't there</i> , that they would have to be helping to <i>change your culture</i> , rather than walk into a culture that has already changed. And a lot of people are just exhausted, and don't want to be... <i>that one female, or that one person of color</i> ...to lead up the <i>diversity initiative</i> ..."
Executive I	We just got <i>acquired by private equity</i> , and I see us taking an even further step backwards, because they have pretty much just <i>identified people for the roles, they're not interviewing, they're not looking at diversity</i> , and they're not looking broadly.
Executive I	I think he was very <i>good at sponsoring me for operational roles where he would get tremendous value in me doing that role</i> . When I started to talk to him about... <i>board work</i> ...his first response was, " <i>you know, it's a lot of work</i> "...but <i>you don't get to make that decision for me</i> . I make it myself as to whether I want to take it on. I do think there is a <i>barrier for women to get seriously considered for some of these board positions</i> . It's <i>the barrier of men, white, older men on boards</i> , even these innovative startup boards...
Executive L	I was at a recent <i>board meeting</i> of one of the organizations I was on, and a guy CISO, he leans over to me and says, "How do you find <i>qualified women CISOs</i> ?" And I'm like, "I don't know, how do you find men that are qualified?" I didn't think he was serious. I thought he was just kidding me. He was serious.
Executive O	I do think that <i>it is not easy to get on a board</i> . You really have to work at it. I think now the legislation that they have coming through is kind of forcing companies to consider more women. But I think that <i>we still don't have a good path for women to the right companies</i> . So we have...companies that try to make money off of having a big database of women that can be on boards. And groups to help groom you to be on boards but want you to pay them to do that.

Gender bias from venture capitalists (VC). Executive participants who were CEOs or founders were more likely to describe the barrier of *raising funds from venture capitalists* and

the *gender bias* they encountered through that experience. They also described an invisible and unconscious bias that accompanied the normal challenge CEOs experience of fundraising for their companies. Executive A described the difficulty she had raising money for her company and how many VCs looked to her male co-founder for decisions, even though they shared this responsibility. Executive O also described her challenge in raising money for her companies and the barrier of an *invisible, unconscious lack of credibility* she continues to face and overcome when raising money from VCs. Her impression is that the VCs have a *perception* about what characteristics they expect to see from a CEO, and those do not always align with her characteristics. Executive D described her experience raising capital for her company. She had a male co-founder and added a male CEO in future rounds. But she described being the one doing the pitches. When she helped another woman pitch later on, she noticed *unspoken responses* from VCs that made her believe there was some bias based on gender. Executive C shared a story about her experience with a company she worked for and their VC. She described how she was well liked by this VC until there was a mistake in the organization that she said did not have anything to do with her, but for which she took the blame. And for taking the fall, they in turn, moved her into another company as the CEO. But reflecting back, she expressed frustration over how things transpired and wondered if her gender played a role.

Table 60.

Barrier 17: Gender Bias from Venture Capitalists (VC).

Participant	Comments
Executive A	I've had hard times fundraising for my company. I have a male co-founder. And there are a few times, not all the time, but there are maybe five to 10% of the <i>venture capitalists</i> we pitched automatically <i>defer to him as the decision maker</i> , turned and asked him questions, even though we're equal founders. And so you could see that <i>inequality</i> .
Executive C	Being a <i>VP of Sales in software as a woman, super rare</i> ...and [name of VC], which is a very big name...loved me, and couldn't wait to do a deal with me. Fast forward four years where a

mistake happens in the organization that clearly I wasn't aware of...here I am...*the fall person for something that happened...I know that if I was a man, it wouldn't have gone down that way.*

Executive D We raised \$24 million...and another \$10 million with my second company. The barriers that I ran into were the *basic fundraising barriers for women*...I do think that *being a woman was a huge part of why this was hard for me*. And I did almost all the fundraising by myself...once I knew that there was all this bias in the Valley...I could see it ...you walk in the room and see their face drop...and their continence change...it was so disheartening.

Executive O When pitching them... I would make a point, and then the VC would... maybe brush it off. Later, [the male founder] would make that same point. They would go, "Oh, oh, okay. I see." The limitations are nothing concrete, it really has to do with *how difficult it is for me to raise money*. And I've raised a lot of money in my career with venture capitalists, and...I think that *their perception is the successful entrepreneur is the geek. And it's the male geek. And so if you don't meet that model, then you have to overcome this unconscious lack of credibility.*

Overcoming barrier to raise money. Both CEO executives D and O explained how they were extremely successful in raising money for their companies, despite the barriers they encountered. Executive D pointed out that she had to be *very well prepared* for her pitches, understand her problem space really well, and *become an expert* in it. Executive O stated you had to *prove yourself* more if you were up against a bias and be an *enthusiastic storyteller*.

Table 61.

Overcoming Barrier to Raise Money.

Participant	Comments
Executive D	I got very good at, when a VC would say no, of walking right into that next VC meeting... <i>if you believe in what you're doing, you need to just keep at it...</i> And I practiced a ton...I probably practiced my pitch 20 times a day...but the other thing that changed the game for me was that I actually had this <i>expertise</i> . To overcome the barrier of raising money, go <i>find an idea that you know is going to work</i> .
Executive O	So you have to be that much more <i>fabulous...in order for them to fund you...</i> I've raised eight rounds of funding in my tenure, so I've raised a lot of money, and I've been successful with it. I think, <i>in raising money, I've got this enthusiasm for this technology</i> . And I think of raising

money as being a *storyteller, rather than selling*...once you start building a great business, then it's easy to raise money.

Question 9: Have you ever been asked to take on a leadership role for an organization already at risk for failure or during a period of crisis where risk of failure was higher? Please describe the experience.

Executive participants described varying experiences where they were asked to take on leadership roles that were at risk of failure or during times of crisis where the risk of failure was high. Some executives described this as *part of their skillset or job* to clean up problems or manage crises, others described experiences that seemed *at risk of failure*, but became *opportunities to succeed*. And then there were those who described *failed experiences* that were *already in motion* before they took over.

Risk of failure is an opportunity. Executive L is a CISO who described a big moment where the risk of failure seemed high to her. When the previous head of IT stepped down, she was asked to lead IT security for a world event using a new technology. This challenge was accompanied by attacks to the technology from other countries and gender bias that made communication with another country challenging, but where her actions prevailed and made the situation a success. Executive O described herself as a go-to-market CEO whose job often involves taking over when a company is failing to go to the next level, or the current CEO is not able to meet goals. She is usually brought in by the investors or the founder. She described it as something she enjoys. Executive P described a skill and an expectation of her job as *crisis management*. She said she expects to be put in positions where risk of failure is high because managing crises and risk is one of her strengths that makes her great at her job as a CISO.

Table 62.

Risk of Failure is an Opportunity.

Participant	Comments
Executive P	There are two worlds the CISO lives in. One is the ‘every day,’ running the business, doing the work, getting it done, and then there's the ‘ <i>hair on fire</i> ’, what I would call the <i>crisis management mode</i> . So when there's been a breach or an intrusion...and you're doing recovery, you're <i>running a crisis</i> . I had a defining moment when I turned off remote access for 85,000 people [due to a major breach]. It was being briefed...daily...to the White House...even the CEO said, “What do you need me to do?”
Executive O	They had a technology CEO who was unsuccessful. In their mind, I was coming to take the company to the next level, but in reality, <i>they weren't achieving their goals...unable to raise money. That's why I was brought on board</i> . I come in when they've started out. They say, if I build it, they will come. And they don't understand how hard it is to actually bring a security product to market because it is very noisy, and very complex. That's what I do.
Executive L	I look at now and I'm like, what were they thinking? And to have chosen me? Like, anybody else but me. I was able to lead it successfully. We got business continuity plans in, we had disaster recovery all set up. In hindsight, it was pretty much a <i>failure</i> event, but you know, <i>that which does not kill us makes us stronger</i> .

Failure is inevitable. Executive C is a CEO who shared her story about spending a big part of her career with the same two founders. She shared her experience of taking the blame with the investors when there was a mistake in one company and the disappointment for how the situation was handled, considering she was not involved with the mishap. The two founders removed her from that company and made her the CEO of another company of theirs. She described how they *made her a CEO of a struggling company* with a new product, *allowed her to invest in the company*, and then took it away from her when she told them it was not working. Executive E described a time early in her career where she was put in a leadership role as things were falling apart in the organization and women were leaving in large numbers. She described how she could not fix the problems herself as they were larger, more systemic issues. She wrote

an email to the board, letting them know about the problem they needed to fix or she would have to leave as well. She said a year later, someone on the team was criminally charged with rape, there was a lot of turmoil in the organization, and they cleared out the board and hired all new people. But she chose not to stay. Executive G is a CEO who took on the role as President of a company that looked to be promising and on the verge of going public. Within a short period of time of starting her new and exciting role, it became apparent that the CEO committed fraud and she would need to help clean up the mess. Executive K described how early on for the first ten years of her career, she was always brought in to be the *cleanup woman* and decided she needed to be brought in earlier in any process in order to help prevent these issues. She still *sees herself going into situations where she is fixing or leveling up the organization*, but she said it was important to clarify that it is better to be included earlier in the strategy and solution than to come in working so hard to fix the failure.

Table 63.

Failure is Inevitable.

Participant	Comments
Executive C	The third company that I went to, as CEO, was a restart, which means it's a really old company...the <i>company was running out of money</i> . And it was <i>trying to launch a new product to save it</i> ...but once I got in there and really understood what was going on and was bringing them the information that they needed to hear, they didn't like it...I was recommending closing the company. And I'd <i>already put in a million dollars</i> ...earlier <i>believing we had something</i> ...
Executive E	You have to <i>recognize opportunities to be a leader, where you can have an impact and determine whether it's healthy</i> . And <i>if it's not healthy, if it's so broken</i> , or if that's too much, I think <i>part of being a leader is knowing when not to be involved</i> .
Executive G	Three months into the job, I <i>uncovered major fraud</i> by the CEO...I thought I was walking into a \$75 million business and we were going to take the company public in the next 12 to 18 months...and turns out the CEO fabricated bank statements for the last four years...and fled once I scheduled an appointment for him to hand over bank credentials and bank accounts to the

finance team. Within a 24-hour period of all that unraveling, I was named CEO and President and had to...*manage this horrible situation to the best of my ability.*

Executive K You need to leverage me at the beginning of the process, because I may be able to help you think differently around what our solutions are going to be. But I can't keep coming in on the back end, working ridiculous hours to *try to clean up a mess that I didn't create...*and this is not who I want to be professionally. *I don't want to be a cleanup woman. And we tend to do that with women in these spaces.*

Thematic Findings

There are five major themes that emerged related to this research question; 1. Transformative experiences in career and development, 2. Significant transformative relationships, 3. Crucial aspects to her leadership, 4. Bias and discrimination, and 5. Risk of failure. These are displayed in Table 64.

Table 64.

Emergent Themes and Sub-themes

Themes	Sub-themes
1. Transformative experiences in career and development	1. Level up in career 2. Networking 3. Changed how she saw herself
2. Significant transformative relationships	1. Mentors and sponsors 2. Shortage of female mentors 3. Trusted advisors, peers, and executive coaches 4. Learning through observation
3. Crucial aspects to her leadership	1. Leadership styles 2. Leadership strengths
4. Bias and discrimination	1. Her voice not being heard 2. Inequities in the workplace 3. Gender stereotype imposed on her 4. Not identifying her as a leader 5. Invalidating her experience 6. Being a mother 7. Racial and gender bias imposed on her 8. Lack of diversity on boards 9. Raising money from VCs

5. Risk of failure is high

1. Risk of failure is an opportunity
2. Failure is inevitable

Theme 1: Transformative Experiences in Career and Development

The first theme was most identifiable because the transcripts read as stories of their careers and the relationships that helped the women executives throughout their careers. Most of these relationships lined up with major transition points that projected them upward or helped them through a transition. The relationships usually played a role either to prepare for the transition, create the transition, or provide guidance during or after the change. From the accounts of pivotal moments where executive participants described the relationships that impacted their careers, there were three main sub-themes identified; 1. Level up in her career, 2. Networking, and 3. Changed how she saw herself.

Sub-theme 1: Level up in career. The executive participants described accounts of being introduced to new positions and new opportunities by their mentors. Most referred to sponsors who were involved in their experience of leveling up, but some used the term mentor. In some cases, the participant was introduced to the mentor's network. In other cases, they described being given opportunity due to consideration of the quality of the connection they made more than the evaluation of her experience. The leveling up that was also expressed in relation to a mentor or sponsor were during their breakthroughs into their executive and C-level positions. For some, this transition was their own personal break through the glass ceiling, describing it as against all odds, while others described the trust they felt from this sponsor for this opportunity. The descriptions showed how some sponsors helped open up different opportunities, or a new path that the participants were not considering. In some cases, the sponsor interfered with the participant choosing to leave an organization for a different position.

Sub-theme 2: Networking. Another transition that involved a mentor or sponsor type of relationship were those pivotal moments where the executive was introduced to a new network for making connections at a new level. The theme of networking is constant throughout the interviews. In some aspects, the women executives found that some sponsors opened up their networks to them which either caused a pivotal time in their careers or was the result of a pivotal moment of leveling up into a new role. These new networks allowed the participants to have connections to a peer group that was accepting of them due to their new role. This was often more evident in CISO roles than CEOs. The CEOs described this experience of being introduced to a new network as opportunities for those connections to invest or as those interested in investing then sharing their connections for other potential investors.

Industry events and conferences were also described as a way many of the executive participants met influential connections that became mentors, sponsors, investors, even customers. Speaking engagements at these events were described as allowing for more visibility to a larger audience of potential connections and opportunities. The industry events were a platform for connecting with others in the business that allowed for a space to easily make connections or be introduced to influential people.

Sub-theme 3: Changed how she saw herself. When describing the mentor or sponsor relationships that were pivotal to their development as leaders, the common sentiment expressed by the executive participants was how this person saw something in them that they did not see themselves. This was almost always related to an opportunity this person provided to them. Many of the executives perceived their mentors as having some insight into them and their potential that was not known yet to the executive. And through this insight they described, the mentors helped transform them through awareness or opportunity. The common expression over

and over suggested that these executives found this ability of their sponsor or mentor to be very important to their development. It suggests that the sponsor's ability to see opportunity or possibility for the participant was pivotal for the development of that person.

Some executive participants described feelings of uncertainty about stepping into a role they were not sure that belonged to them. Some of the participants attributed this to the imposter syndrome while others described the experience without using the term, but it involved them not seeing themselves capable of the opportunities and roles in front of them. The descriptions the executive participants used included qualifying themselves out of an opportunity. The pivotal moment was the relationship of a mentor or sponsor who then validated their ability to do that role, giving them the confidence to push past those feelings of being an imposter.

Theme 2: Significant Transformative Relationships

Sub-theme 1: Mentors and sponsors. The word *mentor* was often used loosely to label the relationship of the person providing guidance or advocacy for the executives. Sometimes the term *sponsor* is used. So sometimes meaning must be gathered from the surrounding context to determine whether the executives are referring to someone who was a *mentor*, a *sponsor*, or acted as both. Other times, the executives are explicit about their meanings. All of the executives named relationships that were pivotal to their development as a leader. The terms *mentor* and *sponsor* were the most used terms for the relationships that they described. Sponsors were the advocates for the executive participants who opened up new opportunities and connections for them, whether part of the political arena of an organization or industry, sponsors were mostly informal with relationships that were reciprocated with value to both the sponsor and the protégé. Of the 16 women executive participants, only two reported formal *mentorships* before they were executives. Most of the relationships the executives described were organic in nature, either

driven from internal or external connections. Sponsorship, whether by mentor or sponsor, was what was described most in the pivotal moments involved.

Sub-theme 2: Shortage of female mentors. The executive participants discussed the shortage of women in general in the cybersecurity industry and how there are even fewer leaders, making it a challenge for women leaders to find other women who have more experience to mentor them. Some of these women are truly groundbreakers, breaking the glass ceiling in their careers. There were not a lot of female role models so many of them were used to having male ones. And for those who sought other women for advice, many times there were no other women who had gone through what these women were experiencing for the first time. There were those who professed that there were not many women to turn to in leadership roles that could help.

Eleven of the 16 executive participants identified male mentors/sponsors first when describing significant relationships during pivotal moments in their careers, with six of the participants having identified all male mentors/sponsors. Those who stated that they preferred male mentors were part of the six who only had male mentors. They described women as either to prescriptive or unsupportive. However, one CISO described a pivotal moment in her career was having her first female boss. She said she never had another male boss after that change and thinks that much of that is out of her own choice (Executive K). Due to the limited amount of female executive role models in cybersecurity, women are more likely to have male mentors. For female CEOs and other C-level executives who face loneliness and isolation in the field, the perspective of relating or connecting to someone with shared experiences as a professional and as a woman, there may be some preference for a woman mentor. CISOs appear to connect with each other more in peer groups that help prevent them from feelings of isolation from others with

similar experiences. From the perspective of getting an advocate or sponsor to open doors or make connections, there are still more men in more positions of power than women.

Sub-theme 3: Trusted advisors, peers, and executive coaches. Mentors and sponsors were the most discussed by the executive participants. However, there are other relationships that influenced and were pivotal to the women executives' careers and were often identified as advisors, peers, and executive coaches. The advisors they described were often trusted colleagues or previous mentors/sponsors that the participants have brought into the company in an executive role for a startup or as an advisor for the company.

When advisors were described as peers, a cohort, and colleagues, they were described as providing both professional and personal support. These advisors are people whose counsel they seek and whose judgement they trust. A couple of the executive participants described their own defined group of connections that could range from four to 15 people that they turn to. The CEOs often described a trusted advisor as someone who may have been a mentor previously or is at their level but some years advanced. They sometimes become paid positions for an organization. The CISOs described peers or cohorts among a network of CISOs with shared challenges. Both descriptions were similar.

At the executive level, some reported being provided the opportunity to use an executive coach, which is an external relationship often paid by the company or the board. Participants who had executive coaches, for the most part, were provided one by their company or board when stepping into a new C-level role. The participants found value in having a coach. Sometimes the culture of an organization is challenging to transition into and retention can be difficult for new leaders. Also being able to choose someone that feels compatible is empowering for the candidates who had this option. Although one executive felt the advice and

experience was fantastic, she also thought that the conversations were private. From this study, it is difficult to know whether there are instances of executive coaches reporting progress to the party paying their fees.

Sub-theme 4: Learning through observation. Some executive participants described their pivotal moments as learning through observation rather than active participation from a mentor or sponsor. This included observing behavior and choosing to emulate that behavior or not emulate the behavior. Participants described actively watching, listening, understanding the context of everything going on in the business through observation. But they also described sometimes learning more from watching behavior they did not want to repeat as a leader. In addition, some of the executive participants who have mothers who are working professionals reported the benefit from a solid foundation of observing and exposure to another female professional in a leadership role herself. Some of the executive participants described their mothers as role models whose influence was pivotal in their careers.

Theme 3: Crucial Aspects to Her Leadership

Sub-theme 1: Leadership style. This section consists of emerging themes from the descriptions the women executives gave about their leadership styles. The executive participants described their leadership styles. A leadership style can be developed through a culmination of their experiences and their own development. The following are 11 categories that emerged from the descriptions the executive participants used to explain their leadership styles: 1. Strategic direction, vision, mission, ideas, 2. Collaborative, listen to ideas, then make decisions. 3. Give them space and ownership, help remove obstacles, be flexible. 4. Be inclusive. Instill a sense of belonging. Embrace diversity. 5. Create a safe space. 6. Transparent and open. 7. Empower

others. Be a servant leader. 8. Hire great talent. 9. Accountable leader. 10. Develop people. 11. Define roles and responsibilities.

The leadership qualities show an emphasis on soft skills. In order to avoid laying out the descriptions of their leadership style in a way that favors the stereotype of women leaders being heavy in soft skills, and to take a look at what they identify as crucial aspects to their leadership, the descriptions have been matched with the four frames or perspectives of an organization in order to better identify how these styles might impact different aspects of an organization.

Bolman and Deal's (2017) four frames refer to structural, human resources, political and symbolic frames by which to gain a more comprehensive view of an organizational issue. For reporting the findings in this study, the term "people" has been used to replace "human resources" and to avoid preconceived notions of that term and the assumption that the people frame belongs solely to the human resources function of an organization. Seeing issues of an organization through all four frames can help leaders devise strategies for change based on a more wholistic view of the various ways the organization could be impacted. Here are the definitions of the four frames, or perspectives, of an organization. Table 65 shows how the described leadership styles align with the four frames based on the descriptions provided, creating a comprehensive view of how the described style fits with the aspect of the organization.

Structural. This frame focuses on the architecture of an organization, formal roles, rules, goals, policies.

People. This frame emphasizes the fit between the people and the organization, recognizes people and their needs, skills, relationships, and empowerment.

Political. This frame sees a competitive arena with scarce resources, competing interests, struggles for power and advantage, recognizing coalition building, negotiation, and advocacy.

Symbolic. This frame views culture, ritual, ceremony, heroes and heroines, symbols by creating and promoting a common vision, sharing stories, making meaning and inspiration.

Sub-theme 2: Leadership strengths. This section has themes that emerged from the executive participants' descriptions of their strengths as a leader which show the self-identified positive leadership qualities from the sample of women executives in cybersecurity. The executive participants described the strengths they had that they felt made them good leaders. These qualities are derived from their own development, experiences and through influential mentors and other relationships throughout their career.

Table 65.

Leadership Styles and Organizational Frames

Leadership Style	Structural Frame	People Frame	Political Frame	Symbolic Frame
1. Strategic direction, vision, mission, ideas	Provide high-level timeframe and components	Make sure team is working together	Getting buy in from team	Create mission and vision, moving toward higher goal, setting the vision, clear rationale and justification
2. Collaborate, listen to different ideas, make the decision		Collaborate	Collaborate, consensus driver	
3. Give them space and ownership. Help remove obstacles. Be flexible.	Remove obstacles.	Give them space, ownership, give them tools to be successful. Adapt style to what people need, support flexibility	Give them tools to be successful. Remove obstacles.	Guiding factor for team
4. Be inclusive. Instill sense of belonging. Embrace diversity.	Provide other great skills to an organization	Help others feel included, belonging. Hire diverse talent		Sense of belonging, incorporate inclusion into culture
5. Create a safe space		Empowering, psychologically safe		Create space that helps drive the mission
6. Transparent and open		Transparent, trust, people first		
7. Empower others, servant leadership		Empower, servant leadership, empathetic, be the best possible version of themselves		
8. Hire great talent		Hire skilled professionals to do their job	Seek people with complementary skills, hire smarter	
9. Accountability	Relationships with business, doing job	Holding people accountable		

10. Develop people		Develop people	Develop people with opportunities, advocate	
11. Define roles and responsibilities	Clearly define roles and responsibilities, tasks and projects	Understand their role and how they fit in		

Table 66 shows how the self-identified leadership qualities are defined by the four organizational frames.

Table 66.

Leadership Strengths and Organizational Frames

Leadership Strengths	Structural Frame	People Frame	Political Frame	Symbolic Frame
1. Empathy, Compassion, care, nurture		Caring for people, kind, nurturing		
2. Communication	Willing to have hard conversations	Encourage, positivity, communicate effectively, consensus driver, articulate for people to understand	Negotiation, consensus driver	Communicate vision, creating mission toward higher goal, bring the message to people
3. Crisis management	Defining the problem and using a framework to solve	Team needs calm leader to not become chaotic during a crisis	Building necessary relationships, fighting against the business	Calm in the face of crisis, fighting the bad guys
4. Driven/driving	Drive to meet goals and expectations		Driven	
5. Intuitive		Read people well, understand their motivations	Manage social and political situations	
6. Risk-taker			Take risks to advance	

Table 67.

Crucial Aspects of Mentors and C-Level Women Executives

Perceived Crucial Aspects of Mentors	Self-identified Leadership Strengths of Executives	Self-Identified Leadership Style of Executives
Giving advice	Communication	Guiding factor for team. Define roles and responsibilities.
Provide connections Advocate		
Care and empathy Personal relationship	Empathy, compassion, care, nurture.	Empower others. Servant leader.
Mutual success / team	Team building	Collaborate, listen, make decision

Strategic, visionary Provide opportunity Encouragement Space to do on own	Driving mission, Driven	Strategic direction, vision, mission Hire great talent. Develop people. Empower others. Give space and ownership. Remove obstacles. Create a safe space.
Calm Role Model Courage Inclusive	Calm Crisis management, Risk-taker Intuitive	Accountability Be inclusive. Instill sense of belonging. Embrace diversity.
		Transparent and open

Table 67 is helpful for seeing the similarities and differences between the crucial aspects the executive participants described of their role models and the crucial aspects they described about their own strengths as a leader. Their own self-identified qualities and styles do not always match up to the qualities they described about their mentors. There are many factors that could explain the differences and this relationship was not within the scope of the study. This table allows for further questions concerning the relationships between the perceived crucial aspects of their mentors and their own self-identified strengths as a leader. Future studies would be necessary to examine this questioning further.

Theme 4: Bias and Discrimination; Sub-themes 1 - 7

Sub-theme 1: Her voice not being heard. Many of the executives described experiences in their careers, or have witnessed other women, where it was difficult to be heard in a room full of men. Or to have their opinion dismissed only to be validated when a man said the same thing. The participants expressed their own issues of speaking up or being heard and they shared instances of other women who have difficulty competing with the loud male voices. There were many accounts from the executive participants regarding the concept of having a voice. We see evidence of this challenge from our political leaders, for example, when Kamala Harris, currently Vice President-Elect, stated “I’m speaking” during a debate where her male counterpart

attempted to cut her off. These executive participants shared their perception about this barrier. They described how the loudest and most demanding person was allocated more resources. One executive described the importance of speaking up and being prepared, implying the need to prove herself worthy of the position she held. The participants described experiencing or witnessing other women being talked over, not heard, having ideas not listened to.

Sub-theme 2: Inequities in the workplace. Executive participants described several inequities due to bias and discrimination that they encountered as barriers throughout their careers. These inequities included compensation gaps, inability to negotiate salaries, access to promotions and sponsorship, biased hiring practices, and limiting resource allocation. Inequity in compensation is also expressed as a huge barrier for women. Participants described the necessity of learning to negotiate salary in order to combat this inequity. They expressed the importance of communicating their value and standing their ground against traditionally held practices to be compensated what they are worth. The participants who discussed inequity in promotion, equated it with inequity in sponsorship. Sponsorship is what allows for promotion, and some of the executive participants described encountering women not having the same level of sponsorship as their white male colleagues. Some of the participants described an unconscious bias that exists about a woman applying for cybersecurity jobs. Job descriptions are also not written for women candidates. Better hiring practices would include writing job descriptions that would relate to women. According to the findings, job descriptions in the industry tend to be developed for the rare person who has all the skills rather than strategically based on breaking down the skills to different strengths. The few people who meet all the requirements cannot fill all the open positions. Men are more likely than women to apply for a job for which they are not fully qualified. Related to not being heard, some of the executives reported not getting the same

resources or budgets allocated to the programs as their male counterparts. This is an example of inequity in the workplace that was a barrier for these executives to overcome.

Sub-theme 3: Gender stereotype imposed on her. The descriptions of gender bias in response to barriers executive participants encountered as a woman in the industry were many, and they were not all the same. The bias described included exclusion, blatant sexual objectification, gender stereotypes, sexist behavior, and other sexist language. Descriptions of these encounters were put into the following categories to define the experiences and identify the sub-theme for Bias and Discrimination. The categories of descriptions that make up the Gender stereotype imposed on her theme were: 1. Expectations based on gender stereotype, 2. Sexual objectification, 3. Sexist language, and 4. Inappropriate behavior, including sexism and alcohol.

Sub-theme 4: Not identifying her as a leader. The findings show examples of female executives not being perceived as leaders. The descriptions from the findings identify assumptions of inferiority where others assume the female in the room of males is in an assistant or server role to the males. The descriptions from the findings also identify assumptions about the experience of the women, especially in areas that they perceive as in relation to males such as technology and sales. Both of these assumptions are examples of gender bias and both are barriers these women faced.

Sub-theme 5: Invalidating her experience. There were accounts from the executive participants that described encountering attempts to invalidate their experience and the value they brought to the industry. They explained these encounters were due to the other parties being patronizing, competitive, intimidated, or threatened. Executive participants also gave several descriptions about women whose invalidating actions and behaviors were barriers they encountered. Other women who were barriers were described as toxic, unsupportive,

exclusionary, and negative toward other women. The findings showed examples of both men and other women attempting to invalidate the women leaders because they do not see her specific traits as a leader aligning with their own perceptions of traits of a leader. These situations of gender bias were barriers for some of the executive participants to overcome in their careers.

Sub-theme 6: Being a mother. The finding showed that the women executives faced significant challenges with managing different roles between family and the stress of the industry, but there were also accounts of the COVID-19 pandemic that added additional responsibilities to their role as mother. Also evident was that there are assumptions from others related to being a mother. There were accounts of assumptions being made for women based on their choices after maternity leave or other men understanding the transition to juggling both her professional responsibilities and personal ones, but there were also examples of support for women making their own choices in managing their profession and motherhood. In addition to the bias that women can run into becoming a mother, there is the bias imposed toward women who do not have children as well. Being the “breadwinner” has historically been thought of as the male’s role, and this assumption has been used against women who did not have children as an excuse toward inequity in pay or other benefits given to their male counterparts.

Sub-theme 7: Racial and gender bias imposed on her. There were some executive participants who encountered racial bias in addition to gender bias in their careers. These accounts come from exploring the barriers the executives encountered throughout their careers. The diversity within the executive participants was not expected for the scope of this study. Because of the homogeneity expected from an industry where women and minorities are underrepresented and women executives are very few, finding diversity among the ethnicities of the participants was unexpected. This is mostly due to the snowball sampling method employed

and the connections that participants chose to refer. More emphasis on racial bias would have been included as part of the research questions if representation from participants were expected. However, since there were different ethnicities represented, descriptions related to racial bias did emerge, many times in relation to gender bias. It should not be construed that racial bias is somehow less of an issue than, or secondary to, gender bias based on the data from this study. Of the 16 executive participants, three women described their experiences with racial bias.

Theme 4: Bias and Discrimination; Sub-themes 8 and 9

There are still areas these women describe as barriers they currently deal with, even being at the top of their field. Many women still have a difficult time attaining board positions as most of them are held by older, white, males, even in startup technology companies. One VC that was referred to by four different executive participants, is a member of around 13 boards. One of the participants shared her story of a male sponsor who had been an advocate for her several times over her career in situations where he benefited from the move as well. But his support of her continued development ended when she asked for his support to attain a board position. The non-verbal response of doing nothing told the executive that he no longer supported her continued development. His silence represented his perception that a board position was beyond her reach.

Sub-theme 8: Lack of diversity on boards. Some of the executive participants described difficulty in attaining board positions and a lack of diversity on boards. Some of the same gender discrimination and stereotypes encountered with VCs exist on boards as well where VCs also preside. Attaining board positions may be a glass ceiling that women executives are still finding difficult to break past. Based on the findings, there are assumptions from the dominant male board members that qualified board members are difficult to find among diverse candidates. This shows bias and potential discrimination of women and people of color. The

descriptions also show that attaining board positions may be a glass ceiling situation for some female executives in the industry due to these assumptions.

Sub-theme 9: Raising money from VCs. One of the biggest barriers to overcome for any CEO is raising investment money for your company to scale the company and get the product to market before the competitors. There are a lot of complexities to growing a company successfully. The executive participants that are CEOs described additional aspects to the barrier of raising money from venture capitalists. There were instances they described encountering gender discrimination where decisions were deferred to male counterparts or they made an important point in a pitch and it was ignored until the same point was made by a male. The unconscious lack of credibility applied to female executives pitching to VCs adds to the already difficult task of raising investment money from VCs. The women CEOs who shared this barrier explained that overcoming it meant being even more prepared when pitching to the VCs.

Theme 5: Risk of Failure is High

Executive participants described varying experiences where they were asked to take on leadership roles that were at risk of failure or during times of crisis where the risk of failure was high. Some executives described this as part of their skillset or job to clean up problems or manage crises, others described experiences that seemed at risk of failure, but became opportunities to succeed. And then there were those who described failed experiences that were already in motion before they took over. There are different contexts of experiencing this phenomenon. In some cases, women embraced the skillset they have for crisis management and handling people, understanding their talent is part of what allows them to be successful. But there are situations where this concept may adversely affect women professionals when they are

not part of the strategy of the situation. And in other situations, some of the executives were just thrust into a situation of potential failure disguised as a promising opportunity.

CHAPTER 5: CONCLUSION

This phenomenological study aimed to explore the experiences of women in C-level executive positions in the cybersecurity industry and their perceptions of the pivotal moments in their careers where relationships such as a mentor, sponsor or trusted advisor was transformational to their development. It aimed to determine the crucial aspects they discovered of their leadership and the barriers they encountered as women in a predominantly male industry.

Discussion of Research Questions and Summary of Responses

This section will provide an overview of the research questions established for this study and give meaning to them based on a summary of responses from the descriptive phenomenological analysis of the data collected and the current literature.

Research Question 1: How do women executives in the cybersecurity industry describe their perception of the pivotal lived experiences in their career where relationships such as mentors, sponsors, or trusted advisors, were transformational to their development as a leader?

Recent studies about women in cybersecurity suggest that organizations should commit to formalized mentorship programs to retain women in the industry and provide a career trajectory for them (Frost & Sullivan, 2017). Studies also show that there are several kinds of relationships that help provide guidance and opportunity throughout a career (Burrell & Nobles, 2018; Myers, 2017). This question was to determine what sort of relationships had an impact on key transformational moments in the careers of successful C-level women executives in the cybersecurity industry. It is important to note that many of the executive participants used the term “mentor” to label the relationship they described. In many cases, these relationships were both mentor and sponsor or solely mentor or sponsor. But the participants did not always

differentiate between the two. It is from their description of the experience that a clearer idea was derived as to whether the nature of the relationship was more mentorship or sponsorship or both.

There are two main parts to this overarching question; the relationships that were transformational to their development as a leader and the pivotal experiences related to those relationships. The findings from this study show that mentors and sponsors were most likely to influence the executive participants right before or right after they moved into a defining role that was a level up from their current one. Advisors were described in two different ways; peer and trusted. The peer advisors may have been from an industry group, and the relationship may have been more of an exchange of experiences and challenges. The trusted advisor was usually someone further along in their career than the executive and may be a current relationship, later in their careers, or may even be a paid resource for their organization. Executive coaches were sometimes provided and paid for by an organization or board when the executive participant transitioned into an executive position.

The most described relationship that the women executive participants found was most influential at pivotal times in their careers was sponsorship. This aligns with Frost & Sullivan's 2017 study that found that women in cybersecurity who reported higher levels of access to sponsorship, felt more valued. As mentioned before, the participants may have referred to someone as mentor but then described their willingness to advocate for them or their connections that propelled them forward in their careers. These are characteristics of sponsorship, and this role, whether it was someone who was only a sponsor, or it was a mentor who also advocated for the person, is the essence of the relationship that was described as most impactful to those pivotal moments in their careers.

The pivotal experiences that were most prevalent from the findings involved leveling up in her career. Whether it was in support of new opportunities, new positions, or a new path in her career, these transitions were the ones most cited. Networking was another pivotal experience for these executives. These women made influential connections attending and speaking at industry events and conferences. Some met their mentors and sponsors at events, and their mentors and sponsors provided pivotal experiences to some by opening their network to them. Women need to network with people to find advancement opportunities in their careers.

In addition to the transitions of career and connections, some of the women executives developed their sense of self and leadership by experiencing a transformation in how they saw themselves. It is through mentorship and sponsorship that they were made aware of their potential when they had a person that they look up to see and acknowledges capability in them and open up opportunities in response to that visibility. Some women experienced the imposter syndrome (Bothello & Roulett, 2018), feeling as if they did not belong to or deserve the role they were becoming. Through a mentor or sponsor's involvement, they became aware of their possibilities and became accepting of their own abilities and their own self-efficacy.

There were instances described that fit all the suggested relationships, mentors, sponsors, trusted advisors, peer advisors, and executive coaches. However, the findings from this study showed that the relationships these women executives found most transformational to their development were not formal mentors but informal sponsors. In their current situations, many rely on trusted advisors or their own self-managed personal board of directors that consist of experts in the field that they have identified and either formally or informally recognize as high-level advisors to them. There is a reliance on informal relationships and personal accountability for developing and maintaining these relationships.

Research Question 2: What do women executives in the cybersecurity industry perceive as the crucial aspects of their leadership?

The data related to this question was derived from the exploration of how the women executives perceived their own leadership style and qualities. The findings for their leadership style was presented through Bolman and Deal's Four Organizational Frames to provide a more in-depth view of how those leadership styles and qualities can affect different influences in an organization. The purpose for this choice was to take a more comprehensive look at the aspect of the organization that is affected by their leadership. By categorizing them this way, we are not limited to labelling their leadership style or quality to one aspect of the organization but can see how different aspects are also affected by that style or quality. Women are generally categorized as empathetic leaders who focus on the people of their organization, and the people frame is the dominant frame in this presentation. But these styles also affect the political, structural, and symbolic frames that are used to lead organizations, according to Bolman and Deal (2017). The leadership style that was most described by the executive participants included strategic direction, vision, mission, and ideas. One purpose of this style is to make sure the team has a shared direction to work together, so one might say this affects the people frame of the organization. However, an aspect of this style reported that this strategic direction was getting buy-in from teams. This could require the leader to use the political frame. Creating a mission and vision are part of setting a strategic direction, but leaders may need to use the symbolic frame to develop that common vision and make meaning for the people in their organization. Strategic direction also requires setting goals. The structural frame can be used by leaders to help develop goals toward a strategic direction. In this way, the data under the first leadership style reported suggests that it not only emphasizes the people of the organization, but it also is affected

by all four frames. The presentation of the findings for leadership style and qualities is based on these four frames. The people frame is still the dominant frame for both leadership style and quality, but findings show both styles and qualities can affect all four frames of an organization.

Self-identified crucial aspects of leadership qualities and styles shared by the women executives were similar to the perceived crucial aspects of their mentors/sponsors. However, three crucial aspects reported for mentors: provide connections, advocate, and personal relationship, were not reported as leadership qualities or styles of the women executives. In addition, the leadership style described as transparent and open was not one of the crucial aspects they reported for their own mentor/sponsor relationships. See Table 8.

Research Question 3: What barriers do women executives in the cybersecurity industry perceive they encountered in a predominantly male field?

Bias and discrimination are the main barriers women executives in the cybersecurity industry described encountering during their careers. There were many different accounts of bias that were categorized and defined. These successful women executives many times dismissed these accounts as they had overcome them to be where they are today. Some of the accounts were described as unconscious or invisible biases that were difficult to prove and easy to dismiss. Other accounts were clearly intentional discrimination. Many of the sub-themes and descriptions from the findings aligned with the theory of microaggressions (Sue, 2010). Microaggressions are behaviors that are intentionally or unintentionally discriminatory toward a marginalized group.

The bias and discrimination sub-themes identified were: 1. Not having a voice, 2. Inequities in the workplace, 3. Gender stereotype imposed on her, 4. Not identifying her as a leader, 5. Invalidating her experience, 6. Bias of mother role, and 7. Racial and gender bias imposed on her, 8. Lack of diversity on boards, and 9. Raising money from VCs. The last two

biases were both barriers that some of these women executives were currently facing, identifying potential glass ceilings for these women executives.

In addition to exploring the glass ceiling attempts imposed on these women executives, the concept of Ryan and Haslam's Glass Cliff theory (2009) was also examined to determine if these women had experienced being placed in risky leadership roles. Women are overrepresented in organizations at risk of failure due to organizational circumstances or systemic disadvantages. The concern is that women who manage to break through the glass ceiling find themselves in these roles that are at risk for failure. According to Hurley and Choudhury (2016), the glass cliff may be responsible for many women managers leaving their organizations prior to reaching the top. Some of the women executives interviewed that were more likely to have taken on roles where the risk of failure was high described this risk of failure as an opportunity to succeed, recognizing their specific skills were put to use and saved the situation. This aligns with the literature that states that women are more likely to be appointed to lead companies in a situation of crisis, as they are considered to have the soft skills necessary for handling situations involving other people (Hurley & Choudhary, 2016). Some of the women executive participants identified that failure was inevitable before they took on the role and, in some cases, they were able to turn it around, but in others, there was no real way to fix the problem once they were appointed.

Interpretation of Findings and Alignment with the Literature

After an analysis of the data collected, five overarching themes emerged that provided insight to the lived experiences of women executives in the cybersecurity industry, the relationships that were transformational to their development, the crucial aspects of their leadership, and the barriers they encountered in a male-dominated industry. In chapter four, direct quotes and excerpts were used to support the relevance of each theme throughout the data

analysis and the thematic findings were presented. Chapter five began with a discussion of the research questions and will move into an interpretation of the thematic findings and how they contribute to the existing literature and align to the conceptual framework.

Transformative Experiences in Career and Development

The transformative experiences described by the executive women participants included transitions such as a promotion, or starting an executive role, or having a new path opened for her. Another pivotal moment described by participants involved a mentor or sponsor relationship extending their network to a new level. Networking through industry conferences, groups, and events is where they met influential people. Sometimes these people became mentors or sponsors for her, and other times, it was the mentor or sponsor providing the influential connections. The description of some of these experiences showed how some sponsors helped provide different opportunities that the participants were not considering. In some cases, the sponsor interfered with the participant choosing to leave an organization for a different position. The sponsor had insight into situations that could negatively impact the participant or that could be more beneficial than the choice the participant was about to make. In these cases, the sponsors used their influence and insight into the organization to help the participants create new paths within the organization (Dworkin, 2012; Helms, et al., 2016; Kruger, 2017).

When describing the mentor or sponsor relationships that were pivotal to their development as leaders, the common sentiment expressed by the executive participants was how this person saw something in them that they did not see themselves. This was almost always related to an opportunity this person provided to them. The pivotal moment was the relationship of a mentor or sponsor who then validated their ability to do that role, giving them the confidence to push past those feelings of being an imposter. The imposter syndrome is the belief

that one is fooling everyone on the outside and feeling undeserving of success, and it is related to feelings of self-efficacy (Bothello & Roulett, 2018). The descriptions the executive participants used included qualifying themselves out of an opportunity. Mentors and sponsors provided an opportunity for these women executives to overcome the imposter syndrome and develop a self-awareness of their own potential and capabilities that may have been masked by their own hidden bias about what they were capable of achieving as women in their industry.

Significant Transformative Relationships

Mentors and sponsors were the most described significant relationships related to pivotal moments in the women executive's careers. As mentioned previously, sponsorship was identified the most whether it was from a mentor, sponsor, or other significant relationship. Although some of the executive participants shared that they had formal mentors sometime in their careers, it was the informal mentors and sponsors that were described for the most pivotal moments in their careers. The descriptions of mentors and sponsors aligned with the literature. According to Dworkin, et al.(2018), mentors are role models who can model experience and share their skillset and expertise with mentees. The relationship can be limited for the shared knowledge, or it can become long-term. Many times, the mentor gains some sort of satisfaction from helping the mentee. Sponsors are advocates of their protégés. They leverage their power in an organization, industry, community or otherwise, to provide opportunity for their protégé. Sponsors have a bigger view of the playing field and understand how their protégé fits into the political framework (Helms, et al., 2016; Ibarra, et al., 2010).

However, sometimes participants referred to a mentor when the description really described sponsorship. It is uncertain whether the executive attributed other mentor characteristics to the sponsor. An example of this could be seen with Executive I. She had a

sponsor who advocated for her in new positions throughout her career. She referred to him as her mentor. However, when she went to him for advice about attaining a board position, he was unresponsive and unwilling to help. She reflected on the situation and realized that he benefitted from every operational role he brought her. This suggests a potential issue from these informal relationships. Mentorship may be rewarded from a sense of satisfaction upon the mentee's achievement, but sponsorship may require a reciprocation that is more based on power and resources. Without a clear understanding of both, the relationship could have unmet expectations. Another issue is that other competent women professionals may be passed over for opportunities where there is not a sponsor relationship available.

Another significant relationship described by the executive women was the trusted advisor. Their descriptions aligned with the literature as it showed that trusted advisors come from a long-term, trusted relationships that surpassed mentor or sponsor roles (Allen & Finkelstein, 2003; Wasylyshyn, 2015). Mentors and sponsors can become trusted advisors over time. Often trusted advisors received payment or shares of a company through their involvement. This aligns with Wasylyshyn (2015). Peers or colleagues with the same title were also described as advisors. There is a difference between the trusted advisor and a peer advisor. The trusted advisor had a more personal relationship with the executive and potentially became an advisor for the company with some compensation. The peer advisors may have been more collegial or collaborative, exchanging advice about similar pain points and experiences.

Some of the participants described their pivotal experiences involved observing role models rather than having a relationship such as mentorship. A few of the participants described their mothers as role models, being professionals and leaders for them to observe and emulate. Others described observing other role models in their careers and emulating them or learning

what not to do. They described this as essential for their development. This aligns with Bandura's social cognitive theory (1997), which explains that people who observe a model performing a behavior and the consequences of that behavior, will remember the sequence of events and use it to guide their own behaviors. Observing a model can also prompt the participant to engage in behavior they already learned by replicating the actions of others. Successful behavior increases feelings of accomplishment associated with self-efficacy and leads to reinforcement of the behavior. Although the person may not actively participate in a relationship with the other person, the transformation is still possible through observing them. The executives who described their mothers as a relationship pivotal to their development shared that their mothers were professionals, leaders, even executives in technology. Early exposure for one of the executive participants, whose mother was an executive at a software company, made it easier for her to navigate her career path early on.

Women are not going into cybersecurity in the same numbers as other industries. This shortage also impacts vertical leadership. If there are not many women in the industry overall, there are even smaller numbers of women in top leadership roles to mentor or sponsor other women. Unlike the CISOs interviewed who have peer groups based on a shared interest in keeping their large organizations safe from cyber threats, women CEOs in cybersecurity are fewer and have fewer opportunities or reasons to meet with one another unless it is through industry events. But there is a competitiveness to the CEOs as they may be in companies competing for the market. Regarding the CEOs interviewed, the loneliness in the industry and lack of female mentorship aligns with the literature stating that many women in cybersecurity are experiencing isolation with a necessity to increase mentorship to combat that barrier (Bagchisen, et al., 2010; Littlejohn, 2016; Woszczyński & Shade, 2010).

Crucial Aspects to Her Leadership

By reviewing the perceived leadership styles and qualities described by the executive participants through Bolman and Deal's Organizational Frames (2017), there is a more comprehensive view about how their leadership encompasses a variety of aspects for an organization. It is not limited to a one-dimensional summary about being strong in soft skills and relating to people. Although most of the descriptions fall under the people frame, the structural, political, and symbolic frames are also represented, giving a fuller picture about how the styles encompass different aspects of the organization. According to Bolman and Deal's Four-Frame Model (2017), the people frame signifies leadership based on empowerment with needs, skills, and relationships as the central concepts. The political frame implies a leadership based on advocacy with power, conflict, and competition as central concepts. The structural frame suggests leadership that focuses on social architecture with rules, goals, and policies as central concepts. The symbolic frame supports leadership assuming a role of inspiration with culture, meaning, rituals, stories, and heroes as central concepts. The people frame is the dominant one with the political frame next. When considering the two most significant relationships identified in this study, mentors and sponsors, the frames that support the people and political frames align best with the descriptions. Mentors seem to be working primarily from the people frame while sponsors are guided by the political frame. From an organizational perspective, understanding these roles by the crucial aspects they align with could help in developing a formal model of mentorship and sponsorship to support all women in the organization.

Bias and Discrimination

The barriers described primarily related to bias and discrimination based on gender and aligned with the social role theory (Eagly, 1987) and the role congruity theory (Eagley & Karau,

2002). The nine sub-themes that informed the bias and discrimination theme were: 1. Her voice not being heard, 2. Inequities in the workplace, 3. Gender bias imposed on her, 4. Not identifying her as a leader, 5. Invalidating her experience, 6. Bias toward mother role, 7. Racial and gender bias imposed on her, 8. Lack of diversity on boards, and 9. Raising money from VCs. The bias and discrimination theme could also be referred to as the glass ceiling that women face when having to break the limitations that are set before them based solely on their gender. This aligns with the social role theory (Eagly, 1987) which applies to the glass ceiling outcomes that prevent the advancement of women to upper echelon positions within corporations. The sub-themes “not identifying her as a leader”, “invalidating her experience”, and “bias toward mother role” align with the role congruity theory which explains the negative behavioral reaction toward female leaders due to inconsistencies between the characteristics associated with the female gender stereotype and those associated with the typical leadership. Role congruity refers to positive behaviors aligning with gender roles that are socially acceptable (Buckalew, et al., 2012).

In addition to these two theories, the microaggression theory (Sue, 2010) was employed to analyze the hidden or invisible meanings the executive participants referred to and to identify the barriers they encountered on a more descriptive level. Three forms of microaggressions include: 1. Microassaults, which are the conscious, deliberate behaviors of discrimination, 2. Microinsults, which are usually unconscious, subtle rudeness that communicates a covert insulting message that conveys stereotypical, demeaning messages based on the person's identity, and 3. Microinvalidations, which are disconfirming messages that exclude, negate, or dismiss the thoughts, feelings, or experiences of certain groups (Sue, 2010). Microaggressions specific to gender include: 1. Sexual objectification, 2. Second-class citizenship, 3. Use of sexist language, 4. Assumption of inferiority, 5. Restrictive gender roles, 6. Denial of the reality of

sexism, 7. Denial of individual sexism, 8. Invisibility, 9. Sexist humor and jokes, and 10.

Environmental invalidations which include macrolevel aggressions that are systemic in nature (Gartner, Sterzing, Fisher, Woodford, Kinney, & Victor, 2020). According to Sue (2010), the steps to eliminating microaggressions involve defining them, recognizing them, and then deconstructing the hidden meaning of them. This theory became a framework by which to define the barriers from gender discrimination described by the participants. See Table 9.

It is important to note that there were a lot of descriptions shared about the barriers that were based on gender bias, and many of the participants wanted to make it clear that they did not let these instances get in the way of them being successful. Some of them started off by stating they had not run into any sort of gender bias but then either continued to share an experience or one emerged through the discussion. These were strong women, driven and powerful. There was a sense that they did not want to be perceived as having weakness or being a victim. However, the stories they shared showed that they had encountered gender microaggressions throughout their careers. And although these barriers were overcome and did not stop them from being successful, the research shows that microaggressions can be associated with long term impacts on both mental and physical health. Gender microaggressions have been found to be connected to reactions of guilt and shame (Nadal, Hamit, Lyons, Weinberg, and Corman, 2013). They have also been associated with elevated stress, depression, and post-traumatic stress (Gartner, 2019). One of the executive participants used PTSD, post-traumatic stress disorder, to describe the encounter she had. Although these women provided evidence that they were able to overcome these barriers, it does not preclude other women from being stopped, nor does it prevent the potential damage from other long-term health issues associated with microaggressions.

Table 68.

Bias and Discriminations Aligned with Microaggressions

Bias / Discrimination Described by Executives	Microaggressions Theory (Nadal, 2010; Sue, 2010; Sue & Capodilupo, 2008)
Voice not being heard	Invisibility Microaggression, Environmental Invalidation
Inequities in the workplace	Environmental Invalidation Microaggression
Expectations based on gender	Restrictive Gender Roles Microaggression
Sexual objectification	Sexual Objectification Microaggression, Microassault
Sexist language	Use of Sexist Language Microaggression, Microassault
Inappropriate behavior, sexism and alcohol	Sexual Objectification, Use of Sexist Language, Microassault
Not identifying her as a leader	Microinsult
Invalidating her experience	Microinvalidation
Bias toward mother role	Restrictive Gender Roles Microaggression
Racial and gender bias imposed on her	Microassault, Microinsult, Microinvalidation
Lack of diversity on boards	Microinvalidation
Raising money from VCs	Microinvalidation

Risk of Failure

Some of the accounts of leadership experiences where risk of failure was high aligned with the glass cliff theory, which is the concept that women are overrepresented in organizations at risk of failure due to organizational circumstances or systemic disadvantages (Ryan and Haslam, 2009). According to the glass cliff theory, women are more likely to be appointed to lead companies in situations of crisis as they are perceived to possess the competence to handle people (Bruckmüller & Branscombe, 2012; Bruckmüller, Ryan, Rink, & Haslam, 2014; Hurley & Choudhary, 2016). There were several accounts from these executive participants that could be explained by the glass cliff theory, but some of the participants defined their strengths as leaders to include being able to handle crises, many of them embracing this as a strength to their leadership. Those that identified crisis management as a crucial aspect of their leadership also described stepping into roles at risk of failure as part of what they do. Some of the CEOs described this as part of their job, to step into businesses that are failing to scale them up and

make them successful. However, there were descriptions from other CEOs about being handed a company without knowing that failure was already in motion and unreversible.

Implications

There was a global study published in 2017 about women in cybersecurity that involved 19,461 respondents from 170 countries (Frost & Sullivan, 2017). The findings from that study showed that women comprised only 11 percent of the cybersecurity workforce. Men were four times more likely to hold C-level and other executive level positions in cybersecurity than women and nine times more likely to hold middle managerial positions. That study also showed that 51% of women surveyed indicated that they had experienced various forms of discrimination. With a projected workforce gap of 1.8 million cybersecurity professionals by 2022, the issue of underrepresentation of women needs attention. One recommendation from the study was for executives to evaluate their organizational culture to determine if it is one that values and supports women. Another recommendation was for executives to identify and sponsor high potential women for advancement and providing mentorship and leadership development programs to increase their sense of belonging and feeling valued.

This study explored the experiences of 16 C-level women executives in the cybersecurity industry to determine what relationships, mentors, sponsors, advisors, or others, were involved in pivotal moments during their career that were transformational to their leadership development. It also explored their perceptions of the crucial aspects of their leadership and the barriers they encountered in the male dominated industry of cybersecurity.

This study found that the relationships indicated as most pivotal to their development were not from formal programs through their organization but rather organic from either within the organization or in the community. This still leaves the question as to whether cybersecurity

organizations acknowledged the recommendation to build formal mentorship and leadership development programs for women to combat the workforce gap. In addition, if mentorship and sponsorship are organic, it would depend on a professional and a mentee or protégé coming together on their own. This leaves an unanswered question as to how many women are not being supported. There is also a difference between the value that mentors and sponsors provide. Mentors can help transfer skills and knowledge and be a point person in the organization to go to for advice. However, the pivotal moments that included promotions, new positions, entry into an executive role, or other transformational opportunities in their career paths were mostly associated with sponsors, or mentors who were also sponsors. These sponsors were the ones who were advocates for these women, opened doors, made connections, brokered relationships, and offered new opportunities. These were the relationships that the women executive participants found to be most impactful in their career and their leadership development. However, women are not receiving sponsorship as much as their male counterparts.

Sponsors can make connections to influential people, and networking is also a crucial aspect of the career development of an executive. This was a topic that came up a lot throughout the interviews with the women executives. Women need to network to make the relationships that provide further opportunities. Networking through industry or business boards, industry groups, and events all help provide a way for women to meet influential people that help advocate for a job or a new business or investment of a new business. It also allows executives to connect with other executives and share common challenges, discover the latest developments in the industry, and find an audience to hear them speak about their specific expertise.

The barriers of discrimination are still existent. This study focused on gender discrimination, but racial discrimination was also reported. There were no accounts of other

discrimination discussed in this study, but that does not indicate they do not exist. The study was limited to sixteen women executives and may not have participants representing experiences from other biases. The executive participants shared many accounts of discrimination so the microaggression theory was used to help better define the types of gender bias and discriminations they encountered. These women executives overcame these barriers they encountered, as evidenced by the success of the positions they now hold. Many of them stated that they did not let these instances stop them from achieving their executive status. And some of them wanted to make it clear that they did not see these instances as a threat to their success. However, discrimination and bias create barriers that can hold back people from marginalized groups, making successful outcomes difficult. Although it is commendable that these women succeeded even after facing microaggressions based on their gender or race, it does not make it acceptable in practice and it could deter women and people of color from the industry. These women could also have long-term effects from any microaggressions they encountered as they have been found to have a negative impact on both physical and mental health (Gartner, 2019). Through definition and recognition of microaggressions, we can begin to deconstruct gender and racial discrimination and prevent any future occurrences from causing more damage.

The glass ceiling is a well-known term to describe the invisible barrier that keeps women from rising to the highest levels of power, where men are most likely to reside. In this study, all of the participants are at a level that many women are still trying to break through to, but it is possible that some boards are the next glass ceiling that needs to be broken. Legislature has been passed in California to help combat this issue, and companies acting as brokers are developing in response to the need, but executives in these organizations need to be more cognizant whether

their board consists of a diversity of thought and experience that help support the innovation that needs to exist in the cybersecurity industry, or whether their board is homogenous and stagnant.

Recommendations for Actions

Organizations need to shift their mindset regarding diversity. Diversity is often seen as the responsibility of Human Resources in an organization; to find people who bring in diversity, to provide training about diversity, to write policies about diversity. But this is not a holistic approach to the bigger issue. The real issue is that organizations in cybersecurity must be innovative to stay ahead of the threats. Innovation relies on creativity and diversity of thought. It should be a strategic goal to examine the organizational culture to determine if there are barriers that exist to disallow diversity to exist. In addition, there is a workforce gap that exists and an underrepresentation of women in the industry. Organizations need to adjust their cultures and practices to attract and retain women.

Job descriptions need to be reframed for women reading them. The focus should be on finding matching aptitudes, soft skills, and cultural alignment, and building internal training for technical skills. Identify what skillsets would help build out a diverse team, and do not require positions to have requirements of every function listed in one job. Stop searching for the unicorn who has experience at everything and start designing positions and departments that specialize in different expertise. Design some positions around the human aspect of cybersecurity such as risk management, social engineering, and management. Identify key personal attributes, bring in candidates with strengths in these areas, and train them on the technology.

Organizations should also educate internally about unconscious bias and the various types of microaggressions. Have an outside evaluation to uncover any practice that consciously or unconsciously promotes discrimination, bias, and other inequitable practices or behaviors.

Define them, recognize them, deconstruct their hidden messages, and then fix them. If organizations have a mentorship program, evaluate whether it is benefiting the participants and providing opportunity for career and leadership development within the organization.

The underrepresentation of women and the workforce gap in the cybersecurity industry are not just a problem of diversity to be handled by HR. This is an organizational issue that is deserving of strategic attention with actions that can be integrated across different aspects of the organization. According to Bolman and Deal's Four Frames (2017), if executives only work from the people frame, aspects affecting the culture, the political arena, and the structure of the organization that are impacted will be ignored. By recognizing this is an organizational issue, changes in culture and practice that are necessary to remedy the problem are more possible.

Women should also be educated about how to navigate an organization. There is an unconscious bias that women are not technical enough for cybersecurity. Technology is not the only expertise that is necessary for a cybersecurity organization to succeed. And yet this unconscious bias prevents talented women from entering and excelling in the industry without a champion or sponsor to combat the stereotype. Providing navigation tools for women in higher education or technical programs that outline the types of organizational structures and the types of positions that are held in that organization could provide pathways where more women are able to recognize crucial aspects that they find suitable to their interests and strengths. Organizations could provide a similar training for new talent, finding a place in the organization that aligns with their strengths and interests. Developing frameworks that provide a pathway within specialized areas would allow new avenues for women to enter organizations. These frameworks could be developed in association with business programs in higher education that would help women find satisfying career paths in an industry that is desperate to fill positions.

Business programs could offer a cybersecurity track that provides information about how accounting, project management, sales, marketing, and other key positions contribute to a cybersecurity organization. Teach women that cybersecurity is a business, and it requires a variety of skillsets. Provide training that allows them to step into any organization, examine the environment, assess the need, and determine how to gain the additional skills they need and meet the influential players who can be advocates. Navigating an organization is a skill. Women can be trained about how to identify the four frames of an organization, the structure, the people, the political arena, and the culture and vision. By learning the org chart and the various departments and how they work, they can learn how to identify their own mentors and sponsors. As part of their professional development, train them about how to navigate the organization. As part of navigating an organization, teach women professionals the concept of developing their own personal board of directors. This was something several of the executive participants mentioned.

These recommendations are intended to empower women to use a framework that allows them to step into any organization and navigate the various components and to be their own advocate for leadership and career development. Organizations must do their part as well to shift the mindsets by deconstructing microaggressions and removing socially outdated biases from all aspects of the organization including processes and culture. Empowering women to find new and different pathways that align with their aptitudes, interests, and expertise will bring a diversity to the organizations that is necessary for continuous innovation. Women who are also driven and take personal accountability to navigate the organizations and develop their own program of mentors may very well pave the way to breaking some new ceilings.

Recommendations for Future Research

As mentioned before, there was not a lot of focus on racial bias and discrimination among women executives in cybersecurity. Due to the small scope and the level and availability of the participants, finding any diversity among the participants was not expected. There were some women of color among the participants and descriptions of racial bias and discrimination were shared. However, the bulk of the findings were about gender bias. But this should not be an indication that it is more or less prevalent than racial discrimination, which is a systemic issue within our nation. Further studies about barriers people of color face in cybersecurity may help provide more insight about microaggressions for organizations in order to deconstruct them and begin to break down the discriminatory behaviors that exist in the workplace and our society.

This study included C-level women executives in cybersecurity. This included women with the titles, CEO, COO, CISO, CSO, and CTO. However, these positions have different experiences. This was evident in some of the similarities in responses from the CISOs as well as different responses from the CEOs. It did not adversely affect the study, but a separate study specifically about women CEOs may provide interesting insight about women and entrepreneurship and the continuous innovation landscape that is the cybersecurity industry. Also, further studies in microaggressions and interventions that break them down would be informative to organizations and for social implications as well.

Conclusion

This qualitative phenomenological study highlighted crucial aspects of being a woman executive in the male dominated industry of cybersecurity. It provided information about the relationships that help women advance their careers and develop as leaders. There were a lot of shared stories of barriers encountered and overcome against bias and discrimination based on

gender. Examining these instances through not only social role and role congruity theories, but also microaggression theory, helped define the variations of bias. According to Sue (2010), microaggressions can be deconstructed if they are defined and recognized. By using this study to help define conscious and unconscious discriminatory behaviors faced by these female executives, hopefully it can start the process of deconstructing these microaggressions and their potential to have long-lasting repercussions on both mental and physical health.

Also informative from this study was learning that these women identified pivotal moments in their leadership development as times of promotion or opportunity mostly provided through sponsorship. Through the Bolman and Deal's four frames, the mentor and sponsor work from different aspects of an organization. A mentor can work more from a structural view, providing guidance, setting goals and monitoring process, or a mentor may work more from the people frame, encouraging and empowering the mentee. Or a mentor could work between the two and may cross into the role of a sponsor, advocating for them and opening doors. The sponsor works from the political frame, leveraging their power and influence to get them noticed in the political arena of the organization. It is important for women to understand the difference in these roles and learn how to identify what works best for them. By working on eliminating barriers based on gender discrimination and putting in place behaviors and practices that support that goal, organizations can build a culture that is more enticing for women. Women who are taught how to navigate organizations, assess the components of an organization, and identify the relationships needed to develop within the company will also be empowered to succeed.

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Appendix A

Interview Criteria

1. Are you currently holding a C-level position with a company, and your career has been in cybersecurity?
2. What is your title?
3. Can you identify one or more instances where your relationship to a mentor, sponsor or trusted advisor during your career has been pivotal to your leadership development?
4. How many years of experience do you have as a professional in this field?
5. What is highest level degree that you have earned? In what discipline(s)?
6. Would you be willing to participate in an interview?

Appendix B

Interview Protocol

Date of Interview:

Interviewee Code:

Start Time:

End Time:

Opening Statement: Good morning. Thank you for taking time out of your busy schedule to allow me to interview you. My name is Toni Plato, a doctoral student at the University of New England. We are currently examining the theories about leadership and applying them to our own institutions. My intention with this interview is to apply our learning to your experience as a leader. Your identity will not be disclosed, and I will remove any identifiable information. You are not obligated to answer any questions you do not wish to answer. This interview should take about 45 minutes, and I would like to record our session to ensure accuracy. Do you have any questions? If this all meets your approval, I will begin recording.

- **Question 1:** For demographics purposes, can you please state your:
 - Age:
 - Ethnicity:
 - Marital Status:
 - Number of Children:
- **Question 2:** Can you please state the title of your current position or leadership role and who you report to?
 - **Probe:** How many years have you been in the cybersecurity industry? What led you to it?
- **Question 3:** Can you please give a brief overview of your educational background and career path and when you entered this industry?

- **Question 4:** Take a moment and try to recall a pivotal experience anytime during your career where a relationship such as a mentor, sponsor, or trusted advisor, was transformational to your development as a leader. In as much detail as possible, describe that experience.
 - **Probe:** During what part of your career path did you have this relationship?
- **Question 5:** How would you describe the relationship with that person?
 - **Probe:** How did the relationship develop?
 - **Probe:** What were the qualities of that person that made the relationship a good fit for you?
 - **Probe:** Define the roles both of you had in that relationship.
 - **Probe:** How would you describe the benefit(s) of that relationship?
 - **Probe:** How long was the relationship?

(Ask if there is more than one instance/relationship they would like to share, go through the questions 2-3 again.)

- **Question 6:** How do you describe your leadership style?
- **Question 7:** What do you think are your greatest strengths as a woman leader?
 - **Probe:** Do you feel any of those strengths were aided by someone like mentor?
- **Question 8:** What barriers have you perceived or encountered as a woman in a predominantly male field?
 - **Probe:** Has there been a time in your career where you felt you were being limited because you are a woman?
 - **Probe:** Do you have any specific examples you could describe?

- **Question 9:** Have you ever been asked to take on a leadership role for an organization already at risk for failure or during a period of crisis where risk of failure was higher? Can you describe the experience?
- **Question 10:** Do you have any additional thoughts you would like to add?
- **Question 11:** Would it be alright to follow up by email if I have any additional brief questions?
- **Question 12:** Do you have any questions? Can you recommend anyone qualified for this study who might be interested in participating?

Closing statement: Thank you so much for your time and participation in this interview.

Appendix C

University of New England

Consent for Participation in Research

Project Title: The Lived Experiences of Women Executives in Cybersecurity

Principal Investigator(s): Toni Plato, University of New England

Introduction:

- Please read this form. You may also request that the form is read to you. The purpose of this form is to give you information about this research study, and if you choose to participate, document that choice.
- You are encouraged to ask any questions that you may have about this study, now, during or after the project is complete. You can take as much time as you need to decide whether or not you want to participate. Your participation is voluntary.

Why is this research study being done?

- The purpose of this study is to explore the professional, lived experiences of women executives in the cybersecurity industry within the United States. It will explore the pivotal experiences that women executives in cybersecurity perceive have advanced their careers, and whether instances of mentorship, sponsorship, or a trusted advisor have been influential to their success.

Who will be in this study?

- You have been identified as a potential participant because of your current role as a woman in a C-level position within the cybersecurity industry in the U.S. You have also identified yourself as having one or more instances of a mentor, sponsor, or trusted advisor that influenced your career. There will be ten to twelve participants.

What will I be asked to do?

- You will be invited to participate in an oral interview that will last 60-90 minutes. A shorter follow-up may be requested. The purpose of the interview is to have you describe one or more experiences of pivotal moments in your development as a leader that were influenced by a mentor, sponsor or trusted advisor. You have intentionally agreed to participate. There is no financial reimbursement for your time.

What are the possible risks of taking part in this study?

- There are no foreseeable risks associated with participation in this study.

What are the possible benefits of taking part in this study?

- There are no direct benefits to you for participating in this study.

What will it cost me?

- There is no cost to participate in this study.

How will my privacy be protected?

The following steps will be taken to protect your privacy.

- All interviews will be conducted at a time that works best for the participant via a secure GoToMeeting link.
- Recorded interviews will be saved as mP4 files to a secured network.
- Transcribed interviews will be saved as Word documents to a secured cloud network.
- Interviews in the GoToMeeting platform will be deleted at the completion of the data analysis.
- These files will not be printed on paper. All coding will be completed and saved on the secured network.
- Files will be deleted within five years after completion of the study.

Participants in this study will be given confidentiality pertaining to their names and organizations. All data collection, analysis, interpretation, and communication will be checked by the researcher to ensure there is no identifiable information. Recorded interviews will be saved to a secure electronic file that is part of a secure network, inaccessible to anyone but the researcher. Transcribed interviews will also be securely kept as electronic files on the secured cloud network. Both sets of files will only be kept accessible to the researcher for as long as necessary to complete the study and will not be printed in paper. Files will be deleted within five years after completion of the study.

How will my data be kept confidential?

The following steps will be taken to ensure your private data will be kept secure.

- All participants will be assigned a pseudonym known only to the principal investigator and the participant.
- All files of the recordings and the transcripts will be labeled with the pseudonym.
- Transcripts of the interviews will be done within the secured, upgraded GoToMeeting platform accessible only by the principal investigator's login and password.
- All videos, transcripts, and consent form files will remain in the possession of the principal investigator and saved on a secured network. At the conclusion of the study, the GoToMeeting recordings will be deleted.

What are my rights as a research participant?

- Your participation is voluntary. Your decision to participate will have no impact on your current or future relations with the University.

- Your decision to participate will not affect your relationship with the industry.
- You may skip or refuse to answer any question for any reason.
- If you choose not to participate there is no penalty to you and you will not lose any benefits that you are otherwise entitled to receive.
- You are free to withdraw from this research study at any time, for any reason.
 - If you choose to withdraw from the research there will be no penalty to you and you will not lose any benefits that you are otherwise entitled to receive.
- You will be informed of any significant findings developed during the course of the research that may affect your willingness to participate in the research.
- If you sustain an injury while participating in this study, your participation may be ended.

What other options do I have?

- You may choose not to participate.

Whom may I contact with questions?

- The researcher conducting this study is Toni Plato, M.S.
 - For more information regarding this study, please contact Toni Plato at tplato@une.edu
- If you choose to participate in this research study and believe you may have suffered a research related injury, please contact Ella Benson, Ed.D. at ebenson2@une.edu
- If you have any questions or concerns about your rights as a research subject, you may call Mary Bachman DeSilva, Sc.D., Chair of the UNE Institutional Review Board at (207) 221-4567 or irb@une.edu.

Will I receive a copy of this consent form?

- You will be given a copy of this consent form.

Participant's Statement

I understand the above description of this research and the risks and benefits associated with my participation as a research subject. I agree to take part in the research and do so voluntarily.

Participant's signature or
Legally authorized representative

Date

Printed name

Researcher's Statement

The participant named above had sufficient time to consider the information, had an opportunity to ask questions, and voluntarily agreed to be in this study.

Researcher's signature

Date

Printed name