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Retention and advancement of African American women into senior leadership positions in high technology companies

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RETENTION AND ADVANCEMENT OF AFRICAN AMERICAN WOMEN INTO

SENIOR LEADERSHIP POSITIONS IN HIGH TECHNOLOGY COMPANIES

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A Research Project

Presented to the Faculty of

The George L. Graziadio

School of Business and Management

Pepperdine University

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In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Organization Development

_____

by

Odetta Scott

August 2011

This research project, completed by

ODETTA SCOTT

Under the guidance of the Faculty Committee and approved by its members, has

been submitted to and accepted by the faculty of The George L. Graziadio

School of Business and Management in partial fulfillment of the requirements for

the degree of

MASTER OF SCIENCE

IN ORGANIZATION DEVELOPMENT

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Abstract

High technology companies have a reputation for innovation and delivering cutting edge technologies to the American public. Additionally, the ability to innovate gives companies important competitive advantages such as being able to better satisfy customer needs, respond to environmental changes, and leverage emerging opportunities. However, a company's ability to innovate is hampered when diversity is lacking. Research has demonstrated that African American women are under-represented in both high technology and in the executive ranks of organizations. This qualitative study involved interviews with 15 African American women who held or had held a senior-level position within a high technology company. They identified success factors and barriers to the advancement of African American women into senior leadership positions within high technology companies (specifically, the defense and aerospace industries).

While it appears that the success factors and barriers may vary from person to person, creating a career plan, developing oneself, finding mentors, and intentionally building one's networks can help African American women reduce or eliminate their barriers and achieve the success they desire. Recommendations include developing mentoring programs for African American women, increasing support and visibility of talented African American women, and stirring interest in high technology among African American youth. Limitations of the study included its use of a small, non-representative sample and potential researcher and participant bias. Suggestions for future research include updating the research on the glass ceiling, conducting longitudinal research on African American women's success factors and barriers, and conducting comparative research in other industries.

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Chapter 1

Introduction

High technology companies, defined as organizations where the majority of employees hold technical degrees, have a reputation for innovation and delivering cutting-edge technologies to the American public (Glick, 2010). The ability to innovate gives companies important competitive advantages such as being able to better satisfy customer needs, respond to environmental changes, and leverage emerging opportunities (Xie, Zeng, & Tam, 2010). Innovation also helps companies increase their market share (Hansen, 2010).

Being able to innovate requires certain characteristics and competencies within the organization, such as adequate organizational communication, employee engagement, and employee skill development (Denning, 2010). Additionally, "Leaders play an integral role in facilitating innovative efforts at multiple levels and across multiple stages of the creative process" (Friedrich, Mumford, Vessey, Beeler, & Eubanks, 2010, p. 6). Diversity has also been linked to improved innovation (Johansson, 2005). Therefore, when company leadership fails to proportionately represent the United States workforce and the general United States population, the innovations that are designed and delivered may fail to meet the needs and desires of the organization's customers. In turn, the company's efforts to innovate, create competitive advantage, and even to survive may be hampered (U.S. Department of Labor, 1995).

Instead, to fully exercise and realize the benefits of innovation, it is necessary for high technology companies to assure that their leadership ranks proportionately reflect the populations of women and minorities in the United

States workforce (Johansson, 2005). This is not currently the case. In particular, African American Women (AAW) are underrepresented in senior level positions within various industries (Davis & Watson, 1982; Kanter, 1977; Killingsworth & Reimers, 1983). AAW comprise a demographic group that is particularly under-represented—both in high technology as well as in the executive ranks of organizations (The U.S. Equal Employment Opportunity Commission, 2009). The reasons for this lack of representation are not completely understood (Kottke & Agars, 2005). Increasing awareness of the barriers was the goal of this study.

Purpose of the Study

This study identified the barriers to the advancement of AAW into senior leadership positions within high technology companies (specifically, the defense and aerospace industries). Additionally, recommendations are provided for helping to remove those barriers so this critical subgroup can transition into those senior level positions.

Definitions

Several key terms are important to this study. These include the following:

1. Affirmative action: An active effort to improve the employment or educational opportunities of members of minority groups and women (Woodhouse, 2002).

2. African American, Black Americans of African descent: Black and African American are used interchangeably (Brinson, 2006).

3. Concrete ceiling: Barriers facing AAW in business, which include negative, race-based stereotypes; more frequent questioning of their credibility and authority; and a lack of institutional support; experiencing a "double outsider"

status; exclusion from informal networks; and conflicted relationships with white women. These barriers are believed to stem from the historical legacy of slavery, legally enforced racial segregation, and discrimination based on skin color (Anderson, 2007; Bell & Nkomo, 2001; Catalyst, 2006).

4. Dualism: Having double characteristics of being both Black and a woman (Brinson, 2006).

5. Glass ceiling: Artificial barriers that occur in career advancement for women and people of color as they work toward advancing into senior leadership positions (Anderson, 2007).

6. Hispanic: Refers to any person who is of Spanish language speaking or Latin American descent (Wills, 2010).

7. Racism: The doctrine of individual and institutional discrimination, segregation, prejudice, and negative acts that are overtly or covertly directed toward a particular racial or ethnic group (Brinson, 2006).

8. Sexism: The doctrine of individual and institutional discrimination, segregation, prejudice, and negative acts that are overtly and covertly directed toward women simply because they are women (Brinson, 2006).

9. White, Caucasian, European American: Americans of European ancestry (Johnson, 2006).

10. Women of color: Encompasses a diverse group of women of many different racial, ethnic, cultural and linguistic backgrounds (inclusive of African, Asian, Hispanic, and Native Indian descent) (Osuoha, 2010).

Organization of the Study

Chapter 2 of this research project examines the extant literature on the advancement and retention of AAW, including a profile of AAW in the workforce and AAW in senior leadership. A discussion of the barriers to and facilitators of their advancement also is provided, along with case studies of two organizations that have successfully enhanced the representation of women and minorities at the level of senior leadership. Chapter 3 describes the methods used in this study, including a description of the research design, sample, interview procedures, and data analysis procedures. Chapter 4 reports the findings. Chapter 5 presents the conclusions, recommendations, limitations, and suggestions for research emerging from this study.

Chapter 2

Literature Review

This chapter provides an examination of literature relevant to this study. Topics include AAW in the workforce, AAW in senior leadership, barriers to advancement, facilitators of advancement, and case studies of two organizations that have successfully enhanced the representation of women and minorities at the level of senior leadership.

AAW in the Workforce

In 2005, women accounted for 47% of America's workforce (U.S. Department of Labor, 1995) and AAW accounted for 8% of all employees across all industries (The U.S. Equal Employment Opportunity Commission, 2009). Of particular interest to this study is the proportion of AAW in technical industries. The U.S. Equal Employment Opportunity Commission reported that AAW accounted for 5% of all employees in the professional, scientific & technical services. These statistics reveal that AAW are particularly under-represented in technical industries.

Catalyst (2003) explained that AAW are over-represented in service industries and professions such as clerical and sales positions and are under-represented in technical and business industries and positions such as officers, managers, professionals, and technicians. For example, the finance and banking industry historically has been considered masculine (Granleese, 2004). Accordingly, entry-level positions were filled by male recruits who were considered protégés for managerial careers. However, when the men went to serve in the military as part of World Wars I and II, the labor shortage prompted

banks to turn to women to fill their bank teller, bookkeeper, and minor office positions (Katz, Stern, & Fader, 2005). Nevertheless, it was not until the mid-1980s that women were viewed as anything but short-term employees (Wirth, 1998).

AAW in Senior Leadership

Both minorities and women have witnessed increased opportunities for employment over the course of the 20th century. From 1990 to 2001, the number of Hispanic women in the workforce increased by 104%, while the number of AAW in the workforce increased by 43% (Office of Information and Planning, 2003).

However, there remains low representation of women (Kanter, 1977) and AAW in management (Davis & Watson, 1982; Killingsworth & Reimers, 1983). Between 1982 and 1986, approximately 30% of United States managers were female and 3% to 4% were Black (International Labor Office, 1986). While this may sound substantial, these groups were actually underrepresented in the management ranks, as the labor force was 44% female and 10% Black. The statistics become even more dismal as one moves further up the corporate ladder: only 2% of senior executive jobs (Brenner, Tomkiewicz, & Schein, 1989) and 2.8% of the 6,543 directorship positions in the Fortune 500 (Shenhav, 1992) were held by women.

A 1992 survey of Fortune 500 companies found that 3% to 5% of senior managers were women, and 95% were of Caucasian, non-Hispanic descent (U.S. Department of Labor, 1995). In contrast, women held 46% of America's jobs and earned more than half of the master's degrees being awarded. The

researchers concluded that women do not readily attain advancement to senior-level positions and that AAW were particularly affected. Women also are under-represented on corporate boards of advisors. As of 2003, they accounted for only 13.6% of board seats at Fortune 500 companies, revealing a decrease from 96 in 1995 to 54 in 2003 (Catalyst, 2003).

In 2008, the U.S. Equal Employment Opportunity Commission (2009) found that the United States labor force was 60% female but held only 45% of management positions. Additionally, 12% of the labor force was comprised of Black employees; yet, these individuals held only 6% to 7% of the management positions. Specifically, AAW were found to hold only 3% of the first- and mid-level management positions across industries and only 2% of these positions in high technology. AAW held even fewer executive positions: only 2% of the executive offices across industries and 1% of these positions in high technology. Even when women do reach the management ranks, they fail to earn salaries equal to their male counterparts (Anderson, 2007; Elmuti et al., 2003). Anderson found that the top female managers in the companies she surveyed averaged only 72% of their male colleagues' salaries.

More recently, Augustine, Bulthuis, and Mohapatra (2010) conducted a study of women in management within the Standard & Poors 100 companies. They found that women held approximately 18% of director positions, but held only 8.4% of the highest paid positions within these companies. Only 14 Standard & Poors 100 companies have two or more female or minority officers in the highest paid positions and 56 companies have no female or minority representation in their highest paid positions. Among these companies, there

were only six female chief executive officers—three of whom were minorities. Additionally, there were two minority male chief executive officers within these companies. In contrast to these 8 positions that were held by women or minorities, 92 companies had Caucasian male chief executive officers.

This same trend of under-representation of women and minorities as one moves up the ranks is evidenced across industries around the world (Lyness & Terrazas, 2006; Russell, 2006; Ryan, Haslam, Hersby, Kulich, & Wilson-Kovacs, 2009).

The under-representation of AAW in leadership ranks suggests that organizations are failing to fully leverage their available talent (Bingham, Ward, & Butler, 2006; Fassinger & Asay, 2006; Lyness & Terrazas, 2006; Russell, 2006; Ryan et al., 2009; Zhang, Schmader, & Forbes, 2009). Without this representation, these companies are missing the valuable voices and perspectives of AAW employees. Accordingly, the companies may be missing important business opportunities that could translate into competitive advantage (Johnson, 2005). Johnson goes even farther to argue that companies that fail to cultivate AAW and give them leadership positions are exploiting the talent that keeps them in business.

Despite these dismal statistics, there is some indication that the tide may be turning. Research by Goodman, Fields, and Blum (2003) involving 228 medium to large private sector companies revealed that a significant number of women occupied senior-level positions in organizations where there was a greater number of women occupying lower-level management positions. This suggests that building capacity and promoting women throughout the

organization may ultimately result in helping women reach the top ranks of the organization. Goodman et al. added that the banking industry is one area where women are gaining the opportunity to achieve senior-level management positions.

<div align="center">*Barriers to Advancement*</div>

Several studies have been conducted to identify the barriers to advancement that AAW face (Brinson, 2006; Calvert, 2006; Combs, 2003; Henry-Brown, 1995; Ibarra, 1995; Jackson, 2009; Johnson, 2006; Osuoha, 2010; Patterson, 2006; Wills, 2010). The results of these studies have pointed to a variety of barriers, ranging from organization-level factors to human resource practices, to personal attributes.

Organization Structure

Giscombe and Mattis (2002) concluded that an organization's level of structural integration provides the context for many barriers. They explained that large corporations typically exhibit low levels of structural integration, such that the representation of women and those from minority-cultural backgrounds is highly skewed by function, level, and workgroup. This means that women and minority employees tend to be found in service-oriented and support functions rather than the profit centers and functions from which senior level leaders tend to be promoted.

Diversity Practices

A human resources practice that has been linked to barriers is diversity practices. Specifically, the benefits of diversity practices for helping AAW reach the executive ranks have been debated. Catalyst (1999) found that diversity

initiatives are not as effective as they could be or were intended to be for women of color. A total of 75% of the women of color surveyed reported that they were aware of training in their corporation to address race and gender issues, but only 22% say their managers received adequate training in managing a diverse workforce. More than half (53%) of the women believed their companies' diversity programs were ineffective in dealing with issues of subtle racism, 26% of the women said that career development was an important part of their companies' diversity programs, and only 17% believed their managers were held accountable for advancing women of their racial or ethnic group.

Similarly, Mattis (2001) observed that these practices could help enhance and celebrate workforce diversity, but most corporate diversity training programs focus on changing attitudes rather than identifying and teaching specific behaviors that foster diversity in organizations. In Wills' (2010) recent study of AAW, participants reported these programs as rarely being helpful in assisting AAW climb the corporate ladder.

Similar to previous research, training leaders in managing and valuing diversity has recently grown as a focus in leadership development (Kilian, Hukai, & McCarty, 2005; Jackson, 2009; Wills, 2010). Calvert (2006) and Witherspoon (2009) both argued that diversity programs within organizations are beneficial to the organization.

Lack of Informal Networks

Informal networks within corporations consist of both social and business relationships that act as the conduit for communicating important information, sharing valuable expertise, filling new opportunities, having influence, and

making the connections that can lead to promotions (Fryxell & Lerner, 1989;

Mizruchi, 2000). As a result, the social network plays a critical role in career

advancement and job effectiveness (Catalyst, 2006; Combs, 2003; Ibarra, 1993).

However, AAW often are excluded from these important informal networks

(Bell & Nkomo, 2001; Catalyst, 1999, 2006; Combs, 2003; Ibarra, 1993;

Patterson, 2006). Among women of color, AAW perceived the highest level of

workplace exclusion at 42%, while Latina and Asian women perceived workplace

exclusion at a rate of 21 and 27%, respectively (Catalyst, 2006). A survey of 150

senior corporate executives conducted by Harris Interactive for The Executive

Leadership Council (2009) concluded that having weaker or less strategic

networks was a key reason why AAW have difficulty reaching the C-suite.

Lack of Similar Mentors and Role Models

Mentoring is also considered a key aspect for facilitating promotion to

senior management positions for AAW (McCracken, 2005). Women of color can

benefit from having mentors in their environment who they can observe

navigating both formal and informal networks. These role models can

demonstrate that women and minorities can succeed in performing executive-

level duties. Seeing other women in senior management also shows that women

can handle these positions in addition to having families. Mentoring is tied to also

tied to visibility, which consists of being included in informal and formal

networking with colleagues and with exposure to high-visibility assignments.

However, studies of African-American managers' experiences with

mentoring and sponsorship indicate that it is more difficult for them to obtain

mentors and to build the type of developmental relationships necessary to long-

term career development (Brinson, 2006; Calvert, 2006; Clay, 1998; Combs, 2003; Ibarra, 1995; Jackson, 2009; Johnson, 2006; McCracken, 2005; Osuoha, 2010; Pfleeger & Mertz, 1995). Ibarra (1995) explained that managerial ranks tend to be segregated by race and gender such that there are few women or people of color in influential positions. Lack of similar "others" in high positions, in turn, may lead to a lack of mentorship or sponsorship. The American Association of University of Women studied women's entry into the computer science and engineering fields and concluded that the small number of women scientists and engineers translated into fewer and fewer women selecting these fields of study in college (Pfleeger & Mertz, 1995).

Fewer Opportunities and Promotions

While women have been reported to receive appraisals that are as good as their male counterparts (Henry-Brown, 1995), Kern-Foxworth (1995) argued that professional women of color are expected to meet or exceed performance standards set for the most part by their white male colleagues. Accordingly, AAW have been found to receive fewer opportunities for training and promotions (Clay, 1998; McCracken, 2005; Patterson, 2006; U.S. Merit Systems Protection Board Study, 1992). In Henry-Brown's (1995) study of women's advancement in the federal government, women, overall, were promoted less often over the course of their government careers than were men, regardless of their comparable experience, education, and skills. According to Combs (2003), African Americans, more than any other groups in the workplace, are most likely perceived as being unfairly treated in terms of promotion and opportunities for

training, perceived more significant disengagement, and are percevied to be more of a target for discrimination at work.

Stereotypes

Many women, particularly AAW, reported that pervasive stereotypes, subtle assumptions, and adverse attitudes (e.g., racism, sexism) affect their advancement (Anderson, 2007; Brinson, 2006; Burke & Vinnecombe, 2005; Calvert, 2006; Catalyst, 1999; Clay, 1998; Henry-Brown, 1995; Jackson, 2009; Johnson, 2006; Metz, 2009; Osuoha, 2010; Patterson, 2006; Witherspoon, 2009). These are reported to affect how managers sometimes view women's potential for advancement (U.S. Merit Systems Protection Board Study, 1992). The researchers found in these studies of AAW and their professional advancement that the intersection of race and gender biases often result in workplace inequities that distort others' perceptions of AAW's capabilities and, thus, permeate the everyday experiences of AAW. For example, Henry-Brown (1995) found in her study of women in federal government careers that women often were perceived to be less committed to their jobs than men. Patterson (2006) added that women often were subjected to excess scrutiny and questioning of their authority and credibility.

Double Bind

Women of color experience are reported to experience both a double outsider status (Catalyst, 2002; Patterson, 2006) and the double bind phenomenon (Brinson, 2006) whereby they lack a basic fit with the organization (Patterson, 2006). Their experiences are different from those of White women and men; their experiences also differ from men of their own racial and ethnic

groups. Women of color are removed from White men, typically the most powerful group in business organizations, by both gender and race. Brinson explained that this removal results in racism and sexism that yields the double outsider status (Henry-Brown, 1995). Regarding leadership roles, Brinson (2006) described the double bind as an attribute that exists between men and women, where women lack power. This often results in the double bind being represented as a discriminatory barrier that limits women's career advancements and represses their success.

Personal Attributes

Bell (1990) suggested that beyond the pressure to conform to professional standards and dominant cultural values found in organizations, AAW professionals also struggle with managing expectations, values, and roles in relation to the Black community, where they are expected to be the figurative spokespersons. They also may have substantial roles to fill at home, necessitating adequate work-life balance. The needs for work-life balance, in turn, can limit these women's ability to attend after-hours meetings and social events that can be instrumental in them gaining access to informal networks and other opportunities that lead to advancement (Fryxell & Lerner, 1989; Mizruchi, 2000).

Glass Ceiling

The barriers described in this section combine to form a glass ceiling that serves to block women's ascension to the top ranks in the organization (Brinson, 2006; Chen, 2005; Kilian et al., 2005; Porter, 2003). The term glass ceiling first appeared in the 1986 edition of *The Wall Street Journal* (Calvert, 2006;

Patterson, 2006; Payne, 2005; Witherspoon, 2009). The glass ceiling is not physical; instead, it is a metaphor that refers to an invisible, yet impermeable barrier that limits the career advancement of women and minorities (Burke & Vinnicombe, 2005). The majority of research on the glass ceiling has focused on its impact on the workforce of women and minorities in various fields (Anderson, 2007; Clay, 1998; Henry-Brown, 1995). Others have studied the glass ceiling as it relates to gender and ethnicity (Calvert, 2006; Witherspoon, 2009).

In August 1991, the U.S. Department of Labor released results that a glass ceiling does exist and it occurs much lower in the organization than previously reported. In addition, it was noted that minorities tend to hit the glass ceiling earlier than women do. Clay (1998) concluded that the glass ceiling is operating in full effect at the Defense Logistics Agency, given that only 3.8% of the 4,662 employees in high grade positions were AAW.

The statistics that women and minorities remain underrepresented at the leadership ranks of organizations suggest that the glass ceiling still remains today, despite these employees' increased education and experience and the legislature designed to remove it.

Because of the significant barriers AAWs face, Catalyst (1999) argued that AAWs do not face a glass ceiling, they face a *concrete ceiling.* Whereas a glass ceiling could be broken and glass allows women the ability to see the upper ranks as well as be seen by them, concrete is opaque and difficult—if not impossible—to penetrate. Thus, the concept of a concrete ceiling is a powerful metaphor for the difficulty AAW have in ascending the corporate ladder.

Result of Barriers

The phenomenon of the glass ceiling and its myriad manifestations often are not openly discussed in many companies. Its existence often only becomes open when women publicize its effect in lawsuits. Publicizing the phenomenon generally has negative repercussions for the employees who complain; therefore, women usually discuss the issues among themselves or eventually leave the company to avoid a backlash. Other women, on the contrary, become even more persistent about their careers and eventually find a place in the executive suite of male-dominated companies.

Ultimately, the result of the various barriers AAW and other women face is that organizations lose invaluable human potential (Cox & Smolinski, 1994). Eventually, these women express their frustrations about unequal opportunities by moving on to other opportunities at other organizations. Therefore, the glass or concrete ceiling, along with the barriers they involve, can result in retention issues and loss of talent and knowledge for the organizations that lose AAW.

<div align="center">*Facilitators of Advancement*</div>

As the workforce of the United States has steadily increased in diversity over the last few decades, many organizations assumed that their executive ranks would naturally diversify as the entry pool of diverse workers rose up the corporate ladder (Kilian et al., 2005). However, the statistics shared earlier in this chapter demonstrate that diversity in the lower ranks has not translated to equal representation at the senior level positions of corporations.

Research on the factors that enhance diversity at the senior leadership level has identified three types of success factors or interventions that have been

used to address the issue: individual characteristics, organization culture and leadership, and legislation. The goal of these factors is to create organizational demand for diversity while simultaneously giving individuals the tools they need to succeed (Kilian et al., 2005).

Individual Characteristics

Metz (2009) examined women's management advancement in banks and concluded that having ambition, masculinity, aspirations to advance through management, task-orientation to get the job done or the problem solved, and ability to adapt to new working environments and changing conditions are associated with advancing to the leadership ranks. Henry-Brown (1995) additionally found in her study of women in federal government jobs that career advancement was associated with openness to mobility, job commitment, and work experience.

Additionally, emotional intelligence, defined as the ability to (a) accurately, perceive, appraise, and express emotion; (b) accept or generate feelings when they facilitate thought; (c) understand emotion and emotional knowledge; and (d) regulate emotions to promote emotional and intellectual growth, was found to be an essential factor for AAW and their advancement (Jackson, 2009; Mattis, 2001).

Many of these individual characteristics factors can be learned and consciously increased. In turn, one's career advancement can be positively impacted.

Organization Culture and Leadership

Catalyst (2001) conducted a roundtable discussion to consider how organizational environments could be enhanced to support women's advancement. Participants offered two key recommendations: improving the inclusiveness of corporate environments and strategically identifying and developing talent. Other researchers emphasized the importance of approaching diversity management on a systematic level—for example, by instituting a mentoring program (Henry-Brown, 1995) or addressing cultural and other organizational practices that obstruct women's and minority individuals' advancement (Catalyst, 2001).

Additionally, several researchers explained that chief executive officers must demonstrate their support and commitment for diversity initiatives if they are to be effective (Brinson, 2006; Catalyst, 2006; Kilian et al., 2005). This commitment should be visibly and effectively communicated to employees at all organizational levels, and leadership should be held accountable for achieving diversity goals.

Legislation

Federal legislation also has been created to support women's and minority advancement. Affirmative Action was created more than 40 years ago by Title VII of the Civil Rights Act of 1964, Executive Order 11246, and subsequent amendments. This policy prohibits employment discrimination against any individual due to gender, ethnicity, color, or race (Bell, 1997).

The concept of Affirmative Action was birthed from two somewhat separate legal origins. The first impetus was the *Brown v. Board of Education*

decision in 1954, which was a racially segregated public school case. The second impetus was employment discrimination and the beginning of the Civil Rights Act of 1964 (Woodhouse, 2002), which focused on employment and education admissions, although compliance was required for those employers or institutions receiving federal funds or contracts. Following these events, in September 1965, President Lyndon B. Johnson issued Executive Order 11246. It was the fifth in a series of similar orders designed to generate fair employment practices among government contractors. It differed from its predecessors in that it was designed not only to assure that government contractors do not discriminate against minorities and women, but that they also take positive measures to prevent discrimination. Enforcement responsibility was lodged with the U.S. Department of Labor (Anderson, 1996). This order required all business firms with government contracts worth $50,000 or more and with 50 or more employees to conduct a self-audit to determine whether their employment of minorities and women across the broad spectrum of occupational groups correlated with the availability of persons in such groups that are qualified for employment by the firm. If a significant disparity was found between the available women and minorities and those actually employed, the contractor was required to develop an affirmative action plan.

The affirmative action plan identified the set of procedures the employer would follow in recruiting, evaluating, hiring, training, and promoting employees in order to ensure that qualified minorities and women are considered for employment at every level within the organization. Contractors were expected to make a "good faith" effort to follow this plan in managing their human resources.

The Office of Federal Contract Compliance Programs used the compliance review as its main enforcement tool. Each year, the Office of Federal Contract Compliance Programs conducts about 4,000 reviews of contractor affirmative action plans, ensuring that affirmative action plans are implemented in accordance with their goals and objectives.

Anderson (1996) has concluded that there has been an ebb and flow in the energy, commitment, and determination devoted to achieving equal job opportunity through affirmative action over the last 30 years. He added that implementation has been significantly affected by both strategies pursued and the resources available for enforcement. Clinton's inauguration signaled a renewed emphasis on glass ceiling reviews to enhance employment opportunities for minorities and women in management and executive jobs.

Companies have found the recipe to create an inclusive culture while leveraging their AAW talent. Following are case studies of two organizations that have successfully enhanced the representation of women and minorities at the level of senior leadership.

Enhancing Women and Minority Leadership

Deloitte & Touche launched an Initiative for the Retention and Advancement of Women to develop programs to enhance working relationships between men and women; enhance career opportunities for women through mentoring, networking, and career planning programs; develop business planning and human resource goals with definable criteria for measuring progress; support individuals in their efforts to balance multiple commitments; and communicate change. Since 1992, Deloitte & Touche has more than tripled

the number of women holding key leadership positions and the number of women partners. In addition, Deloitte & Touche is the first of the Big Five professional services firms to achieve 11% women partners. In 1993, the company formed the Women's Initiative to drive marketplace growth and create a culture where the best women choose to be (Deloitte, 2007).

WellPoint, the Catalyst 2003 Award Winner, is another example of an organization that successfully increased diversity in their senior leadership ranks. The organization began to actively acquire other companies and designed an acquisitions strategy that involved active integration by seeding new companies with WellPoint leaders. WellPoint did not have many formal systems in place, but the senior leadership group understood that the company had a ready-made talent pool of associates— the majority of whom were women or people of color. Company leadership realized that identifying and developing internal talent would improve the diversity of leadership and provide new leaders for the fast-growing company. The chief executive officer and senior leadership group then created a company goal of 75% internal promotions and began by reducing the turnover rate, which was well above the national average.

WellPoint's award-winning strategy for female and minority advancement included several features, including (a) education to inform and train managers on the cost of turnover, (b) communication to highlight the connection between the internal talent pool and the business-related goal of diversifying the senior leadership, and (c) technology to provide an efficient system for rolling out the initiative throughout the management layers of the company (Catalyst, 2008).

This three-pronged approach proved highly successful for increasing diversity of their senior leadership.

Summary

This chapter provided an examination of literature relevant to the advancement of AAW to senior leadership ranks of organization. Women and especially AAW are under-represented both in high technology and in the senior leadership ranks of most industries (Augustine et al., 2010; Brenner et al., 1989; Catalyst, 2003; Davis & Watson, 1982; Kanter, 1977; Killingsworth & Reimers, 1983; U.S. Department of Labor, 1995; The U.S. Equal Employment Opportunity Commission, 2009). These statistics suggest that organizations are failing to fully leverage their available talent (Bingham et al., 2006; Fassinger & Asay, 2006; Lyness & Terrazas, 2006; Russell, 2006; Ryan et al., 2009; Zhang et al., 2009).

Barriers to the advancement of AAW include organization structures that disadvantage women and minorities (Giscombe & Mattis, 2002), ineffective diversity practices (Catalyst, 1999; Mattis, 2001; Wills, 2010), lack of the informal networks that play critical roles in career advancement and job effectiveness (Bell & Nkomo, 2001; Catalyst, 2006; Combs, 2003; Ibarra, 1993; Patterson, 2006), lack of similar mentors and role models (Brinson, 2006; Calvert, 2006; Clay, 1998; Combs, 2003; Ibarra, 1995; Jackson, 2009; Johnson, 2006; McCracken, 2005; Osuoha, 2010; Pfleeer, 2005), having fewer opportunities and promotions (Clay, 1998; McCracken, 2005; Patterson, 2006; U.S. Merit Systems Protection Board Study, 1992), stereotypes (Anderson, 2007; Brinson, 2006; Burke & Vinnecombe, 2005; Calvert, 2006; Catalyst, 1999; Clay, 1998; Henry-Brown, 1995; Jackson, 2009; Johnson, 2006; Metz, 2009; Osuoha, 2010;

Patterson, 2006; Witherspoon, 2009), experiencing a double bind of racism and sexism (Brinson, 2006; Catalyst, 2002; Henry-Brown, 1995; Patterson, 2006), and personal attributes that compete with AAW's professional demands (Bell, 1990; Fryxell & Lerner, 1989; Mizruchi, 2000).

The barriers AAW face culminate in a glass or concrete ceiling that symbolize the inaccessibility of the senior office for women and minorities (Anderson, 2007; Brinson, 2006; Burke & Vinnicombe, 2005; Calvert, 2006; Catalyst, 1999; Chen, 2005; Clay, 1998; Henry-Brown, 1995; Kilian et al., 2005; Porter, 2003; Witherspoon, 2009). The impact of the glass ceiling is that organizations often lose invaluable human potential, knowledge, and skills as frustrated women leave for other opportunities (Cox & Smolinski, 1994).

Due to the costs of these losses, several researchers have examined what could be done to increase diversity at the senior ranks. Three key success factors for AAW advancement that have been identified include individual characteristics (Henry-Brown, 1995; Jackson, 2009; Mattis, 2001; Metz, 2009), organization culture and leadership (Brinson, 2006; Catalyst, 2001, 2006; Kilian et al., 2005), and legislature (Anderson, 1996; Bell, 1997). Table 1 summarizes the findings of the literature review.

This present study built upon what was already known about AAW advancement and more deeply examined the barriers to advancement AAW face that are specific to reaching senior leadership positions within high technology companies. Chapter 3 outlines the methods used in this study, including the research design, sample, and procedures related to data collection and analysis.

Table 1

Summary of Literature Review Findings

Factors	Themes and Findings	Source
Diversity Practices	• Interventions (diversity initiatives, degree attainment, formal and informal networks, and mentoring) can improve diversity of the pipeline • Lack of diversity programs impact AAW advancement	Jackson (2009), Kilian et al. (2005), Wills (2010)
Lack of Networks	• Race and gender barriers can pose barriers to informal social networks for AAW managers. AAW can lack access to or have weaker, less strategic networks	Bell and Nkomo (2001), Catalyst (1999, 2006), Combs (2003), Executive Leadership Council (2009)
Lack of Mentor	• Lack of mentors impacts women's advancement to senior leadership positions • Better mentoring is needed for AAW aspiring to senior leadership positions • Mentoring is tied to increased visibility	Calvert (2006), Deloitte (2007), Ibarra (1995), Jackson (2009)
Lack of Role Models	• Lack of role models impact AAW retention and advancement • Few AAW role models mean young AAW typically do not choose fields of science and engineering	Calvert (2006), Deloitte (2007), Jackson (2009), Pfleeger and Mertz (1995)
Perceptions of the Glass Ceiling	• Human capital, discrimination, sociopsychological, and systematic barriers affect AAW in the federal career services • Personal and professional traits and views affect AAW's experiences in male-dominated cultures • Glass ceiling exists for AAW in Defense Logistics Agency • Re-envisioning the glass ceiling based on race, gender, and ethnicity • Glass ceiling is an impenetrable *concrete ceiling* for women and minorities	Burke and Vinnicombe (2005), Calvert (2006), Clay (1998), Henry-Brown (1995), Jackson (2009), Johnson (2006), Metz (2009), Osuoha (2010), Patterson (2006), Witherspoon (2009),
Barriers	• AAW face race and gender challenges to becoming leaders in corporate America • AAW's barriers to organizational advancement include stereotypes, visibility, and scrutiny; questioning of authority and credibility; lack of "fit" in the workplace; double outsider status; and exclusion from informal networks; lack of institutional support	Anderson (2007), Brinson (2006), Calvert (2006), Henry-Brown (1995), Patterson (2006)

AAW = African American Women

Chapter 3

Methods

The objective of this research is to identify top barriers AAW face in their advancement to senior leadership positions within high technology companies. This chapter describes the methods used in this study. First, the research design is described, followed by a discussion of the sampling, interview, and data analysis procedures.

Research Design

This study used a qualitative approach. Qualitative research tends to be emergent rather than tightly defined (Creswell, 2003). Understanding of the phenomena being explored tends to develop through a process of initial coding, which then develops into broad themes, and coalesces into a tentative theory. Marshall and Rossman (2006) elaborated that qualitative analysis involves a search for general statements about the nature of the phenomena and the relationships underlying them.

This study sought to uncover the experiences of AAW to gain a richer understanding of their path to the senior level of organizations. Participants' career journeys were examined through detailed interviews, which enabled participants to share their in-depth experiences.

Sample

Sampling procedures concern issues of who will be selected to participate, how participants will be found, and how the participants will be enrolled into the study.

Determining who will be selected to participate is aided by creating selection criteria that identify the characteristics individuals need to exhibit to participate. Three selection criteria were defined to guide participant selection:

1. The participant needed to be an AAW.

2. The participant needed to be currently employed or employed within the previous 5 years within the high technology industry.

3. The participant needed to have held a senior leadership position as an individual contributor or a manager in the organization.

These criteria assured that the participants would be able to provide data that were relevant to the study.

A sampling strategy outlines how qualifying participants will be found for the study. The initial strategy utilized to find participants was a convenience sampling approach (Miles & Huberman, 1994), wherein eight participants were identified and recruited through the researcher's personal contacts, through professional organizations, through networking at professional conferences, and through executives who agreed to participate in the study. A secondary strategy used to identify participants was a snowball sampling strategy (Osuoha, 2010). During the initial stages of participant selection, interviewees identified others who could participate in the study, and those individuals identified still more participants. In total, 15 AAW were interviewed.

Enrolling the participants involves how potential participants are contacted and what is communicated to them. Each potential participant received an introductory letter that described the study and a consent form to participate in the study. The introductory letter described the research study and requested

their consent to participate (see Appendix A). The letter explained that

participation would involve a 1-hour interview conducted either by telephone or in

person.

Interview Procedures

The interview was designed to obtain information about AAW's

experiences and perceptions regarding the advancement and retention into

senior leadership positions in high technology companies. Interview questions

were created based upon the research purpose, previous research, and the

researcher's personal experience. The interview started with open-ended

questions to encourage participants to share their experiences related to their

career progression in high technology companies.

Questions focused on the factors participants identified as guiding or

impeding career advancement, who or what inspired and influenced their

leadership development, what obstacles to advancement they recognize within

high technology industry, specifically in Defense and Aerospace, and what

strategies were developed to assist in navigating the corporate structure (See

Appendix B).

Each interview lasted 45 to 60 minutes, depending upon the extent of the

participant's responses. The 15 interviews were audio-taped and the researcher

also took handwritten notes. Interviews were held in a quiet, comfortable, and

private location that was convenient for participants. These factors of the setting

were important to promote participation and assure the quality of the interview

and confidentiality of the data (Morse & Field, 1995).

Data Analysis

The goal of the data analysis was to fulfill the research purpose by uncovering the factors that support and obstruct AAW's advancement to senior-level positions within high technology companies. The following data analysis steps were designed based upon procedures outlined by Marshall and Rossman (2006):

1. Immediately after each interview, the researcher reviewed her notes and recorded her interpretations and additional thoughts for each question. This is referred to as analytic notation and involves activities such as identifying problems, developing new interview questions, and discerning patterns and themes in the data. This also represents an opportunity to jot down feelings, ideas, impressions, and speculations about what is going on.

2. When the interviews were transcribed, participants' responses to the interview questions were coded into categories and themes. This step consisted of identifying the meaning units within each response and then sorting the responses into like categories. Marshall and Rossman (2006) explained that identifying salient themes, recurring ideas and language, and patterns of belief that link people and settings together is the most intellectually challenging phase of data analysis. This step can result in themes that are expected as well as themes that are surprising (Creswell, 2003).

3. A second rater evaluated a subset of the data analysis of the data to ensure that researcher bias did not skew the analysis.

Summary

This chapter described the methods used to collect and analyze data for this study. The study used a qualitative design and involved interviews with 15 AAW who held or had held a senior-level position within a high technology company. Participants were selected using convenience and snowball sampling techniques. Interviews lasted 45 to 60 minutes and the data were subjected to thematic analysis. The next chapter reports the results.

Chapter 4

Results

This study sought to identify the top barriers AAW face in their advancement to senior leadership positions within high technology companies, specifically the aerospace and defense industry. This chapter reports the results, including participant characteristics; the factors that contribute to AAW's success in high technology; the barriers facing AAW in high technology; the source, role, and impact of role models, mentors, and networks; and the impact of gender and race on the advancement of AAW in high technology.

Participant Characteristics

A total of 25 AAW were contacted and 15 participants were interviewed. All the participants were at the senior management level in their organization, with titles including program engineer, manager, senior manager, director, vice president, executive vice president, and president and chief executive officer. They worked in research, technology, process integration, engineering, operations, human resources, organization development, diversity, and information systems functions.

Participants were asked to identify what drove their attraction to the high technology industry (see Table 2). The leading reason, voiced by 47% of participants, was personal interest and success in discipline. One participant explained she was "always a geek. I watched Start Trek. I wanted to be an astronaut, applied to the Air Force Academy. I also was good at math and science." Another 27% of participants found the opportunities and assignments personally meaningful. One participant explained she was drawn by the

uniqueness and glamour of NASA and wanted to work on something that traversed the norm.

Table 2

Attraction to the High Technology Industry

Attraction Factor	N	%
Personal interest and success in discipline	7	47%
Meaningfulness of the opportunities and assignments	4	27%
Fit with the organization and the people	3	20%
Personal contact in the industry	2	13%

N = 15

Participants were asked to describe themselves at the current time (see Table 3). Four participants (27%) described themselves as strong and perseverant. One explained, "I am a survivor, being in this industry with the economy and organizational shifts. I've survived and am still making a contribution after 23 years in same company." Another 20% of participants described themselves passionate and soulful. One interviewee elaborated she was "authentic. I believe strongly. I am action oriented and try to bring out the best in people. I also am passionate. Part of my authenticity has impacted my success in terms of my confidence, communication, etc."

Table 3

Self-Descriptors

Self-descriptor	N	%
Strong and perseverant	4	27%
Passionate and soulful	3	20%
Cognitively adept	3	20%
Content	2	13%
Spiritually blessed	2	13%

N = 15

Success Factors

Participants were asked to identify the success factors that enabled their career success (see Table 4). They identified eight success factors; however, strong consensus around the factors were lacking. Three factors were each mentioned by a third of the participants: networking, taking advantage of opportunities and stretch assignments, and mentors. Regarding networking, one participant shared, "It was helpful to have job rotations and the flexibility to be mobile, which expanded my network. . . . The rotation program provided exposure and also allowed me to build her skill set." Regarding opportunities and stretch assignments, one interviewee explained, "I was given several opportunities to be in several different career development programs. I was exposed to entire organization and provided with stretch assignments." Another participant emphasized the importance of mentors to her career by stating, "I had mentors. I was smart and talented, and they took me under their wing."

Table 4

Success Factors

Success Factor	N	%
Networking	5	33%
Taking advantage of opportunities and stretch assignments	5	33%
Mentors	5	33%
Personal support system	3	20%
Higher power	3	20%
Organizational learning, feedback, and tools	3	20%
Maturity and business and political savvy	2	13%
Career plan	2	13%

N = 15

When asked about the future generation of AAW, one participant asserted that future generations would not experience the same level of discrimination that

she and her colleagues had. She explained, "I don't think they will follow in the same path. My company just hired 3,000 college hires who grew up in a different era. Forty percent were diversity candidates. They have competed and lived with folks that are different from them." Participants also voiced two main wishes they had for the future generation (see Table 5). The first, cited by one third of the participants, was that they would be offered more opportunities. One participant explained,

> I hope that future and present companies are more open and welcoming to all people. Externally, receivers of talent need to be ready to receive AAW. AAW bring different opinions, approaches, and experiences. Understand what that looks like and accepting with open arms. Welcome the differences. Receivers need to understand how their biases come into play.

The second wish stemmed from the participants' own experiences of having to change themselves (e.g., adopt culturally male or Caucasian attributes) to succeed in the workplace. Because of this, three participants hoped that future AAW would no longer have to change themselves to succeed. One of these participants explained, "I hope future women don't have to take the outward personality of traditional male to succeed. It's OK to look and sound different and still be an effective manager. It's OK to be strong and speak your opinion."

Table 5

Wishes for Future African American Women in Technical Careers

Hope	N	%
Have more opportunities	5	33%
No longer have to change oneself to succeed	3	20%

N = 15

Participants offered several pieces of advice to women aspiring to attain a

senior leadership position (see Table 6). The leading piece of advice, offered by

60% of participants, was to seek mentors and to be mentors. One participant

urged, "Find a person to share and help us grow. It does not happen naturally

either at the top or the bottom, and there is little in the middle." Another

explained,

> Develop a team of trusted advisors to ask directions of. This is
> important so you don't feel that you are the only person who has
> faced that. Have a personal cabinet that you can discuss business,
> finance, and personal issues with.

Table 6

Advice for Women Aspiring for Senior Leadership Positions

Advice	N	%
Seek mentors and be mentors	9	60%
Develop a career plan	8	53%
Develop confidence and assertiveness	8	53%
Develop business, technical, and leadership competence	7	47%
Develop a network	6	40%
Develop self-awareness and identify your goals	5	33%
Seek development opportunities	5	33%

N = 15

Two additional pieces of advice were mentioned by more than half the

participants: develop a career plan (53%) and develop confidence and

assertiveness. In terms of a career plan, one participant explained,

> We focus on the assignment and not the location and how it is
> going to benefit me today. Think more long term. Younger people
> are typically looking for the next promotion though they have not
> had the experience. Perception is we are not qualified. Need to
> perform to create opportunities for those behind us.

Confidence and assertiveness referred both to resisting self-doubt as well as actively and appropriately promoting oneself in the organization. One participant emphasized,

> Never accept that you are a second-class citizen. Self-doubt sabotages us. Women are more quick to apply self condemnation and doubt to themselves. Believe we can do it. Take our seat at the table, even if you are not invited. I have always taken my seat at the table. Learn how to market ourselves: What's my brand and how do I sell this during the right moment?

Additionally, participants identified several specific qualities that were important for potential management candidates to develop (see Table 7). The leading skill, mentioned by 87% of participants, was communication skills and interpersonal competence. One participant explained, "Be a good, active listener. Check in to make sure you hear what the person is saying to you, even if it is a contradiction to you. Provide feedback of appreciation. Be an open listener, check in, have patience, and empathy." The second needed quality is technical competence, voiced by 67% of participants. One participant described this as, "capacity, bandwidth, critical thinking, relationship building, clear barriers, allocate resources."

Table 7

Desired Qualities of Potential Management Candidates

Quality	*N*	%
Communication skills and interpersonal competence	13	87%
Technical competence	10	67%
Skilled and ethical leadership	5	33%
Work ethic and accountability	4	27%

N = 15

Participants also identified six organizational measures that would help increase the representation of AAW in high technology (see Table 8). The first measure, cited by 73% of participants, was focusing on developing AAW. One participant urged organizations to "insist senior leaders provide an opportunity for AAW that they would not otherwise be given.

Table 8

Measures to Increase Representation of African American Women in High Technology

Organizational Measure	N	%
Focus on developing AAW	11	73%
Provide mentors and role models	6	40%
Encourage young AAW to go into technical fields	5	33%
Help young AAW form networks	4	27%
Create more visibility for young AAW	2	13%
Appreciate the value AAW bring	2	13%

N = 15; AAW = African American Women

Barriers Facing AAW in High Technology

Thirteen of the 15 participants stated that they were well-respected within their organizations, although they had to prove themselves initially. One participant explained, "Now I am received fine. A few people were wary and wanted to see if I could succeed." Nevertheless, 13 participants also stated that the glass ceiling does exist (see Table 9). One added that the glass ceiling is, in fact, a concrete ceiling. Five participants explained that evidence of the ceiling is the lack of opportunities and leadership positions for AAW. One participant explained, "Yes, if it didn't exist, you would see more AAW in leadership positions. The glass ceiling encompasses given opportunities and tools to succeed to climb the ladder." Importantly, another five participants emphasized that AAW can break through the ceiling. One participant stated, "You can blow

through it. Know what you want and have courage to face obstacles head on."

Four participants further asserted that progress is being made to shatter the

ceiling. One interviewee shared, "It's not as strong as it has been. I see an

increased number of AAW in senior level roles compared to 20 years ago, so it

has improved. Hope to see it get weaker." Three also stated that they have not

personally experienced a glass ceiling.

Table 9

Perceptions of Glass Ceiling

Perceptions of the Glass Ceiling	*N*	%
Glass ceiling exists	13	87%
Evidence of the ceiling is the lack of opportunities and leadership positions for AAW	5	33%
AAW can break through the ceiling	5	33%
Progress is being made	4	27%
Not personally experienced	3	20%

N = 15; AAW = African American Women

Participants identified eight specific barriers they experienced to their

career progression, although none was cited by more than one third of

participants (see Table 10). One barrier cited by a third of participants was that

AAW face a higher bar at work and have to produce more evidence to prove

themselves. One interviewee explained, "AAW have to speak louder to make

their voices heard. Work harder to get recognized; AAW takes longer to be

accepted." Another barrier voiced by five participants was prejudgments about

AAW's abilities. One participant explained, "Growing up, there were prejudices,

some subtle, some overt. . . . Other naysayers at a time when I wanted to be

liked." Importantly, two participants stated they did not face any barriers to their

progression.

Table 10

Barriers to Career Progression

Barrier	N	%
Higher bar and more evidence needed for AAW to prove themselves	5	33%
Prejudgments about AAW abilities	5	33%
Had to change self	4	27%
Lack of self-confidence	4	27%
Lack of mentors	4	27%
Having few AAW colleagues at same level	2	13%
Ageism, sexism, and racism	2	13%
Lack of opportunities	2	13%
None	2	13%

N = 15; AAW = African American Women

Role Models, Mentors, and Networks

Participants were asked to describe their experiences with role models, mentors, and networks. Fourteen of the 15 participants reported they had role models. Specifically, they reported that they had found their role models among their professional colleagues (67%), family members (47%), and high school teachers and counselors (20%). These people were the participants' role models because they had desirable traits or achievements, as reported by 40% of interviewees (see Table 11). One participant described her role models: "one went back to school and got her degree and became a school teacher. The other grandmother is very well networked and everyone likes to be around her. Education was key to my family on both sides." Five participants added that their role models advocated for them and gave them support. One participant explained that her role model "placed a lot of people in different positions" and another participant stated her role model was "an advocate and an ear for her." Role models additionally acted as a source of encouragement and inspiration

(20%) and also acted as a sounding board and source of feedback (20%).

Additionally, nine participants reported that they have been a role model for other

aspiring women. Specifically, they have provided advocacy and development

opportunities.

Table 11

Role Models

Themes	N	%
Source of role models		
Professional colleagues	10	67%
Family members	7	47%
High school teachers and counselors	3	20%
Characteristics and impacts		
Had desired traits or achievements	6	40%
Advocacy and support	5	33%
Source of encouragement and inspiration	3	20%
Sounding board and source of feedback	3	20%

N = 15

Participants provided varied answers regarding their experiences with

mentoring (see Table 12). Six (40%) of the participants reported that their

mentors had been managers, directors, or executives in their company. Five

participants additionally reported that other personnel within their company acted

as their mentors. Four participants pointed out that most of their mentors were

men and that few AAW were available to mentor. Accordingly, only one

participant reported that she had been mentored by an AAW.

Mentors provided a number of benefits for the participants. Seven

participants (47%) reported that the mentor provided advocacy, exposure, and

opportunities. One participant explained, "The vice president of material gave me

exposure to an area I did not work in. I he also mentored me on a special

assignment and gave me a task to support his special assignment."

Seven participants (47%) also reported that their mentors provided

interpersonal coaching. One participant shared,

> We also have been able to discuss soft skills—universal concepts,
> such as how to handle specific situations. He talked me through an
> approach to handle two employees that were in conflict. This skill
> can be used in real world.

Table 12

Mentors

Source of mentors	N	%
Managers, directors, and executives	6	40%
Other mentors within the company	5	33%
Mostly men, few AAW	4	27%
Friends, family, and church colleagues	3	20%
AAW	1	7%
Impact		
Provided advocacy, exposure, and opportunities	7	47%
Interpersonal coaching	7	47%
Provided insight, advice, feedback, and discussion	5	33%
Business skills coaching and insights	5	33%
Career planning and advice	4	27%
Industry and technical guidance	4	27%
Developed cultural, political, and business savvy	3	20%
Mentors did not aid advancement	2	13%

N = 15; AAW = African American Women

Participants described their experiences with social and professional

networks (see Table 13). Their social networks consisted of their friends (47%),

family (40%), significant others (33%), and parents (27%). These individuals

were reported to offer emotional support (27%) and professional motivation and

encouragement (27%), as well as act as a sounding board (13%). One

participant explained, "You hear 'no' so often, you have to have someone in your

corner telling you 'Yes you can.' My parents taught me to accept criticism."

Fourteen of the 15 participants believed that their social support influenced their ability to succeed.

Table 13

Social and Professional Networks

Social network	N (%)	Professional network	N (%)
Friends	7 (47%)	Network is vital to successful career	15 (100%)
Family	6 (40%)	Must be intentional to have impact	5 (33%)
Significant other	5 (33%)		
Parents	4 (27%)		
Support offered		Support offered	
Emotional support	4 (27%)	Opportunities	9 (60%)
Professional motivation and encouragement	4 (27%)	Feedback, belonging, encouragement, and support	4 (27%)
Sounding board	2 (13%)		

N = 15

All participants reported that a professional network was vital to a successful career. One interviewee emphasized, "Network is a great impact on anyone—particularly for AAW." Five participants (33%) added that forming the network must be intentional to have a positive effect. One participant explained, "African American people don't know how to network. When we get together, it is more social. You do need to have a network." Another added, "Have to network with the right people. Need to go two to three levels above you. If they are at the same level, it is more of a social hour."

The leading benefit that the participants' professional networks offered was opportunities. One participant elaborated,

> More business decisions are made outside of the office. Who is wearing your shirt in the room when you are not there? A woman that I had to work with there remembered me and provided my name as a candidate for a position later. This job helped me move two steps in my career.

Four participants (27%) additionally stated that the professional network offered feedback, belonging, encouragement, and support. One participant explained, "It provides that community to ask questions. It's nurturing and supportive, very encouraging. It allows me to stay connected and it is uplifting."

Impact of Gender and Race on the Advancement of AAW

Finally, participants were asked about the impact of race and gender on AAW's advancement. Seven participants (47%) believed that race has a greater impact on career than gender (see Table 14). One participant explained, "Race is the most impactful. There are more women than minorities in executive positions."

Participants were asked to describe the specific impacts of race and gender that they experienced. Eight participants (53%) reported that these were associated with stereotypes and led to a negative impact. One participant explained,

> Many people believe that women and people of color don't have the capability to work in technical fields. When they are in a position, it is because of quota. Perceptions and stereotypes prevail. That's why we have to show up and be on our top game at all times.

Seven participants reported that race and gender resulted in fewer AAW in the technical workforce. One participant explained,

> The impact is significant because workplaces are white male dominated. As a result, people want to hire folks that look like them. As we experience the talent crunch, it is going to get harder. AAW

when hired sometimes don't want to bring in other AAW. That
results in a double whammy.

Table 14

Impact of Race and Gender

Race versus Gender	N	%
Race has a greater impact on career than gender	7	47%
Race and Gender have equal impacts	2	13%
Gender has a greater impact on career than race	2	13%
Impacts		
Associated with stereotypes and produces a negative impact	8	53%
Fewer AAW in the technical workforce	7	47%
Companies have made efforts to promote women and minorities	2	13%
Performance, not race or gender, affect advancement	2	13%

N = 15

Summary

This chapter reported the study results, including participant

characteristics; the factors that contribute to AAW's success in high technology;

the barriers facing AAW in high technology; the source, role, and impact of role

models, mentors, and networks; and the impact of gender and race on the

advancement of AAW in high technology. Fifteen AAW at the senior

management level in a high technology organization were interviewed. The next

chapter provides a discussion of the results.

Chapter 5

Discussion

The purpose of this study was to identify the barriers to the advancement of AAW into senior leadership positions within high technology companies (specifically, the defense and aerospace industries). This chapter provides a discussion of the study results, including a presentation of the conclusions and key recommendations for helping remove barriers so this critical subgroup can transition into those senior level positions. Limitations and suggestions for future research also are provided.

Conclusions

Conclusions were drawn related to AAW's success factors; barriers to advancement; role models, mentors, and networks. The impact of gender and race also was considered. These conclusions are described in the sections below.

AAW Success Factors

Participants reported eight specific success factors and each was identified by a maximum of five and no less than two of the participants, suggesting that different people attribute their success to different factors. In general, success factors concerned the importance of development plans and opportunities; organizational support; personal development; and others (e.g., personal and professional networks, mentors, God). In terms of organizational support, participants advised that organizations should focus on developing AAW, provide mentors and role models, and attract and support young AAW. Regarding personal development, participants believed that AAW should focus

on developing their communication skills and interpersonal competence, technical competence, leadership ability, and work ethic and accountability.

In keeping with these success factors, participants advised AAW to seek mentors and to be mentors; develop career plans; develop confidence and assertiveness; develop business, technical, and leadership competence; develop a network; develop self-awareness and identify your goals; and seek development opportunities. Looking forward, participants hoped that young AAW would have more career opportunities available to them and no longer have to change themselves (e.g., exhibit masculine characteristics) to succeed.

Similarly, several past authors concluded that certain individual characteristics, such as ambition and aspiration, masculinity, task-orientation (Metz, 2009), openness to mobility, job commitment, and work experience (Henry-Brown, 1995) were important for career advancement. Although this study's findings emphasized the importance of communication and interpersonal skills, the participants did not go so far as to suggest that AAW need emotional intelligence (Jackson, 2009; Mattis, 2001).

This study also agreed with findings by Catalyst (2001) that organizations should make their environments more inclusive, eliminate barriers to women's and minority individuals' advancement, and create practices for strategically identifying and developing talent. The study findings also aligned with Henry-Brown's (1995) recommendation to institute a mentoring program. However, this study did not address the need for chief executive officers to demonstrate their support and commitment for diversity initiatives that was highlighted by other researchers (Brinson, 2006; Catalyst, 2006; Kilian et al., 2005).

The identification of success factors—both in this study and in past literature—provides evidence that the advancement of AAW in technical fields is possible. It would helpful to help AAW leverage these success factors for their own careers. These success factors also could be used to provide encouragement and inspiration to AAW at all levels of organizations. Simultaneously, individuals and organizations who fail to leverage these success factors may find themselves falling short of their career or diversity goals. In turn, the issue of low numbers of AAW in technology may persist.

Barriers Facing AAW in High Technology

Nearly all the participants believed the glass ceiling existed, although several noted they had not personally experienced the ceiling, others stated that progress is being made to shatter it, and one third emphasized that AAW could break through the ceiling. The finding that participants believed the glass ceiling existed, despite some not having experienced it and others noting its diminishment or shattering, is consistent with the literature, which argued that the ceiling continues to exist in full effect (Anderson, 2007; Brinson, 2006; Burke & Vinnicombe, 2005; Calvert, 2006; Catalyst, 1999; Chen, 2005; Clay, 1998; Henry-Brown, 1995; Kilian et al., 2005; Porter, 2003; Witherspoon, 2009). These collected findings lead to questions of whether the ceiling is concrete, glass, or some permeable type of barrier. Further, it is reasonable to ask whether the ceiling is a historical artifact or the product of perception. These questions require further examination. Given the amount of discussion about the glass or concrete ceilings, this is an important direction for research.

Participants identified eight specific barriers to AAW's advancement, although each was mentioned by a maximum of five and no less than two of the sample. It is important to note that 13% of participants perceived having experienced no barriers. These results suggest that each person may experience different barriers in the course of her career. In general, the barriers concerned discrimination and double standards, lack of opportunities, lack of other AAW as colleagues and mentors, and self-doubt. Several studies similarly identified lack of opportunities, lack of similar role models, and stereotypes as barriers to the advancement of AAW (Anderson, 2007; Brinson, 2006; Burke & Vinnecombe, 2005; Calvert, 2006; Catalyst, 1999; Clay, 1998; Combs, 2003; Henry-Brown, 1995; Jackson, 2009; Johnson, 2006; Kern-Foxworth, 1995; McCracken, 2005; Metz, 2009; Osuoha, 2010; Patterson, 2006; Witherspoon, 2009). Unlike past literature, participants did not mention organizational structure (Giscombe & Mattis, 2002) or their company's diversity practices as sources of barriers (Catalyst, 1999; Mattis, 2001; Wills', 2010).

Reflecting on these findings, it appears that the barriers identified in the literature continue to affect AAW's advancement, although the specifics of each person's career path (including barriers and facilitators) may vary. This explains why one-size-fits-all diversity programs may have limited effect and why mentoring is emphasized as a critical success factor. With mentors and other individualized career support, each person could focus on reducing or eliminating the specific barriers she is experiencing.

Role Models, Mentors, and Networks

Many of the participants had received the support of role models, mentors, and personal and professional networks throughout their careers. Professional colleagues, managers, parents and family members, and educators all had served in these roles. Often, the participants' mentors were men, as few AAW were available to act as mentors. Notable benefits of role models, mentors, and networks included advocacy and support; encouragement and inspiration; advice, feedback, and acting as a sounding board; exposure and career opportunities; and coaching and skill development. Participants emphasized that a professional network, in particular, is vital to a successful career and must be intentionally formed and maintained if the network is to have a beneficial impact.

These findings echo those of McCracken (2005), who emphasized that mentoring was an integral strategy to help AAW reach senior management positions. Although past authors argued that AAW have more difficulty obtaining and building fruitful mentoring relationships and suffer from not having similar others in high positions (Brinson, 2006; Calvert, 2006; Clay, 1998; Combs, 2003; Ibarra, 1995; Jackson, 2009; Johnson, 2006; McCracken, 2005; Osuoha, 2010; Pfleeer, 2005; Pfleeger & Mertz, 1995), this study's participants shared that they were well-supported by their mentors—many of whom were White males.

Similarly, several authors argued that AAW often are excluded from the important informal networks that act as as conduits for communicating important information, sharing valuable expertise, filling new opportunities, having influence, and making the connections that can lead to promotions (Bell & Nkomo, 2001; Catalyst, 1999, 2006; Combs, 2003; Fryxell & Lerner, 1989;

Ibarra, 1993; Mizruchi, 2000; Patterson, 2006). This study's participants emphasized that networking is essential to career advancement and emphasized that AAW must be intentional about forming and maintaining their networks. Given intention and effort, it appears that AAW can overcome any natural barriers that may exist concerning this aspect of career development.

These findings are notable because both past literature and this study's findings agree that mentoring and networks are critical for career advancement. However, while the literature argues that AAW are at a disadvantage for forming mentoring relationships and excluded from informal networks, this study's participants appeared to excel in forming productive networks and mentorships. This suggests that it is possible for AAW to leverage these important success factors and reap the benefits of their efforts.

Impact of Gender and Race

Participants reported that both race and gender affect AAW's advancement. Study results also indicated that race might have a stronger impact than gender. Participants believed that the ultimate result of racism and sexism are stereotypes and having fewer AAW in the technical workforce. Nevertheless, two participants believed that companies have made efforts to promote women and minorities. Two participants additionally emphasized that performance, not race or gender, affect advancement.

Past literature also emphasized that gender and race affect the careers of women of color, which they explained culminates in a double outsider status (Catalyst, 2002; Patterson, 2006) and the double bind phenomenon (Brinson, 2006) whereby they lack a basic fit with the organization (Patterson, 2006).

Brinson (2006) added that these result in disempowerment, limited career advancement, and repressed success for women. Past literature did not explore whether race or gender had a stronger impact on women's career outcomes. Past literature agreed that the ultimate impact of these negative effects of race and gender is the loss of invaluable human potential (Cox & Smolinski, 1994).

Based on these results, it appears that race and gender do affect AAW's advancement, although some evidence suggests that companies may be supporting high performing employees regardless of race or gender and also may be actively developing and promoting AAW. Therefore, it is even more important to help AAW leverage the success factors and mitigate the barriers identified in this study.

Recommendations

Three recommendations are offered based on this study's findings. These are described in the sections below.

Develop Mentoring Programs for AAW

Mentoring was identified as a key success factor for AAW, both in previous literature and in this study's findings. Therefore, Science Technology Engineering and Mathematics (STEM) organizations are advised to develop strategic mentoring programs for AAW who have been identified as having leadership potential and capabilities. For example, potential future leaders could be paired with current senior leaders to help the potential leaders gain the vital exposure, support, and experiences they need to advance. The organization could assess whether the program is meeting its goal of helping AAW advance

through the organization by evaluating and tracking mentees' career activities and progression.

Increase Support and Visibility for Talented AAW

Based on participants' reports that AAW experience a lack of career opportunities, organizations are advised to provide greater exposure for their talented AAW. Specifically, talented individuals need to be identified and a career plan should be developed for those individuals. It is important during this process that opportunities for challenge and exposure (stretch assignments) are planned. These stretch assignments will help the AAW create a "strong brand" for themselves, in the words of one participant, "that will in turn create momentum for her advancement. With a good "brand" and strategic mentoring, the number of AAW ascending to senior leadership positions can increase over time."

Stir Interest in STEM among African American Youth

Ensuring that a representative number of AAW are in senior leadership positions within high technology companies requires building a competent pool of minority women throughout all levels of the organization. One way to create that pool is to start early by reaching out to African American youth to stir their interest in STEM industries. This recommendation was echoed by participants. One participant emphasized that every grade school child needs to have access to a computer and understand the importance of math and science. If interest in STEM is stirred in these children, there is a higher probability that the working age African American population in STEM also will increase.

Some STEM organizations have already begun creating programs that target middle school-aged children in Grades 5 and 6. These organizations

understand the criticality of the talent pool and have anticipated the coming lack of available technical talent in future years. STEM organizations could partner with local schools to build technical interest and talent by providing mentors, creating or supporting technical competitions or challenges where students are rewarded with scholarships for college, and awarding grants to teachers and schools.

Limitations

A primary limitation that affected the study was the small sample size. Although 25 AAW were contacted, only 15 participants were willing to be interviewed. While these numbers seem substantial, many of the themes did not receive strong consensus (e.g., each success factor and each barrier were mentioned by only a maximum of 5 and no less than 2 of the participants). It is possible that given a large sample, the most helpful success factors and most debilitating barriers might be identified with greater clarity. This clarity could then lead to more effective diversity programs being designed to support the advancement of AAW and other women of color.

Second, the participant group was, by virtue of the study design, a purposive sample. Therefore, these results might not be transferable to the larger population of AAW in technology. Future studies could avoid this limitation by drawing a representative sample or drawing a large participant group using random sampling.

Third, it is possible that biases such as researcher bias and various forms of participant bias affected the results. This means that the researcher's own career experiences and beliefs regarding AAW's advancement affected the

collection, analysis, and interpretation of the data. These risks were mitigated by subjecting the analysis to a second rater. In addition, a participant may have overemphasized or downplayed her own success. The researcher attempted to detect any occurrence of these forms of bias and probe participants' answers to gather complete and accurate data.

Suggestions for Future Research

Comparing past literature to this study's findings pointed to some important questions about the actual nature of the glass ceiling phenomenon. Namely, it is uncertain whether the ceiling is either concrete or glass. Further, it is reasonable to ask whether the ceiling has become primarily a historical artifact or the product of perception. It makes sense to re-examine the phenomena, given that much of the seminal literature on the glass ceiling was conducted 15 to 25 years before this study and many shifts have occurred within the societal and business climates since the early research.

Another follow-up to this study is to conduct longitudinal research on AAW from their early careers through retirement to capture what factors emerge as barriers and what factors become success factors. This type of research would be helpful, as time and memory may have affected the accounts of participants in this study. It would be important to select high potentials for this research to enhance the probability that the women would have the desire and ability to ascend the corporate ranks.

Finally, a comparative study could be performed on AAW in other industries to more fully understand the unique success factors and barriers in the aerospace and defense industries. Although this study has drawn important

findings and insights, it is unclear whether these are unique to STEM organizations or are applicable across industries.

Summary

This study sought to identify the top barriers AAW face in their advancement to senior leadership positions within high technology companies, specifically the aerospace and defense industry. Findings were drawn regarding the factors that contribute to AAW's success in high technology; the barriers facing AAW in high technology; the source, role, and impact of role models, mentors, and networks; and the impact of gender and race on the advancement of AAW in high technology.

What is evident from this study's findings is that AAW have reached senior management positions and have achieved substantial corporate success in science and technology organizations, despite any racism or sexism that may exist. While it appears that the success factors and barriers may vary from person to person, creating a career plan, developing oneself, finding mentors, and intentionally building one's networks can help AAW reduce or eliminate their barriers and achieve the success they desire.

References

References

Anderson, A. (2007). Investigating career barriers of women of color in the 21st century. *Dissertation Abstracts International, 68*(10), A. (AAT 3284021).

Anderson, B. E. (1996). The ebb and flow of enforcing executive order 11246. *American Economic Review, 86*(2), 298.

Augustine, A., Bulthuis, K., & Mohapatra, A. (2010). *Examining the cracks in the ceiling: A survey of corporate diversity practices of the S&P 100.* Bethesda, MD: Calvert Investments.

Bell, E. L. (1990). The bicultural life experience of career-oriented Black women. *Journal of Organizational Behavior, 11*, 459–477.

Bell, E. L. J. E., & Nkomo, S. M. (2001). *Our separate ways: Black and white women and the struggle for professional identity.* Boston: Harvard Business School Press.

Bell, M. P. (1997). Changing attitudes toward affirmative action: A current issue that calls for action. Paper presented at the meetings of the Academy of Management, Boston, MA.

Bingham, R. P., Ward, C. M., & Butler, M. M. (2006). Career counseling with African American women. In M. J. Heppner (Ed.), *Handbook of career counseling for women* (2nd ed., pp. 219–239). Mahwah, NJ: Lawrence Erlbaum Associates.

Brenner, O. C., Tomkiewicz J., & Schein, V. E. (1989). The relationship between sex role stereotypes and requisite management characteristics revisited. *Academy of Management, 32*(3), 662–669.

Brinson, H. (2006). The effect of race and gender in organizational leadership success: A study of African American women and their challenges to become leaders in corporate America. *Dissertation Abstracts International, 67*(08), A. (AAT 3229907).

Burke, R., & Vinnicombe, S. (2005). Advancing women's careers. *Career Development International, 10*(3), 165–167.

Calvert, L. (2006). The glass ceiling and the impact of ethnicity: An investigation of barriers to organizational advancement for African American women. *Dissertation Abstracts International, 67*(06), A. (AAT 3223887).

Catalyst. (1999). *Women of color report a "concrete ceiling" barring their advancement in corporate America.* New York: Catalyst.

Catalyst. (2001). *Women of color executives: Their voices, their journeys.* New York: Catalyst.

Catalyst. (2002). *Moving women of color up the ladder.* New York: Catalyst.

Catalyst. (2003). *Catalyst census of women board directors of the Fortune 500.* New York: Catalyst.

Catalyst. (2006). *2005 catalyst census of women corporate officers and top earners of the Fortune 500; ten years later: Limited progress, challenges persist.* New York: Catalyst.

Catalyst. (2008). *Harnessing high potential talent: A strategic approach.* New York: Catalyst.

Chen, L. (2005). A study of the glass ceiling and strategies for women's career advancement. *Dissertation Abstracts International, 66*(04), 1418A. (AAT 3171603).

Clay, V. L. (1998). African-American females and the glass ceiling in the defense logistics agency. *Dissertation Abstracts International, 59*(08), 3242A. (AAT 9824837).

Combs, G. M. (2003). The duality of race and gender for managerial African American women: Implications of informal social networks on career advancement. *Human Resource Development Review*, 2(4), 385–405.

Cox, T., & Smolinski, C. (1994). Managing diversity and glass ceiling initiatives as national economic imperatives (Working Paper No. 9410-01). Retrieved from http://digitalcommons.ilr.cornell.edu/key_workplace/117

Creswell, J. W. (2003). *Research methods: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Davis, G., & Watson, G. (1982). *Black life in corporate America.* New York: Random House.

Deloitte. (2007). Women's Initiative (WIN) 2007 annual report. Retrieved from http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/ Documents/us_win_2007annualreport082908opt.pdf

Denning, S. (2010). Rethinking the organization: Leadership for game-changing innovation. *Strategy & Leadership*, 38(5), 13–19.

Elmuti, D., Lehman, J., Harmon, B., Lu, X., Pape, A., Zhang, R., & Zimmerle, T. (2003). Inequality between genders in the executive suite in corporate America: Moral and ethical issues. *Equal Opportunities International*, 22(8), 1–19.

Executive Leadership Council. (2009). Corporate executives say more minorities in the C-suite is good for business. Retrieved from http://www.reuters.com/article/2009/01/08/idUS203898+08-Jan-2009+PRN20090108

Fassinger, R. E., & Asay, P. A. (2006). Career counseling for women in science, technology, engineering, and mathematics. In W. Walsh, & M. Heppner (Eds.), *Handbook of career counseling for women* (2nd ed., pp. 427–452). Mahwah, NJ: Lawrence Erlbaum Associates.

Friedrich, T. L., Mumford, M. D., Vessey, B., Beeler, C. K., & Eubanks, D. L. (2010). Leading for innovation: Reevaluating leader influences on innovation with regard to innovation type and complexity. *International Studies of Management & Organization*, *40*(2), 6.

Fryxell, G. E., & Lerner, L. D. (1989). Contrasting corporate profiles: Women and minority representation in top management positions. *Journal of Business Ethics, 8*, 341–352.

Giscombe, K., & Mattis, M. C. (2002). Leveling the playing field for women of color in corporate management: Is the business case enough? *Journal of Business Ethics, 37*(1), 103–119.

Glick, B. (2010, August 10-August 16). Apple: The hype IT departments cannot ignore. *Computer Weekly,* 12. Retrieved from www.computerweekly.com

Goodman, J. S., Fields, D. L., & Blum, T. C. (2003). Cracks in the glass ceiling: In what kind of organizations do women make it to the top? *Group and Organization Management, 28*(4), 475–501.

Granleese, J. (2004). Occupational pressures in banking: Gender differences. *Women in Management Review, 19*(4), 219–226.

Hansen, E. N. (2010, October-November). The role of innovation in the forest products industry. *Journal of Forestry*, *108*(7), 348–353.

Henry-Brown, R. (1995). Examining barriers to career advancement among females of color in the federal career service. *Dissertation Abstracts International, 57*(02), 859A. (AAT 9616465).

Ibarra, H. (1993). Personal networks of women and minorities in management: A conceptual framework. *Academy of Management Review*, 18(1), 56–87.

Ibarra, H. (1995). Race, opportunity, and diversity of social circles in managerial networks. *Academy of Management Journal*, 38(3), 673–703.

International Labour Office. (1986). *Economically active population estimates and projections, 1950-2025* (3rd ed.). Geneva, Switzerland: International Labour Office.

Jackson, L. C. (2009). Workforce diversity in the federal senior executive service: Exploring African American women's perceptions of the success factors needed to gain appointments in the SES. *Dissertation Abstracts International, 71*(02), A. (AAT 3390412).

Johansson, F. (2005, October). Masters of the multicultural. *Harvard Business Review, 83*(10), 18.

Johnson, N. M. (2006). An examination of the concrete ceiling: Perspectives of ten African American women managers and leaders in corporate America and non-profit organizations. *Dissertation Abstracts International, 67*(06), 2217A. (AAT 3226181).

Johnson, W. U. (2005). Differences in perceptions of factors influencing the advancement of African American women in the workplace. *Dissertation Abstracts International, 66*(07), 2636A. (AAT 3180110).

Kanter, R. M. (1977). *Men and women of the corporation.* New York: Basic.

Katz, M. B., Stern, M. J., & Fader, J. J. (2005). Women and the paradox of economic inequality in the twentieth century. *Journal of Social History, 39,* 65–88.

Kern-Foxworth, M. (1995). *Aunt Jemima, Uncle Ben, and Rastus: Blacks in advertising, yesterday, today, and tomorrow.* Westport, CT: Praeger.

Kilian, C. M., Hukai, D., & McCarty, C. E. (2005). Building diversity in the pipeline to corporate leadership. *Journal of Management Development*, *24*(2), 155–168.

Killingsworth, M. R., & Reimers, C. W. (1983). Race, ranking, promotions and pay at a Federal facility: A logical analysis. *Industrial and Labor Relations Review, 37*(1), 92–107.

Kottke, J. L., & Agars, M. D. (2005). Understanding the processes that facilitate and hinder efforts to advance women in organizations. *Career Development International*, 10(3), 190–202.

Lyness, K. S., & Terrazas, J. M. B. (2006). Women in management: An update on their progress and persistent challenges. In J. K. Ford (Ed.), *International review of industrial and organizational psychology 2006* (vol 21, pp. 267–294). Hoboken, NJ: Wiley.

Marshall, C. M., & Rossman, G. B. (2006). *Designing qualitative research.* Thousand Oaks, CA: Sage.

Mattis, M. (2001). Advancing women in business organizations: Key leadership roles and behaviors of senior leader and middle managers. *Journal of Management Development, 20*(4), 371–390.

McCracken, D. M. (2005). Winning the talent war for women: Sometimes it takes a revolution. In *Harvard Business Review on Women in Business* (pp. 51–68). Boston: Harvard Business School.

Metz, I. (2009). Organizational factors, social factors, and women's advancement. *Applied Psychology: An International Review, 58*(2), 193–213.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.)*.* Thousand Oaks, CA: Sage.

Mizruchi, M. S. (2000). The stability of the American business elite: discrimination, competence or connections? *Industrial and Corporate Change*, *9,* 545–554.

Morse, J. M., & Field, P. A. (1995). *Qualitative research methods for health professionals.* Thousand Oaks, CA: Sage.

Office of Information and Planning. (2003). Women of color: Their employment in the private sector. Retrieved July 13, 2010, from http://www.eeoc.gov/ eeoc/statistics/reports/womenofcolor/womenofcolor.pdf

Osuoha, R. (2010). A study of African American women: The impact of the glass ceiling syndrome on advancement opportunities in organizations. *Dissertation Abstracts International, 71*(04), A. (AAT 3397162).

Patterson, C. A. (2006). The glass ceiling effect: A perspective of African American women. *Dissertation Abstracts International, 67*(07), A. (AAT 3226231).

Payne, D. C. (2005). The glass ceiling ten years later: A study of the professional woman's perception of success in corporate America. *Dissertation Abstracts International, 66*(08), 3003A. (AAT 3186943).

Pfleeger, S. L., & Mertz, N. (1995). Executive mentoring: What makes it work? *Communications of the ACM, 38*(1), 63–74.

Porter, J. L. (2003). An investigation of the glass ceiling in corporate America: The perspective of African American women. *Dissertation Abstracts International, 64*(01), 297A. (AAT 3078972).

Russell, J. (2006). Career counseling for women in management. In W. Walsh, & M. Heppner (Eds.), *Handbook of career counseling for women* (2nd ed., pp. 453–506). Mahwah, NJ: Lawrence Erlbaum Associates.

Ryan, M., Haslam, S., Hersby, M., Kulich, C., & Wilson-Kovacs, M. (2009). The stress of working on the edge: Implications of glass cliffs for both women and organizations. In M. Barreto, M. Ryan & M. Schmitt (Eds.), *The glass ceiling in the 21st century: Understanding barriers to gender equality* (pp. 153–165). Washington, DC, US: American Psychological Association.

Shenhav, Y. (1992). Entrance of blacks and women into managerial positions in scientific and engineering occupations: A longitudinal analysis. *Academy of Management Journal, 35*(4), 889–901.

Simmons, L. (2009). A qualitative case study on the glass ceiling and African American women in banking. *Dissertation Abstracts International, 70*(12), A. (AAT 3388308).

U.S. Department of Labor, Federal Glass Commission. (1995). Good for business: Making full use of the nation's human capital. Retrieved July 13, 2010, from http://www.dol.gov/oasam/programs/history/reich/reports/ ceiling.pdf

U.S. Equal Employment Opportunity Commission. (2009). 2008 EEO-1 National Aggregate Report. Retrieved July 13, 2010, from http://www.eeoc.gov/eeoc/statistics/employment/jobpat-eeo1/2008/us/national.html

U.S. Merit Systems Protection Board Study. (1992, October). *A question of equity: Women and the glass ceiling in the federal government.* Washington, DC: U.S. Merit Systems Protection Board Study.

Wills, L. P. (2010). Examining the degree of influence various factors have on the professional advancement of African American women: A case study. *Dissertation Abstracts International, 71*(02), A. (AAT 3395313)

Wirth, L. (1998). Women in management: Will the glass ceiling ever be broken? *World of Work: The Magazine of International Labor Organization, 23.* Retrieved from http://www.ilo.org/public/english/bureau/inf/magazine/23/ glass.htm

Witherspoon, D. A. (2009). Burden of leadership: Re-envisioning the glass ceiling based on constructs of race, gender, and ethnicity. *Dissertation Abstracts International, 71*(03), A. (AAT 3401628).

Woodhouse, S. (2002). The historical development of affirmative action: An aggregated analysis. *Western Journal of Black Studies*, *26*(3), 155–158.

Xie, X. M., Zeng, S. X., & Tam, C. M. (2010, December). Innovation: Management, policy & practice. *Maleny, 12*(3), 298–310.

Zhang, S., Schmader, T., & Forbes, C. (2009). The effects of gender stereotypes on Women's career choice: Opening the glass door. In M. Barreto, M. Ryan & M. Schmitt (Eds.), *The glass ceiling in the 21st century: Understanding barriers to gender equality* (pp. 125–143). Washington, DC, US: American Psychological Association.

Appendix A

Consent Form

Informed Consent for Participation in Research Activities

Participant: _____

Principal Investigator: Odetta S. Scott

Title of Project: African American Women: Their Advancement and
Retention into Senior Leadership Positions in High Tech Companies

1. I _____, agree to participate in the
   research study being conducted by Odetta S. Scott, a student in the
   Master of Science in Organization Development program at Pepperdine
   University, Graziadio School of Business and Management, under the
   direction of Dr. Julie Chesley.

2. The overall purpose of this study is designed to investigate African
   American Women: Their Advancement and Retention into Senior
   Leadership Positions in High Tech Companies by uncovering barriers and
   success factors via interviews.

3. My participation will involve a 45- to 60-minute interview, which will be
   conducted either face-to-face at the participants desired location or via
   telephone. I grant permission for the interview to be tape recorded and
   transcribed, and to be used only by Odetta S. Scott for analysis of
   interview data. I understand my responses will be kept anonymous and
   confidential. If the findings of the study are presented to professional
   audiences or published, no information that identifies me personally will be
   released. The data will be kept in a secure manner for three (3) years, at
   which time the data will be destroyed.

4. I understand there are no direct benefits to me for participating in the
   study. This is an opportunity to give input about organizational culture as it
   relates to African American Women and their ascension to leadership
   positions within high tech companies.

5. I understand there are no major risks associated with this study.

6. I understand that I may choose not to participate in this research.

7. I understand that my participation is voluntary and that I may refuse to
   participate and/or withdraw my consent and discontinue participation in
   the interview at any time without penalty or loss of benefits to which I am
   otherwise entitled.

8. I understand that I may request a brief summary of the study findings to be delivered in about one (1) year. If I am interested in receiving the summary, I will send an email request to [contact information].

9. I understand that the researcher, Odetta S. Scott, will take all reasonable measures to protect the confidentiality of my records and my identity will not be revealed in any publication that may result from this project. The confidentiality of my records will be maintained in accordance with applicable state and federal laws.

10. I understand that the investigator is willing to answer any inquiries I may have concerning the research herein described and that I may contact the researcher, Odetta S. Scott at [contact information]. I understand that I may contact Dr. Julie Chesley at [contact information] if I have other questions or concerns about this research. If I have questions about my rights as a research participant, I understand that I can contact Dr. Doug Leigh, Chairperson of the Institutional Review Board, Pepperdine University, at [contact information].

11. I understand to my satisfaction the information regarding participation in the research project. All my questions have been answered to my satisfaction. I have received a copy of this informed consent form, which I have read and understand. I hereby consent to participate in the research described above.

_____ _____
Participant Signature   Date

_____
Participant Name

I have explained and defined in detail the research procedure in which the subject has consented to participate. Having explained this and answered any questions, I am cosigning this form and accepting this person's consent.

_____ _____
Principal Investigator: Odetta S. Scott   Date

Appendix B

Interview Questions

One-on-One Interview Questions

1. Tell me your career story highlighting factors that you believe played a key role in your success?

2. What attracted you to the high tech industry?

3. As you reflect on your career what helped you get where you are today? Were there any organizational enablers that you found invaluable? Please explain.

4. What advice would you provide to other women as they aspire to ascension into senior leadership positions?

5. What impact did mentoring have on your progression? Were you mentored? By whom?

6. What specific skills or knowledge have you gained through your relationship with your mentor? Describe a time when you have put those skills to use.

7. Has you mentor provided you with any forms of support that are more universal than industry specific or technical advice? Can you please give me an example?

8. From your experience what is the impact of networking on career progression for African American Women? Can you give me an example?

9. What characteristics/qualities do you look for in potential management candidates?

10. What is your hope for the next generation of AAW starting their careers today? As you think about your career progression, what things would you like to change for them?

11. If you could use one word to describe who you are today – what would that word be? Why? How has this characteristic impacted your success?

12. What do you consider were barriers to your career progression?

13. As an AAW, how were you received within your organization?

14. Do you feel that the glass ceiling, impenetrable barrier, exists for AAW today?

15. Did you have role models? Who were they and what was their impact? Can you provide an example where you have been a role model for other aspiring women?

16. Did your social support have any influence on your ability to succeed?

17. Explain the impact you feel gender and race have on advancement in high tech companies?

18. In your opinion what can be done to increase the number of AAW into senior leadership positions in high tech companies?