WOMEN IN TECH: THE FACTS

2016 UPDATE // See what's changed and what hasn't.

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national center for
women &
INFORMATION
TECHNOLOGY

PRODUCED IN PARTNERSHIP WITH
NCWIT'S WORKFORCE ALLIANCE

The authors also thank Tim Faiella and Adriane Bradberry for their significant contributions to this report.

Find Out How Your Company Might Be Missing Out On

- **Highly Qualified Candidates**
- **Key Contributions to Innovation**
- **Increased Productivity & Profit**

FOR AN EXECUTIVE SUMMARY, SEE THE WOMEN IN TECH INFOGRAPHIC AT NCWIT.ORG/THEFACTS.

WOMEN IN TECH: THE FACTS

ABOUT THIS REPORT

In 2015, women held 57% of all professional occupations, yet they held only 25% of all computing occupations. And the numbers are even lower when considering women of color; for example, Latinas and Black women hold only 1% and 3% of these jobs, respectively. Furthermore, even fewer women are found in software development, technology leadership, or the other kinds of key roles that have a significant influence on future innovation. Consider that 88% of all information technology patents (from 1980–2010) are invented by male-only invention teams while only 2% are invented by female-only invention teams. These and other statistics imply that the technology the world uses today is being created by a relatively homogeneous group of people.

Such patterns are especially troubling given ample evidence of the critical benefits diversity brings to innovation, problem-solving, and creativity. Indeed, a solid body of **research** in computing and in other fields documents the enhanced performance outcomes and benefits brought about by diverse work teams. At the same time, additional research included in this report and elsewhere documents that these patterns can not be chalked up to the results of individual interests or "choices." This research clearly demonstrates that a variety of cultural factors and implicit biases prevent all of us from recognizing highly qualified talent even when it is right in front of our eyes.

In 2004, the National Center for Women & Information Technology (NCWIT) set out to address these challenges. Since its inception, NCWIT has been compiling data from existing national sources and sponsoring research projects in an effort to understand why participation is declining and how companies can reclaim the technical talent of women and other underrepresented groups. The original edition of this report, sponsored by NCWIT's Workforce Alliance and published in 2010, brought together findings from the latest research related to technical women. This second edition updates that research, elaborating on new findings and research-based practices for increasing the representation of women and other underrepresented groups in technology.

GOALS OF THIS REPORT

- Tell a "coherent story" about the current state of affairs for technical women, synthesizing the best available data into one, easy-to-access resource.
- Provide an overall summary of the key barriers to women's participation in technology and promising practices for addressing these barriers.
- Serve as a benchmark for measuring the future effects of industry efforts to increase women's participation.
- Serve as a resource for advocates, policymakers, and change agents.

WAYS TO USE THIS REPORT

- Make the business case for diversity in technology with top-level executives, colleagues, policymakers, and others.
- Motivate others to advocate for reform and act as change agents.
- Measure or compare your company's performance regarding women in technology to national benchmarks.
- Guide your efforts to create more inclusive and productive technical workplaces.

TERMINOLOGY: SOME DEFINITIONS AND CONSIDERATIONS

Because this report draws on a number of data sources and studies that define technical or technology slightly differently, a careful discussion of terms is important.

- **Technology/Information Technology/IT:** In this report, we use these words synonymously to refer specifically to computing and computing-related professions and industries.
- **Science, Engineering, Technology (SET):** Some reports studied technical women in particular, while others studied women in science, engineering, and technology. When possible, we report findings specific to technology contexts. Of course, technical men and women also work in engineering and the other sciences, so we also present relevant data for the whole science, engineering, and technology (SET) workforce when this data is not available by industry. In these cases, we identify that this data pertains to SET companies or environments.
- **Mid-Career Level:** Because the mid-career level has been identified as a particularly perilous time for retaining technical women, special attention is often given to this career point. Different reports define mid-level slightly differently. In general, however, the term refers to employees who have significant work experience, ranging between 10-20 years, but have not yet reached high-level leadership positions.
- **Technical Men and Women:** We use these terms to refer to employees who work in computing-related occupations.
- **Intersectionality:** It is important to recognize that women and men are not homogeneous groups and that they vary in important ways when it comes to race, class, sexual orientation, ability, age, and other identity dimensions. In this report, we aim to address some of these intersections. When possible we disaggregate data by gender and race. We also aim to explore how these intersecting identities lead to variations in experiences of biases and the workplace in general. Likewise, the practices we suggest are intended to address multiple biases and make the workplace better for a variety of underrepresented groups.
- **Limitations of male-female binary terminology:** Not everyone identifies as male or female, so framing the current conversation in these terms continues to significantly marginalize those individuals. Second, it tends to set women and men apart as distinct groups, potentially exaggerating their differences. In fact, women and men actually share more **similarities** than the public rhetoric usually recognizes, and we differ within gender more than we differ across genders. In many contexts, it can be useful to mention these facts or to simply acknowledge that the male-female frame is imperfect.

WOMEN IN TECH: THE FACTS

WHAT IS THE CURRENT STATE OF AFFAIRS?

01 WOMEN IN COMPUTING: What Are the Numbers?

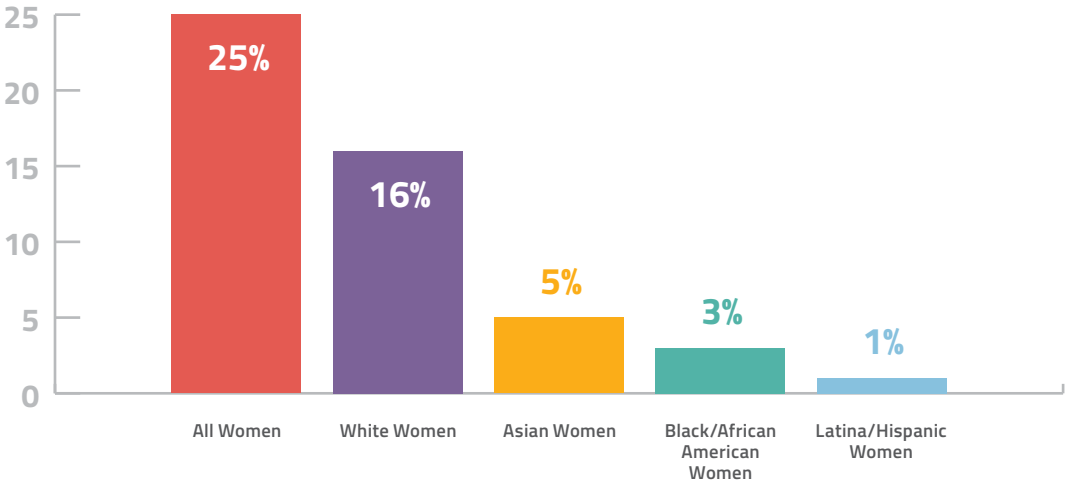
CHAPTER SNAPSHOT

- **Overall Participation:** How many technical occupations are held by women? How do these patterns vary by race/ethnicity? What are the trends over time?
- **Female Retention:** What are the rates of attrition for technical women? Where do they go when they leave?
- **Why Are Women Leaving?** Workplace experience, lack of access to creative technical roles, and dissatisfaction with career prospects are key.

OVERALL PARTICIPATION: How many technical occupations are held by women? How do these patterns vary by race/ethnicity?

In 2015, women made up 25 percent of computing-related occupations. As Figure 1.1 indicates, levels of participation are even more concerning when it comes to women of color (Bureau of Labor, 2016).

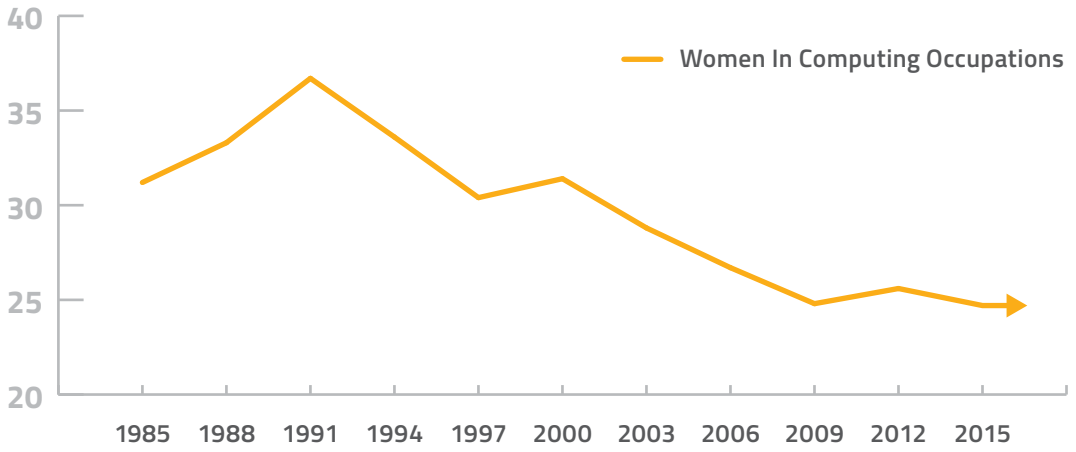
FIG. 1.1 // Percentage of Computing Occupations Held By Women, 2015



What are the trends over time?

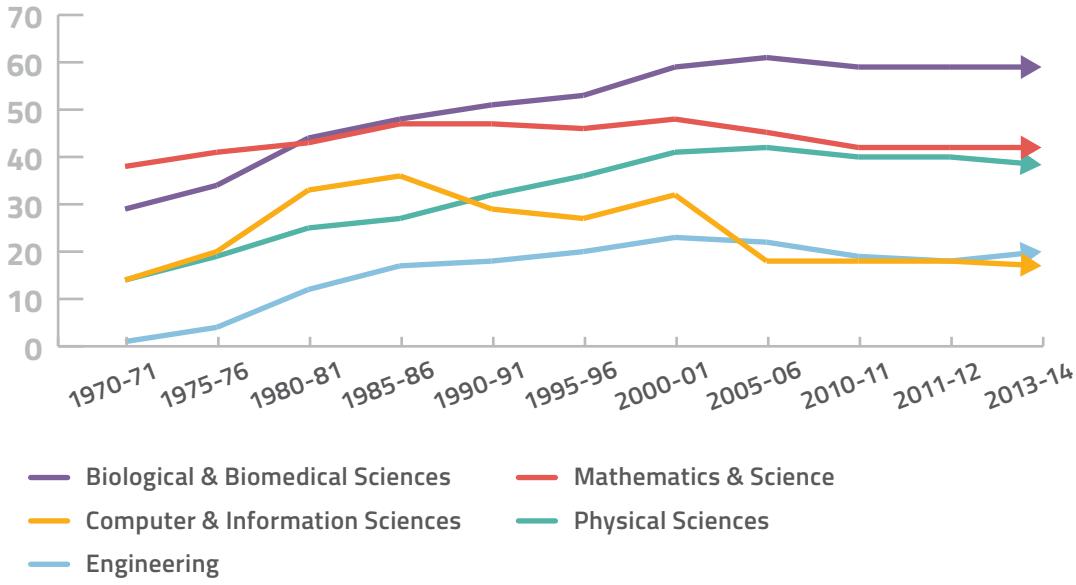
For the most part, the percentage of computing occupations held by women has been declining since 1991, when it reached a high of 36 percent (Bureau of Labor, 2016).

FIG. 1.2 // Percentage of Computing Occupations Held By Women Has Been Declining Since 1991



Meanwhile, during this same time period, women's participation in many other sciences has increased significantly (U.S. Department of Education, 2014).

FIG. 1.3 // Female Percentage of Select STEM Undergraduate Degree Recipients



Breaking it down: How does women's participation vary by specific computing job category and by race/ethnicity? Figure 1.4 illustrates women's 2015 participation in select computing occupations as tracked by the U.S. Department of Labor (Bureau of Labor, 2016).

FIG. 1.4 // Percentage of Jobs Held by Women in Various Computing Occupations, 2015

JOB TITLE	Black/ African American Women	Latina/ Hispanic Women	Asian Women	White Women	WOMEN TOTAL
Computer & Information Research Scientists	-	-	8%	13%	19%
Computer & Information Systems Managers	2%	1%	4%	20%	27%
Computer Systems Analysts	5%	2%	8%	21%	34%
Information Security Analysts	3%	-	0%	14%	20%
Computer Hardware Engineers	1%	3%	4%	7%	13%
Computer Programmers	2%	1%	5%	13%	21%
Software Developers	1%	1%	7%	9%	18%
Web Developers	4%	1%	4%	25%	34%
Computer Support Specialists	4%	2%	2%	19%	26%
Database Administrators	2%	1%	4%	29%	38%
Network & Computer Systems Administrators	2%	1%	1%	13%	16%
Computer Network Architects	4%	2%	1%	8%	12%
Operations Research Analysts	10%	5%	2%	37%	51%

NOTE: Estimates for the above race groups (White, Black or African American, and Asian) do not sum to totals because data are not presented for all races. Given the way DOL categorizes the data, persons whose ethnicity is identified as Hispanic or Latina may be of any race. Updated population controls are introduced annually with the release of January data. Dash indicates no data or data that do not meet publication criteria (values not shown where base is less than 50,000).

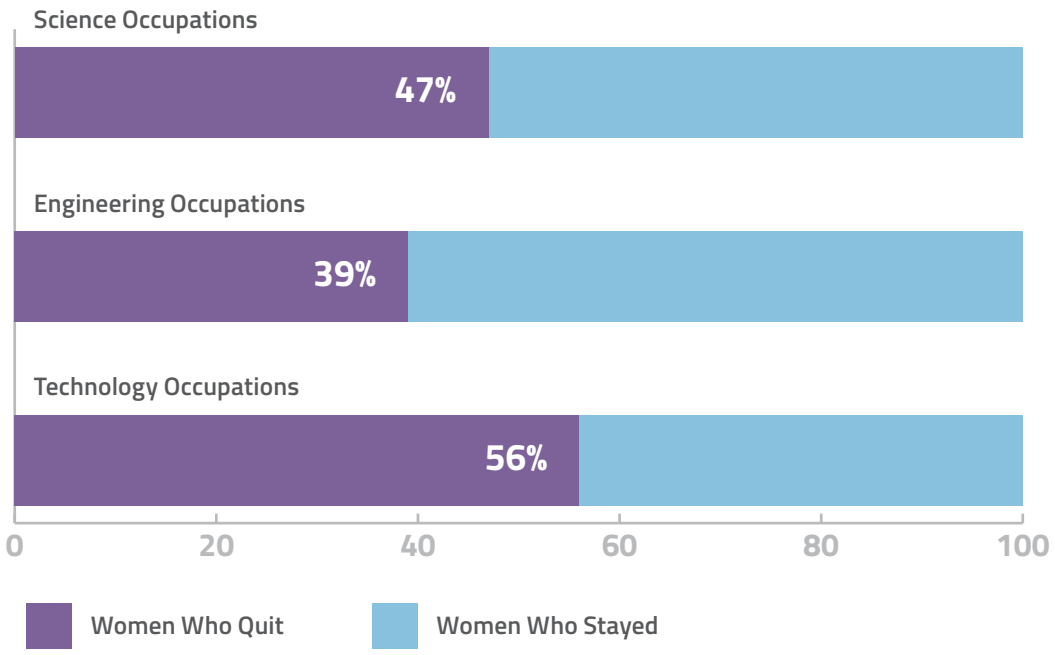
FEMALE RETENTION: What are the rates of attrition for technical women?

According to a study by the Center for Talent Innovation:

- Eighty percent of women in SET report "loving their work" (Hewlett, Sherbin, with Dieudonné, Fargnoli, & Fredman, 2014).
- Yet 56 percent leave their organizations at the mid-level points (10-20 years) in their careers (Hewlett et al., 2008).

As Figure 1.5 illustrates, female attrition is higher in technology than in science and in engineering. In all cases, the quit rate for women is higher than it is for men. In the high tech industry, the quit rate is more than twice as high for women (41 percent) than it is for men (17 percent) (Hewlett et al., 2008).

FIG. 1.5 // Female Quit Rate Across SET



Rerendered from Hewlett et al., 2008

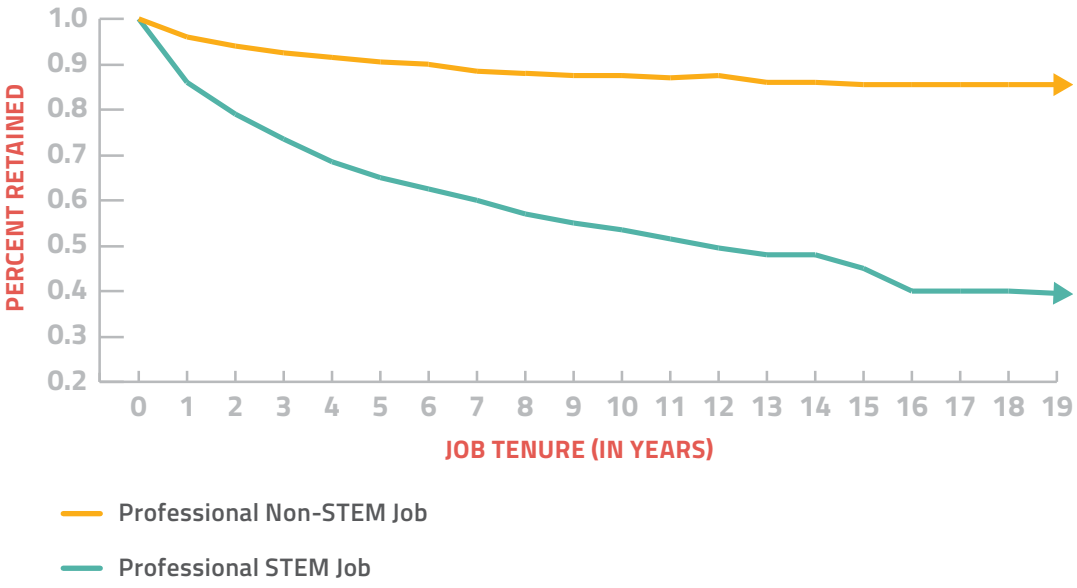
In the high tech industry, the quit rate is more than **twice as high for women,** as it is for men:

41% FOR WOMEN

17% FOR MEN

Female attrition rates are also higher in technology than they are in other non-STEM fields. One large-scale study found that after about 12 years, approximately 50 percent of women had left their jobs in STEM fields—mostly in computing or engineering (Glass, Sassler, Levitte & Michelmore, 2013). As Figure 1.6 indicates, only about 20 percent of women working in other non-STEM professional occupations left their fields during the 30-year span covered by the study. Women in STEM also were more likely to leave in the first few years of their career than women in non-STEM professions.

FIG. 1.6 // Percentage of Women Retained in Career Field Over Time

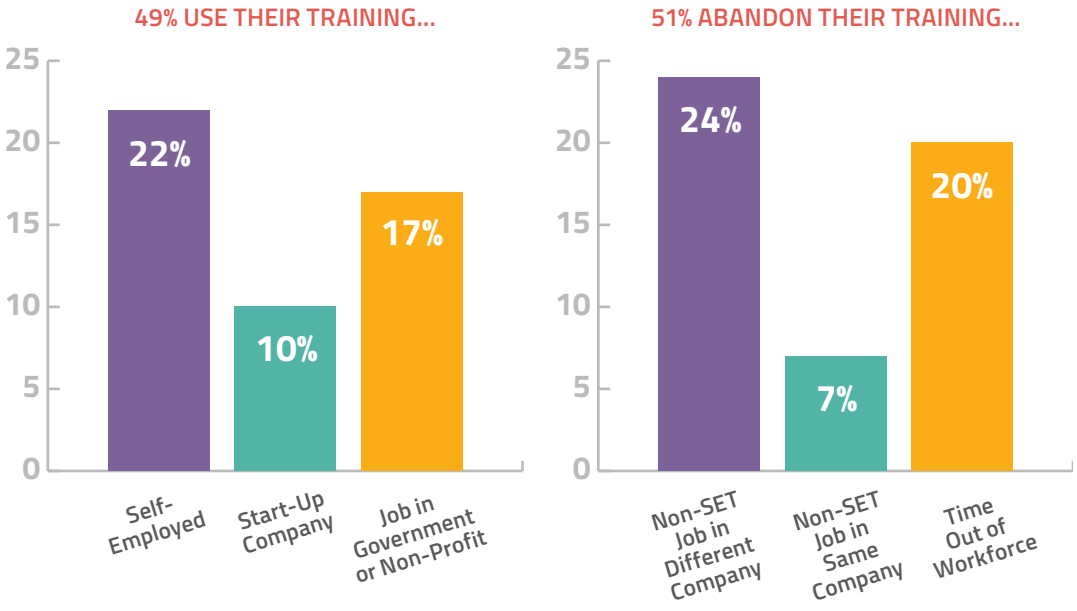


Rerendered from Glass et al., 2013

Where do they go when they leave?

In a Center for Talent Innovation study, nearly half of the women who left the SET private sector continued to use their technical training in jobs in other sectors (e.g., non-profit, government, or startup companies). The remaining 31 percent stayed in the workforce but took a non-SET job, sometimes at the same company but more often at a different company (Hewlett et al., 2008).

FIG. 1.7 // Women Who Leave the Private SET Workforce—Where Do They Go?



Rerendered from Hewlett et al., 2008

Only 20 percent of the women who left large private sector companies left to take time out of the workforce. And evidence suggests that many of these women would not have left had there been more on- or off-ramping options or other supports for competing life priorities. Similarly, Glass and colleagues (2013) also found that exiting the workforce altogether was quite rare for women who left STEM or non-STEM professional jobs and that family factors did not account for the majority of exits from STEM jobs.

Contrary to popular opinion, then, research suggests that women are not exiting these careers primarily for family concerns—and even when they are, they might have made different "choices" if more flexible options to support these competing responsibilities had been available. Understanding why they are really leaving is key for improving retention and advancement.

WHY ARE WOMEN LEAVING?

Evidence suggests that workplace conditions, a lack of access to key creative roles, and a sense of feeling stalled in one's career are some of the most significant factors contributing to female attrition from the tech field. Below we provide a glimpse into this evidence; for more detail, see **Chapters 3 and 4**.

Workplace Experiences

Workplace experiences emerge as one of the most significant differences between women who stay in computing and those who leave. In a recent study of approximately 5,500 technical women, Fouad, Singh, Fitzpatrick, and Liu (2012) set out to understand what factors influenced women's decisions to leave or remain in engineering. All of the women surveyed held engineering degrees; more than half of these women were currently working as engineers, approximately 25 percent had left the field after working for several years, and another 25 percent never entered engineering.

Interestingly, no significant differences emerged in personal or psychological characteristics of women who stayed in the field versus those who left. Both groups of women had similar majors, were of similar racial/ethnic background, and were equally likely to be married and have children. They were also similar in terms of a number of psychological measures including interest in engineering and confidence in their engineering skills.

The primary differences that did emerge related to women's experience of the workplace environment. Women who left were less likely to report opportunities for training and development, support from a manager, and support for balancing work and other competing responsibilities. They were also more likely to report undermining behavior from managers.

See **Chapters 3 and 4** *for more detail on the kinds of workplace conditions that matter and* **Chapters 5 and 6** *for ways to create the kinds of conditions more likely to retain highly qualified women and underrepresented employees.*

WOMEN ARE EXITING TECH CAREERS.

Research suggests that they are **NOT**, for the most part, exiting for family concerns.

SO WHY ARE THEY LEAVING?

Lack of Access to Creative Technical Roles

Evidence suggests that women face difficulties in accessing core, innovative technical roles. This can make it difficult to make meaningful contributions and can lower job satisfaction. While determining the percentage of women in technical roles is relatively easy given the available data, determining what *kinds* of technical roles these women are actually in is a bit more difficult. Doing so is important, however, for understanding the daily work experiences of technical women. Below, we explore some of the existing data that helps us measure women's contributions to innovation and the effects this has on career satisfaction and retention.

Female Patenting is Very Low. While it is certainly not the only measure of innovation, patenting is one measure that helps us understand the extent to which women are able to contribute to innovation in meaningful ways.

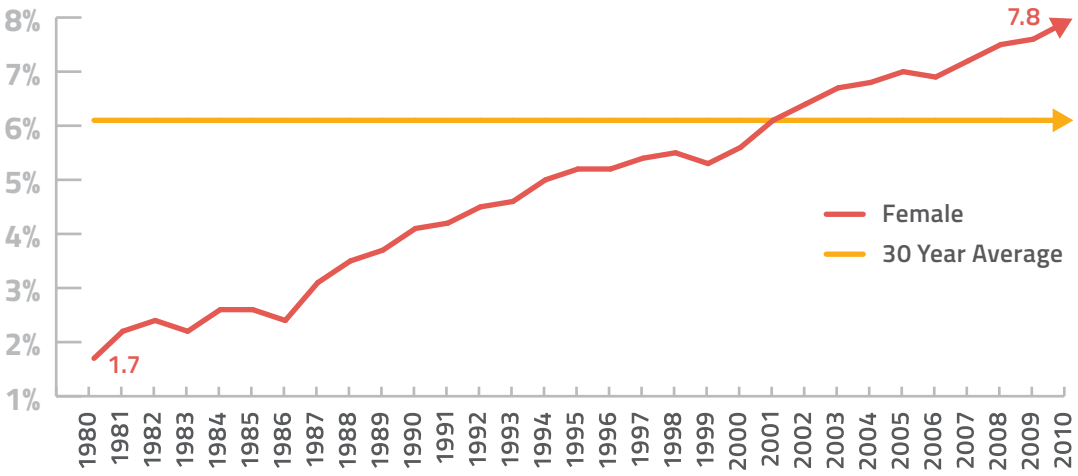
As Figure 1.8 illustrates, an NCWIT study of all U.S. invented U.S. information technology patents found that, depending on the subcategory, male-only teams account for 82-90 percent of all information technology patents (Ashcraft & Breitzman, 2012). Female-only teams account for approximately 2 percent while mixed-sex teams count for 8-15 percent. As a result, women are even more underrepresented in technology patenting than they are in the technology workforce overall.

FIG. 1.8 // Male and Female Collaboration Statistics for U.S. Invented IT Patents by Category

CATEGORY	Female Only	Mixed-Sex Team	Male Only	NUMBER OF MATCHABLE PATENTS
Communications	2.1%	8.5%	89.4%	163,480
Computer Hardware	1.7%	9.7%	88.6%	132,486
Computer Peripherals	1.9%	9.7%	88.4%	45,732
Information Software	2.9%	15.1%	82.0%	105,256
Semiconductors/ Solid-State Devices	2.0%	10.5%	87.5%	156,310
All Information Technology	**2.1%**	**10.5%**	**87.4%**	**603,192**

Importantly, female patenting has increased over time, from 1.7 percent in 1980 to 7.8 percent in 2010. This is particularly noteworthy because, during the past twenty years, the percentage of women employed in computing has declined from 32 percent in 1983 to 25 percent in 2009 (with a high of 36 percent in 1990-1991).

FIG. 1.9 // Percent of U.S. Female-Invented Patents Over Time



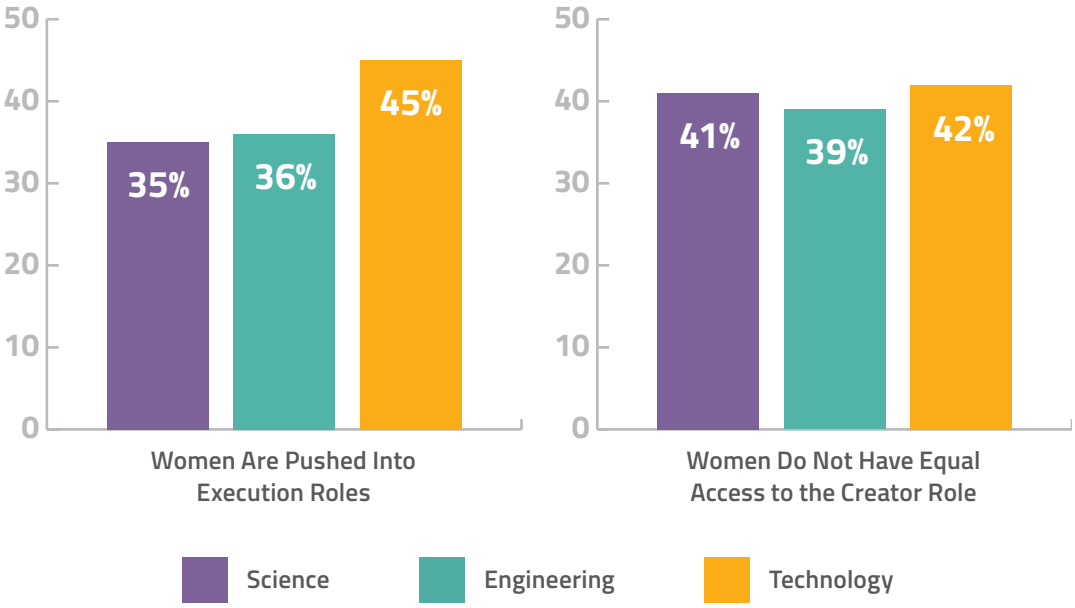
Interestingly, female patenting rates also differ widely from one organization to another. In some organizations the number of patents with at least one female inventor was 5 percent, while in other organizations it was as high as 30 percent. A number of companies have produced large increases in female rates of patenting. For example, 20 years ago, several companies had no female inventors; but by 2005, approximately 25 percent of these same companies' patents had at least one female inventor, if not many more (see Ashcraft & Breitzman, 2012).

These differences indicate that workplaces can create conditions that increase female patenting. One potential reason for low rates of patenting is that, in most companies, patenting is not a very transparent process. A lot of informal knowledge and support is required for employees to figure out if their idea is even worth patenting and if so how to go about obtaining a patent. Because women and other underrepresented groups typically have less access to the informal networks that often provide this kind of tacit information (see **Chapter 4, page 36**), they may face more difficulty in determining whether and how to go about patenting.

See **Chapter 6** *for some practical ideas for making patenting processes more transparent and for creating other conditions that might foster increased female patenting.*

Another potential reason that women are even more underrepresented in technology patenting than in technology more broadly may be the kinds of technical roles women typically hold. As Figure 1.10 illustrates, women in one study reported that men more frequently occupy the creative and innovative roles while women are more frequently channeled or clustered into execution roles. These women reported difficulties in accessing the more innovative tasks, assignments, and occupations (Hewlett et al., 2008).

FIG. 1.10 // Creator Versus Executor Roles



Rerendered from Hewlett et al., 2008

Similarly, as Figure 1.11 illustrates, Dice's 2012-2013 annual salary survey found that the top five tech occupations for women and men differed significantly, with "Project Manager" as the top position for women and "Software Engineer" as the top position for men (Kawamoto, 2013).

FIG. 1.11 // TOP 5 TECH OCCUPATIONS FOR WOMEN AND MEN

TOP TECH POSITIONS

FEMALE	MALE
1 Project Manager	1 Software Engineer
2 Business Analyst	2 Systems Administrator
3 Other IT	3 Project Manager
4 QA Tester	4 IT Management
5 Technical Recruiter	5 Applications Developer

Kawamoto, 2013

Although it may be tempting to conclude that these patterns result from personal "choices" that women and men make, the research clearly demonstrates that it is not this simple. Chapters 3 and 4 explore some of the more systemic factors that can contribute to these patterns. While more research is needed to fully understand these trends, such patterns can make it more difficult for women to make meaningful contributions to technical innovation and also can lead to greater job dissatisfaction.

Dissatisfaction with Career Prospects, Especially for Women of Color

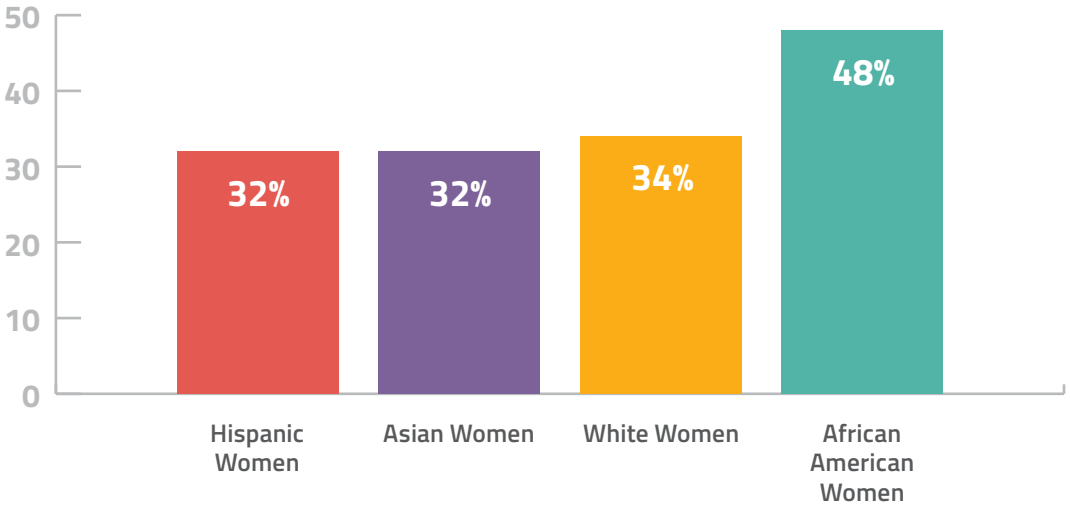
Indeed, another survey found that technical women generally report lower satisfaction in their careers than men. A survey of 25 high-profile tech companies revealed only 4 companies with women more satisfied than men, 15 with men more satisfied than women, and 6 with equal satisfaction (Glassdoor, 2014).

Women in SET Fields Find Themselves "Stalled"

The most recent study by the Center for Talent Innovation found that 32 percent—roughly 1 in 3 SET women—report that they feel "stalled" in their careers and are likely to quit their jobs in one year" (Hewlett et al., 2014).

Women's experience of feeling stalled in their career also varies by race/ethnicity. African American women experience the highest perceived stall rates at 48 percent. Thirty-four percent of White women feel stalled, and 32 percent Asian and Hispanic women feel stalled (Hewlett et al., 2014).

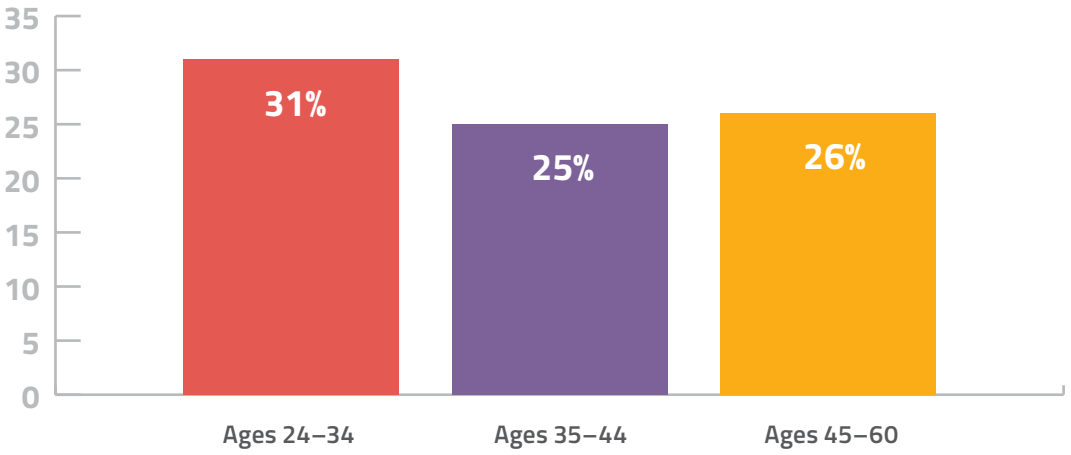
FIG. 1.12 // Women's Perceived SET Stall Rates



Hewlett et al., 2014.

Importantly, young women, regardless of race/ethnicity, report feeling stalled more than any other age group (Hewlett et al., 2014).

FIG. 1.13 // Women Who Report Feeling "Stuck in Place" by Age Group



Rerendered from Hewlett et al., 2014.

According to the Center for Talent Innovation, younger SET women "simply don't see a future in the field…they're jumping ship while they can still find a career that offers them a better chance of success, leaving companies without a crucial tranche of talent to train and without young role models to attract the next class of female graduates" (Hewlett et al., 2014, p. 26).

These trends may be another reason women leave large technical companies for smaller startups or other sectors where they feel they may have more influence.

Women also find it difficult to advance into leadership roles. According to the 2014 Harvey Nash CIO survey, women held only 7 percent of CIO positions globally, which is down 2 percent from the year before. The figure, while still low, creeps up to 11 percent of CIO positions held by women in the United States. Women make up only 4 percent or 20 of all CEOs in S & P 500 companies. Of these 20 women, 5 are in tech-related industries (HP, IBM, Yahoo, Oracle, and Xerox).

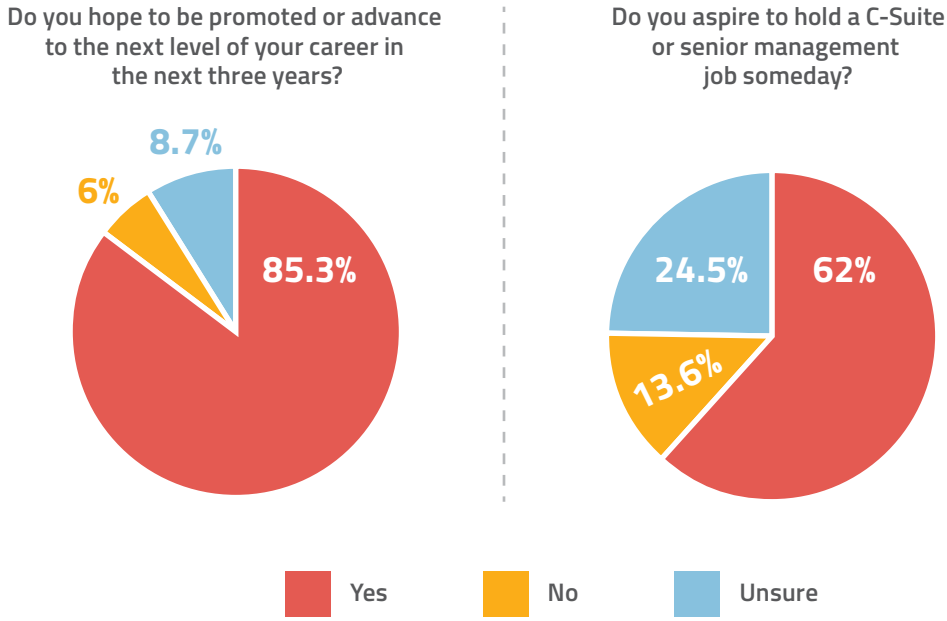
An analysis of tech companies' boards of directors also shows discouraging numbers for women. For example, when examining ever-growing ad tech companies, Digiday found that only 10 percent of board members and 6 percent of executive officers in top ad tech companies were women (Morrissey, 2013). Moving beyond executive officers and to broader leadership positions, another study of the technical workforce in Silicon Valley found that the odds of being in a high-level or leadership position was 2.7 times greater for men than for women (Simard et al., 2008).

Importantly, despite these and other statistics, the Harvey Nash (2014) survey found that 29 percent of CIOs—or approximately 1 in 3—do not think that women are underrepresented in tech. This is particularly troubling given the importance of top leadership support in implementing successful change efforts (see Chapter 5).

These difficulties in moving into leadership are particularly problematic given recent research that many technical women want to pursue leadership roles. The Center for Talent Innovation reports that 76 percent of SET women consider themselves to be "very ambitious," and 70 percent are eager to be promoted to the next job level (Hewlett et al., 2014).

Another survey of technical women in junior and mid-level executive roles also found that women expressed strong leadership ambitions (Anderson, Gilmour, & Castro, 2013). Over 85 percent of these women want career advancement in the next three years, and 62 percent are seeking a C-suite or senior management position in the future.

FIG. 1.14 // Career Advancement Aspirations of Technical Women



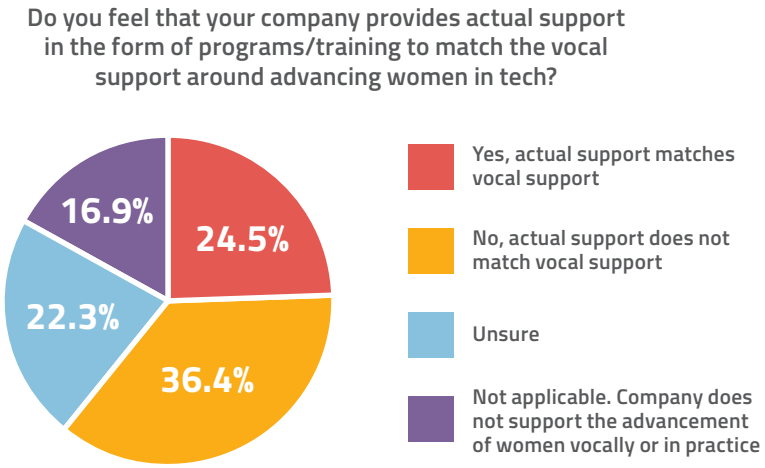
Rerendered from Anderson et al., 2013

76% of SET women consider themselves **"VERY AMBITIOUS"**

70% are eager to be **PROMOTED TO THE NEXT JOB LEVEL.**

However, as Figure 1.15 illustrates, despite these aspirations, only about 1 in 4 of the technical women in this study reported that their organizations support their leadership aspirations. This disconnect leaves many women skeptical about whether their companies are committed to advancing qualified women into leadership roles (Anderson et al., 2013).

FIG. 1.15 // Actual Support Women in Tech Report Receiving



Rerendered from Anderson et al., 2013

When job satisfaction is diminished and the chances for advancement seem low, women and other underrepresented groups may begin to look elsewhere for fulfilling careers.

At the same time, it is important to note that while job satisfaction and advancement opportunities are certainly important, at least one study has found that "women in STEM fields do not react as positively to increasing job satisfaction, job tenure, and advancing age as do women in non-STEM professions" (Glass et al., 2013). These findings also suggested that "climate issues" and that a lack of "fit" or belonging in these jobs persists for longer periods of time in STEM careers than in non-STEM careers.

This observation brings us back to other aspects of workplace experience that can create unwelcoming climates or communicate a lack of "fit" or "belonging." The next two chapters examine these aspects in more depth—in particular, the role that bias plays in shaping climates and cultures that can make members from underrepresented groups feel unwelcomed even when they are highly qualified.

When job satisfaction is low, **WOMEN AND OTHER UNDERREPRESENTED GROUPS** begin to look elsewhere for fulfilling careers.

02 UNDERSTANDING IMPLICIT BIAS IN THE TECHNICAL WORKPLACE:
What Is It? What Role Does It Play?

CHAPTER SNAPSHOT

- **Intro to Implicit Bias:** What is it, and how does it contribute to underrepresentation in computing?
- **How Do These Biases Play Out in Everyday, Subtle Interactions in the Technical Workplace?**

Key Takeaways

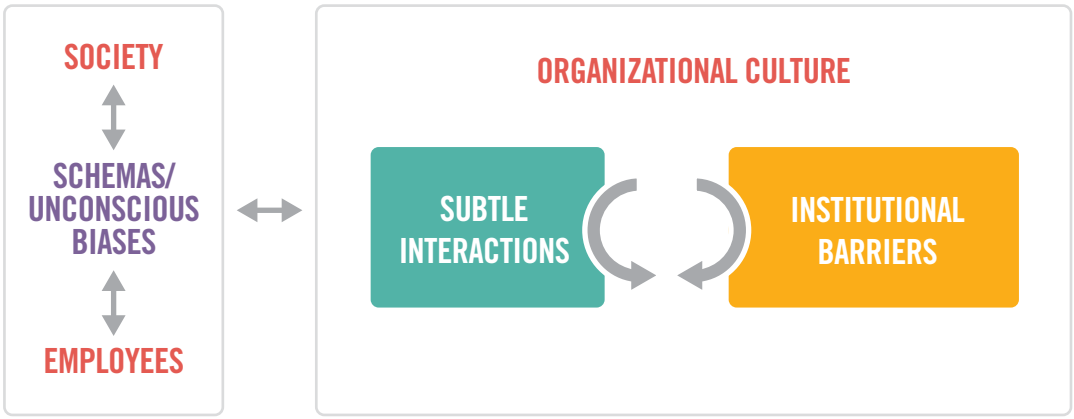
- Implicit bias results from schemas that we all develop as we move through society. These schemas are important for filtering information, but they sometimes lead us to filter this information erroneously, resulting in bias.
- Biases are a problem for all workplaces but can be especially significant in majority-minority group environments, such as tech.
- Implicit bias plays out in two ways: 1) subtle, everyday instances and 2) institutional barriers. In this chapter, we discuss the following kinds of everyday instances of bias:
  - Microinequities
  - Stereotype Threat
  - Tokenism
  - Gender or Color Invisibility
- Implicit bias *is not* about blame or about fixing people; it IS about taking the effort to recognize these biases and taking action to address them.

INTRO TO IMPLICIT BIAS: What is it, and how does it contribute to underrepresentation in computing?

As illustrated in Figure 2.1, everyone possesses implicit biases simply from being members of our larger society. From the time we are young, we acquire culturally-based schemas (or mental models) for the objects, systems, activities, and other people in our world. These schemas are important and function as short cuts that allow us to quickly assimilate and filter the massive amounts of information we encounter every day.

However, these schemas also lead us to filter information in ways that may lead to misperceptions, misinterpretations, or misunderstandings, resulting in unconscious biases. For example, we might miss certain strengths, talents, or characteristics when someone does not fit our "schema" for what a "good leader" or a "good technical person" looks like. Likewise, we might misinterpret behaviors, like characterizing women as "too aggressive," when the same behavior from men is often deemed more acceptable. See NCWIT's interactive video on unconscious bias that explains these dynamics in more detail: **ncwit.org/resources/unconscious-bias-video.**

FIG. 2.1 // Implicit Bias is More Salient in Homogeneous Organizations



These biases can pose problems for all workplaces, but they can be even more pronounced in "majority-group" environments, as is the case in many tech companies or departments. In such an environment, systems emerge to reflect and meet the needs of the majority-group population. However, if these policies or systems do not change with the times, they can *inadvertently* inhibit the success of members who differ from the majority. A wealth of research shows that these biases also ultimately diminish innovation, productivity, and the **company's bottom line**.

As noted in Figure 2.1, implicit biases play out in two distinct ways: subtle, everyday interactions and institutional practices. Subtle dynamics may be isolated to specific individuals, teams, or interactions. When these biases become more systemic or encoded in company policies or practices, they result in larger institutional or systemic barriers.

Below, we first take a close look at some of the ways these biases play out in **everyday interactions.** In the following two chapters, we will take a look at how these biases also create **institutional barriers** to recruitment, retention, and advancement of underrepresented groups.

HOW DO THESE BIASES PLAY OUT IN EVERYDAY, SUBTLE INTERACTIONS IN THE TECHNICAL WORKPLACE?

Subtle instances of implicit bias often build upon each other, creating environments that push underrepresented employees out the door. The following are some concrete examples of how these dynamics play out in computing companies.

> **"My manager is always looking away, texting, or somehow distracted when I talk to him. But he's not usually like that with my male colleagues. What's going on?"**

Microinequities

Microinequities—often caused by implicit bias—are subtle, cumulative, and repeated negative messages that can devalue, discourage, and impair performance in the workplace (Young, 2007). These messages include looks, gestures, tone of voice, and other verbal and non-verbal signals. They often accumulate in ways that lead employees to underperform, withdraw from co-workers, and ultimately leave the workplace.

Examples of Microinequities

- Recruiters and interviewers using the pronoun "he" when discussing a position or potential candidate.
- Enthusiastically greeting men but being more hesitant to greet women at job fair booths or recruiting functions.
- Frequently mispronouncing someone's name.
- Consistently confusing the few people of color in the company with each other.
- Failing to recognize an idea when expressed by one employee, but acknowledging it when paraphrased by another employee.
- Looking at the clock, answering cell phone, or other subtle behaviors that indicate a manager or supervisor is not interested in the conversation with an employee.
- Subtle norms that make it acceptable for heterosexual people to talk about what they did on the weekend with husbands, wives, or family but not as acceptable or comfortable for LGBTQ employees to do so.

Hidden biases and barriers cost corporate America $64 billion per year in employee turnover—and that is a conservative estimate.

This estimate accounts for the annual cost of employee turnover due solely to unfairness resulting from bias. This turnover disproportionately includes employees from underrepresented groups. When considering other intangible factors, such as the cost to company reputation and ability to recruit new talent (including men), the price tag soars even higher. Additional intangible costs result when implicit biases silence the employees who do stay or prevent them from contributing their best ideas.

Kapor Klein, 2008

Stereotype Threat

Stereotype threat is the fear or anxiety that our actions will confirm negative stereotypes about an identity group to which we belong (e.g., gender, race, age). More than 300 research studies have documented that these fears and anxieties reduce feelings of competence and belonging, and can negatively affect performance (see Aronson et al., 1999, and reducingstereotypethreat.org for more information).

> **"Great job! You're living proof that women really do have technical minds!"**

Recognizing stereotype threat is important; otherwise employers, supervisors, or coworkers might incorrectly assume that a "so-called" lack of performance or confidence is the result of personal characteristics of the employees themselves when it is really more about the environment. Leaving these environmental conditions unaddressed ensures that these employees are not able to live up to their full potential and will most likely leave the company.

Conditions That Can Trigger Stereotype Threat

The following conditions can trigger stereotype threat and cause otherwise highly qualified candidates to underperform or appear less "confident:"

- An all-male or all-white (or otherwise homogeneous) interview team.
- Features of the physical office environment that signify a stereotypically "geeky," "male," or "white" space (e.g., action figures, sci-fi posters, stacked soda cans, "geek" stuff).
- Attention called to gender or race during application, interview, or other evaluation processes.
- Organizations with a "fixed" mindset—that is, they see talent as fairly innate (e.g., either you have it or you don't). This mindset tends to reinforce stereotypes and invoke stereotype threat (Emerson & Murphy, 2015).

How Stereotype Threat Might Show Up In Technical Workplaces

- Reluctance to speak up in team meetings or to take on leadership positions.
- Appearing "less confident" in interview settings.
- Reduced performance in interviews or other work contexts.
- Tendency to discount own performance during reviews and evaluations.

Tokenism

Tokenism occurs when only a few employees belong to a particular identity group (e.g., in terms of gender, race, age, sexual-orientation), and those individuals are singled out to represent or relate to that group. This ignores the reality that a wide range of variation exists within any identity group, and that it is unreasonable to expect one person to fully represent this within-group variation (for example, rarely do we expect a white person to speak for all whites or a man to speak for all men).

> **"We're so excited to have you on board. We've really needed someone like you to help us understand the Asian market."**

Examples of Tokenism

- Job ads that indicate a strong desire for women or minorities to apply. These statements can signal that hires will function as "tokens" in the organization. An expressed desire for diversity should not be about "body count;" it should be built into the skills and competencies required for the job itself (e.g., an ability to create technologies with different populations in mind).
- Diverse candidates are selected solely to demonstrate an institutional commitment to diversity.
- Members from underrepresented groups are often expected by others to "speak for" or "represent" the group as a whole.
- Underrepresented members are expected to be able to "relate to" customers or clients who are also members of the same or similar identity groups.
- Underrepresented members are asked to take responsibility for a larger share of "diversity" work. This frequently prevents them from putting as much time into other aspects of their jobs, often negatively affecting job performance, evaluations, and advancement.

The Glass Cliff: A Specific Type of Tokenism

"Well, we've been getting pressure to diversify management, so we better give her a shot even if she's not quite ready."

This phenomenon occurs when members from underrepresented groups are promoted too early or put in charge of tasks they do not yet have the expertise, resources, or authority to carry out. Related to tokenism, this often happens as supervisors, managers, or company leaders try to meet "diversity requirements." This, however, sets these employees up to fail and is detrimental to the company, to the employee, and to future efforts to diversify the workforce.

Ryan, Haslam, & Postmes, 2007

Gender or Color-Invisibility

Individuals frequently make well-intentioned assertions (like the one in the box to the right) in an effort to combat prejudice and treat employees equitably. A gender or color-invisible stance might be appropriate if the larger society also was gender and color-invisible. Since this is not the case, holding such a stance is actually a failure to recognize significant and important factors that affect these employees' life and work experiences.

> **"I don't see color or gender; you do your work well on my team, and you'll succeed!"**

Women, people of color, and other underrepresented employees often have experiences that shape their lives differently (e.g., women more often than men have to think about or are asked to explain how they balance work and family responsibilities). These individuals also face different prejudices and inequities. "Treating everyone the same" ignores these realities and the fact that existing workplace conditions do not meet these employees' needs.

Such treatment also ignores the fact that current workplace conditions are not natural; they have subtly evolved to meet the needs of the original population. For example, when most employees have a stay-at-home-spouse (typically a wife who is taking care of children), flextime does not become a norm because these employees do not need it. If most employees were single parents or had dual-working relationships, different systems would most likely have evolved.

Examples of Gender or Color-Invisibility

- Language referring to "the best candidate" for the job or promotion—often a red-flag indicating unaddressed or unconscious bias.
- Insisting that a decision to hire because the candidate was just "not a good fit"—another red flag indicating possible unconscious biases.
- Language that stresses "treating everyone the same." Though well intentioned, it tends to minimize or ignore reality.
- Language that claims meritocracy in performance and advancement review processes, such as, "We do not see gender or race."

Overcompensation: Another Type of Gender or Color-Invisibility

"It's really not about gender; it's just about talent and/or how hard you work. Most of my best employees are women!"

This claim, or versions of it, is a common response to diversity efforts. However, it signals several potential problems:

- Reiterates the myth of meritocracy. Research shows that it isn't JUST about talent or how hard you work.
- It ignores the biased systems that implicitly create barriers.
- Even though the last part is phrased positively in this example, it can come across as disingenuous or attempting to "overcompensate."

CONCLUDING THOUGHTS

It is important to remember that, more often than not, these biases are not the result of any ill intentions. The goal, therefore, is not to find fault or assign blame; this is not about *fixing people,* but rather it is about recognizing and interrupting these biases, thereby *fixing the environment.* For more information on how to address these biases, see NCWIT's Supervising-in-a-Box series, available at **www.ncwit.org/supervising.**

Interested in testing your own biases?

Check out the Implicit Association Test at **www.projectimplicit.net**

THE PARADOX OF MERITOCRACY:

Thinking We Are "Fair-Minded" Can Make Matters Worse

When a company's core values stressed meritocracy, men were offered higher bonuses on average than were women with equivalent performance.

Castilla & Bernard, 2010

03 INSTITUTIONAL BARRIERS:
How Do Biases Influence Recruitment?

CHAPTER SNAPSHOT: FOUR BARRIERS TO RECRUITMENT

- **Job Ads:** Biased and exclusionary language.
- **The Recruiting Process:** Hiring people like ourselves.
- **The Interview and Selection Context:** Practices that trigger stereotype threat and other biases.
- **The Physical Office Environment:** Subtle cues about who belongs here.

Key Takeaways

- Job ads often contain language and other subtle cues that discourage women and other underrepresented candidates from applying.
- Resume review and selection criteria often embed unconscious bias.
- The technical interview context often triggers stereotype threat and can prevent interview teams from recognizing highly qualified talent even when it is right in front of them.
- The physical environment can communicate who does and does not fit-in, ultimately influencing candidates' decisions about joining a company.

FOUR BARRIERS TO RECRUITMENT

This chapter focuses on how implicit bias plays out in institutional practices related to recruiting. Often, these biases are difficult to recognize because they are embedded into the "normal" operations of recruiting and appear to be "just the way it is." When left unchecked, however, they cause hiring managers and others to miss out on finding and hiring many highly qualified candidates.

JOB ADS: Biased and Exclusionary Language

Research has shown that subtly biased job ad language can deter women (and many men) from applying for jobs. Such language includes extreme modifiers, gender-specific pronouns, and the overuse of historically masculine descriptors. Effects include reminding people of their minority status in negative ways, reinforcing stereotypically gendered physical and virtual environments, and calling attention to recruiting efforts that signal a lack of diversity. The effects have direct negative consequences in candidate perceptions of potential "belongingness" and the overall appeal of a job or company (Kay, 2012).

Extreme Modifiers in Job Ads

Phrases like "best of the best," "ninja, "rock star," "world-class" or "unparalleled" can deter anyone who has been raised/socialized to downplay their expertise or not to "toot their own horn." Many women and other underrepresented candidates are less likely to categorize themselves in these ways, even when they are very highly qualified.

In addition, job ads with a long "laundry" list of qualifications that often include things that are not strictly required, but are desired, have been shown to deter women from applying. Research shows that women can be harsher critics of their work and can be less likely than men to apply for jobs unless they meet all the criteria (Correll, 2001). Shortening such lists where possible, grouping items into different categories of responsibilities, or dividing such lists into "required" and "desired" lists can all help to mitigate this unintended outcome.

Another common issue with job ads is a failure to communicate the meaningful nature of the job, which may subtly or overtly deter some applicants including women and other members of underrepresented groups. Stating why the job is important to the company and its mission, how it fits into the other functions or jobs as a part of the whole, and how the job contributes to solutions to problems or improving society are all ways to more effectively engage and attract more applicants. Job ads that include these "bigger picture" elements, eliminate biased language, and avoid extreme modifiers can help enhance (rather than inhibit) a sense of belonging for diverse applicants.

THE RECRUITING PROCESS: Hiring People Like Ourselves

Referrals

Many recruiting efforts rely on referrals or word-of-mouth communication. While convenient, this practice greatly exacerbates the tendency to reproduce the status quo. When it comes to referrals and recommendations, *people tend to recommend others much like themselves,* a phenomenon known as "assortative matching" (Schwartz, 2013). Consider these examples:

- According to a study for the Federal Reserve Bank of New York, 64 percent of employees recommended candidates of the same gender, while 72 percent referred candidates of the same race or ethnicity (Brown, Setren, & Topa, 2013).

- At least one study has found that women referred for entry-level tech jobs are significantly more likely to be hired than women without referrals; the same study found that for executive high-tech jobs, referred candidates are much more likely to be men than women (Fernandez & Campero, 2012).

64% of employees recommend candidates of the same gender and 72% the same race or ethnicity.

My Unconsciously Biased Address Book – The 20 Percent Problem

Rick Klau (2015), partner at Google Ventures, described an interesting personal exercise he conducted related to bias and his address book:

"Earlier this year, I cleaned up my contacts and became interested in what the gender split would look like for my address book. Not only was it no better than my Twitter experiment from last year, the numbers were exactly the same. Of the just over 1,900 contacts in my primary address book, 399 are women. Last year, people I followed on Twitter were 79.7% men; today my address book is 79.9% men....

If the majority of leaders at most companies are men and if the majority of their networks are men (as mine are), then this is a self-perpetuating problem...It really is who you know. And who I know is 80% men...I suspect that many people will be similarly surprised at what the data says about their networks.

Once you know your own ratio, I think you'll be motivated as I was to make it better..."

KNOW AND IMPROVE YOUR OWN RATIO!

Sourcing

Related to referrals, other sourcing strategies also can perpetuate the status quo. A common reason given for the lack of gender diversity (and diversity in general) in technology companies is the lack of diversity among the qualified applicants seeking such jobs. However, recent findings call this claim into question. For example, a study by LinkedIn examining millions of profiles across a dozen industry groups found that industries outside of technology employed *more* women software engineers than did the tech industry. Women accounted for about 32 percent of software engineers in healthcare and 25 percent in banking, compared to only 20 percent in the technology industry (Murthy, 2015).

Where and how you recruit can make a big difference—either to reproduce existing non-diverse demographics or to be powerful tools for increasing the diversity of your candidate pools.

- Research has shown that women are not as likely as men to encounter job opportunities and get hired through informal networks (word-of-mouth, online social networking, personal referrals) despite their competitive work experience (McDonald & Day, 2010).
- Recruiting candidates only from elite institutions results in decreased diversity in both candidate pools and resulting hires, simply due to the fact that such institutions are skewed toward a higher income, white, and privileged student populace (Rivera, Soderstrom, & Uzzi, 2010).
- Even within internships, a highly regarded recruiting pathway, women have been shown to be nearly three times less likely to seek internships in tech than men (Looksharp, 2015).

Relying on the same short-list of universities and programs for their graduates, word-of-mouth, or always returning to the same sources, are not recommended pathways to increase diversity in your candidate pools. Proactive recruiting from multiple diverse sources, without lowering standards, is a better approach. Also, collecting data on the diversity of your applicants and not just for your employees, by gender for example, is a powerful way to measure progress in your recruiting methods.

THE INTERVIEW AND SELECTION CONTEXT: Practices that Trigger Stereotype Threat and Other Biases

Following the generation of a candidate pool, resume selection and interview processes are the next critical hiring steps. These steps are prone to specific forms of unconscious bias that may stifle diversity and cause you to overlook the best applicants. For example, extensive research on resume evaluation reveals patterns of both gender and race-related bias:

- In one study, resumes with white-sounding names prompted 50 percent more callbacks than the exact same resumes with black-sounding names (Bertrand & Mullainathan, 2004).
- Another recent study found that science faculty rated female applicants significantly lower in competence and hireability, recommended lower salary offers, and expressed less willingness to mentor these applicants (Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012).
- In a review of post-doctoral applications for a science fellowship, women applicants needed to produce more than 99 "impact factors" to be perceived as competent as men who had produced only 20 "impact factors" (Wennerås, & Wold, 1997).
- In one study, college administrators were far more likely to say they would hire candidates with resumes that had male names rather than female names even though the resumes were identical. This effect was exacerbated when women made up a smaller proportion of the candidate pool, as is often the case in technical companies or departments (Steinpreis, Anders, & Ritzke, 1999).
- In contrast, orchestras conducting interviews for new talent behind curtains increased the probability that women candidates would advance out of preliminary rounds by 50 percent and increased the percentage of new hires that were women anywhere from 25-46 percent (Goldin & Rouse, 2000).

In one study, resumes with white-sounding names prompted **50%** MORE CALLBACKS than the exact same resumes with black-sounding names .

You May Be Triggering Stereotype Threat and Not Even Know It

The interview process and context can also communicate unintended and subtle biases that may negatively impact the performance of underrepresented candidates (Walton et al., 2015). For example, any of the following can trigger stereotype threat in the interviewing process:

- Having all-male or otherwise non-diverse interview teams.
- Using "Gotcha!" interview techniques (such as defend-your-code tactics).
- Including comments, questions, or language that contains unconscious bias when describing the culture of the company and assessing the "cultural fit" of a candidate.

Any of these conditions can cause candidates to underperform, thereby increasing the likelihood that interview teams will miss highly qualified talent even when it is right in front of them.

THE PHYSICAL OFFICE ENVIRONMENT: Subtle Cues About Who Belongs Here

The design of physical working spaces communicate a company's culture and what kinds of people might fit-in or not fit-in (e.g., Hattenhauer, 1984). Feelings of belonging or potential belonging are important factors when candidates consider both joining a new workplace or remaining in one (Walton et al., 2015). For these reasons, efforts to attract a broader population must avoid communicating bias and stereotypes that lead women or other underrepresented groups to feel excluded, unwelcome, or alienated.

Technology work environments often communicate a stereotypically masculine culture and related expectations.

- In research done with college students, stacked soda cans, cliché sci-fi images and paraphernalia, video game boxes, comics, science fiction books, electronics, and computer parts communicate a lower sense of belonging to young women and to young men who do not resonate with these "geeky" characteristics (Cheryan et al., 2011; Cheryan et al., 2009).
- This effect of stereotyped environments measurably reduces women's interest in declaring a computing major and their anticipated success in computing.

CONCLUDING THOUGHTS

Clearly, recruiting strategies and processes present multiple challenges as well as opportunities for confronting bias and promoting diversity and inclusion while maintaining standards of excellence. Recognizing and changing problematic recruitment and selection processes not only improves work environments for underrepresented employees but also creates a more inclusive and thriving workplace overall.

Industries outside of technology employ more women software engineers than do the tech industry.

Women accounted for about 32% of software engineers in healthcare and 25% in banking, compared to only 20% in the tech industry.

Murthy, 2015

Women referred for entry-level tech jobs are SIGNIFICANTLY MORE LIKELY TO BE HIRED than women without referrals;

the same study found that for executive high-tech jobs, referred candidates are much more likely to be men than women.

Fernandez & Campero, 2012

04 INSTITUTIONAL BARRIERS:
How Do Biases Influence Retention and Advancement?

CHAPTER SNAPSHOT: FOUR BARRIERS TO RETENTION & ADVANCEMENT

- **Managerial Relationships:** Employees leave managers, not companies.
- **Isolation:** Lack of sponsors and informal networks reduces sense of belonging.
- **Performance Evaluations and Promotion:** We tend to develop and promote people who are like us.
- **Competing Life Responsibilities:** Failure to provide flexible options has consequences for ALL employees and for the company.

Key Takeaways

- Because they are often promoted on the basis of their technical expertise, technical managers often have less training or expertise when it comes to effectively managing people.
- A lack of sponsors and informal networks makes it more difficult for women to navigate "unwritten" company rules and norms. This can also reduce women's sense of belonging in the organization.
- Many technical women report feeling stalled in their careers.
- In performance evaluation, women receive advice that they need to be "less abrasive" or should "tone it down" much more frequently than do men.
- Both women AND men increasingly report a desire for flexible work. Meanwhile evidence suggests that employers often underestimate the importance of flexible work for employees.

MANAGERIAL RELATIONSHIPS: Employees Leave Managers, Not Companies

The managerial relationship is important because it influences so many aspects of an employee's day-to-day work life. Managers have the power to exacerbate or remedy many of the barriers technical women and other underrepresented groups face. For example, managers can have a profound impact on reducing isolation, recommending or functioning as mentors and sponsors, providing access to flexible schedules, and reducing bias in performance evaluations and promotion procedures—all key barriers to technical women's advancement. Technical women are less satisfied on a number of measures with their managerial relationships than women in non-technical roles, men in technical roles, and men in non-technical roles (Foust-Cummings, Sabattini, & Carter, 2008).

> **"I need honest advice on how to take the next step in my career, and my manager is not in a position to do that — he has made it clear that he wants me to stay put."**
>
> **—Woman Technologist**
>
> Hewlett, Jackson, Sherbin, Sosnovich, & Sumberg, 2008

Technical Companies and Departments Face Unique Managerial Dilemmas

Failing to adequately train managers is particularly problematic in technical companies, as these employees may be advanced into these roles for their technical expertise rather than their managerial capabilities (Foust-Cummings et al., 2008).

In addition, many mid-level men and women explained that rapid turnover in the technical industry meant that they had been through several different managers. As a result, most technical men and women simply do not expect to have a long-term relationship with their managers (Simard et al., 2008).

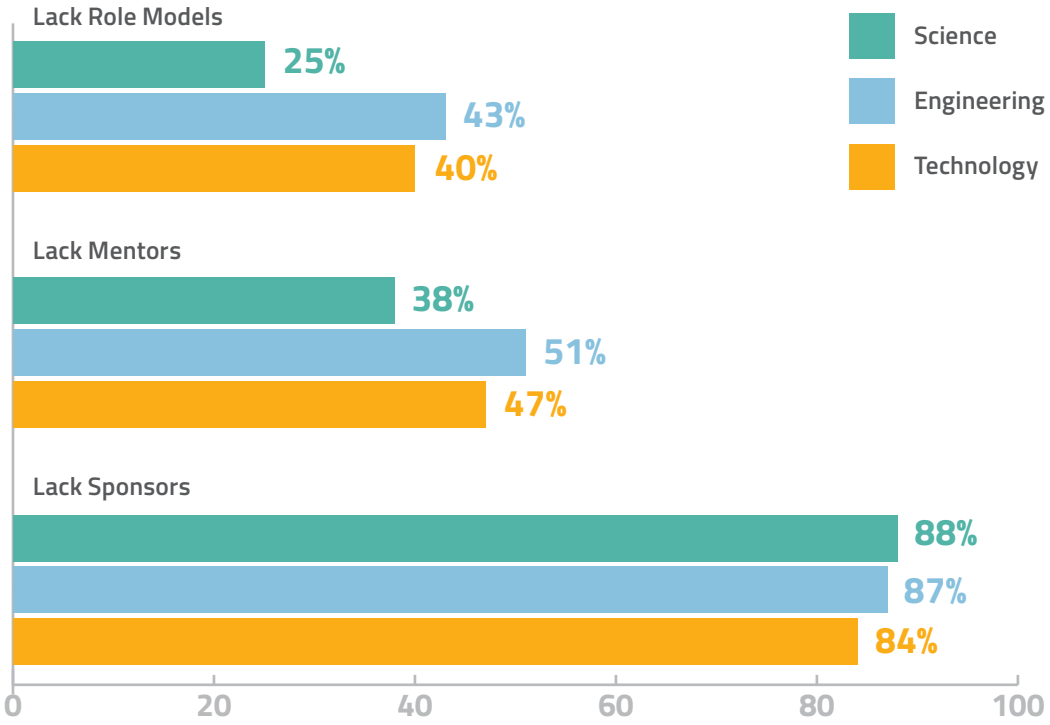
Companies need to take steps to address these dilemmas if managerial relationships are to improve in ways that retain women and all technical talent.

Managers need information and resources that enable them to give regular constructive feedback, discuss employee career paths and goals, and provide employees with growth opportunities. In one study, only about 1 in 5 mid-level technical women and men reported that these issues were regularly discussed with their managers (Simard et al., 2008). Improving managers' ability to give feedback and develop their employees in these ways can go a long way to improve retention and advancement of women and other underrepresented groups who report mysterious career paths and unwritten company rules as key barriers to their advancement. Importantly, improving managers' ability to have these conversations would also help make the most of ***all*** employees' talent, not just that of underrepresented groups.

ISOLATION: Lack of Sponsors & Informal Networks Reduces Sense of Belonging

Technical women identify isolation and a lack of mentorship or sponsorship as one of the key barriers to their retention and advancement. In one large-scale study, 30 percent of women in private-sector SET jobs said they felt extremely isolated at work (Hewlett et al., 2014). In a prior study, 40 percent of U.S. women in SET jobs reported lacking role models, while nearly half reported lacking mentors, and 84 percent reported lacking sponsors—that is, someone who would help make them and their accomplishments visible with the right people at the right time within the organization (Hewlett et al., 2008).

FIG. 4.1 // Women Lack Role Models, Mentors, and Sponsors Across SET



Rerendered from Hewlett et al., 2008

Similarly, in another study, more than one-third of women perceived that the following affected their advancement to either a "great" or "very great" extent (Simard et al., 2008):

- Lack of role models
- Lack of mentors, sponsors, or champions who make their accomplishments visible
- Being excluded from the networks of key decision-makers

This experience of isolation reduces a sense of belonging for many females (and other underrepresented employees), AND it negatively affects their ability to fully develop their talents. In one study, more than 1 in 5 technical women felt that the following factors—closely related to having few mentors, sponsors, or informal networks—hindered their advancement to a "great" or "very great" extent" (Hewlett et al., 2014):

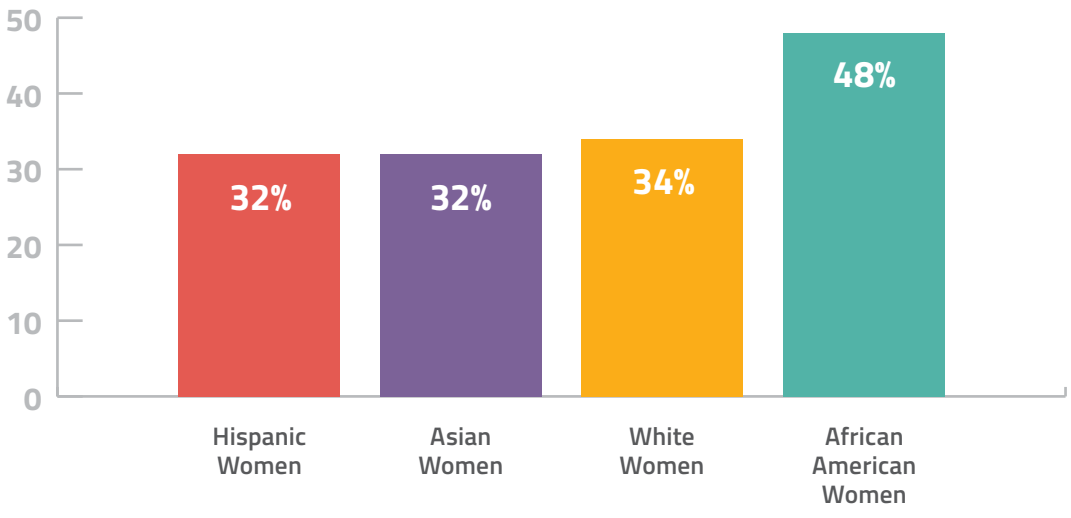
- Having a limited number of important or special job assignments that are highly valued by higher-level managers.
- Not understanding the "unwritten rules" or norms of my company or department.

Women in Technical Fields Find Themselves "Stalled"

Similarly, the Center for Talent Innovation reports that 80 percent of Science, Engineering, and Technology (SET) women "say they love their work," but 32 percent "say they feel stalled and are likely to quit their jobs within a year." (Hewlett et al., 2014).

Feeling stalled also varies by race/ethnicity. As Figure 4.2 details, African American women experience the highest perceived stall rates at 48 percent. Thirty-four percent of White women feel stalled, and 32 percent Asian and Hispanic women feel stalled (Hewlett et al., 2014).

FIG. 4.2 // Women's Perceived SET Stall Rates



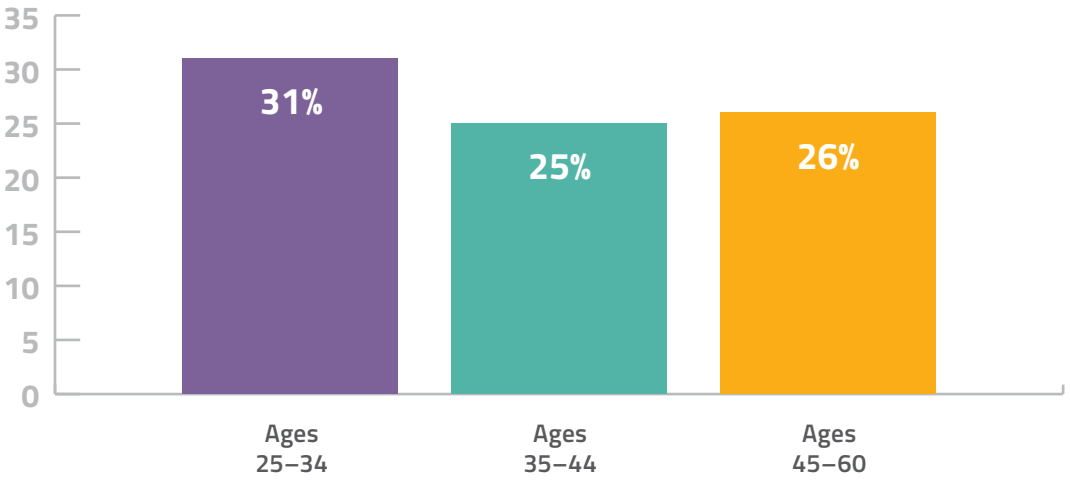
Hewlett et al., 2014

The Center for Talent Innovation also found that women reported being channeled into "execution" roles with less access to more creative or innovative technical roles (Hewlett et al., 2008).

These patterns likely contribute to the fact that technical women report lower levels of satisfaction with their careers than men. This, of course, influences the likelihood that these women will leave the company. A survey of 25 high-profile tech companies revealed only 4 companies with women more satisfied than men, 15 companies with men more satisfied than women, and 6 companies with equal satisfaction (Glassdoor, 2014).

Importantly, as Figure 4.3 illustrates, recent data show that younger, early career women are reporting greater dissatisfaction with their career prospects (Hewlett et al., 2014). This alarming data indicates that these women are not seeing a future for themselves in the field. Companies are not only poised to lose their most experienced employees, as illustrated by prior data on the flight of mid-career women (discussed in Chapter 1), but are now increasingly faced with the threat of relatively new employees leaving the field due to dissatisfaction with these careers.

FIG. 4.3 // Women Who Reported Feeling "Stuck in Place" by Age Group



Rerendered from Hewlett et al., 2014

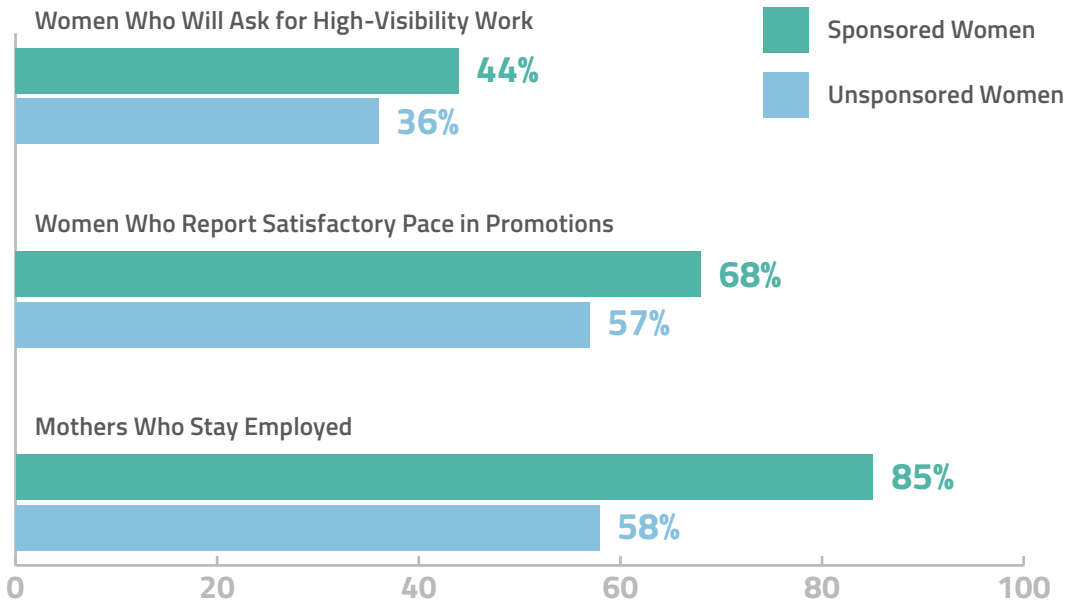
Both this sense of isolation and the feeling of being stalled in one's career often translate to attrition. Women who are isolated are not only *less committed*, but are 13 percent more likely than women who do not report isolation to also report being *unsatisfied* with their job. Women who are not satisfied with their jobs are 22 times more likely to leave than women who are satisfied. Likewise, women without mentors or sponsors are also more likely to leave their companies (Hewlett et al., 2008).

Mentor vs Sponsors: Do You Know the Difference?

A SPONSORING RELATIONSHIP...		A MENTORING RELATIONSHIP...	
PROVIDES	Public and private endorsements & advocacy for highly visible "stretch" assignments, jobs, and promotions.	PROVIDES	Tips, strategies, advice, networking.
ENABLES	Career advancement and positive visibility with senior leaders.	ENABLES	Increase confidence/ competence, reduce isolation/stress, and navigate unwritten rules.
FORMS	At the discretion of the sponsor, who drives the relationship and expects loyalty and performance in return.	FORMS	At the request of a mentee or as a result of a formal mentoring program.
EXISTS	At senior levels of the organizational hierarchy.	EXISTS	At any level of the organizational hierarchy.

The good news is that having a sponsor—or someone who advocates for you publicly within the organization—can help increase women's access to high-visibility work, as well as their promotion and retention rates, as illustrated in Figure 4.4 (Hewlett et al., 2014).

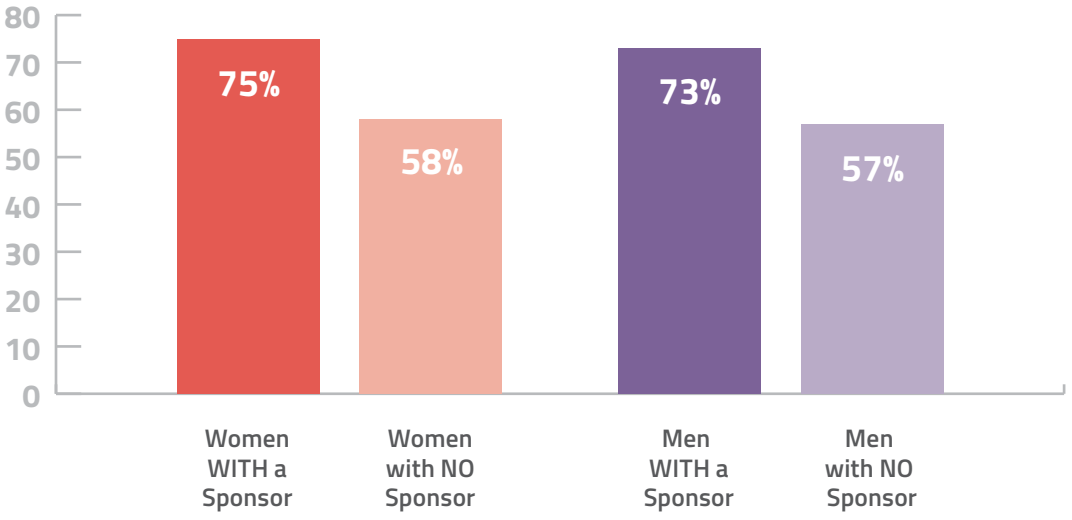
FIG. 4.4 // Sponsored Women Vs Unsponsored Women



Hewlett et. al, 2014

Importantly, having a sponsor can increase satisfaction with job and advancement prospects for both women and men, as illustrated in Figure 4.5 (Hewlett et al., 2014).

FIG. 4.5 // Satisfied With Rate of Advancement and Promotions



Rerendered from Hewlett et al., 2014

PERFORMANCE EVALUATIONS AND PROMOTION: We Tend to Develop and Promote People Who Are Like Us

Gender bias permeates the performance review and promotion process. In one study, almost half (46 percent) of technical women report that gender bias influences performance evaluations (Hewlett et al., 2008). Similarly, 1 in 4 technical women reports that women are often seen as intrinsically less capable than men in their companies. This is higher than in sciences overall where only 16 percent report this phenomenon (Hewlett et al., 2008). In general, technical women are less satisfied with their companies' approaches to fairness and voice than women in non-technical roles, men in technical roles, and men in non-technical roles (Foust-Cummings et al., 2008).

Extensive research on candidate selection processes, recommendation letters, and performance evaluations confirms the prevalence of gender bias in these processes. Myriad studies demonstrate that recommendation letters for men (written by both men and women) tend to be longer and contain more "standout" language (excellent, superb) than letters for women (e.g., Moss-Racusin et al., 2012; Trix & Psenka, 2003). In contrast, letters for women included more "doubt-raisers" ("she had a somewhat challenging personality") and "grindstone" adjectives that made a woman seem like a conscientious secretary (meticulous, reliable). Similarly, men's accomplishments are attributed to effort and individual skill, while women's accomplishments are more likely to be attributed to luck and easy assignments.

In general, across industries and occupations, women more frequently experience what we term *personality penalties* or advice that suggests they are "too abrasive" and need to "tone it down." In addition, preliminary findings from another study on 125 performance evaluations in a tech company document the fact that women receive 2.5 times as much feedback related to their aggressive communication styles as do men. In addition, the researchers found that:

- Women's evaluations contain nearly twice as much language about their communal or nurturing style.
- Men are three times as likely to receive feedback related to business outcomes and twice as likely to garner comments related to technical experience and vision.
- Women's evaluations contain 2.39 times the amount of references to team accomplishments, as opposed to individual ones.

Interestingly, these preliminary findings also suggest that managers are almost 7 times more likely to advise their male employees that their communication style is too soft. This finding, in particular, highlights how men are also held to gender norms— further evidence that both women and men stand to benefit from expanding our schemas when it comes to acceptable gendered behaviors (Simard as cited in Lebowitz, 2015; for more info see http://gender.stanford.edu/people/caroline-simard).

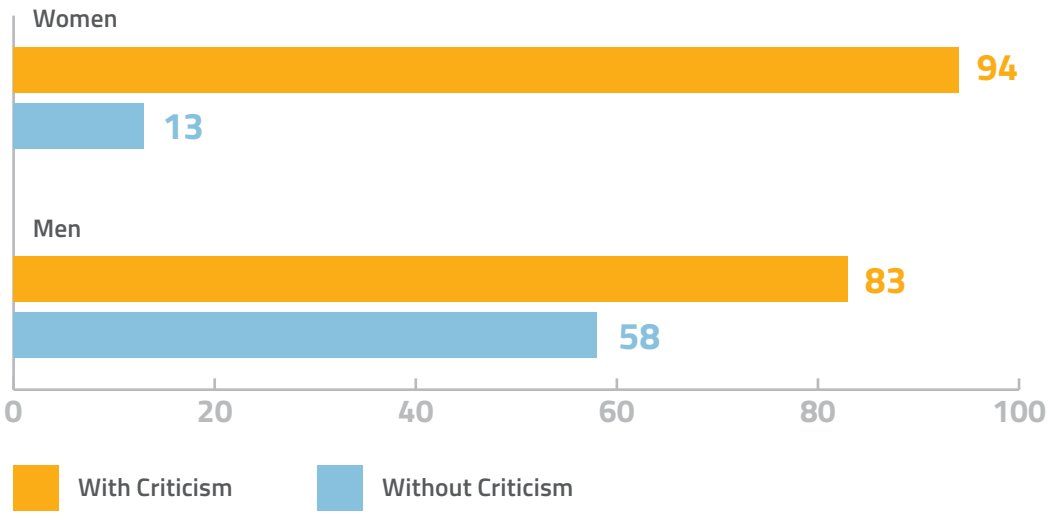
80%
of science, engineering, and technology (SET) women say "they love their work" but

32%
say "they feel stalled and are likely to quit their jobs within a year."

More on Personality Penalties in Performance Reviews

In a preliminary analysis of 248 performance reviews (141 for men; 107 for women), one investigator found the following: Women are more likely to receive critical reviews *regardless of their manager's gender*. Approximately 59 percent of reviews for men contained some kind of critical feedback, as compared to 88 percent of the reviews for women (Snyder, 2014).

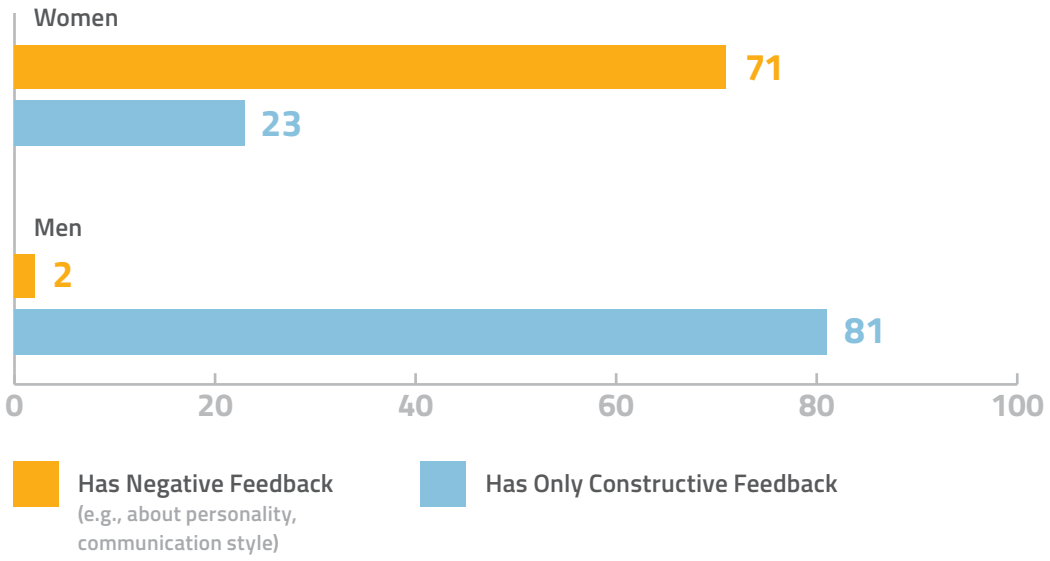
FIG. 4.6 // Reviews Including Critical Feedback



Snyder, 2014

In addition, the *type* of critical feedback received by women and men differed. In the reviews containing constructive feedback, women were far more likely to also receive negative feedback regarding factors like personality or style. Comments such as "You can come across as abrasive sometimes," "Pay attention to your tone," and "Sometimes you need to step back to let others shine" were frequent. As Figure 4.7 illustrates, this type of feedback appeared in 71 of the 94 reviews for women; in the 83 reviews for men, it only showed up twice (Snyder, 2014).

FIG. 4.7 // Kind of Feedback Received in Critical Reviews



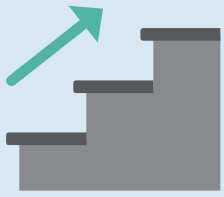
Snyder, 2014

Research also illustrates that bias permeates who gets chosen for leadership development programs or other development opportunities (Warren, 2009). Because organizations rarely make the requirements for promotion to leadership explicit, employees look to senior leaders for cues about the characteristics necessary for advancement. Since senior leadership in tech is predominantly male, these characteristics often reflect more traditionally masculine leadership or communication styles (Warren, 2009). These norms are reinforced in a vicious cycle of who is seen as a "leader" or who is seen as "technical" and who gets selected for leadership or technical opportunities (Warren, 2009).

Establishing Fair and Clear Promotion Criteria Is Key for Retaining ALL Technical Employees

While women are more likely than men to view clear and balanced promotion criteria and processes as important to retention (68.7 percent), a high proportion of men (61.3 percent) also see fair and transparent promotion practices as essential to retaining technical employees.

Simard et al., 2008



For example, many women report that assertive communication styles are rewarded, rather than truly rewarding employee performance. As a female interviewee in one study observed, "You have to be able to blow your own horn. You have to be convinced that you're smarter than everybody else and everybody should listen to you. This is a certain ego trait that I don't think is rewarded in women. It is certainly not seen as feminine...Whereas those same personality traits in men are somewhat admired" (Simard et al., 2008). These dynamics create a significant "double-bind" for many women, where they are penalized whether they exhibit less-aggressive styles or more-aggressive styles. The former clash with the culture and the latter are (often implicitly) seen as inappropriate or inconsistent with stereotypical or "appropriate" feminine characteristics (Simard et al., 2008).

Challenging gendered norms benefits all talented employees, including men, with less-"aggressive" styles.

Research suggests that many of the characteristics valued by both technical men and women as important for success are not rewarded or seen as criteria for promotion by companies. In one study, both mid-level men and women strongly valued teamwork and collaboration as important for success. The majority of interviewees, however, also described highly competitive evaluation processes, where they were judged "on a curve" or placed on rank-lists. These processes force managers to fight it out if they wish to receive higher rewards for their employees (Simard et al., 2008). Revising these processes and revisiting the implicit or explicit criteria for advancement will benefit all employees and help the organization capitalize on a wider variety of strengths and abilities.

Executive Presence: A Word of Caution

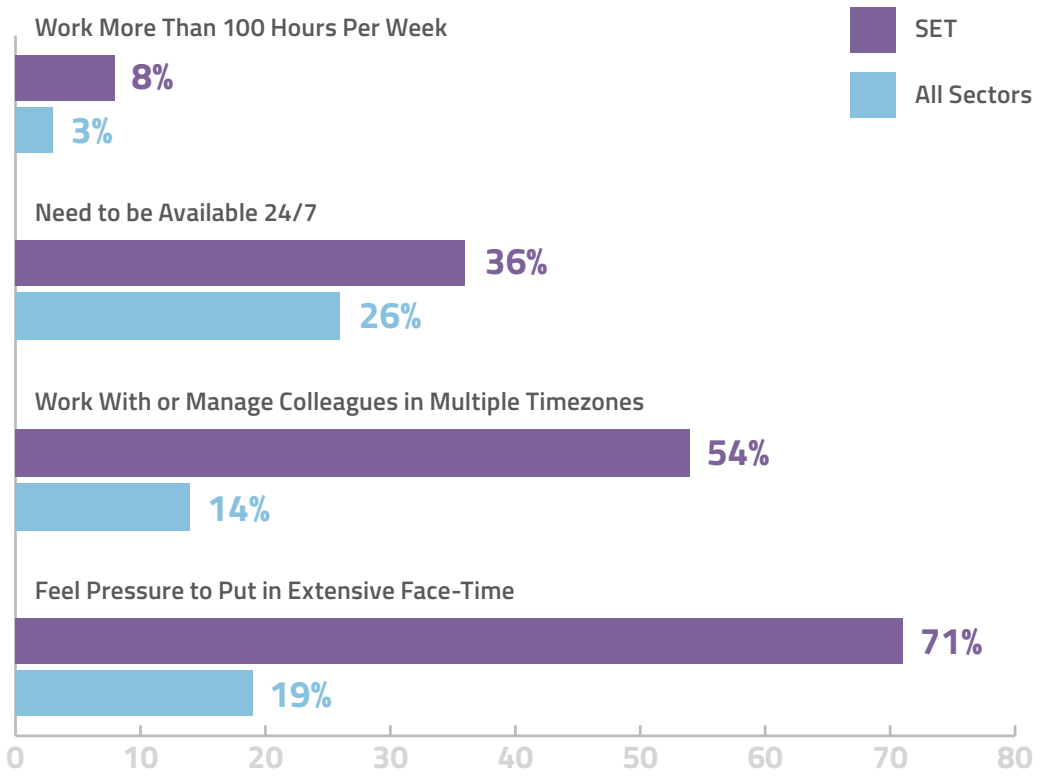
Executive Presence is an increasingly popular area for professional development in tech workplaces. Senior leaders surveyed in one study report that "Executive Presence"—or that "aura of authority, expertise, and confidence that marks you as someone who is, or deserves to be, in charge"—accounts for 26 percent of what it takes to get promoted (Hewlett et al., 2014). However, what counts as that "aura of authority" often contains hidden biases that are based on traditionally masculine leadership styles. As a result, these types of programs run the risk of taking a "fix the individual" approach. As one former project manager at a tech giant from Hewlett et al.'s (2014) study noted, "What does it take to be considered leadership material? "I think you have to be a man."

Unless implemented very carefully, these programs are likely to reproduce biases rather than challenge them unless they simultaneously implement a "fix the system" approach that focuses on expanding the definition of what counts as executive presence.

COMPETING LIFE RESPONSIBILITIES: Failure to Provide Flexible Options Has Consequences for ALL employees and for the Company

Women in SET report experiencing significantly more pressure to put in "face time" and to be "available 24/7" than do women in other sectors (Hewlett et al., 2008).

FIG. 4.8 // Extreme Job Pressures: Women in SET Compared with All Sectors



Rerendered from Hewlett et al., 2008

Additional pressures to working extreme hours include:

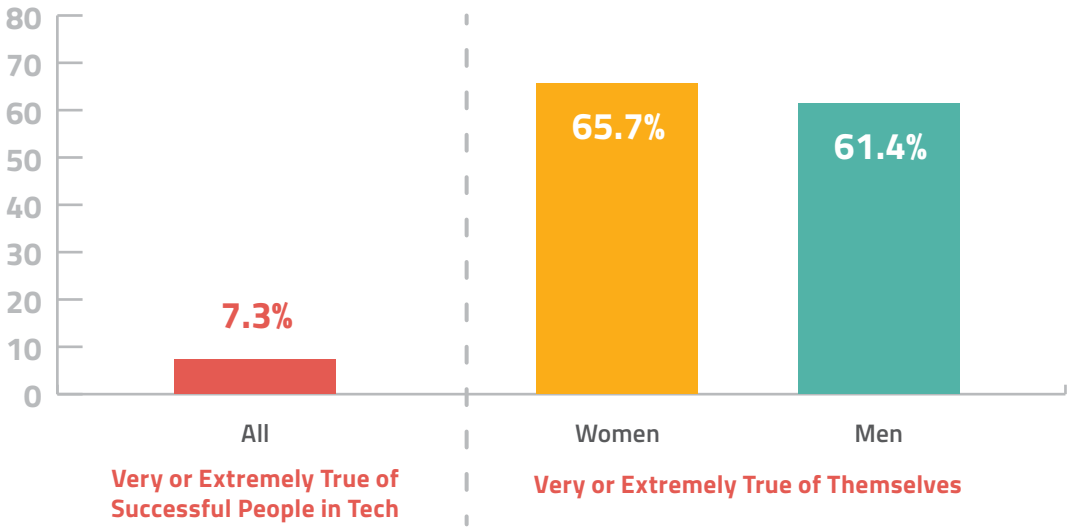
- "Relocation or relegation"—that is, the idea that one must be willing to relocate or their work will be relegated to others—a norm which favors men and younger single employees without family concerns.
- Shorter runway for "career takeoff " and a more rapidly changing industry as compared to other non-SET industries.

These pressures often make it difficult for employees to access flexible work schedules and manage competing life responsibilities such as family care (Hewlett et al., 2014).

Interestingly, both men and women believe that being family-oriented is not associated with success in technology. Many mid-level women report experiencing a "family penalty" where supervisors assign them less important or fewer high-visibility tasks. Likewise, many men also experience family responsibilities as a potential roadblock to advancement.

In fact, as Figure 4.9 illustrates, only 7.3 percent of mid-level technical employees agreed that successful technologists are family-oriented. At the same time, however, more than 60 percent of these same women and men described themselves as family-oriented. This disconnect can have very real consequences for all employees and for the company that risks losing their talent (Simard et al., 2008).

FIG. 4.9 // "Family-Oriented:" Attribute of Success Versus Self-Perception Among Mid-Level Technical Men and Women



Rerendered from Simard et al., 2008

As Figure 4.10 shows (Simard et al., 2008), among mid-level technical employees who are married/partnered:

- Mid-level women are more than twice as likely as men to have a partner who works full time.
- Mid-level men are almost four times more likely than women to have a partner who assumes the primary responsibility for the household/children.

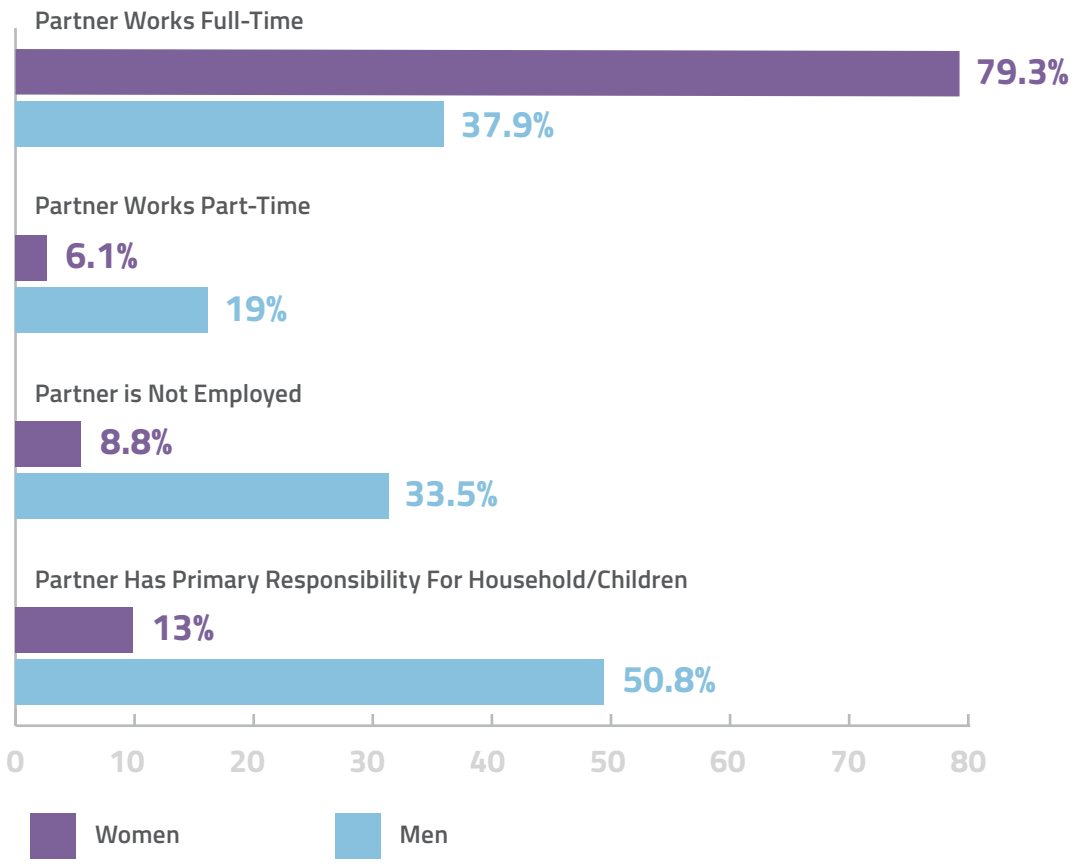
Many mid-level women commented that the "motherhood assumption" was a barrier to their career success, while some male interviewees perceived motherhood as a barrier to women as well.

Some Heads Count More

Some technology companies' use of a single "head count" method makes it difficult for managers to offer flexible schedules, even though they are available in theory. This method involves determining and distributing workgroup resources using a "head count" of whether each employee is part-time or full-time. Therefore, a manager who allows an employee to work a 60 percent schedule will not realize the additional 40 percent of resources allocated back to his or her group. This deters many managers from agreeing to part-time or similar flexibility arrangements.

Simard et al., 2008

FIG. 4.10 // Household Characteristics of Partnered Mid-Level Technical Workers, by Gender



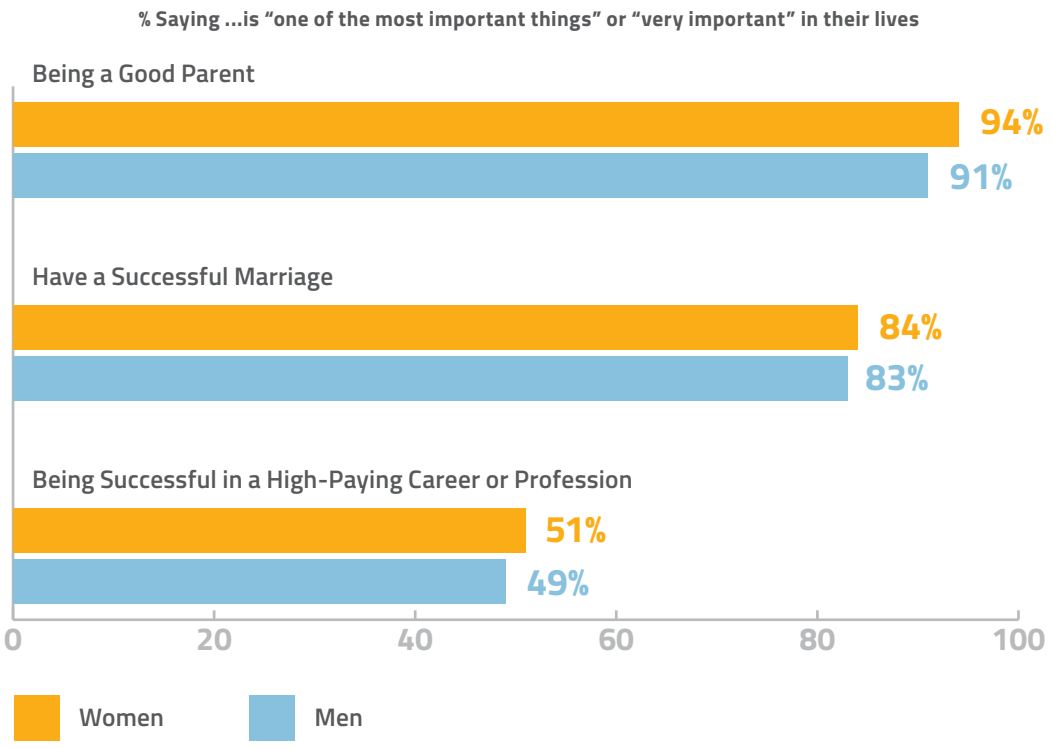
Rerendered from Simard et al., 2008

Work-life concerns are increasingly important to both women AND men. As Figure 4.11, illustrates men and women are quite similar in the value they place on being a parent and having a successful marriage, with both ranking these as significantly more important than having a high-paying career (Pew Research Center, 2012).

Interestingly, as seen in Figure 4.12, in recent years and for the first time ever, young women have surpassed men in ranking a "high-paying career or profession" as "very important" in their lives (Pew Research Center, 2012).

These trends indicate that policies supporting competing responsibilities are increasingly vital if companies are to attract, retain, and benefit from the talent of employees of all genders.

FIG. 4.11 // Family Highly Valued for Men & Women



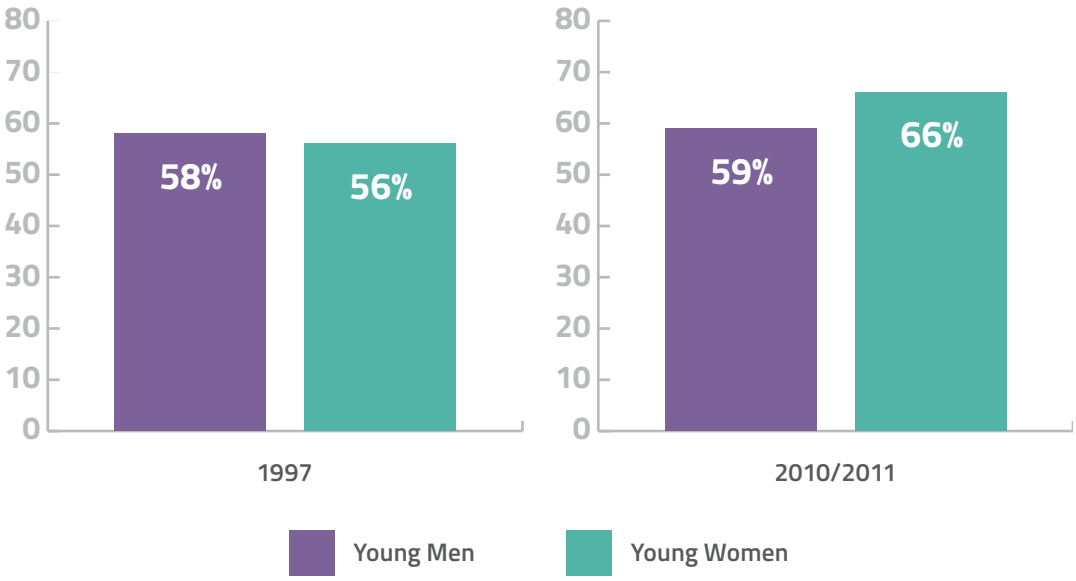
Rerendered from two Pew Research Center surveys from Dec. 6-19, 2011, and Jan. 14-27, 2010. Patten & Parker, 2012.

Inflexible Flexibility

Interestingly, mid-level employees more often reported that *informal* company practices—not *formal* company policies—made securing a flexible schedule difficult. For example, while flexible work schedules are often "technically" available, managers make accessing these schedules difficult, either through their authority or through informal comments. Women and others who take advantage of flexible scheduling often experience subtle reminders that they have been given "special treatment" and, as a result, end up working extended hours. These comments, combined with the lack of a "family-oriented" workplace culture, lead many women or others who temporarily take part-time positions to believe they are taking a "step down" on the career ladder (Simard et al., 2008).

FIG. 4.12 // Career Importance for Young Men and Women

% of 18–34 year olds saying being successful in a high-paying career or profession is "one of the most important things" or "very important" in their lives.



Rerendered from two Pew Research Center surveys from Dec. 6–19, 2011, and Jan. 14–27, 2010.
1997 data from Washington Post/Kaiser/Harvard Univ. survey, Aug. 14–Sep. 7, 1997. Patten & Parker, 2012.

Evidence suggests that employers significantly underestimate the importance of flexible arrangements for employee retention and job satisfaction. While not specific to tech, this evidence suggests an important disconnect.

One large-scale study found that while 86 percent of workers responded that work-life balance and fulfillment are top career priorities, only 12 percent of employers surveyed believed these to be crucial to hiring and retention (Spherion, 2009).

Similar studies have shown that employers often underestimate the importance of workplace flexibility. For example, another study found that 75 percent of employees ranked workplace flexibility as the most important benefit employers offer, but only 50 percent of employers thought that flexibility was that important to employees (CareerArc, 2015).

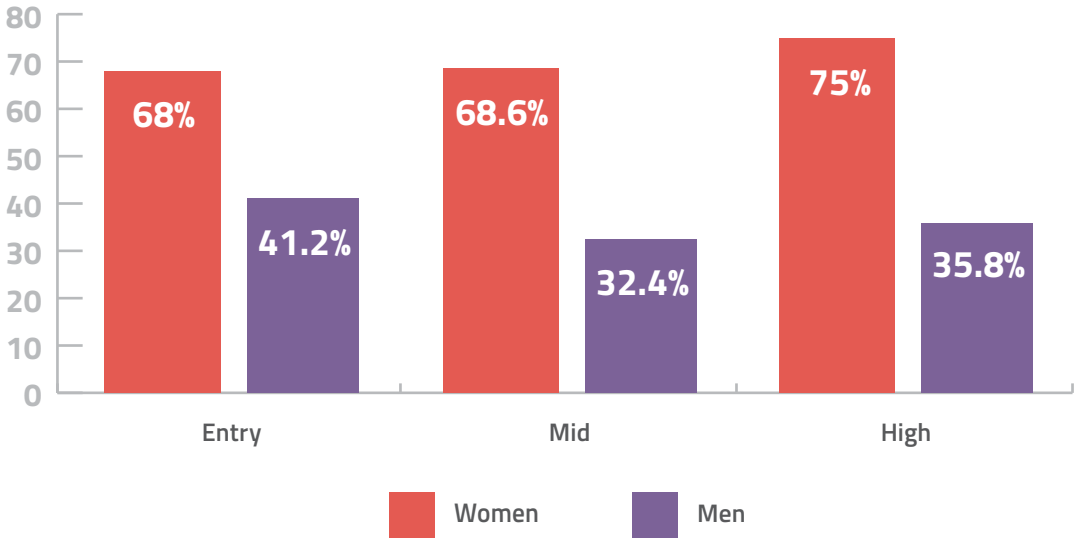
Likewise, employers often underestimate the increases in productivity that flexibility can bring. For example, one study showed that despite high levels of initial skepticism, after seeing flexible work policies in place for a few months, 98 percent of managers reported no negative impact and many reported positive effects: 53 percent reported team interaction improved; 24 percent said customer service improved, and 20 percent said productivity had improved (Cavanaugh, Sabatini Fraone, & Kacher, 2015).

And the Plot Thickens: Dual Tech Career Households Can Make the Need for Work-Life Policies Even More Urgent

Nearly 70 percent of partnered mid-level technical women (vs. 33 percent of men) have partners who also work in technology.

Thus, not only do women at the mid-level work and live in dual-career households, but both partners often work within the constraints of technology careers. This means these constraints are more likely exacerbated for these women (Simard et al., 2008).

FIG. 4.13 // Percentage of Partnered Respondents in Dual Technical Career Households, by Gender and Level



Rerendered from Simard et al., 2008

CONCLUDING THOUGHTS

These difficulties in accessing flexible schedules result in serious consequences for not only women's retention and advancement but increasingly for the retention and advancement of all employees. Additionally, they can cost the company in other areas: increased turnover and reduced innovation, productivity, and efficiency.

05 GETTING STARTED:
Taking an Ecosystem Approach

CHAPTER SNAPSHOT

Setting the Stage for Success: A word about research-based approaches to change.

Taking an Ecosystem Approach: Overview of the NCWIT Industry Systemic Change Model.

Getting Started: Important first steps.

- Enlist top leadership support.
- Educate managers.
- Ensure data transparency and accountability.

Final Thoughts: Male or "majority-group" allies also matter.

Key Takeaways

- Addressing the barriers to diverse participation in tech requires a strategic and multi-pronged approach to change.
- The NCWIT Industry Systemic Change Model (see Figure 5.1) identifies the key focus areas for creating more inclusive and productive environments.
- You can start small with individual pieces of the puzzle, but these pieces should be part of a larger strategic plan for change.
- Getting started involves three key foundational steps: 1) enlisting top leadership support, 2) educating managers, and 3) collecting appropriate data to lay the groundwork for informed change efforts.
- It is also important to make explicit the important role that male (or majority-group) allies and advocates can play in accelerating change.

SETTING THE STAGE FOR SUCCESS: A Word About Research-Based Approaches to Change

It is vital to set the stage for success by dispelling some common misperceptions and making sure that change efforts are informed by research.

Research-Based Change Efforts:

- **Are not about blame; they are about working together to address biases we all share.** Minority-groups are not broken or in need of fixing, and majority-groups are not the enemy. We all grow up in a society where we develop similar kinds of implicit biases. The good news is that we can take action together to address these biases.
- **Are not about lowering standards; they are about making sure that you're not inadvertently missing out on the "best candidates."** Though tech often prides itself on being a meritocracy, research shows that this is not the case. Subtle biases affect who we are predisposed to see as the "best." Without even realizing it, companies may be creating conditions that cause candidates to underperform and that cause them to miss out on highly qualified talent.
- **Are not only about the "pipeline;" they are also about changing your own organizational culture.** First, while pipeline efforts are important, it will do little good to increase the "pipeline" if companies can not retain employees once they get there. Second, the metaphor reinforces faulty assumptions that people primarily enter the technical workforce through traditional pathways—when we know many people enter through alternative pathways. Furthermore, the pipeline often functions more like an obstacle course, where underrepresented groups encounter biases and barriers that cause them to leave the field. Third, the pipeline metaphor encourages us to think in terms of a "one-way" flow, but in reality, the "pipeline" flows both ways. Perceptions about conditions in the technical workforce trickle down to students, causing them to question whether these are careers that they want to pursue.
- **Are not "women's issues" or issues for underrepresented groups; they require actively involved "male allies" or "majority-group members" in change efforts.** These issues are human issues and business issues; therefore, we need all hands on deck. Framing approaches as "for women" or "for underrepresented minorities" fails to recognize the ways that these change efforts will benefit all employees, as well as the business itself. Effective practices are framed as for everyone and are mainstreamed into the experiences of all employees.
- **Are not about fixing people; they are about changing the environment.** Teaching women to be more "confident," to "lean in," or to have better "executive presence" will not change the system. This kind of professional development can help a few individual women, as well as men, advance, but it will not bring about systemic change. Such advice also ignores the fact that women often implement strategies that make them seem "less confident," "too diplomatic," or not "direct enough" as a way to survive a system that otherwise perceives them as too aggressive. If companies do not change the system that makes these behaviors necessary, real change will not occur.

MORE

See NCWIT's **Critical Listening Guide** for more information on the above principles. Repeatedly communicate these ideas to employees and managers (e.g., through talks, email tidbits, newsletters, formal trainings) in order to create a shared understanding about effective approaches to increasing diverse participation.

TAKING AN ECOSYSTEM APPROACH: Overview of the NCWIT Industry Systemic Change Model

Creating an Ecosystem

To realize the benefits of diverse talent, companies need to employ a multi-pronged approach. Instituting piecemeal practices may be helpful in some cases but will not result in sustained, systemic change. Drawing from the latest research, NCWIT Senior Research Scientist Catherine Ashcraft developed the following model for how companies can effectively address key factors that affect women's participation in information technology. The two elements at the center of the model are vital for the sustained success of all other efforts: **1) establishing top leadership support and institutional accountability and 2) improving the managerial relationship.** Without these foundational efforts, other reforms are less likely to have the desired impact.

FIG. 5.1 // NCWIT Industry Systemic Change Model

GETTING STARTED: Important First Steps

Enlist Top Leadership Support

Ensure that leaders of diversity efforts include high-level executives and senior employees who actually have the authority to make, carry out, and enforce necessary decisions. These leaders need to be visibly involved and hold diversity committees and other diversity efforts accountable for

reaching their goals. For example, in one study of more than 700 private sector companies, the most effective strategy for increasing and advancing diversity was establishing diversity committees with senior leadership and holding them accountable for reaching clearly articulated diversity goals. This strategy increased the odds of holding management positions by 19 percent for white women, 27 percent for black women, and 12 percent for black men. The effectiveness of other efforts such as diversity training and mentoring also improved when used in conjunction with top leadership support and institutional accountability (Kalev, Dobbin, & Kelly, 2006).

Educate Managers

Focusing efforts on improving the managerial relationship is crucial for two reasons: 1) research that suggests employees leave managers, not companies, and 2) the managerial relationship overlaps with and exerts significant influence on all of the other change areas in the model. Even if an organization has excellent policies and programs in place, these will be of little good for employees whose managers do not allow them access to these policies or programs. Change efforts must include educating managers about bias and ways to address it early in the change process. For concrete resources that help managers create high-performing, diverse technical teams, see **www.ncwit.org/supervising.**

The most effective strategy for increasing and advancing diversity was establishing diversity committees **WITH SENIOR LEADERSHIP.**

Ensure Data Transparency and Accountability

Developing a diverse workforce needs to be treated like any other critical business concern. One of the first steps in creating a company's strategic plan should be to gather data on the current state of diverse participation. In general, this involves:

- Collecting demographic data on relevant metrics in your company—e.g., disaggregating technical from non-technical roles; data on what ***kinds*** of technical roles (e.g., creative vs. support) women and other underrepresented employees hold.
- Comparing and contrasting these data with national and international benchmarks .
- Conducting a climate analysis to collect experiential data about employee perceptions of the current environment.

This data will help companies decide which areas of the change model they should focus on first. Companies should then set *top-level targets* for progress (e.g., percent increases in number of women and racial/ethnic minorities hired this year; increases in promotion rates or decreases in attrition rates for underrepresented employees).

After deciding which areas to target and what practices, programs, or interventions to implement, be sure to evaluate the effectiveness of these programs. These evaluation data are important for letting companies know the effectiveness of these programs and how they might refine them. These data also can provide you with *intermediary metrics* that help you know whether or not you are making progress even if your top-level targets are not met as quickly as you may like.

The other key component of data collection is *transparency*—whether it be *internal transparency* or *external transparency* with the public. It is increasingly considered industry standard for technical companies to publicly release their diversity data. These trends are an important break with historical patterns that discouraged the release of such data.
As the adage goes, what gets measured is what gets done. With this in mind, external data transparency can be an important step in building trust, adding to the knowledge base of

what works, and in measuring progress going forward.

If your company is unable to go public with its data at the moment, *internal transparency* is still a must for creating real change. Organizations should identify the key stakeholders and what data they need access to in order to measure progress and implement effective change. See **NCWIT's Data Collection & Strategic Planning Guide** for detailed information on data collection, transparency, and strategic planning.

FINAL THOUGHTS: Male or "Majority-Group" Allies Also Matter

Why include men and other majority-group (e.g., white, heterosexual) advocates in efforts to diversify participation in technology?

"Majority-group" allies and advocates are key for successful change efforts in majority-minority workplaces or environments. While anyone can make change, majority-group advocates (e.g., male or white advocates) often have more power and are in a better position to make significant change with less risk.

Increasing diverse participation is not a women's issue or an issue that is only relevant to underrepresented groups. Diversity and inclusivity are business issues, and they are human issues. **Research shows that businesses profit from diverse perspectives that bring innovation and company competiveness.**

Majority-group members benefit from increased diversity. People of *all* genders are held to restrictive standards around gender, racial, and other identities that limit their potential and the kinds of things they are able to do. Since these are issues that impact us all, we should all come together to work on them. Additionally, recognizing the benefits of increased diversity to all employees dismantles claims that "special privileges" or "special help" is being given to underrepresented technologists.

Men make up the majority of technical leaders, so they are often in a better position to put some of these practices into place. Men currently hold a majority of formal and informal positions of power in tech, so they are able to have a great deal of influence on the current climate—whether it be in subtle everyday moments or in changing larger systems.

Read more about NCWIT's **Male Advocates research** (Ashcraft, DuBow, Eger, Blithe, & Sevier, 2013), and share our **Fast Company article** (Ashcraft & DuBow, 2015) for a quick overview about the importance of male allies and potential challenges to majority-advocates. Use NCWIT's **Male Allies Toolkit** to engage male allies in diversity and inclusion efforts.

> **"85% of our leaders are men in this company, and if they are not advocates, then the culture won't change—we won't have the right environment."**
>
> **—NCWIT Male Ally and Advocate Interviewee**

MINORITY-GROUPS ARE NOT BROKEN

or in need of fixing, and majority-groups are not the enemy. We all grow up in a society where we develop similar kinds of implicit biases.

THE GOOD NEWS IS THAT WE CAN TAKE ACTION TOGETHER TO ADDRESS THESE BIASES.

06 NEXT STEPS: USING THE NCWIT INDUSTRY SYSTEMIC CHANGE MODEL to Improve Recruitment, Retention, and Advancement of a Diverse Workforce

CHAPTER SNAPSHOT

- **Subtle Biases in Everyday Interaction:** Five "bias interrupters" that everyone can start implementing right now.
- **Recruitment and Selection:** Making sure you *really* find and attract the "best" candidates.
- **Employee Development:** Creating a "growth mindset" environment and ensuring access to core, creative tech roles.
- **Performance Evaluation and Promotion:** Examining biases and establishing clear criteria.
- **Support for Competing Life Responsibilities:** Removing stigma and framing as important for ALL employees.

Key Takeaways

- There are several small steps that everyone can start doing today in order to make change. These include helping to ensure productive team meetings where all members can contribute, intervening when you hear "personality penalties" or other kinds of potentially biased comments being made, sharing your story as a member of an underrepresented group in tech or as an ally, and providing legitimate encouragement to take risks and new opportunities.
- When it comes to recruitment, organizations can take multiple steps to address bias, including rewriting job ads, expanding recruiting venues and strategies, analyzing interview questions and practices for potential biases, and auditing recruiting materials and physical office environment for potential biases.
- It is important to foster a "growth mindset" (Dweck, 2006) throughout the organization, examine task assignment patterns for biases, consciously create visibility and development opportunities for underrepresented employees, and engage in active sponsorship.

- Examining potential biases in performance evaluation criteria, discussions around promotion, and other promotion or advancement processes are also important for sustained change.
- Organizations can take several important steps related to flexible work, including offering an array of options and on-ramp/off-ramp opportunities, removing the stigma that is sometimes associated with taking advantage of these options, doing away with or modifying policies that penalize departments or units for having part-time employees, and encouraging senior leaders and managers to model flexible practices.

FIG. 6.1 // NCWIT Industry Systemic Change Model

Technical organizations need a multifaceted approach to encourage diverse talent to come, stay, and thrive. In Chapter 5, we introduced the NCWIT Industry Systemic Change model and discussed three important foundational steps for getting started: **(1) establishing top leadership support and institutional accountability, (2) educating managers and improving managerial relationships, and 3) ongoing data collection/transparency.** Here, we will focus on how you can use the remaining areas of the change model to implement promising practices.

CHANGE MODEL FOCUS AREA #1

SUBTLE BIASES IN EVERYDAY INTERACTION: Five "Bias Interrupters" That Everyone Can Start Implementing Right Now

Below, we highlight five key ways individuals can help interrupt subtle biases that seep into daily organizational life. While involving everyone in these changes today can bring real change to technical workplaces, these bias interrupters (Williams, 2014) can be especially important for male or majority group allies to take on.

SUBTLE BIASES often result in women and people of color experiencing "personality penalties" more often than majority group members.

Tip 1: Ensure Productive Team Meetings Where All Employees Can Contribute.

The best meetings include a cacophony of voices. The tips below will help foster diverse voices and will go a long way to reducing stereotype threat and other subtle biases that lead some employees to being interrupted more often or not getting credit for their ideas.

- **Solicit the opinion of quieter employees during the meeting or after the fact.** Ask to hear from the quieter employees or approach them later to see if they had ideas they would like to share.
- **Intervene when someone is being interrupted or not getting credit.** Simply commenting along the lines of, "Let's let _____ finish, and then we'll come back to you" can make a big difference.
- **Find a meeting ally who can support you and help notice subtle biases.** If you are the person facilitating a meeting, it can be hard to keep track of all the contributions and directions. Invite a partner to be on the look out for tracking who has spoken, where ideas originate, who wanted to contribute next, and so on.

Tip 2: Listen for and Correct "Personality Penalties."

As discussed in Chapter 4, subtle biases often result in women and people of color experiencing "personality penalties" more often than majority-group members. These include being labeled as "pushy, aggressive, or having a challenging personality" or being told that they could "tone it down a little" and "let others shine." Watch out for instances where you may make these comments and intervene when you hear others make them. Ask questions like: "What do you mean by that exactly?" or "Do you think we might be operating on some hidden biases here?"

Tip 3: Share Your Stories to Enlist More Allies and Advocates.

Research shows that stories motivate people to act! Share your own experiences as a woman, member of an underrepresented group, or as a male or majority-group ally. While a business case may get allies theoretically on board with industry changes, it often takes personal stories to move people to action.

Stories Inspire Action

Consider the following example from an interviewee in **NCWIT's study on male allies and advocates**:

"When it finally started to hit me about gender diversity…We were in a big meeting and…she made a comment about how difficult it was for her to be a leader in the organization as a woman. And so, here is someone who I literally was putting on a pedestal saying this…And I…was like, 'Wow!' So I asked her after the meeting… "Hey I want to go to lunch with you, I want to understand this!"

Hearing how this female colleague who he admired struggle with gender discrimination and biases made him want to understand how to promote change and sparked his ongoing role as a male ally.

Tip 4: Talk to Other Men (or Majority-Group Members) and Make it Okay to Make Mistakes.

Anyone can do this, but it is often an easier task for male or majority group allies. Here are some ideas you might try:

- Talk about the kinds of challenges underrepresented groups encounter in IT.
- Share your personal experiences as a person in a minority position or talk about your experiences as a male or majority group ally.
- Discuss research findings about bias problems and change solutions.
- Remind men that we *all* experience unconscious bias and can work to challenge it, such as through sharing **NCWIT's unconscious bias video** and debriefing after.
- Emphasize that it is okay to make mistakes and take risks to have a conversation. Sometimes people are afraid to have a conversation because they might "say something wrong" or "not get it all." Endeavoring to have the conversation, even if it has awkward moments, is important when you are sharing experiences and research about problems and solutions.

Make it Okay to Make Mistakes and Learn!

"Every person that becomes an advocate had to go through that door where they take the first risk and realize, 'Oh, that wasn't so bad.' So I would talk about the risk-taking that you take the first or second time and how, all of a sudden, it is no longer risk-taking."

Interviewee from NCWIT's Male Ally and Advocate Research

Tip 5: Provide Legitimate Encouragement.

Research shows that simply encouraging others to apply for a certain position or take on a certain role can go a long way toward mitigating stereotype threat. Such encouragement is important for all employees but is particularly important for minority members in a majority-group environment.

CHANGE MODEL FOCUS AREA #2

RECRUITMENT AND SELECTION: Making Sure You *Really* Find and Attract the "Best" Candidates

Remember diversifying the tech workforce is NOT about lowering standards; it is about making sure that you're not missing out on "highly qualified" talent even when it's right before your eyes. Though tech often prides itself on being a meritocracy, a wealth of research shows that it is not that simple. Subtle biases affect who we are predisposed to see as the "best" and often cause us to miss out on highly qualified talent. In addition, while it may seem like we are all operating in the same workplace or environment, research shows that these biases also affect how we experience the environment and how we perform in it. For a summary of this research, see page 23.

REMEMBER
Diversifying the tech workforce is **NOT** about lowering standards; it is about making sure that you're not missing out on "highly qualified" talent even when it's right before your eyes.

TIPS/RESOURCES

Examine job announcements/criteria for bias. Consider the following kinds of questions:

- Does the language subtly reflect stereotypically masculine or feminine characteristics?
- Are all of the criteria listed relevant for the job, or do some criteria reflect biases about the kind of skills needed to do this job well?
- Could additional criteria be included that would open up possibilities for a wider range of candidates who might still do an excellent job?
- Do you include criteria such as "ability to work on diverse team or with a diverse range of people"?
- Do you include the phrase "salary is negotiable?" Research shows that this significantly reduces the pay gap between female and male hires (Leibbrandt & List, 2012).

Check out the NCWIT **Checklist and Tips for Writing Better Job Ads** to assist you in creating better job ads.

Advertise and recruit in a variety of venues that target diverse audiences.

- Recruit where women and underrepresented minorities have group memberships. For example, consider **AspireIT** or universities that have clubs and programs for underrepresented computing professionals.
- NCWIT also offers connections to talented young women through **Aspirations in Computing** where our alliance members can offer them internships and other work-related opportunities in computing.

Consider anonymous resume and interview processes. New software and interview protocols purport to assuage such biases. Although not currently tested in research, there is potential to explore anonymous review further given success in some other industries.

Ensure diverse interview teams. Just as research shows that diverse work teams make better, more innovative decisions, we can apply this same logic to interview teams. If your technical team is currently all male, invite employees from other areas to be involved in the hiring committee. And remember, diverse hiring teams are good for *all* candidates, not just underrepresented ones, as such interview teams can engage in thoughtful and even divergent decision-making conversations together to make the best choices.

Examine interview questions and selection criteria for biases. Many of us begin new hiring rounds by recycling old questions. A new hiring process is a good time to rethink selection criteria. Try to:

- Check for unconscious bias in your current questions and be open to writing new questions.
- Seek out sample questions from peer organizations that have successfully hired diverse technical teams.
- Make sure your final questions really capture the relevant job criteria for this particular posting.
- Reconsider hostile, "defend your code" interview practices. Such practices can trigger stereotype threat.

Check out **NCWIT's Recruitment & Selection Toolkit** in its Supervising-in-a-Box series for tools to help you evaluate and rewrite interview questions.

Analyze the physical office environment. As you prepare to bring in candidates for interviews, review the physical space. Just as you want to "tidy your house" for guests, you want to give job candidates a welcoming first impression of your office. For example, research shows that a working space that uses "geeky" stereotypes (e.g., comics, stacked soda cans, computer parts) is less appealing and communicates a lower sense of belonging to young women and to young men who do not resonate with "geeky" characteristics (Cheryan et al., 2011; Cheryan et al., 2009).

Watch out for "red flag" statements. In hiring conversations, be on the look out for coded biases in language. For example, phrases like "That candidate isn't a good fit," or "We're just looking for the 'best' candidate" ignore the fact that there is no one definition of what makes an ideal candidate. Such phrases are often codes for biases. When these statements are made, stop to examine what is really going on. Have people articulate what they mean by "not a good fit."

Create/promote alternative pathways to technical careers. Implement policies or programs that make it possible to recruit and hire internally, from non-tech positions, from a diverse range of institutions, and from alternative programs such as military spouse programs, return-to-work, and community college programs. Advocate for these policies company-wide if possible.

Systematically track demographics of candidate pools and successful hires. It is hard to know how you are improving with your hiring unless you are tracking it.

For more information and concrete resources, see the Recruitment & Selection Toolkit in NCWIT's Supervising-in-a-Box series available at **www.ncwit.org/supervising.**

CHANGE MODEL FOCUS AREA #3

EMPLOYEE DEVELOPMENT: Creating A "Growth Mindset" Environment and Ensuring Access to Core, Creative Tech Roles

WATCH FOR
Biases in task assignment by tracking what **KIND** of tech roles underrepresented employees hold.

Once technical women and people from other underrepresented groups are recruited and hired, it is important that equity efforts do not stop there, especially given high transition and quit rates due to lack of job satisfaction. In fact, all employees benefit from organizations that are committed to their development and growth throughout their careers. This section will review some resources for developing current employees to encourage their satisfaction, growth, and retention in your organization.

TIPS/RESOURCES

Establish a "growth mindset" environment (Dweck, 2006). A wealth of research shows that, for the most part, talent and ability are not fixed or innate. Yet many technical organizations operate with a "fixed mindset" that either you have "what it takes" or you do not. Fixed mindsets tend to exacerbate biases as we tend to presume that those who are most like us or most like those who have been successful in the past are the ones who "have it" (Leslie, Cimpian, Meyer, & Freeland, 2015). Research shows that fostering a "growth mindset" helps organizations create inclusive environments and makes it more likely for employees to develop their full potential. For tips on how to create a "growth mindset" environment, see **NCWIT Tips to Give Employees More Effective Feedback Using a Growth Mindset.**

Track what kind of tech roles women are in. While tracking the number of women in tech vs. non-tech jobs is important, it also matters what **KINDS** of technical jobs women and other underrepresented groups occupy. Are they in core, creative roles? Are they able to make meaningful contributions to innovation? To assess this, consider **collecting data on who is represented in leadership roles, creative and core technical roles, patenting, and so on**. This will help you know where to focus employee development efforts.

Actively invite and encourage underrepresented employees to take on creative roles, tasks, or projects. Often employees find out about these opportunities through informal networks, but it is often more difficult for underrepresented employees to access these networks. Likewise, given the presence of stereotype threat, underrepresented employees are sometimes harsher critics of their work or reluctant to take opportunities that may seem risky. As a result, actively and personally inviting underrepresented team members can make a big difference and can illustrate your belief in their capabilities to take on such roles.

Create company-wide development opportunities for employees to participate in technical professional development on company time. Also create specific opportunities for *leadership and management* development. Adjust workflow to allow employees to take advantage of these opportunities since many employees cite a lack of time due to work responsibilities as the number one barrier to updating technical skills (Simard, et al., 2008).

Analyze selection criteria for high-potential or leadership development programs. Reviewing criteria for who is encouraged to apply or is invited to development programs is important. One bias that occurs in such programs is that we tend to select people who are like ourselves for these programs (e.g., "She reminds me of me, a real self-starter!"). If we create criteria that only seek out "mini-me"s or people with similar backgrounds to our own, we are missing out on important leadership talent.

Help managers examine task assignment processes for bias. Educate managers and others about how biases shape who gets assigned to what tasks and what teams. Look for patterns in who gets assigned the high-reward or high-visibility tasks versus who gets assigned high-risk or "scapegoat" tasks. Try increasing more informal visibility opportunities such as speaking roles at meetings and events, leadership opportunities on special projects, etc. For tools to do this, see the **Employee Development** & **Team Management Boxes** in the NCWIT Supervising-in-a-Box series.

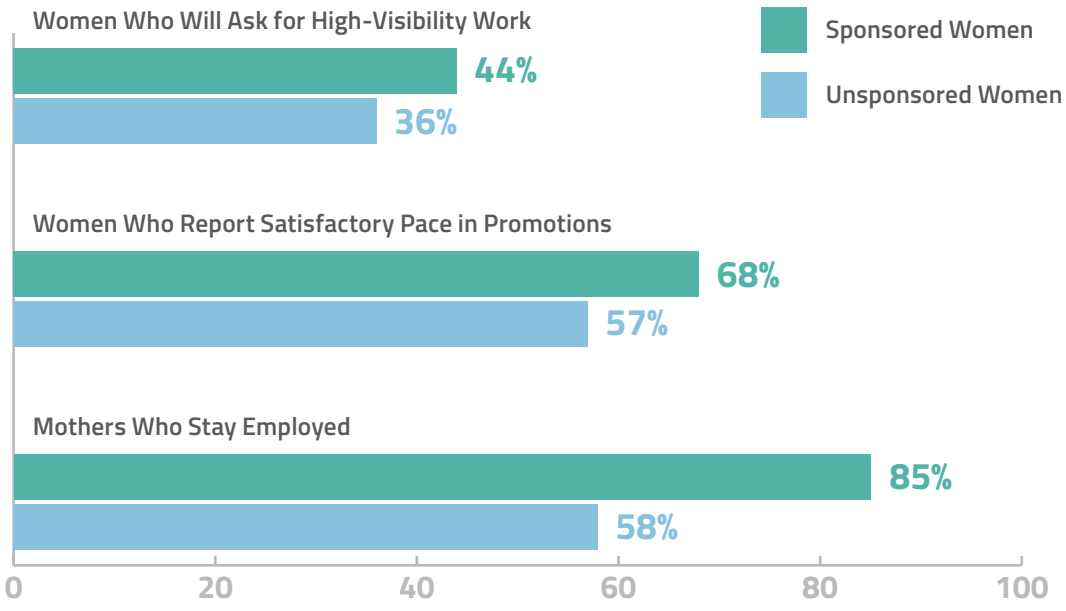
Implement patenting or other types of learning communities. These communities can provide networks, support, role models, and professional development. Be sure to build in time for employees to meet in their learning communities. For more information on these kinds of learning communities, see **How Can Companies Promote Innovation with Diverse Employees?**

Ensure access to mentors. Mentors help provide strategies, advise, and increase employee confidence and empower their mentees. Mentoring programs should be made available to all employees, not just women or underrepresented groups. When creating programs, provide access to a diverse range of mentors—mentors who are both similar and different from the employee from all levels of the organization. **See Mentoring-in-a-Box**.

Ensure that managers are educated about and equipped to provide constructive feedback and run productive teams. Technical managers are often promoted because of their technical talent but not given much information for managing people. Educate managers about 1) creating a "growth mindset" environment, 2) recognizing and adjusting for potential biases in how they assign tasks or advise employees, and 3) **running productive team discussions and environments**.

Actively sponsor underrepresented employees. Sponsors—leaders who are usually two or more levels above their protégés—can make a significant impact by increasing protégés' visibility and advocating for their advancement. Men are 45 percent more likely to have sponsors than women, often because sponsors pick out protégés that remind them of themselves (Hewlett et. al., 2014), so educate potential sponsors on these biases. As Figure 6.2 illustrates, sponsored women report higher satisfaction in their organization than do women without sponsors. Women who are mothers particularly cite sponsorship as helping them stay employed while raising children, with 85 percent staying employed with a sponsor compared to 58 percent without one. See NCWIT's Sponsor Toolkit for more information and resources.

FIG. 6.2 // Sponsored Women Vs Unsponsored Women



Hewlett et al., 2014

For more information and resources on Employee Development, see the following resources:

- Employee Development and Team Management Boxes in the NCWIT Supervising-in-a-Box series
- Top 10 Ways Managers Can Retain Technical Women
- Top 10 Ways Managers Can Increase Technical Women's Visibility

CHANGE MODEL FOCUS AREA #4

PERFORMANCE EVALUATION AND PROMOTION: Examining Biases and Establishing Clear Criteria

Review your company's tools and criteria for performance evaluation for bias. Check current standards for evaluation to be sure bias is not lurking in your forms and tools. Be sure criteria are clearly communicated and that employees receive copies of expectations at the start of their position and in advance of any evaluation. As you update these criteria, update your employees so they know their new expectations.

TIPS/RESOURCES

Examine and update your company's promotion criteria. Ensure that measurable steps for promotion are clearly articulated. Leaving guidelines vague or only for those "in the know" prevents many highly qualified people from finding out about, pursuing, and ultimately receiving promotions and new leadership roles.

Analyze implicit biases in promotion processes. Pay attention to the language used in promotion processes and interrupt possible personality penalties (e.g., "too abrasive" or "need to tone it down") or phrases that are "red flags" for potential biases (e.g., "not leadership material" or "not a good fit for the position.") Also be aware of any tasks, assignments, or tests that are used in determining promotions, and consider what protocols can enable all employees to shine and present their best case for their own promotions. Educate managers and involve them in analyzing and altering these practices.

Include work on diversity efforts as part of performance evaluation or promotion criteria. Reward managers and others for being actively engaged in the career advancement of their employees and for engaging in mentoring and sponsoring activities.

Hold managers accountable for implementing diversity practices into recruitment, retention, and advancement processes. Requiring that managers intentionally implement inclusive practices into recruiting and retaining diverse employees communicates a strong message that the organization is serious about these issues and helps to ensure that these issues receive adequate attention.

Create company awareness about diversity of communication and leadership styles. Ensure that a variety of communication and leadership styles are represented in the executive ranks in order to foster company-wide diversity.

See the Performance Evaluation and Promotion Box in the NCWIT Supervising-in-a-Box series for concrete resources to examine these biases.

CHANGE MODEL FOCUS AREA #5

SUPPORT FOR COMPETING LIFE RESPONSIBILITIES: Removing Stigma and Framing as Important for ALL Employees

Flexible scheduling is a crucial practice for retaining all employees. Do NOT frame these policies as for women, as we all can benefit from work-life flexibility. Actively encourage all employees to take advantage of these schedules.

FLEXIBLE SCHEDULING is a crucial practice for retaining all employees. Do NOT frame these policies as "for women" since everyone can and should benefit.

TIPS/RESOURCES

Make flexible scheduling and work-life programs a norm and promote these within the company and externally. Develop a reputation for being a company that acknowledges the well-being of its employees and that encourages flexwork. Advertising and lauding such programs encourages new and seasoned staff and managers to support these programs.

Interrupt conversations where you hear people frame these as "women's issues" or where people talk about this as a matter of "choice." If you hear comments such as these, remind folks that these are important issues for everyone not just women. Currently, women often bear a bigger share of family or home responsibilities, but this is not simply the result of a "choice" that women make. Societal structures and norms influence the choices that we ALL make related to these issues. Providing more options allows for more and different choices. For ways to talk about this, see **NCWIT's Critical Listening Guide** and Chapter 4 of NCWIT's **Male Allies and Advocates** report (Ashcraft et al., 2013).

Account for flexible schedules in promotion decisions. Adjust evaluations and promotion practices to acknowledge part-time, flexible, or telecommuting schedules so that these practices do not negatively affect employees' careers.

Assess flexible work policies and their accessibility. Be sure your current policies are clear for flex-workers and for fellow teammates. For example, examine resource allocation policies to see if they unfairly penalize flex-time workers or teams with flex-time workers. Employees will be reluctant to take flexwork positions if they feel it could harm their team's experiences or negatively impact others' impression of their work ethic. Ensuring creative resources for flex-workers and face-to-face team members are important and potentially exciting and innovative opportunities, especially in technology.

Create on- and off-ramp opportunities. Experiment with promising new practices such as on-ramp and off-ramp programs that make it easier for employees to take time off and return to work. Companies can also significantly increase retention by providing extended parental leave options for *all* employees.

Model flexible practices at the executive and managerial levels. Such modeling helps make these practices culturally acceptable and remove stigma about flexible work. Seeing leaders participate in and encourage flexible work opens discussion of how and why flexible working arrangements matter. NCWIT's male advocates research showed that male managers did things like set aside time to attend family or personal events, publicly utilized leave policies, and respectfully encouraged their employees' alternative or flexible work hours (Ashcraft et al., 2013).

Share the "hows" behind flexwork. Flexible working arrangements can feel intimidating when putting all the pieces together. Educate managers and HR representatives about policies and the importance of creating a safe space to discuss with employees how they can use these policies. Consider open forums and webinars where flex-workers share their experiences, managers share policies, and everyone has time for questions. See **NCWIT's Tips for Managers and Employees About Having Conversations About Work-Life Arrangements**.

Give new practices time to take hold. Cultural shifts in work patterns often take a bit of time and trial and error before getting it "right." Be sure to periodically gain feedback and make adjustments before deciding too early that something "just isn't working."

For more information, see **Supervising-in-a-Box** or the **Male Advocates and Allies** report, specifically Section 4, about improving work-life for all through options like flexible work.

CONCLUSION

The current era and the coming decade present challenges and exciting opportunities for the technology industry. Technological innovation will play a crucial role in almost every facet of society and the global economy. Meanwhile women and other groups currently underrepresented in technology will increasingly influence technological purchases and consumption. Companies that capitalize on these diverse perspectives to improve technological invention will be well poised to appeal to these markets, to benefit from the perspectives of a diverse range of talent, and to ultimately become and remain leaders in the technology industry. Furthermore, increasing the meaningful participation of underrepresented voices will lead to technological innovations that better meet the needs of a diverse society and that help us address a broader array of social problems and inequities. And finally, expanding gender, racial, and other societal norms will help ensure that we are all able to live up to our full potential. Realizing these benefits, however, requires careful planning and attention to systemic change. Such change may not be easy, but it is important and well worth the effort.

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