

FRANCE WINDDANCE TWINE

GEEK GIRLS



Inequality and
Opportunity in
Silicon Valley

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For Daily Twine, Sophie Blee-Goldman, and everyone fighting for economic, gender, and racial justice in the technology industry

I'm not a woman at Google. I'm a geek at Google.

—Marissa Mayer, former Google vice president,
San Francisco Magazine, 2011

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PREFACE

Augusta Ada Byron, also known as the Countess of Lovelace, is recognized as the first conceptual computer programmer—a visionary who anticipated the future of computing more than a century before the first electronic modern programmable computer was built. Ada Byron, the only child from the marriage of Anabelle Milbanke and the poet George Gordon Byron, was born on December 10, 1815. Her father, who was commonly known as Lord Byron, separated from her mother when she was four weeks old. Her mother, an educational reformer, introduced Ada to mathematics as a child.¹ During an era when aristocratic women in England were tutored by governesses and barred from attending universities, Ada was tutored in British mathematics by family friends including Augustus De Morgan, a founding professor of computer science at London University (now University College London).²

In 1833, the seventeen-year-old Ada Byron met Charles Babbage, an English inventor known as “the father of the computer.” A Cambridge-educated mathematician, Babbage designed the first general-purpose computer and became one of Ada Byron’s mentors and collaborators.³ Babbage, who used his inherited wealth to advance British mathematics, hosted a series of salons where leading British scholars discussed the new ideas in British science. In an article describing the early education of Ada Byron Lovelace, Christopher Hollings, Ursula Martin, and Adrian Rice situate her training in a larger historical context: “Lovelace’s early mathematical education can be viewed in a broader context of changes in British mathematics. . . . Her later mentors, Babbage, De Morgan, and Somerville, were at the heart of attempts to change it, and to align mathematical education and research with newer more rigorous approaches emerging from Europe. . . . The widespread availability and use of elementary mathematics also led to a surprising familiarity with mathematics in popular culture—young ladies did examples from Euclid for pleasure, periodicals like *The Ladies’*

Diary published mathematical questions and readers' answers, and astronomy was a popular pursuit."⁴

Ada Byron acquired the title of the Countess of Lovelace from her marriage to William King, who became the 1st Earl of Lovelace. In an analysis of Lovelace's mathematical abilities, Thomas Misa argues, "The evidence is reasonably clear that Lovelace created the first step-by-step elemental sequence of instruction—that is, an algorithm—for computing the series of Bernoulli numbers that was intended for Babbage's Analytical Engine."⁵ In a review and analysis of pioneering women in computing, Denise Gürer explains the significance of Ada Byron's theoretical contributions to modern computer science: "Her paper . . . discussed the Difference Engine, the first automatic calculating device, and the Analytical Engine, which contained the first set of principles for a general-purpose programmable computing machine. Lovelace's series of notes included a table describing the operations necessary for solving mathematical problems. She therefore became the first conceptual programmer for Babbage's Analytical Engine. In subsequent writings, she developed the 'loop' and 'subroutine' concepts—a century before electronic computing machines appeared."⁶

I begin with the contributions of Ada Byron Lovelace, the daughter of English aristocrats, for two reasons. First, Lovelace was a Victorian mathematician who laid the foundations for modern computing technologies a century before the first electronic computers were built. The Analytical Engine was a forerunner to the electronic calculating computers built in the twentieth century and shares "key design features used in modern computing."⁷ Second, until recently, women who were pioneers in the field of computing had been written out of the history of artificial intelligence and computing technologies.⁸ Ada Byron's accomplishments during an era when women were excluded from attending universities reveal the ways that class status, social capital, and family support intersected to allow her to pursue the study of advanced mathematics in Britain.

On the other side of the Atlantic, ninety years after the birth of Ada Byron Lovelace, a Cherokee woman, who would cofound the Society for Women Engineers, was born. Mary Golda Ross, a citizen of the Cherokee Nation, was born in 1908 and grew up in rural Oklahoma. Ross taught high school mathematics before she became a statistical clerk for

the Bureau of Indian Affairs, in Washington, DC. After earning a graduate degree in mathematics, she was hired for a wartime job at Lockheed Missiles and Space Company (now Lockheed Martin) in Southern California in 1942.

Ross, the first woman to be classified as an “engineer” at Lockheed, cofounded the first chapter of the Society for Women Engineers (SWE) in Southern California and later founded another chapter in Silicon Valley.⁹ The Society of Women Engineers is now considered part of an “old girls’ network” that has forty thousand members globally. After the war ended, she continued to work for Lockheed and “became the only woman in a forty-person think tank for special projects—‘the skunk work’—out of which was born the missile and space division. When the firm launched LMSC in Sunnyvale, she moved to the Valley and worked there until her retirement in 1973.”¹⁰

In 1999, Ross reflected on her career: “You could just practically name what you wanted to do. It was terribly exciting. They’d give us a mission, and we’d figure out how to accomplish it.”¹¹ Lockheed Missiles and Space Company played a key role in the opportunity structure for women engineers in the mid- to late twentieth century. In an analysis of industry archives and interviews with former employees, Glenna Matthews notes, “From about 1960 to the very recent past, Lockheed Missiles and Space Company (LMSC) was the largest private employer in Santa Clara County. At the height of the firm’s prosperity, it employed some twenty-five thousand employees, of whom 20 to 25 percent were female, depending on the year. That Lockheed employed a few women in highly responsible positions and that the firm had a ladder for encouraging those in secretarial or other hourly jobs to move into management suggests that LMSC may have inadvertently been a catalyst for social change.”¹²

During the mid-twentieth century, women were welcomed into the aerospace industry. Silicon Valley military contractors were pressured to hire talent, and although women were concentrated in nonengineering jobs, they could still “prove themselves”. And, if given an opportunity, could remain in their positions after the Second World War ended. But by the end of the twentieth century, the workforce of Lockheed had shrunk dramatically.¹³

Esther Williams, a White engineer and a cofounder of the Society of Women Engineers, was born in 1913 and grew up in Washington, DC.

She earned a degree in engineering at the University of California at Berkeley. During the Second World War, Williams was hired by the Kaiser Shipyards in Oakland. After the war, she secured a job at Douglas Aircraft of Southern California, before going to Lockheed.

Williams organized a meeting while she was working in Los Angeles, and Mary Ross was among the eighteen women who attended. They were both transferred by Lockheed to Silicon Valley, where they established another chapter of the Society for Women Engineers. Both women benefited from labor unions, which played a key role in the development of corporate policies that allowed women to move up the occupational ladder within the firms producing military-based electronics. In the mid-twentieth century, defense contractors like Lockheed recruited, hired, and promoted women in the aerospace industry. Women engineers like Ross and Williams created the first infrastructure of support for women engineers. Mary Ross died in 2008 in Los Altos, California, the heart of Silicon Valley.¹⁴

Three years before Ross's death, Sarah Lamb, an independent British technology consultant was invited to a "Geek Dinner" in London. As one of the few women at this male-dominated event, Lamb's experience inspired her to organize a dinner for "Girl Geeks" in London. Lamb (now Sarah Blow) recalls, "I'd been in the business world for twelve months when I decided to start up the Girl Geek Dinners, and it all came after going to a Geek Dinner event. . . . The situation there was enough for me to realize how isolated women in the industry were. It also made me understand that some (not all!!) men don't really know how to react to a technical female. . . . I blogged the idea about a Geek Dinner for Girls, . . . which is how the name 'Girl Geek Dinners' came out of it all."¹⁵

In 2008, Angie Chang founded the Bay Area chapter of Girl Geek Dinners and organized the first Girl Geek Dinner, which was held in San Francisco. Four hundred participants attended. The mission of Girl Geek Dinners includes the following:

- To break down old-fashioned stereotypes
- To identify routes around barriers to entry for anyone to get into technology
- To encourage and nurture women who are interested in technology

- To work with local schools, colleges, and universities to encourage more women to enter the tech industries
- To support women who are currently in the industry and work together to figure out the problems and the solutions
- To include men, women, and children in this journey and not exclude men from Girl Geek Dinner events

These dinners have since developed into a network of sixty-four chapters all over the world, which provides a support structure for women in technology—and inspired the title of this book.

Geek Girls provides the first multiethnic and multivocal sociological portrait of the optimism, opportunities, and obstacles that cisgender and gender-fluid technically skilled women negotiate in their pathways into careers in technology firms in Silicon Valley. Are you a founder, entrepreneur, venture capitalist, engineer, or someone else who wants to enter the technology industry? Do you care deeply about racial, gender, and economic justice? Are you interested in moving beyond “diversity theater” and unconscious bias trainings that have failed to change the status quo? If you want to peek behind the Silicon Valley curtain and learn from technically skilled women working in this industry, this book is for you.

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Introduction

To be a computer geek is to be the ultimate twenty-first-century entrepreneur, someone who reaps the very tangible rewards of the most lucrative scientific field of the new millennium by virtue of being talented, capable and driven.

—Roli Varma (2007)

On July 17, 2012, Marissa Mayer, a, thirty-seven-year-old White, Stanford-trained computer scientist and Google executive, was hired by Yahoo to serve as its seventh chief executive officer (CEO). At the time, Mayer was one of the most glamorous, powerful, and highly visible “geek girls” in Silicon Valley. When Mayer accepted the position as Yahoo’s CEO, “she was the youngest CEO—male or female—of a Fortune 500 company, a distinction that placed her at No. 3 on *Fortune*’s annual 40 under 40 ranking.”¹ In an industry dominated by Asian and White men, Mayer stood out as a blond, blue-eyed geek celebrity considered beautiful, brilliant, and fashion-forward. Her geek girl status and hypervisibility generated constant media scrutiny.²

At the age of twenty-four, Mayer was the first woman engineer hired at Google. Thirteen years later, she was the vice president in charge of managing geographical and local search products including Google Earth for one of the world’s most powerful technology firms. When Mayer joined Yahoo, she was described as “someone who has both business acumen and geek cred at the helm.” The *New York Times* described her as being a member of a “shortlist of women in the technology industry to hold the top spot.”³ At the time, only a handful of White women including Sheryl Sandberg, chief financial officer (CFO) of Facebook; Meg Whitman, CEO of Hewlett-Packard; and Virginia Rometty, head of IBM, enjoyed comparable leadership positions in Silicon Valley.

Mayer’s departure from Google was interpreted by some industry insiders as evidence of the phenomenon known as a “leaky pipeline,”

which refers to the loss of qualified women at a company that had been distinctive for having strong women leaders. Reporting for the *New York Times*, Claire Cain Miller noted,

Executives have been concerned that too many women dropped out in the interviewing process or were not promoted at the same rank as men, so they created algorithms to pinpoint exactly when the company lost women and to figure out how to keep them. Simple steps like making sure prospective hires meet other women during their interviews and extending maternity leaves seem to be producing results—at least among the rank and file. Still senior women at the company are losing ground. Since Larry Page became chief executive and reorganized Google last year, women have been pushed out of his inner circle and passed over for promotions. They include Marissa Mayer, who left last month to run Yahoo after being sidelined at Google.⁴

Seven months before Marissa Meyer was hired to lead Yahoo, the December 2011 cover of *San Francisco Magazine* featured the headline, “Tech’s Femme Boom.”⁵ Mariam Naficy, a serial entrepreneur and founder of Minted,⁶ a stationery website, was featured on the cover as a “Geek Crasher.” This celebratory cover story profiled twenty-four women who worked in the tech industry as angels (investors), founders, and connectors. In a section titled “The Strong Suits,” Marissa Mayer (then age thirty-six), was featured alongside Meg Whitman, Carly Fiorina, Sheryl Sandberg, and Barol Baartz (former Yahoo CEO). These women had broken what sociologists call “the glass ceiling,” an invisible barrier that women bump up against as they seek to advance into leadership and management position.

In spite of the high visibility of a number of high-profile White women in Silicon Valley like Marissa Mayer, men continue to rule in Silicon Valley, and the mythology of the geek male genius remains intact. In a study of women in geek culture, Roli Varma reminds us of the significant role that gendered mythologies play in beliefs about who can be a talented engineer. Drawing on the work of Roland Barthes, Varma notes, “Myths circulate in daily life and once they become established in people’s beliefs and values, myths serve the ideological agendas of the dominant classes. . . . Gendered constructions of technology portray

women's 'normal' occupations to be in non-computing areas, while men's 'dominant' employment to be in high-computing areas. . . . Geek culture legitimizes men's exclusive claim to computing on the one hand and defuses the power relations between men and women in the high-technology sphere on the other hand."⁷

In an article titled "Where Is the Female Mark Zuckerberg?" in *San Francisco Magazine*, E. B. Boyd begins with this declaration, "For the first time in history, Girl Wonders actually have an edge over the boys. . . . Can the New Femme Entrepreneurs seize their moment?"⁸ Later in the article, Boyd argues,

Four decades into the tech revolution, people are still chafing at the fact that there are so few women in the industry, that the typical startup involves a handful of brash young guys and the occasional geekette. The excuses haven't changed much, either: Women are risk-averse. Women aren't technical. Women can't figure out the work-family balance. [Venture capitalists] are so besotted with male Harvard and Stanford dropouts that they barely give brilliant female entrepreneurs the time of day. And yet in the New Boom reshaping Silicon Valley, the old paradigms—gender and otherwise—are rapidly shifting. Now there are more female founders than ever before, but for the first time in tech history, women founders in certain types of businesses have an edge over their male peers.⁹

Three years after this optimistic and celebratory special issue was published, a steady stream of blogs, memoirs, lawsuits, annual diversity reports, and investigative reports by technology journalists began to lift the curtain on the "diversity problem," sexual harassment, systemic wage discrimination in Silicon Valley, gender inequality, and anti-Black racism.¹⁰ The rejection of domestic minorities, especially Blacks, Latinx, and Native Americans, remains entrenched in publicly traded technology firms in Silicon Valley, including both American and Indian multinationals with offices in Silicon Valley.¹¹ While White women have made modest gains moving into management, this has not been the case for Asian American women, Black women, or Latina women.¹² Annual diversity reports, foundation reports, and investigative reporting have all found that the exclusion of Black and Latinx women across all categories of tech employment remains durable.¹³ The leadership ranks

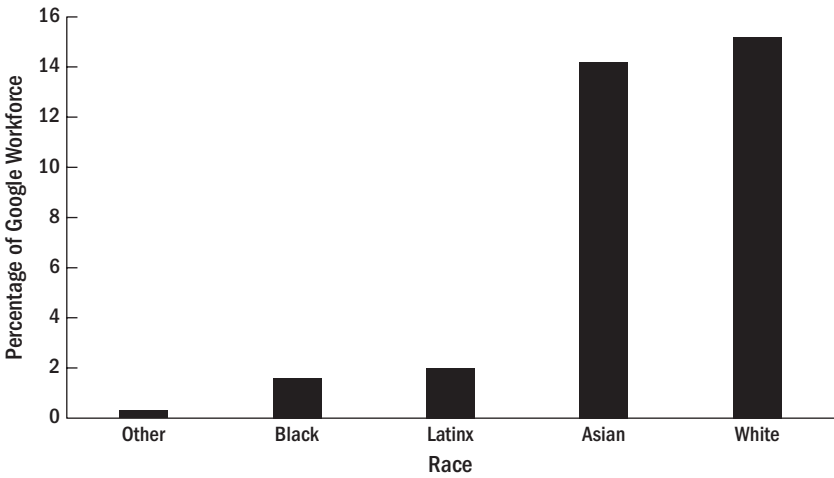


Figure I.1. Women workers by race as a percentage of Google’s overall US workforce, 2020. *Note:* Women make up 33.3 percent of the overall Google workforce. (Google 2020)

and decision-makers at the top technology firms remains dominated by Asian and White men.

Hidden Figures: Data Analytics and Inequality

On October 11, 2013, Tracy Chou, a twenty-six-year-old Chinese American engineer at Pinterest, who had formerly worked at Google and Facebook, wrote a blog post on *Medium* titled “Where Are the Numbers?” arguing, “Every company has some way of hiding or muddling the data on women actually in engineering roles. The actual numbers I’ve seen and experienced in the industry are far lower than anybody is willing to admit. . . . I can’t imagine trying to solve a problem where the real metrics, the one’s we’re setting our goals against, are obfuscated.”¹⁴ Three years after Chou’s post, 250 companies had submitted data to Chou’s repository.

In 2016, women who worked in San Francisco and who had at least ten years’ worth of experience responded to a survey, titled “Elephant in the Valley,” about their experiences as women in the technology industry. This survey generated a massive set of data and was released on a website. This survey found that “of those surveyed 60 percent

reported unwanted sexual advances,” while “one in three women” reported feeling unsafe at work.¹⁵ Suddenly the media narratives about Silicon Valley shifted from its being a region of opportunities to a brotopia—a toxic work culture where women endured sexual harassment, systematic pay discrimination, and racism. Articles and discussions on public media about the “diversity problem” became a regular theme.¹⁶

On May 28, 2014, Laszlo Bock, a Romanian-born businessman who was the senior vice president of people operations at Google, appeared on the *PBS NewsHour* to participate in a discussion on the diversity problem in Silicon Valley. In response to the revelation that only 6 percent of Google’s employees were Black (2 percent) or Latinx (4 percent), whereas more than 91 percent were White or Asian,¹⁷ Bock blamed the educational pipeline:

Part of it is . . . women aren’t taking a lot of computer science courses. And the culture of the tech industry at a lot of places isn’t that great for women. We have been working on this a lot at Google, and particularly in the last year working on bringing more unconscious bias training to our employees and more awareness of this. For African-Americans and Hispanics, the conditions are even worse. It is a smaller population. Even fewer percentage of people with—from those ethnicities actually earn degrees in computer science.

In this same interview, Gwen Ifill poses the question, “We have known that the numbers weren’t good, even though we didn’t have actual numbers to put to it. Why wasn’t action taken before?” Vivek Wadha, an entrepreneur and professor of engineering at Carnegie Mellon, responds to Ifill,

Frankly, Silicon Valley is a boy’s club. It’s like a “frat club run wild,” is what I often say, because you have young kids hiring other young kids. They don’t understand the importance of diversity. They don’t understand why they have to be inclusive. . . . Most people are not overtly sexist, racist, or homophobic, but we’re human beings. And, as a result, we like people who are like us, who watch the same shows, who like the same food, who have the same backgrounds. So we bring this unconscious bias to everything we do. . . . More broadly, though, you have an educational system problem. There is an absolute pipeline problem.¹⁸

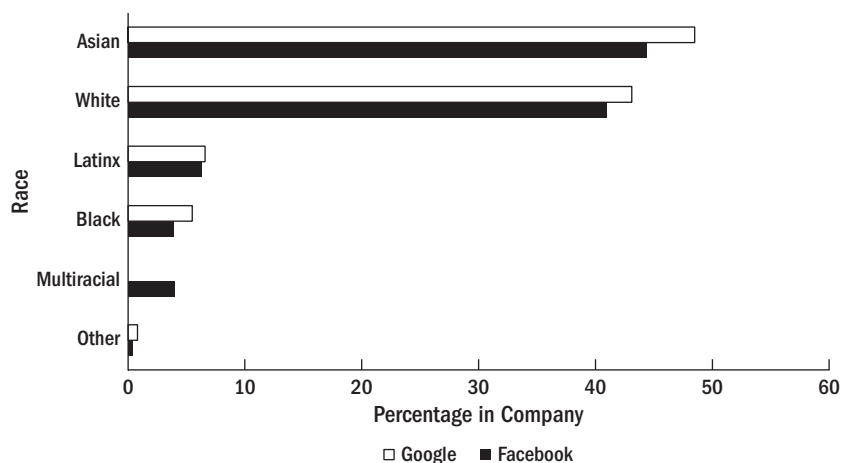


Figure I.2. Facebook versus Google workforce by race, 2020. *Note:* Includes both men and women; Google did not use the multiracial category; Google’s “Native American” category is equivalent to Facebook’s “Other” category in respective reports; Facebook used “Hispanic” rather than “Latinx”; Google’s percentages add to 104 percent. (Statista 2020; Google 2020)

In 2016, only 17.9 percent of university degrees in computer science were awarded to women. Scholars have identified a gender gap in employment in science and technology fields.¹⁹ During the past three decades, employment in STEM fields has grown by 338 percent.²⁰ The high-technology sector employs 25 percent of professionals in the United States. Jobs in computing have experienced the largest job growth of any sector of the US economy.²¹ This job cluster of computing jobs—including software engineers, software developers, mechanical engineers, and programmers—is one of the highest paid and most prestigious fields, yet women, especially Blacks, Latinx, Native Americans, and Pacific Islanders, are being hired at much lower rates than are Asians and Whites in the technology sector.²² In 2019, the *Los Angeles Times* surveyed tech workers of diverse backgrounds and found that “of the 68 tech workers, who responded to the survey, half said they felt tech was not inclusive to people from diverse backgrounds. . . . People whose identities are underrepresented in their field find themselves judged through a different set of lenses, one that ignores questions of privilege.”²³

Scope of This Study

Geek Girls is an innovative, integrative, and intersectional analysis of inequality and opportunity in Silicon Valley's technology industry—the most economically vibrant sector of the US economy. Silicon Valley is the power center of the “new economy” in the United States. This book provides an analysis of the experiences of technically skilled women who design software, develop new apps, build hardware, write code, and write technical guides. It examines the multiple pathways that women technologists follow into Silicon Valley careers. Technically skilled women working in Silicon Valley are neither a singular nor a homogeneous group with regard to their ranked status and positions in a racialized and class-stratified industry. Yet our scholarly understandings of the occupational experiences of women in the technology industry have been informed primarily by the experiences of middle- and upper-middle-class immigrant Indians, Asian Americans, and White women who have earned degrees in engineering or computer science and are presumed to be cisgender and heterosexual.

Geek Girls departs from the earlier work that provides intersectional analyses of the US-based high-tech industry in several ways. *Geek Girls* draws on interviews with cisgender and transgender women of diverse ethnic, racial, and class origins. This is also the first intersectional analysis of women in Silicon Valley to include the caste background of the immigrant Indian women who participated in this study.²⁴ Thus, this study engages and builds on a rich body of data on the South Asian diaspora and the ways that caste-based hiring and merit operate in the global technology market.²⁵

Geek Girls sits at the intersection of feminist studies, critical technology studies, and comparative racial and ethnic studies *to provide an analysis of the social, economic, caste, and ethnic dimensions of opportunity structures in Silicon Valley's technology industry*. This book makes significant contributions to earlier studies that examined discrimination in STEM fields and updates this research by engaging with critical race scholars. Race scholars working in the interdisciplinary field of technology studies have introduced a new set of conceptual tools including *digital elites*, *digital feminism*, *digital caste system*, and *digital discrimination*.²⁶ Research on the IT caste and labor migration has failed to provide

analyses of the relationship between Asian Indian migrants and highly educated and technically skilled Black or Latinx employed in Silicon Valley.²⁷

I make three central arguments in this book. First, I argue that *the quantity and quality of social and symbolic capital that women possess inform and shape the obstacles and opportunities available to them* as they launch their careers and seek jobs in Silicon Valley. I introduce the concept of *geek capital*, a form of social and symbolic capital that emerged in my analysis of the occupational narratives of women and men in this study. I found that Asian American, Asian Indian, and White women's social proximity to men embedded in the technology industry, with whom they share a caste, class, racial, ethnic, and/or familial relationship, provides these women with privileged access to decision-makers who can offer them entry-level and midlevel jobs.

Geek capital is not simply about technical skills. It refers to networks—social relationships that include membership in exclusive alumni, ethnic, status, or class-based networks that ties one to members of a transnational technocracy. In this study, 40 percent of the White women and 90 percent of the Asian Indian women possessed forms of geek capital as the daughters, siblings, spouses, cousins, domestic partners, former classmates, or friends of men and women embedded in the technology ecosystem. These women were typically from high-caste, middle-class backgrounds and were second-generation engineers. This type of social capital is called “bonding capital,”²⁸ and connects members of the same exclusive social networks. These networks can include alumni networks, transnational caste-based networks, regional networks, and family networks. Geek capital allows job candidates to be perceived as possessing “merit-based” qualifications. Their abilities and skills are recognized and rewarded by members of the tech ruling class, who attended a small number of US schools and Indian Institutes of Technology and comprise a narrow slice of the university-educated racial and ethnic demographics in the United States. In a study of hiring practices between the 1950s and the early 1970s, Janet Abbate found that “the most popular strategies for recruiting programmers . . . produced contradictory constructions of skill.”²⁹

My second argument is that an occupational caste system operates in Silicon Valley that consists of layers of discrimination concealed by

beliefs in meritocratic recruitment practices. The social discrimination against Blacks, Latinx, Native Americans, and Dalits (members of India's lowest caste) in hiring, recruitment, promotion, and retention is normative and has profound economic consequences for members of these out-groups.³⁰ The national media covering the technology labor force has reported widely on labor-discrimination lawsuits and investigative reports that have documented systemic employment discrimination against Blacks, Latinx, women, and non-Asian domestic minorities alongside a strong preference for White and Asian men.³¹ I argue that this discrimination is a product, in part, of corporate recruitment practices and exclusion from the social networks of members of the dominant ethnic groups in the tech industry.

My third argument is that a persistent belief in and defense of the pipeline myth and the myth of meritocracy has shielded Silicon Valley technology firms and their executives from being held accountable for their role in reproducing structural racism and gender inequality. I identify and analyze the social and cultural mechanisms that reinforce racial, ethnic, and caste inequality among technically skilled women. The use of social referrals and recruitment practices has reproduced structural inequality and left the ethnic, racial, and gender hierarchies in Silicon Valley's workforce intact. CEOs and their representatives continue to place responsibility on the educational pipeline for the dismal numbers of Black, Latinx, Native American, and other underrepresented groups in Silicon Valley.

Research Methods

Geek Girls draws on a total of eighty-seven interviews and surveys conducted between 2015 and 2019 with men and women employed in Silicon Valley. The interviews included sixty-five women and twenty-two men.³² In addition to interviews, this study draws on blogs, memoirs, surveys, industry-based surveys, Equal Employment Opportunity Commission (EEOC) reports, foundation reports, technology journalism, annual diversity reports released by technology firms, and US Department of Labor investigations. Several research methods were employed to recruit participants, including (1) Facebook postings on a page for women hackers; (2) a key informant at a technology firm

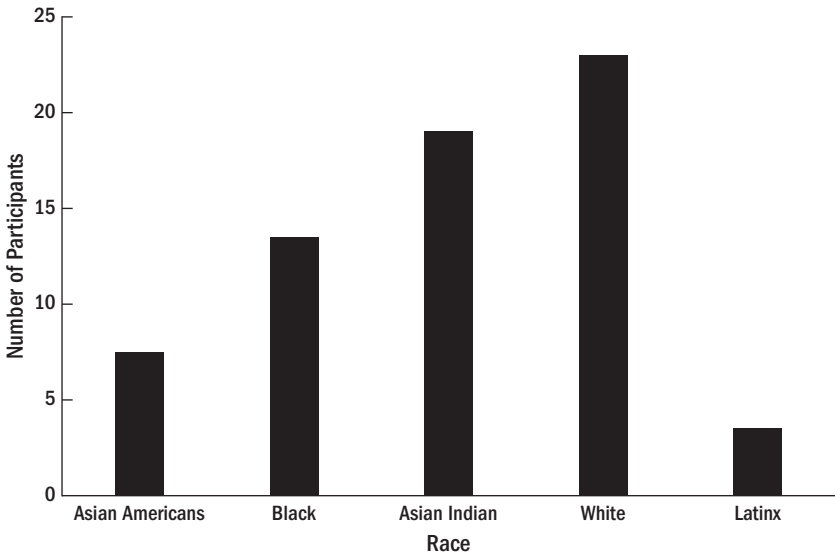


Figure I.3. Female participants by perceived race (n = 65)

headquartered in downtown San Francisco who provided an initial set of referrals; (3) targeted snowball sampling; (4) Tech Inclusion conferences and Lesbian in Tech conferences held in San Francisco in 2015 and 2016; (5) an underground vegan restaurant in Oakland; (6) organizing events for contract workers in Silicon Valley; and (7) referrals from colleagues and neighbors. The interviews ranged from 60 minutes to 120 minutes, and they were recorded and transcribed.³³ Participants and, in some cases, company names have been changed to ensure confidentiality. I employed focused coding to identify recurring themes.³⁴

Participants

Geek Girls draws on interviews and survey data from four generational cohorts of women technologists between the ages of twenty and fifty-eight and employed in Silicon Valley. The participants entered the technology industry between 1989 and 2016 and belong to cohorts representing four generations, including Baby Boomers (born between 1946 and 1964),³⁵ Generation X (born between 1965 and 1980), Generation Y (Millennials; born between 1981 and 1994), and Generation Z (born

after 1995).³⁶ Among the eighty-seven participant-completed surveys, 63 percent were Generation Y (Millennials), 33 percent were Generation X, 2 percent were Baby Boomers, and 2 percent were Generation Z. The technology workers who participated in this study include natives of the United States, foreign nationals, and naturalized citizens from Brazil, Britain, China, India, Germany, Japan, and Mexico.

The technology workers who participated in this study self-identified across a wide spectrum of sexual expressions and gender identity. Among the sixty-seven women in this study, sixty-five completed the biographical surveys. The survey data show that 68 percent identified as cisgender and heterosexual, and 31 percent identified as LGBTQ. White and/or European American women made up 38 percent of the engineers in this study; Asian Indians, 23 percent; Blacks, 16 percent; Asian Americans, 13 percent; Latinx, 6 percent; and multiracial and other comprised, 8 percent. The remaining participants were cisgender men. The participants were employed or formerly worked at start-ups, privately owned companies, and publicly traded companies including Adobe, Airbnb, Amazon, Apple, Autodesk, Cisco, Dropbox, Eventbrite, Facebook, Google, IBM, Indiegogo, Intel, LinkedIn, Lyft, Oracle, Patreon, Salesforce, Square, SurveyMonkey, Twitter, Uber, and Yahoo, as well as more than twenty start-ups.³⁷

Three-fourths of the participants in this study were engineers (software, security, front end, back end, or full-stack). The technology workers who participated in this study included entrepreneurs, engineers, founders, graphic designers, technical trainers, technical writers, diversity consultants, digital marketers, and project managers. The sixty-five women in this study worked as engineers, designers, consultants, digital marketers, project managers, technical writers, and customer-support advocates. Slightly more than one-third ($n = 27$) of the participants identified as LGBTQ, and close to two-thirds ($n = 38$) identified as cisgender, straight, or heterosexual. Among the women engineers, one-fifth of the White engineers had earned a certificate in a twelve-week accelerated coding boot camp after earning their undergraduate degrees in the arts, humanities, social sciences, or area studies.

Earlier studies of women in science and technology fields have typically employed analyses that flatten the experiences of women and have not included gender-fluid women or those who identify as LGBTQ in

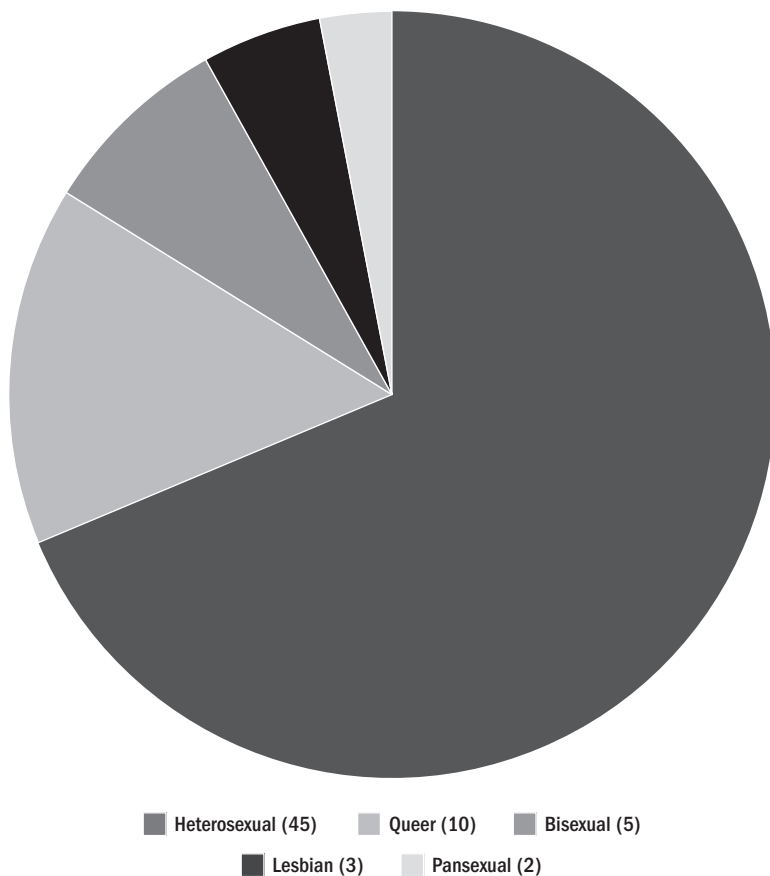


Figure I.4. Female participants by sexual orientation (n = 65)

their analysis. One goal of this book is to provide a nuanced analysis that illuminates the differences between women and the mechanisms that sustain ethnic, racial, and gender inequality in Silicon Valley firms. This book contributes a region-specific case study to a growing number of recent sociological studies of women in the technology industry.³⁸ However, these earlier studies have not provided fine-grained accounts of the complex ways that gender identity and sexual expression operate in concert with race, caste, class background, and marital status to produce barriers to employment in the technology sector for highly educated Blacks, Latinx, and other underrepresented groups.

The women in this study followed six pathways into the technology industry: (1) recruiters, (2) referrals by friends, family, classmates, colleagues, (3) coding boot camps, (4) internships, (5) international visas, and (6) digital/online job boards.³⁹ The two most common pathways involved social referrals and recruiters. These pathways were followed by women with a wide range of educational credentials and technical expertise. Women who used recruiters often possessed forms of symbolic capital—simply by having a prestigious degree and being embedded in powerful alumni networks associated with one of the “feeder schools” into Silicon Valley, including but not limited to Carnegie Mellon, Harvard, MIT, Stanford, UC–Berkeley, UCLA, University of Washington, University of Texas at Austin, and the prestigious Indian Institutes of Technology (IIT).⁴⁰ A third pathway was followed by women who earned degrees in the arts, humanities, or social sciences and who had no technical experiences but enrolled in all-women accelerated skills-based engineering academies (also known as “coding boot camps”). A fourth pathway involved women who were self-taught or who developed technical skills outside of formal classrooms and launched their own businesses before being hired by Silicon Valley firms. A fifth pathway involved women who immigrated from India or Latin America to pursue graduate study in the United States and entered the industry after earning graduate degrees in the United States and working on temporary migrant contracts before going into a full-time contract.⁴¹

The Research Site: Silicon Valley

Silicon Valley is a region in Northern California that is the epicenter of the North American technology industry. The City and County of San Francisco form the northern boundary of Silicon Valley, which extends south for thirty-five miles along the San Francisco Peninsula. The geographical boundaries south of San Francisco include all of Santa Clara County and San Mateo County and the cities of Fremont, Newark, and Union City in Alameda County. Silicon Valley is the global epicenter of the technology industry and the home to more than two thousand startups and technology firms including Alphabet (parent of Google), Apple, Autodesk, Cisco, Eventbrite, Facebook, Oracle, Salesforce, Twitter, Uber,