Professional MBA

Entrepreneurship & Innovation

The Brotopian Cycle:
Gender Inequality in Tech Startups

A Master's Thesis submitted for the degree of
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supervised by
Univ. Prof. Dr. Sabine Köszegi

submitted by
WonJung (Kaitlyn) Chang
Immatriculation Number: h1165354

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Affidavit

I, **WonJung (Kaitlyn) Chang**, hereby declare

1. that I am the sole author of the present Master's Thesis, "The Brotopian Cycle: Gender Inequality in Tech Startups", 119 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

Vienna, 31.08.2018

Signature

For my parents InAe WoonJu Kim and Sooman Chang,

who raised me to be a strong, confident woman.

Abstract

In the wake of the #MeToo era, gender equality has successfully gained a bigger space within public discourse around the world. However, tech startups, supposedly one of the most innovative industries to lead our future, are still heavily male-dominated, with a study in 2017 revealing a meager 17% female ratio in Silicon Valley startups that have less than 100 employees (Bradshaw & Kwong 2017).

This research aims to understand the underlying reasons for the gross underrepresentation of women in the tech startup industry and find practical solutions to improve the status quo. In the first part of the study, based on literature review, the 'Brotopian Cycle' is proposed as a framework to understand the vicious cycle. From the macro societal level (Media and Education) to the individual startup level (Recruitment and Retention), the vicious cycle continuously reinforces and recreates gender stereotypes that involuntarily but systematically filter qualified women out of the industry.

The second part of the study focuses on practical methods to improve gender inequality in tech startups during Recruitment and Retention phases. Findings from a combination of theoretical and practical research through literature review and qualitative interviews suggest that factors such as the lack of management and leadership experience common in young tech startups create, reinforce, and/or neglect gender issues in the startup workplace. The research provides actionable recommendations for startups to follow in order to actively break the vicious cycle and point to possible areas for further research.

Keywords: Startups, Technology, Entrepreneurship, Gender, Women, Diversity

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List of Abbreviations

bn	Billion
CEO	Chief Executive Officer
cf.	confer
CFO	Chief Financial Officer
CTO	Chief Technology Officer
CV	Curriculum Vitae
D&I	Diversity & Inclusion
EBIT	Earnings Before Interest and Taxes
ECWT	European Center for Women and Technology
ESM	European Startup Monitor
e.g.	for example
et al.	and others
EU	European Union
GDP	Gross Domestic Product
HR	Human Resources
HTL	Höhere Technische Lehranstalt (Technical High School)
i.e.	in other words
ibid	ibidem. in the same place
ICT	Information and Communication Technology
IGDA	International Game Developers Association
IMF	International Monetary Fund
IT	Information Technology
KPI	Key Performance Index
MBO	Management by Objectives
MIT	Massachusetts Institute of Technology
ML	Machine Learning
NASA	National Aeronautics and Space Administration
NYU	New York University
OIM	Organization Impression Management
PHP	Hypertext Preprocessor

PR	Public Relations
STEM	Science, Technology, Engineering, Math
U.K.	United Kingdom
U.S.	United States (of America)
UI	User Interface
UNESCO	United Nations Educational, Scientific and Cultural Organization
VC	Venture Capital
VP	Vice President
vs	versus
WBI	Wiener Börse Index (Vienna Stock Exchange Index)

1 Introduction

1.1 Problem Formulation

Every year, Time Magazine selects “Person of the Year”, with a cover article profiling the most influential and newsworthy figure of that year. Last year, the magazine made the unconventional decision to profile not one person but a group of women, portraying them on the cover and calling them the “Silence Breakers” (Zacharek et al. 2017).

This highlighted the #MeToo movement that had swept over the world in 2017 – millions of women worldwide coming forward with allegations of sexual harassment and abuse, often shocking the world because of the powerful positions the perpetrators held in governments and industries. On social media channels like Facebook and Twitter, the movement spread like wildfire – women all around the world came forward to share their own stories of sexual abuse that many had been keeping secret for their entire lives, and #MeToo quickly made its way into daily discourse of the mass population (Langone 2018). This signals a very important change in our society today, in relation to women’s rights and gender equality.

Not unrelated to this societal shift, the tech world has also seen a recent uprising of increased awareness regarding gender equality. Uber is a Silicon Valley startup that is believed to have revolutionized the concept of mobility through shared economy mechanisms. Co-founded in 2009 by Travis Kalanick, the company is valued to be worth $68 billion. After countless allegations and scandals surfaced involving sexual harassment, sexism, bullying and discrimination in the high-profile startup, Kalanick was forced to step down from his CEO position after pressure from his investors (Wong 2017).

The Uber incident sent ripples into tech and startup communities worldwide. Since even before the dot-com era of the 90s, technology startups have been traditionally very male-dominant. Subsequently, its heavily male-biased culture has come to be considered as the industry norm. Technology media *The Verge*, on reporting about the Uber scandal, even writes that “sexism is a well-documented problem in Silicon Valley

(Sottek 2017)[1]". This indicates the need for a more in-depth look into gender inequality especially in the tech startup sector, which was the starting point for this research.

In this research, I will focus on the gender inequality problem in tech startups. By gender inequality, I concentrate mainly on female employment ratio in tech startups. By tech startups, I borrow the definition from European Startup Monitor, hereafter referred to as ESM. According to ESM's 2016 report, tech startups are defined to have three core characteristics: i) be a 'young' company, meaning not older than 10 years since being founded, ii) feature highly innovative technologies and/or business models, and iii) currently demonstrate or strive for significant employee and/or sales growth (Kollmann et al. 2016). This definition therefore does not include large traditional tech companies such as Samsung or IBM that have long corporate history and therefore often have structured & established HR departments and processes. It also rules out young and small companies that are not based on innovation, either by technology used for their product or in their business models. Lastly, this definition also excludes most of single-person freelance/consultancy businesses that usually operate based on hourly rate compensation models and do not aim for exponential scaling and growth. Tech startups, by definition, combine two domains of technology and entrepreneurship, which will be a structural conjoint I will base my research on.

At the beginning of the internet era, many scholars and philosophers including Nicholas Negroponte predicted that technology, namely internet, will bring a complete social revolution. Many proclaimed that through virtual networks, humankind will start to interact with each other on a completely new level, which will "result in enhanced communities and greater world harmony" (Wajcman 2004:59). It is not a stretch to say that technology, especially the internet industry, has been long viewed as the industry that will ultimately lead our future.

Reflecting this excitement and hopes for the industry, we are seeing an exponential increase in the number of jobs in technology. Technology journalist Emily Chang, in her recent book *Brotopia* (2018), estimates that there are currently more than half a million unfilled jobs in the U.S. tech industry, which is expected to double by 2020.

[1] Website, therefore page citation not included.

"The industry is facing a labor crisis much bigger than that of the 1960s. Talent is in super-short supply now, and yet the stereotype of what makes a good engineer continues to exclude half the population." (Chang 2018:35)

Despite the exponential growth of tech startups and the increasing shortage of talent, female employee ratio in this industry continues to be disastrously low. According to ESM's report, globally only 12% of all startup entrepreneurs are female, with Austria having one of the world's lowest female entrepreneur ratio at 7% (Kollmann et al. 2016).

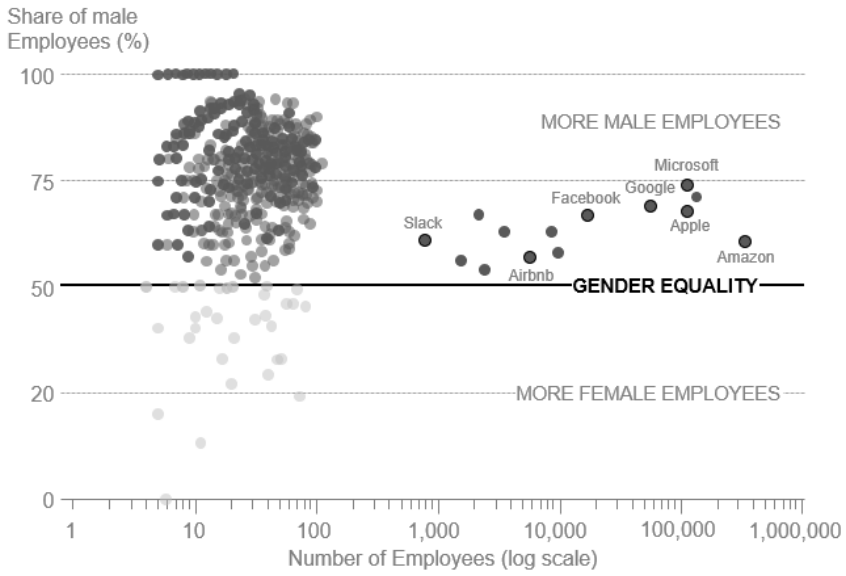

Figure 1. *Diversity Problem of Startups. (Craft 2016, cited in Bradshaw & Kwong 2017)*

Currently, overall female ratio of employees in tech startups is also very low. A Financial Times article in 2017 that analyzed data from 500 Silicon Valley startups with less than 100 employees showed that the average female employee ratio in Silicon Valley startups is only 17%. What's worse - smaller the startup, higher chances there were that it had close to zero female employees on the team (Bradshaw & Kwong 2017, see *Figure 1*).

Considering the societal change we're currently witnessing in regards to overall heightened awareness about gender equality and diversity, one can still hope to challenge and change the status quo.

"I've never seen anything quite like the environment we're in. Now women are

much freer to speak up than perhaps they were in my professional career. Every once in a while in history, there's something big that happens that changes the culture and I'm hopeful that this is it." - Meg Whitman, former eBay and Hewlett-Packard CEO (cited in Chang 2018:250)

1.2 Objective and Investigation Methods

This research aims to understand the various reasons behind the gross underrepresentation of women in tech startups. Through literature review of existing entrepreneurship, sociology, psychology and gender studies research, I will plot and propose what I call the "Brotopian Cycle" framework which summarizes the underlying vicious cycle that systematically weeds women out of the burgeoning industry.

I then propose hands-on solutions for managers of tech startups to actively break the vicious cycle and improve gender equality in their businesses, loosely based on the framework proposed by the *EU Commission's Code of Best Practices for Women in ICT* (ECWT 2011). This research also includes qualitative case-study interviews of females currently working in the tech startup industry in Vienna, Austria.

2 Status Quo – Gender Inequality in Tech Startups

2.1 Growth of the Industry & Increasing Hope for Gender Equality

2.1.1 Growth of the Industry

The technology industry is growing exponentially. According to *Fortune*, the five most valuable companies in the world on the Fortune 500 list in 2018 are all tech companies (Apple, market value $921bn; Amazon.com, market value $765bn; Alphabet(Google), market value $750bn; Microsoft, market value $746bn; Facebook, market value $531bn) (Shen 2018). Reflecting this overall industry growth and optimism, the job market in STEM fields are expected to grow more than non-STEM fields, and STEM occupations tend to be among the best paid jobs currently available (Diekman et al. 2015).

Combined with the rising popularity of technology is the increasing popularity of entrepreneurship and taking part in a startup. Traditional views on jobs and career

paths are changing, and it is becoming increasingly uncommon to work for the same company for one's entire lifetime (Landrum 2017). As Wajcman (2006) suggests, today's economy is characterized by "flexible" or "atypical" work made possible through the proliferation of internet and technology. As a result, social perceptions on entrepreneurs are changing, from "robber barons" to economic growth drivers (Venkataraman 1997).

More and more, starting one's own business or taking part in a startup is becoming an attractive career option that also has potential to yield high returns (Fiet 2001). More university graduates are forming new ventures (Hsu et al. 2007), universities are seeing an increased demand for entrepreneurship education programs (Roach & Sauermann 2015) and the U.S. National Science Board reports a large share of science and engineering major graduates to be employed in "small young firms (National Science Board 2012)", highly likely tech startups.

This shift in trend is not only limited to founders of the tech startups. In her book *Venture Labor*, Neff (2012) examines the rise of "entrepreneurial workers" in depth. She explains how the new cultural attitudes toward technology during the dot-com boom era created an almost "euphoria around the industry", and even made risk-taking, an inherent factor of working in small young tech startups, attractive. The book quotes cultural historian Jackson Lears, who commented that "[This is] a resurgence of risk both as a necessity of economic success and as a mark of what is fashionable […] What's really happening is risk is now cool." (Neff 2012:3)

Because most of the dot-com tech startups did not have established conventions, processes or ways of working, they essentially reinvented the idea of work as something that could be "fun, young and exciting, turning jobs from white-collar into what Andrew Ross (2003) has called 'no-collar.'(Neff 2012:13)" Neff describes venture labor as "the explicit expression of entrepreneurial values by nonentrepreneuers […] how people behave as if they have ownership in their companies, even when they are not actual owners." (ibid)

This phenomenon provides a key to better understanding recruitment and employment behaviors in tech startups. The fact that the tech startup industry is exploding in sheer number and size of course means that more people are becoming actual entrepreneurs, as founders of their own startups. However, this also means that there

are even more people becoming employed in these small companies as “joiners” (Roach & Sauermann 2015), creating many more job openings and alternative, flexible forms of recruitment than was previously possible.

Joining tech startups which inherently pose higher levels of risk differentiates these “joiners” from traditional employees of larger companies. While some levels of character differences may exist, employees of startups are viewed to possess many entrepreneurial characteristics (Roach & Sauermann 2015) and therefore can be categorized as “entrepreneurial workers (Neff 2012)”.

2.1.2 Decreasing Gaps in Tech Usage & Skills

Even more good news - traditional performance gaps in math and sciences between boys and girls in primary and secondary education seem to be closing in. Girls have already been reported to be reaching academic parity with boys in math and science in the early 2000s (Bandura et al. 2001), and across U.S. schools, there is a growing tendency of girls even outperforming boys in math (Diekman et al. 2015).

The traditionally wide gap of tech usage between males and females is also decreasing. Women have been using the internet in equal proportion to men from the early 2000s (Margolis & Fisher 2002). Throughout the 80s and 90s, the stereotype of the father being the person who buys, understands and uses the computer at the household, and “the mother being afraid of ‘that machine’” held strong (ibid). However, such stark gender differences in daily tech usage is not observed anymore.

This means that traditional problems of women having actually sub-par skills or lower accessibility to technology are more or less removed, creating yet more hope for an optimistic outlook on gender equality in technology.

2.1.3 Increased Awareness on the Advantages of Gender Diversity

“*Gender is a business issue, not a women’s issue.” (Wittenberg-Cox 2009)*

Across industries, businesses are starting to recognize the advantages of gender diversity. Scholars have long called for the importance of implementing initiatives to promote entrepreneurship in women, citing it to be a fundamental opportunity for economic growth (Hisrich 1990). *The Economist* magazine has stated that “women’s

economic empowerment is arguably the biggest social change of our times (The Economist 2009)[2]". Global consultancies like McKinsey also estimate that within the next ten years, gender parity could "increase global GDP by $12 trillion." (Techstars 2016)

Multiple studies have shown that gender-balanced or women-led businesses perform financially better than businesses that are not. A study that compared women-owned businesses to all privately held U.S. businesses between 1997 and 2004 saw that in women-owned businesses, employment increased more than trifold the national average and revenues rose by 46% (cf. national average of 34%) (Wilson et al. 2007).

McKinsey has published multiple studies on the topic of gender diversity in businesses, and report that companies with higher female ratio in executive positions perform better and have higher customer satisfaction levels (McKinsey 2008). A more recent study compared top 25% and bottom 25% companies regarding gender diversity on executive teams and saw that the top-quartile were 21% more likely to have above average profitability (measured with average EBIT margin) (McKinsey 2018).

Gender-balanced and women-led businesses not only do well financially, but also tend to perform well on innovation. Female-owned businesses have a higher tendency to out-survive male-owned businesses (Kalnins et al. 2014). In a study published in 2007, Lehman Brothers found that teams that had 50/50 gender compositions were the most innovative, whereas all-male teams performed the least innovative (Lehman Brothers 2007). IMF observed that "replacing just one man with one woman" in either the management or the executive board resulted in 3 to 8% profitability increase. This difference became even more pronounced in the tech sector, due to the "higher creativity and critical thinking" that technology companies require for success, which diversity is generally thought to bring (Chang 2018).

Similar evidences are also found in smaller tech startups. U.S. venture capital firm First Round Capital studied over 300 companies and nearly 600 founders in their portfolio and found that the startups with at least one female founder significantly outperformed those with all-male founding teams by a whopping 63% difference in terms of market

[2] Website, therefore page citation not included.

valuation change (Marion 2016).

Such findings are commonly attributed to the growing belief that women, or the characteristics generally believed to be feminine, are more fit to the changes of industries in the 21st century. In the 20th century, industrialization emphasized “rules, control and direction of people” and “rarely appealed to the ‘human’ in their staff”. It was also customary for businesses to “talk in a much duller language.” (Wittenberg-Cox 2010:264). In the era of flatter hierarchies, flexible, organic processes and structures that view employees as humans rather than nuts and bolts of a giant factory machine, a more emotional and communal aptitude is sought for – which, ironically, perfectly fits the female gender stereotype.

2.2 Persisting Gender Inequality in Technology and Entrepreneurship

2.2.1 Gender Inequality in Technology

Women have been quite literally ‘invisible’ in tech throughout history (Rothschild 1983). Early video conference systems that were designed to automatically detect participants with basic facial recognition technology couldn’t detect women participants in the room (Margolis & Fisher 2002). At the beginning of the tech and computer boom, men being the sole creators and inventors of technology created many problems that seem outrageous today.

Despite all the advances that has been made in the past decades, the world is still far from perfect. There are significantly less women who study and continue their careers in IT, and even when they do, they tend to earn less than men and soon reach the ‘glass ceiling’ (Haynes 2006). Wajcman (2009) declares technology as one of the last domains of male domination, while scholars continuously point out that the computer industry remains a “heavily gendered space” (Vekiri & Chronaki 2008).

This claim is supported by countless data and research. European Commission, for example, published a report in 2011 about women in ICT and declared “European and international stakeholders in the Information and Telecommunications sector recognise that: Women are under-represented at all levels in the ICT sector” (ECWT 2011). In the U.S. alone, although as many women hold jobs as men do nowadays, they hold less than 25% of jobs in the STEM (Science, Technology, Engineering and Math) fields

(Beede et al. 2011). Narrowed down to IT professions in computing, female employee ratio in IT is only approximately 17%, and the ratio of female students in IT even seems to be on the decline (Bath et al. 2008).

Woodfield (2000) also noted that most of the women working in computer-related occupations are still found in mostly data-entry type “low-level” jobs, and few work as programmers or analysts. Financial Times also report that only 18.3% of technology roles within ten major tech companies in the U.S. are occupied by women (Bradshaw & Kwong 2017).

The problem is not just limited to the female employee ratio, but also that they tend to be heavily stereotyped. UNESCO declares gender inequality in tech as a worldwide problem and comments that “despite the fact that women in some areas do significantly contribute to technological developments, […] women’s concerns and contributions are frequently disregarded in science and technology policy, research and development” (UNESCO 2007:45).

2.2.2 Gender Inequality in Business & Entrepreneurship

The problem of gender inequality in tech startups is not only due to gender bias against women in technology, but also against women in entrepreneurship and businesses.

Female representation in the business world is improving in general but remains problematic on the executive level. McKinsey reports that executive level female ratio at global firms in the U.S. and U.K. are only at 14% (McKinsey 2018). Austria fares much worse in this regard, with only 5.6% of women serving on the executive boards in WBI firms, listed on the Vienna Stock Exchange (Sempelmann 2017).

Not unrelated, women are underrepresented in entrepreneurship in general. Notwithstanding the increasing awareness of entrepreneurship as an appealing and valuable career path for women (Heilman & Chen 2003), the rate of entrepreneurship in women remains relatively much lower than that of men (Minniti & Bygrave 2004).

In turn, female representation among startup founders is also low. ESM (European Startup Monitor) reports that the share of male founders constantly remains at about 85.2%, and female founders only at 14.8%. In Austria this difference is even larger, with only 7.1% women startup founders (Kollmann et al. 2016).

The situation doesn't get much better for female ratio in startup employees. Financial Times reported that on average, Silicon Valley startups that have less than 10 employees have only 17% female employees (Bradshaw & Kwong 2017). Craft, the data intelligence company behind the report, note that although this ratio improves very slightly as companies get older and bigger, it remains far from a 50/50 equality (Craft 2016). Another survey of 680 startup founders by Techstars, one of the largest startup incubators in the U.S., report that only 12% of those interviewed were employing five or more minorities or women and that 32% had not hired even one woman or minority employee in tech positions (Techstars 2016).

Stereotypical gender bias is commonly observed in entrepreneurship. There is a prevalent societal stereotype that women only run small companies that are not looking for high levels of growth (Robb & Watson 2012). Often, women-run businesses are regarded as "peripheral forms of business" i.e. home-based or "business that are not 'for real'", i.e. hobbies (Breen 2010). This results in a social perception of entrepreneurial women to be not serious enough, less successful, less innovative and not trustworthy - which then acts as a barrier against their entrepreneurial endeavors (Brush 1997).

2.3 Lack of Research Regarding Gender Inequality in Tech Startups

Despite the problems of gender inequality at the junction of technology and entrepreneurship, not enough research has been done on the topic so far.

The broader topic of women in entrepreneurship has been understudied in general (Mattis 2004, de Bruin et al. 2006), and often unintentionally resulted in reinforcing stereotypical gender classifications in entrepreneurship, positioning women's businesses to have less significance than men's businesses (Ahl 2006).

What makes research in this area more challenging today is the notion that bringing up the issue of women can already seem somewhat passé (Sørensen & Lagesen 2005) and that studies about women in entrepreneurship is immediately regarded to fall in the category of gender studies, instead of being just about entrepreneurship. As Hamilton (2013) notes, research only about male entrepreneurs is always regarded as a research for entrepreneurs, since the "normative entrepreneur is male" and entrepreneurship has been constructed as an essentially male domain (Ahl 2004). On

the other hand, a study about female entrepreneurs is always labeled with gender-studies, and therefore potentially regarded somewhat inferior in significance or even uncomfortable (Strimpel 2012) by many male scholars who still dominate academia.

It is thus unsurprising that studies regarding gender inequality in terms of tech entrepreneurship, an even narrower topic, is also understudied (Ozkazanc-Pan & Clark Muntean 2018). There is much to be still studied on the hiring practices of small startup firms in general (Fairlie & Miranda 2017). Moreover, the entrepreneurial employees or "joiners" of startups who also display entrepreneurial characteristics are still "lost in the shadows" (Roach & Sauermann 2015), while dominating research has been more focused on the founders of startups until now.

Therefore, it is imperative to first review existing literature in gender studies, sociology and entrepreneurial/management sciences. In combination, this may yield further insight and understanding into the complex problem of gender inequality prevalent in today's tech startups.

3 Theoretical Groundwork

3.1 Women and Technology

> *"They were the right stuff, but the wrong sex." - on first astronaut candidates at NASA (Wajcman 2006:447)*

Since the beginning of industrialization, science and technology has been tirelessly depicted as a 'masculine' domain, up to a point where it has become to be regarded as de-facto and was not scrutinized outside gender studies (Fox-Keller 2005). Wajcman (2006), in *Women, Gender and Technology*, describes the anecdote of NASA's first ever astronauts who had initially been comprised entirely of females based on better aptitude and skills. At the last minute, all of the female candidates were removed from the final list of astronauts that went to space - because they were the "wrong sex."

As computer technology increasingly gained popularity in the 1970s, social feminism became the more prominent discourse of feminism, which saw masculinity to be embedded in technology itself. Social feminists initially strived to clarify that the strong

association of masculinity and technology is not based on inherent, biological sex differences, but was rather the result of complex social and environmental constructs. Many socialist feminist frameworks therefore put an emphasis on how technology plays a key role in the male power domination (Cockburn 1983, McNeil 1987, Wajcman 1991). Various environmental factors such as early exposure to technology, education, role models and gender-biased job market all led to cement the construct of men being technically adept and physically strong, and women being “physically and technically incompetent (Cockburn 1983)”.

Often, women were reduced to be mere operators of the technology that was invented and created by men – “women are acquiring the 'what' kind of knowledge, but not the 'how', the 'why' and the 'whether' of technology (Cockburn 1985:142)”.

In the beginning of industrialization, this dichotomy often ‘made sense’ since engineering and technology operation required actual physical strength. Although advances in technology has made it possible for most jobs to become less physically strenuous and actually “lighter” and “cleaner”, gender distinctions between “men’s vs. women’s work” have been gradually readjusted to mean “technical vs. non-technical” (Game & Pringle 1984).

Technology has evolved over time to be a “language for action and self-expression, with consequent gender differences in ability to use this language”, which then created a technological world view that systematically resulted in “silencing” women (Benston 1988:12).

Many feminists have also believed that this was in fact a child from the marriage between patriarchy and capitalism. Murray (1993) put forth that males have been resisting against “dilution” with a “deeper motive to protect a masculine reality that has secured itself in the symbolic […] significance of science and technology.”

> *“To ‘take the toys from boys’ threatens those boys with the removal of one of the symbols that make them feel like boys and, significantly, not like girls. Without those toys […] the boys would no longer be boys as we know them.” (Murray 1993:78)*

In many western countries and especially in the U.S., the development of technology happened in tandem with needs for advancement in military powers, physical

domination and control (Rosser 2006). This offers a historical reasoning behind the construct of technology as a masculine, logic, rational domain.

In the 1990s, the world experienced internet in its truest form for the first time. From this development in technology, many optimistic views about the future of mankind arose - including Cyberfeminism. Donna Haraway, in her *Cyborg Manifesto*, declared that in this era, we are all “hybrids of machine and organism – in short, cyborgs” and that women are “uniquely suited to life in the digital age” (Haraway 1991, Haraway 1999, cited in Wajcman 2009:148).

Unfortunately, after the initial euphoria of the dot-com era, many feminists realized that the situation didn’t really get that much better. Discussions abounded on how the male professional identity itself was being indispensably associated with education, careers, physical strength and achievement while women were continuously being sidelined (Wajcman 1991, Wächter 2002), and how, ultimately, the male gender became completely embedded in technology (Wajcman 2009).

Many scholars noted how computer engineers in technology fields were increasingly becoming a “white, male middle-class profession” (Oldenziel 1999) and how mastering technology itself quickly became a source of “pleasure and power” (Wajcman 2009). This stereotype was constantly reinforced and reproduced with “symbols, images, use of language and systems of belief in the western world (Fox 2006:54),” working itself into the narrative of technology and entrepreneurship success stories.

This narrative is predominantly evident in the ‘hacker culture’ that became tightly associated with tech entrepreneurship since the dot-com boom era. This was personified through the portrayal of extremely successful tech entrepreneurs e.g. Microsoft’s Bill Gates, Apple’s Steve Jobs and Facebook’s Mark Zuckerberg. The media heralded young men who had dropped out of universities to pursue their single-minded passion for computers and succeeded to build a tech empire as the new class of heroes who are changing the world. The computer geeks, or nerds, or ‘hackers’ (all terms used quite synonymously) who had previously been regarded as being antisocial and were even often mocked or bullied suddenly came to the forefront of the society. With themselves, they brought together their personality traits, beliefs and value sets and put them on media pedestals - which were in turn mythicized and came to be regarded as the new recipe for success in the 21st century.

Already in the 80s, after studying MIT computer engineering students, Turkle (1984) pointed out that “though hackers would deny that theirs is a macho culture, […] it is a culture preoccupied with winning (ibid:216)”. A single-minded obsession about winning, and “subjecting oneself to increasingly violent tests” are traits often observed in the hacker culture, which makes “their world peculiarly male in spirit, peculiarly unfriendly to women (Turkle 1986:45)”. Many male computer engineering students report a sort of ‘conquer instinct’ that constituted a big part of their early fascination about computers – essentially, the delight in “having [the computer] do what you want it to do (Margolis & Fisher 2002)”. The salience of these starkly masculine notions combined with computing is often the factor that alienates and further isolates females (Haas et al. 2016).

The stereotypes against the characteristics of STEM jobs is another influential factor that further widens the gender gap. Working in STEM is rarely seen as something that has a communal motivation. A study of sixth grade students showed that they were unlikely to see science as “helping the poor” and associated it more strongly with “power” (Jones et al. 2000). The stereotypical representation of the “mad scientist”, the “lone, nerdy scientist in a lab coat and eyeglasses, [with] chemistry equipment” that is so often depicted in media holds strong in the society, regardless of age or gender (Diekman et al. 2015).

This may be an important factor that influence women’s continued alienation from STEM fields, as women tend to put higher importance on “communally oriented goals” and have stronger communal motivation (Bakan 1966), be it regarding the way of work (e.g. working with others, collaboration) or the nature of the job itself (e.g. helping others, projects that benefit others) (Pohlmann 2001, Diekman & Steinberg 2013, Diekman et al. 2015).

The fact that gender imbalance in technology is still a problem in 2018 indicates that it has a wide-arching systematic root cause, continuously reinforcing and strengthening itself in a loop of vicious cycles. Perhaps lightly echoing the optimism from the cyberfeminism era, some scholars are cautiously mentioning hope of overcoming the age-old dichotomy of male versus female and man versus machine through the rise of “social machines” (Bath 2006). This line of thought believes that new paradigms like interactive and social machines will challenge and hopefully destroy constructed

borders between the technical and social (ibid).

This notion deserves credit and further discussion, as humans and machines evolve further along to be hyperconnected and interchangeable. Technologies like artificial intelligence, voice & speech-based human-computer interaction, natural language processing, Internet of Things, machine learning and robotics are all advancements in computing that essentially aim to blur the strong divide between preexisting concepts of man vs. machine. Moreover, the world today is hyperconnected with social media, which has brought forth societal changes like the #MeToo movement in an unprecedented magnitude. The underlying mechanism of technological and societal change in the 21st century seems to be the blurring of boundaries and hyper-connectivity – which gives food for thought, as to how much then has gender inequality improved over the past decade, and will it really be able to bring drastic change within the near future.

3.2 Women and Entrepreneurship

The relationship between the female gender and entrepreneurship has travelled similar paths to that with technology. Since the industrial era, the entrepreneur has been defined as a male profession – for example, in Germany, entrepreneurs have been identified as “heroic lone fighters” since the 19th century (Schmidt 2002).

Over time, this notion became so engrained into culture that entrepreneurship is no longer just a job but has become an identity (Du Gay 1996). Cultural perceptions of a person undertaking business, or success thereof, has taken on a masculine notion – i.e. the “cult of the individual, the ‘self-made-man’ and the ‘enterprising self’ (Fenwick 2002 cited in Lewis 2014:332).”

Characteristics that are commonly described as recipes for successfully starting a business, e.g. taking initiatives, achieving accomplishments and propensity to risk (Bruni et al. 2004) are all close to societal constructs of the symbolic masculinity (Heilman 2001). As a result, the type of jobs that are typically associated with “power, prestige and authority in a society (Marlow & Carter 2004, cited in Gupta et al. 2009)” are usually stereotyped as a masculine job. This cultivates and reinforces a stereotype that automatically casts females aside, as unfit for the ‘power jobs’.

The masculine professional identity has become so solidified to an extent that the typical image of a successful entrepreneur is “not only male but lean, hungry, predatory and hostile (Greer 1999:299)”. When such extreme stereotypes are reinforced in the society, a bigger portion of the population who do not share these characteristics becomes even more easily subject to bias and discrimination.

Countless studies show how women are often perceived to be inferior to men in entrepreneurship, or even possess opposite characteristics compared to a typical successful entrepreneur (Ahl 2006). Even in the 21st century, our society continues to be skeptic and distrusting when it regards women’s entrepreneurship (Welter et al. 2003). It is also noteworthy that although more women are starting to see their own ‘feminine’ traits to be actually beneficial for entrepreneurship, men, on a large scale, still fail to see this (Schein 2001).

This is not good news, especially because these social constructs even impact entrepreneurial intent in to-be entrepreneurs. Studies show that stereotypes against female entrepreneurship impact not only women’s self-efficacy, but also their perceived hostility of the business environment (Zhao et al. 2005). A research that dived deeper into the relationship between perceived gender identification and entrepreneurial intent found that regardless of biological sex, those who perceived themselves to be closer to the male gender identification had higher entrepreneurial intentions than those who did not – suggesting a correlation between acquired social constructs and entrepreneurial intentions (Gupta et al. 2009).

Relatively less research has been done on female entrepreneurial workers – i.e. those who choose to or intend to work in young startup companies, but not necessarily found the startups themselves. Research suggests that entrepreneurial workers tend to have largely similar entrepreneurial traits as founders and differ only in smaller aspects (Roach & Sauermann 2015). One of the possible differences could be the level of preference for autonomy and control (Neff 2012) and the level of risk tolerance (Hall & Woodward 2010).

Interestingly, both control and risk propensity are traits that are perceived to be masculine and simultaneously regarded as core traits of entrepreneurship. However, preference for autonomy and control is not one-dimensional, and potentially have gender differences at a deeper level (i.e. preference for control over others vs.

preference for control over own working time and style). Further studies into female entrepreneurial workers, i.e. females who choose to work in startups as employees, could potentially shed a helpful light on increasing gender equality in this burgeoning but heavily biased industry.

4 How did it happen? The Brotopian Cycle

4.1 Introduction

So far I have reviewed how, over the course of modern history since the industrial era, women have been grossly underrepresented in both technology and entrepreneurship. A combination effect of both are well reflected in the current gender imbalance in tech startups.

This is not due to inherent genetic differences between male and female, rather to external influences that gradually shape social perceptions against women's tech entrepreneurship. One cannot, for instance, regard the low number of females in the STEM or entrepreneurship fields as a result of inherent weaker drive for success or hard work – a simple comparison between STEM and other "high power fields like law and medicine (Diekman et al. 2015)" shows how women are becoming increasingly more present in some traditionally masculine fields, though not in STEM. As Margolis & Fisher put it, "disinterest and disaffection are neither genetic nor accidental nor inherent to the field but are the bitter fruit of many external influences (Margolis & Fisher 2002:4)".

There are many scholars that have described this systematic underrepresentation of women in tech and entrepreneurship, i.e. "Shrinking Pipeline (Camp 2002)[3]", "Glass Barrier (Langowitz & Morgan 2003)", "The Clubhouse – locking girls out of the science loop (Margolis & Fischer 2002)" and "Gender Asbestos (Wittenberg-Cox 2010)" to name a few. All of them suggest that somehow, women are being filtered out, not just at one point but continuously and ubiquitously, insulating the men in their own boy's club 'loop'. Gender inequality is concealed but persistent within the society,

[3] Commonly referred to as the 'Leaky Pipeline'.

"systematically (re)producing gender distinctions" in a "gender subtext." (Benschop & Doorewaard 1998:787)

Many decision-making level executives in tech startups, when inquired about the gender inequality problem in their startups, universally reply with similar variations of "We'd love to get more women in, but no one applies!", finding the cause in external factors outside of the startups' control. However, in order to achieve gender equality, it is crucial to understand that the root cause is both external and internal. The ubiquitous, systematic stereotypes are entrenched in an almost unbreakable vicious cycle that constantly squeezes women out of the loop through the course of their lives.

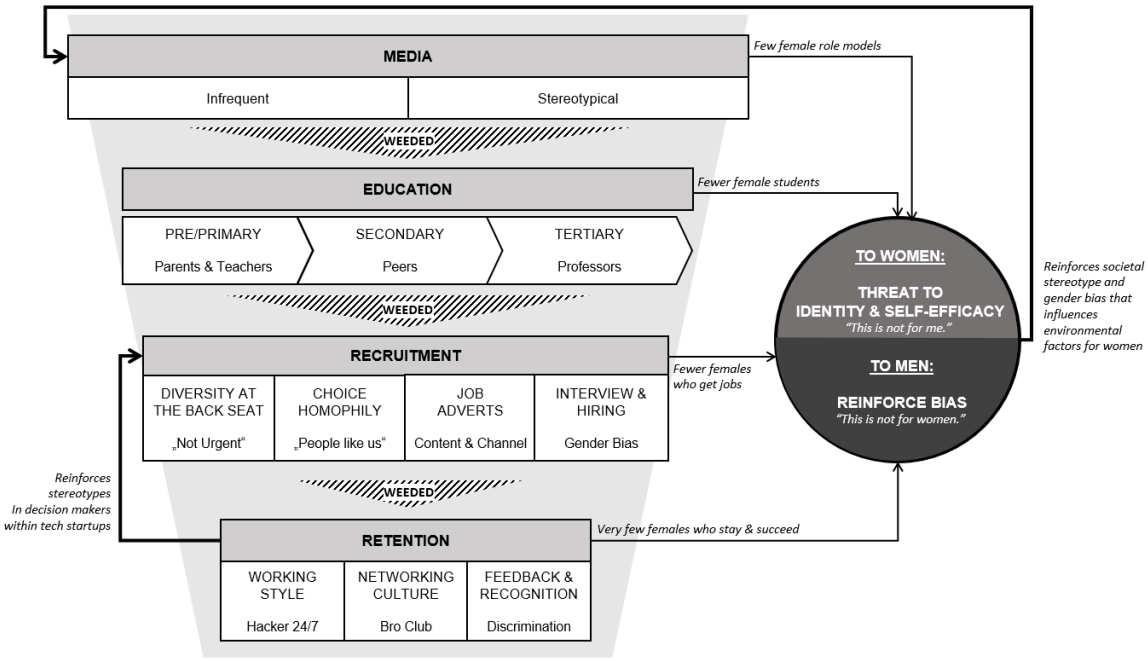

Figure 2. *The Brotopian Cycle. (Own Illustration)*

Through literature review, I will examine how as women pass through each major stages in her life, exposure to media ("Media") shapes gender stereotypes that affect not only herself but everyone around her, which are continuously internalized from early formative years ("Education") then solidified as physical barriers when finding a job ("Recruitment") and continue to influence her career even after entering the industry ("Retention"). Each stage weeds even more women out of the loop than the previous through constantly threatening women's identity and self-efficacy in tech and entrepreneurship, and simultaneously reinforces gender bias in men who witness this, as summarized in *Figure 2*.

4.2 The Role of Media – How Stereotypes Get Shaped in the Society

4.2.1 Infrequent Coverage of Women

> *"Popular media is a powerful force in shaping perceptions of reality." (Langowitz & Morgan 2003)*

Even before a woman is born, the media plays a critical role in shaping and imprinting gender stereotypes into the collective minds of the society.

Women are traditionally less portrayed in media than men – even more so when it comes to entrepreneurs and the concept of entrepreneurship. In the likes of Henry Ford, Donald Trump and Richard Branson, the 'successful entrepreneur' in media is most frequently a "heroic man (Ahl 2006)". This includes entrepreneurship case studies from business schools that define the role models of entrepreneurship (Bird & Brush 2002) as well. To make matters worse, male entrepreneurs drastically outnumber females in the tech industry, which also happens to be the industry that gets the most attention from media and policy makers (Marlow 2002).

Especially for the 'tech (ICT) worker', the dominant image media portrays of them is the typical "white male, nerd/hacker" who "work sixteen-hour days and neither seek nor have access to family-friendly work practices such as part-time and flexible work (Wajcman 2006:87)". As Turkle (1984) describes, technology is a domain where the "male culture of mastery, individualism, nonsensuality" prevails as the norm, where a typical "hacker-style work (Wajcman 2006:87)" culture proliferates.

Among those who have become successful within this industry – the leaders of tech companies – those in media spotlight are almost always male. Wajcman (2006) calls them "the cyber-brat pack for the new millennium – those wealthy and entrepreneurial young guns of the Internet (ibid:87)". Entrepreneurial storytelling by media often consists of a "skillful blending of myth and rationality (Lewis 2014:333)", which in today's times is told and retold in the format of the brilliant but antisocial computer nerd who dropped out of college because he couldn't bear the mundanity of it, then created a world-dominating enterprise out of his own parent's garage. Such narrative is repeatedly imprinted on our society's mind with examples of tech billionaires like Bill Gates, Steve Jobs, Mark Zuckerberg, Sergey Brin and Larry Page.

The self-dubbed “PayPal Mafia”, who all started their careers in the then-startup PayPal and went on to become well known in the Silicon Valley as an informal network of the earliest heroes of the internet, is a good example of this male-dominant tech entrepreneurship narrative.

Figure 3. *The PayPal Mafia. (O'Brien 2007)*[4]

In a *Fortune Magazine* article (O’Brien 2007), the group of men were literally depicted in the cover photo as “gamblers with cigars, drinks, and a deck of cards (Chang 2018:49-58, see *Figure 3*)” – highlighting and cementing the association of qualities such as risk-taking (“gambling”) and oftentimes violent conquests (“Mafia”), all starkly male concepts, as the key traits of successful tech entrepreneurship.

Against this dominant narrative of the brilliant “bro” who has no concerns about “risking everything”, the woman entrepreneur who often manages work and family responsibilities by juggling priorities do not easily ‘fit in’ to the archetype, and thus tend to be largely ignored by the media (Chang 2018).

[4] Back row from left: Jawed Karim, co-founder Youtube; Jeremy Stoppelman CEO Yelp; Andrew McCormack, managing partner Laiola Restaurant; Premal Shah, Pres of Kiva; 2nd row from left: Luke Nosek, managing partner The Founders Fund; Kenny Howery, managing partner The Founders Fund; David Sacks, CEO Geni and Room 9 Entertainment; Peter Thiel, CEO Clarium Capital and Founders Fund; Keith Rabois, VP BIz Dev at Slide and original Youtube Investor; Reid Hoffman, Founder Linkedin; Max Levchin, CEO Slide; Roelof Botha, partner Sequoia Capital; Russel Simmons, CTO and co-founder of Yelp (O’Brien 2007)

A great example of this is the case of Susan Wojcicki – whose name usually does not ring a bell in the public's mind (See *Figure 4*). This is surprising knowing that Wojcicki, a mother of five children, has also been the CEO of Youtube since 2014, grew the company's revenue by billions and was ranked the eighth most powerful woman in the world by Forbes in 2013. The low awareness of her name alone suggests how the media often ignores women entrepreneurs in tech.

> *"The media has never gushed over Susan Wojcicki, nor has it picked her apart. What it has done instead is virtually ignore her – an oversight that becomes more astonishing the more you look at her career." (Chang 2018:93)*

Figure 4. *Susan Wojcicki, CEO of YouTube.*[5]

Women entrepreneurs are, more or less, "invisible" in popular media (Langowitz & Morgan 2003) – a phenomenon some researchers have dubbed "gender blindness" (Baker et al. 1997). This study found that compared to men, women entrepreneurs were featured 20% less frequently in major media in the U.S (ibid). Although the ratio of

[5] Source: TechCrunch https://www.flickr.com/photos/techcrunch/29684662515 – retrieved on 27 June 2018. Photo by Steve Jennings/GettyImages for TechCrunch. Reproduced under Creative Commons License (Attribution 2.0 Generic, https://creativecommons.org/licenses/by/2.0/legalcode – retrieved on 12 Aug 2018). No changes were made to this image.

females in entrepreneurship is constantly on the rise, the same level of increase in women entrepreneurs' media coverage is not observed (ibid).

As a result, the false notion that there aren't enough female entrepreneurs, especially in tech, prevails. In a 2018 survey which asked 1,000 Americans if they could name a famous woman leader in tech, 91.7% of respondents couldn't name anyone. Out of the 8.3% that said yes, only 4% could actually give an answer, and some responses had been "Alexa" or "Siri" – not real human women, but the well-known names of voice assistant software from Amazon and Apple (Zara 2018).

The perception that there are not enough successful female tech entrepreneurs lead women in tech to believe that there are not enough female role models in the industry. As illustrated in the following quote from a female startup founder, perceived lack of role models negatively influences perceived self-efficacy. Needless to say, this then impacts her future career trajectory decisions.

> *"When you don't see a lot of women executing at higher levels, you may not even think you can reach that level." (Bailey 2018)*[6]

4.2.2 Stereotypical Coverage of Women

> *"If we believe what we read in the press or the media, there is a perception that women are less capable, less entrepreneurial, or perhaps they should not be entrepreneurs at all." (de Bruin et al. 2006:586)*

Not only are entrepreneurial women less frequently featured in mass media - when they are, they tend to be portrayed in a stereotypical manner, again reinforcing "the glass barrier" for female entrepreneurs (Langowitz & Morgan 2003).

Achtenhagen & Welter (2011) analyzed over 5,000 newspaper articles in order to determine narrative patterns of female entrepreneurship in media. They found female entrepreneurs were more likely to be associated with "traditionally feminine, typical and 'socially desirable' behavior (ibid:763)". Female entrepreneurs are often depicted in media as "less professional, successful and purposeful" than male entrepreneurs

[6] Website, therefore page citation not included.

(Lewis 2014:336). They are commonly described as not having strong intent for scaling and growth, accidentally “stumbling across” business opportunities and often starting businesses as a means of personal survival to overcome “adverse personal conditions such as illness or death of spouse”, where the finances were “scraped together from personal contacts” - all of which imply that they were neither really serious nor ambitious enough about their businesses (Langowitz & Morgan 2003).

Moreover, women entrepreneurs depicted in media tend to be in “low-growth, low-skilled business sectors […] perjoratively labeled as ‘mice, failure, and plodder’ compared with high-growth ‘gazelle’ businesses that are commonly associated with men” (Lewis 2006 cited in Gupta et al. 2009:400). This only strengthens the stereotype of women entrepreneurs as not being serious or highly ambitious about their entrepreneurship.

Such media profiles of female entrepreneurs establish social concepts about entrepreneurial females and downplay their significance. This affects the entrepreneurial intent of females in general (Habermas 1991) by implying that female entrepreneurship is a career option that is not desirable for women (Achtenhagen & Welter 2011).

Moreover, this impacts the expectations against entrepreneurial women from the environment she must interact with to become successful, e.g. venture capitalists. This further strengthens the “glass barrier” by diluting social expectations (Langowitz & Morgan 2003) and imprints negative stereotypes against entrepreneurial females into the society.

4.3 The Role of Education – How Stereotypes are Internalized

4.3.1 Preschool & Primary Education

From the day a child is born, it interacts with and internalizes the values of the world, which is not a clean slate free of stereotypical constructs. While some gender differences do tend to be observed from a very early stage, much of it is unknowingly and sometimes even unwittingly constructed and reinforced by the child’s environment – including his/her parents and family, teachers, peers and media.

Efforts to reduce gender-biased messaging in educational content has been constantly

increasing, and in today's culture, it is generally considered unacceptable to see obvious illustrations of gender stereotypes, such as those depicted in the children's book, *I'm Glad I'm a Boy! I'm Glad I'm a Girl!* (Darrow 1970)[7] – "Boys can eat. Girls can cook. […] Boys invent things. Girls use what boys invent."

While this may be an extreme example, there are countless studies done on how influences from media and family instill gendered social constructs in children early on in their lives. One such prevailing social construct is how men are tech-endowed and women are not – men are regarded as physically strong and "technologically endowed", and women as incompetent in both (Cockburn 1983).

Both boys and girls, early on in their childhood, absorb this biased worldview and internalize these values, where "objectivity, rationality, control over nature and distance from emotion" is hailed as the recipe for successfully running the world and assigned to males, whereas females are to be better at interpersonal skills and automatically "less rational, less capable of abstract, 'objective' thought" (Benston 1988:12).

A study conducted in the 1980s observed how children reacted differently to learning and playing with computers. Without any priming by the researchers, boys overwhelmingly had a tendency to regard computers as "something to be brought under control (Turkle 1984)", where the task of conquering the technology itself became the single focus. Girls, on the other hand, were more likely to approach the topic as if they were artists, cared about the esthetics of their output, and often worked in a manner of "trial and error" instead of starting with a detailed blueprint. (ibid)

> *"In our culture, girls are taught the characteristics of soft mastery – negotiation, compromise, give-and-take – as psychological virtues, while models of male behavior stress decisiveness and the imposition of will." (ibid:108)*

Parents unwittingly play a vital role in creating and solidifying this stereotype. Studies show that parents tend to explain scientific concepts more to boys than girls (Crowley et al. 2001), give more access to a home computer to boys (Vekiri & Chronaki 2008),

[7] It should be noted that some speculations exist that author Whitney Darrow, a longtime New York Times satirical cartoonist, may have intended the book as satire. However, the book was widely accepted by the public at face value at the time, and the author has himself never clarified his intentions. (Source: https://www.brainpickings.org/2014/01/20/im-glad-im-a-boy-im-glad-im-a-girl-darrow - retrieved 29 July 2018)

often place the computer in the boys' room where they interact more frequently with it, including playing games and regarding it as a toy (Margolis & Fisher 2002), provide boys more opportunities to learn about science, which to boys were offered regardless of their interest in the subject but for girls depended heavily on whether or not they expressed explicit interest in it (Alexander et al. 2012).

Not surprisingly, these reinforcements result in boys who develop much stronger self-efficacy and task-value beliefs (Eccles & Wigfield 1995) in computers early on, which become significant precursors of their future education and career paths (Vekiri & Chronaki 2008). Although many girls tend to outperform boys in science and computers in primary school (Steffens & Jelenec 2011), boys are much more likely to perceive that they are receiving support from parents and peers for computer usage (Vekiri & Chronaki 2008), which causes differences in the frequency and depth of boys' and girls' early interactions with the computer.

4.3.2 Secondary School

By the time these girls and boys grow up to go to secondary school, there is already an observable difference in interest levels for computers and science. A stark example of this is the gender difference in technical high school enrollments ("HTL" – Höhere Technische Lehranstalt) in Austria. According to a *Die Presse* article, the ratio of girls in technical high schools in Austria is a mere 12%, while enrollment of girls in fashion high schools is a staggering 97% (Die Presse 2012). This creates a 'classroom full of boys' in tech and the sense that computers, science and engineering are done better by boys.

Studies show that girls do not differ greatly from boys in terms of enjoyment of computers in primary school. However, this tends to change when they enter secondary school. While most girls view computers as a tool to help them accomplish tasks, boys have a higher tendency to view "computers as toys" and frequently play computer games at home with friends, while also preferring to learn about computers with a "competitive teaching approach" (Wasburn & Miller 2006).

A study conducted in Germany among youths between 14 – 20 years of age in 1999 also suggested large differences regarding perception of computers between boys and girls. While 35% of teenage boys counted computer as their favorite hobby, only 7% of

girls did so – probably not unrelated with the fact that 73% of boys reported to have access to a computer at their homes, whereas only 58% of girls did (Collmer 2001).

Many scholars believe that much of this has to do with the relationship between the desire to control & conquer, and how computers, especially computer games, have long been serving this need exceptionally well. This tendency is eloquently described by Wajcman, as follows:

> *"Many of the most popular games are simply programmed versions of traditionally male noncomputer games, involving shooting, blowing up, speeding, or zapping in some way or another. They often have militaristic titles, […] highlighting their themes of adventure and violence." (Wajcman 2006:87)*

Researchers have observed how the "rise of the culture of video games" have impacted the ratio of women in tech to decrease (Camp & Gurer 1999). Whereas only a minority of games and software available to play on the computer has been appealing to girls (Borg 1999), teenage boys are strongly attracted to the appeal of "control – the possibility of increasing levels of control over a limited, well-defined world (Benston 1988:17)".

> "*The fun for the male students is not only in using the computer but in knowing it and having it do what you want it to do." (Margolis & Fisher 2002:17)*

To make matters worse, this tendency often manifests itself into the representation of gender roles and biases in the actual games. It is not uncommon to see highly sexualized, unrealistic portrayal of female characters (if at all) in popular computer games. IGDA, the International Game Developers Association, reported in 2016 that females constituted only 22% of game developers worldwide, and that men working in the gaming industry were less likely than women to perceive diversity as an important value in both their industry's workforce and within the games themselves (Chang 2018). Incidents like #GamerGate in 2014, the harassment campaign targeting female developers in the gaming industry who had advocated for gender diversity in computer games, even included death threats against the targets (Sherr & Carson 2017) and indicate that this problem still persists in the industry today, affecting millions of teenagers worldwide.

While the 'hacker image' taints the image of science and computer-enthusiasts early on

as control-obsessed and often violent, another critical part that completes the picture is that of the ‘nerd’ or the ‘geek’. The standard image of the nerd/geek as being “anti-social” and incapable of “meaningful relationship” (Turkle 1988) propel teenage girls even further away from the topic. Research has shown the importance of peer approval and its impact on girls’ decisions to pursue careers in science (Baker 2016). These stereotypes often drive talented girls away from further pursuing technology and computer studies (Turkle & Papert 1990).

All of this combined with the way how computer is usually taught at schools often effectively extinguish any remaining interest girls had in the topic. Although girls learn better from educational approaches that involve authentic, direct, realistic contacts, this is often overlooked in teaching styles or curriculum and most computing courses are taught with a competitive, ‘level conquest’ approach (Margolis & Fisher 2002).

As a result, teenage boys who are fascinated by computers delve even deeper into it on their own, often venturing into more “high-tech” activities i.e. programming (Margolis & Fisher 2002, Papastergiou & Solomonidou 2005) and engaging more frequently in related extracurricular activities at school (Jones 1991). Girls, on the other hand, start using computers less frequently (Vekiri & Chronaki 2008) and do not enroll in higher-level computer classes or computer-related extracurricular club activities (Sanders 1995). Already at this stage, interest is dwindling as a compound effect of multiple factors.

This has a negative impact on girls’ self-efficacy in computers and science as well. Research conducted in the U.S. and Canada showed that girls are more likely to attribute success in computer performance to external and uncontrollable factors, i.e. luck, than boys (Vekiri & Chronaki 2008). Female students are likely to perceive themselves as less competent in computers (ibid), which then loops back to a lower likelihood of enrolling into computer-related fields in higher education or going into technological fields in their careers (Wasburn & Miller 2006, Bath et al. 2008).

4.3.3 Tertiary School

By the time girls and boys become young adults and enter higher education in universities, the external forces described have already squeezed out many women who could otherwise potentially have been able to continue nurturing their interest. This

results in a low enrollment level of women students in computing majors in higher education institutions (Sørensen & Lagesen 2005).

For those female students who do continue on their studies, the environment is usually unwelcoming – many report feeling outnumbered and "even intimidated in class" by the overly dominant male student and professor ratio. Wasburn & Miller (2006) conducted a study among university students to describe the overall "chilly climate", where more than 33% of female students surveyed reported that they believe professors in their technology classes did not give equal treatment to male and female students. Many felt uncomfortable asking professors for help outside classes and did not feel they were equal participants with male students when working on group projects. This sentiment is intensified by the lack of female faculty, mentors, peer students and supportive networks in computer engineering (ibid).

A commonly reported theme is feeling 'different', and as a result having their female identities threatened as a computer science major. Margolis & Fisher (2002), in their book *Unlocking the Clubhouse*, interviewed female undergraduate students at Carnegie Mellon University and found out that most had come to computer engineering after having been exceptional math and science students at high school, who "enjoyed problem solving, doing puzzles, exercising logical thinking skills." This was a stark difference to most of the male students, who reported the "experience of falling in love [with computers] at an early age" (Margolis & Fisher 2002:18).

It is then understandable that many female computer science students deliberately and actively erase any distinctively female characteristics to avoid being discriminated due to their "otherness" as a minority group (Fox-Keller 1987). This serves as proof that a constant threatening of the female identity takes place during the education process, which carries over to even fewer women who enter the labor market in technology (Sørensen & Lagesen 2005). Unknowingly, and largely unintentionally, by the time women reach adulthood, much of the interest in computer science that may have been sparked earlier is more or less completely extinguished (Margolis & Fisher 2002).

4.4 The Role of Recruitment – When Stereotypes Solidify into Barriers

4.4.1 "Diversity at the Back Seat"

Now I will shift my focus from the macro social level to a micro level, namely to tech

startups, which is the focus of this study. After women have successfully overcome all the social gender stereotypes from media and education and seek employment, they are met with an even stronger block, which is usually created, albeit unwittingly, by the startups themselves.

In many startups, especially if they are in earlier stages, there is a tendency to see gender diversity as not an urgent issue to solve, something that should be dealt with but can be dealt with 'later'.

Emily Chang, after having interviewed many Silicon Valley recruiters, observes that many refer to it as a "pipeline problem" (Chang 2018). Many male startup founders I have talked to for this research have also often said "There's basically not enough women who graduate with degrees in tech". The pipeline problem approach, however, putts the blame on external factors and effectively makes it someone else's problem to solve.

> *"Missing from this explanation is that the tech industry itself created the pipeline, which is very narrow and built on fanciful assumptions about what it takes to participate. Also missing is any acknowledgement that from its earliest days the industry has self-selected for men: first, antisocial nerds, then, decades later, self-confident and risk-taking bros." (Chang 2018:35)*

Startups, by nature, typically operate on a very small scale with tight financial constraints (Audretsch et al. 2001). There is a strong pressure to survive and budget is limited, meaning there is a high awareness in the founders' minds to find efficient solutions for management issues. Oftentimes, in this regard, diversity is prioritized lower and is viewed as a 'luxury problem' that can be dealt with later.

In addition, startup founders usually lack experience in management, leadership and recruiting (Nyström & Zhetibaeva Elvung 2015) in general. Startups do not have the structured human resource departments of larger companies with years of experience and know-how, and often resort to relying on the founders' gut-feeling to make recruiting decisions. It goes without saying, that gut-feeling based decisions can be prone to being unintentionally influenced by stereotypical bias.

Financial Times reports that although it should theoretically be easier for young, smaller companies to "address gender imbalance when they have only dozens of staff",

too many put the issue to the side “until it is too late” (Bradshaw & Kwong 2017).[8]

The same article quotes Minal Hasan, a former attorney who represented tech companies including Twitter and Uber, saying that in startups, topics such as sexual harassment training are often considered as “issues for bigger companies, not a few engineer friends sitting in someone’s house pulling together their first company.” (ibid)

This is a common belief that often leads on to a compound effect on the startup shortly thereafter, even at the first scale-up stage. Aaron Levie, chief executive of Box, gives a compelling rationale by saying that “Companies need to think about diversity on ‘day one’. The sooner you do this, […] the more you can get dividends later on." (ibid)

4.4.2 Choice Homophily

Homophily is how individuals tend to associate with others based on their perceived similarities (McPherson et al. 2001). Within the startup sphere, with young founders who often have limited leadership experience and are prone to being influenced by stereotypical bias, there exists a misconception that homogeneity in teams are even beneficial for early stage startups.

Peter Thiel, widely respected by many in Silicon Valley as the founder of PayPal (and thus the father of aforementioned “PayPal Mafia”) turned venture capitalist, wrote in his book, *Zero to One,* that since early stage startups must survive on limited resources, they “must work quickly and efficiently in order to survive, and that‘s easier to do when everyone shares an understanding of the world. The early PayPal team worked well together because we were all the same kind of nerd” (Thiel & Masters 2014:122-123).

This enables and validates the thinking of “Let’s get people like us” (Chang 2018:49-58). During the search process for new employees to join their startup, when the startup is already male-dominated, males tend to exhibit more “homophilous network relationships” than females (van den Brink & Benschop 2013). Male recruiters in male-dominated organizations use phrases like “’men prefer men’, ‘rely on’, ‘he is like me’, ‘easy’ and even ‘natural’” (ibid:16) to describe male candidates. Although countless research suggests otherwise, there is widespread belief, especially in male-dominated

[8] Website, therefore page citation not included.

small companies, that recruiting people who are similar to the existing members would not be just easy but even beneficial.

Going back to Thiel, he even “notes with pride that ‘of the six people who started PayPal, four had built bombs in high school” in an interview (Chang 2018:49-58). The phenomenon of choice homophily, the tendency of male founders to look for people who are similar to themselves, is amplified even more by the active search for specifically male-dominant characteristics and personality traits, which are often believed to be success recipes for startups. In the same book, Thiel is quoted as saying “having some extreme personalities […]is somewhat a good thing” (ibid:51).

Wittenberg-Cox (2010) notes similar phenomena in her book, *How Women Mean Business.* When asked what kind of characteristics he looked for in future leaders who could be his potential successor, a male CEO of a large firm responded by saying “I look for people who are hungry for power” (ibid:261). The book describes how the CEO had used these words when he was addressing a room full of 150 high potential female leaders in the company, and after he had left, when asked how many of them would define themselves as ‘hungry for power’, not a single woman raised their hand.

> *“The CEO had unwittingly just told his top female talent that they would not be in the running for his position.” (ibid:261)*

Being bomb-builders and being hungry for power are all characteristics of the stereotypical successful male entrepreneur, “the epitome of ‘he who dares wins’ (Marlow & Swail 2014)”. It depicts impulsive, fearless risk-takers as the ideal norm of a startup worker, which contradict heavily to the common feminine stereotype.

4.4.3 Job Advertisements

Despite all of this, many more startups in recent years are starting to become more aware of the gender diversity problem and wish to recruit more women. A common statement from male founders at this stage is that they really want to recruit more women, but women simply don’t apply.

Therefore, it is necessary to scrutinize the recruitment process in detail – since oftentimes, even when startups do decide that they need to recruit more women, they make multiple unconscious mistakes that reduce the likelihood of women applying.

One example has to do with the “self select-out” phenomenon (Wittenberg-Cox 2010). An internal survey at Hewlett Packard found that females tend to only apply to job ads if they match 100% of the required skillsets, whereas men applied when they only matched 60% (Sandberg 2013). This means, the longer your list of job requirements in job ads, the more chances you have of women not applying to your company – even though many underqualified males still would.

Another important aspect of job advertisements is the unconscious use of gender-coded language that are unattractive to women. Gendered language can inexplicitly impact individuals’ judgments, decision making behavior, influence self-perception and how they interact with others (Prewitt-Freilino et al. 2011). Job advertisements with common male-coded words such as ‘leader’, ‘assertive’, ‘competitive’ tend to attract fewer female applications, compared to job ads with more female-coded words such as ‘cooperative’ and ‘compassionate’ (Bohnet 2016), and gendered wording in job ads sustain gender inequality by impacting the candidates’ perception of belongingness in the advertised firms (Gaucher et al. 2011).

A study that compared the relationship between female student ratios and wordings used in business school application advertisements also found similar results. The schools that had the highest female student ratios (above 40% in this study, including Boston School of Management and NYU Stern) used words such as “the art of business”, think horizontally”, “have a ‘feel’ for business”, “environment of mutual learning, teamwork and support” and “fostering creative research”. Those with the lowest female student ratios (around 20%) used words like “rigorous research”, “attitude and drive”, and “leading business school” (Wittenberg-Cox 2010:82-83).

Statements that are commonly used to depict attractive company culture in startups can also have a detrimental effect. Sentences like ‘we work hard and play hard’ automatically suggest “going out for drinks all the time or being a 20-something (Fink 2017)” and could be factors that are counter-effective to startups looking to recruit women.

A study in 2017 by the company Textio (Snyder 2017) that analyzed more than 25,000 job ads published by major tech companies in the U.S. also found that there were stark differences in the wording companies used to describe themselves, which affect differences in female application ratios. Companies like Slack, the successful tech

startup that builds employee messenger platforms, were more likely to use phrases such as “lasting relationships”, “meaningfully” and “care deeply” – while Amazon used phrases like “wickedly”, “fast-paced” and “maniacal”, and Uber used phrases like “whatever it takes” and “all-star” (See *Figure 5*).

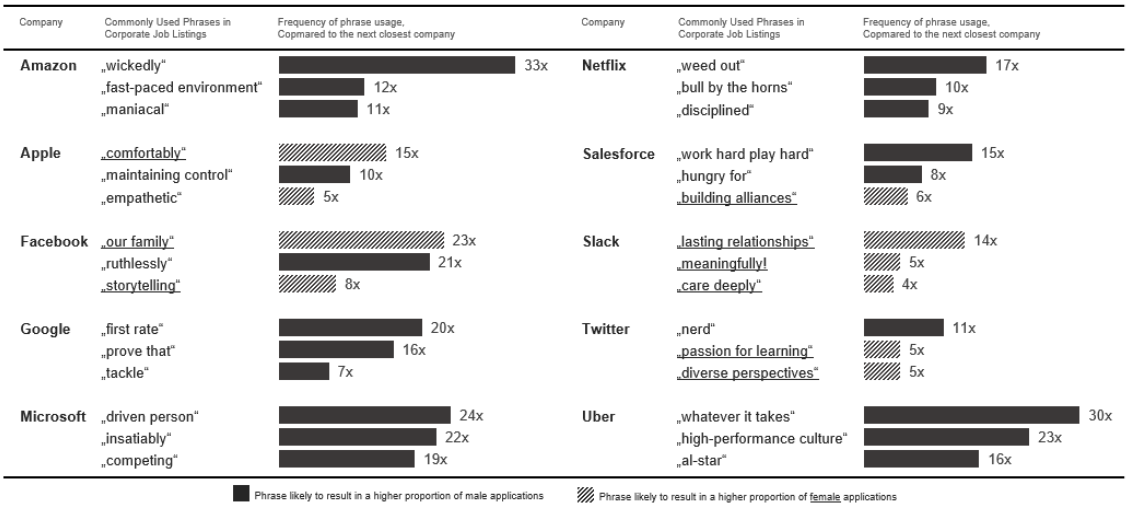

Figure 5. *The Language of 10 Tech Cultures. (Snyder 2017)*

Figure 9(See *Appendix 1*) takes an example job posting from an existing tech startup, published online in 2018, that makes many of the unconscious mistakes discussed above. Apart from using words like “PHP Jedi” as the job title, the advertisement lists more than ten different job requirements and looks for a person who identifies as an “elite swat team” for a position with 3+ years’ experience. The company also lists ten more requirements that are not actual requirements but what they would be “impressed” with. “Ping-pong, Mario Kart and foosball tournaments” are listed as the company culture. Heavily male-coded language that play into the hacker/bro stereotype is used throughout the advertisement, e.g. “your life begins and ends with a slash”, “a day without pushing code makes you sad”, “you have lots of stamina” and “you can’t imagine your life without a whiteboard, […] and definitely CODE.”[9]

Often, gender-coded language in job advertisements aren’t even intended to sound aggressive or macho. Alaina Percival, CEO of Women Who Code, says:

[9] Source: http://www.eu-startups.com/job/php-jedi-2 - retrieved 6 July 2018. Website, therefore page citation not included.

> *"Hiring managers often use phrases in job listings without understanding the exact connotation of the words. Flashy superlatives such as Rock Star, Code Ninja, Unicorn and Code Monkey are meant to be positive and upbeat, but they're actually not respected and can hurt your chances of acquiring talent. This is especially true of women who are often conditioned by society to avoid that kind of pomp and self-promotion." (Percival cited in Fink 2017)*[10]

Another aspect that may have an impact on female application ratio is the aspect of communal goal congruity. Women are more likely to value jobs that have "communally oriented attributes such as working with people, helping others, and an opportunity to make friends (Diekman et al. 2015:62)" and girls have a higher tendency than boys to report "helping other people" as an important factor for their future jobs (ibid).

STEM fields, on the contrary, are traditionally perceived to be less communally oriented with the typical 'lone scientist in a lab coat' image (Diekman et al. 2015). Wittenberg-Cox (2010) also suggests that many companies stereotypically communicate about "performance, competitiveness and positioning" instead of "atmosphere, community and collaboration" (ibid:85), which may further decrease the attractiveness of the job for many female applicants.

This is an unfortunate stereotype, and also one that can be easily debunked with more careful consideration of how startups explain the nature of their work and the meaning of their product in job advertisements. Many tech startups are founded on the premise of solving an existing problem – therefore essentially helping others, usually a previously underserved group of people, in the society. This aspect of startup work can and should be much more highlighted in job advertisements to effectively battle the stereotypes tech startups find themselves against.

4.4.4 Interview & Hiring Processes

Unintended stereotypes and biased behavior continue to persist during the interview and hiring process.

In tech startups, especially for developer positions, coding tests are standard

[10] Website, therefore page citation not included.

procedure. The most common type is called the ‘whiteboard interview’, where candidates stand in front of a whiteboard and solve a coding challenge on it while the potential employers observe with scrutiny. There is a prevailing industry belief, that those who perform well on these tests would generally have stronger stress resistance and better endurance, therefore more fit for the highly stressful startup life.

However, in most cases, the developer’s job requirements usually do not entail such adverse individual competition – usually, challenging tasks are solved together in a team. An article from *The Atlantic* well describes why such practices can be harmful for women or other minority candidates:

> *“Tracing one’s thought process with a dry-erase marker in front of a live, skeptical audience can create extra stressors for people from underrepresented groups. […] people from stigmatized groups spend mental energy grappling with negative stereotypes about those groups, [which] can lead women and minorities with the same skills to perform more poorly.” (Nordell 2018)*[11]

Decision making processes post candidate interview are also unknowingly tainted with stereotypical bias. Uhlmann & Cohen (2005) found that often in hiring processes, discriminations occur due to the ambiguity of hiring criteria. In this study, when respondents had to choose between a male candidate with more practical experience and a female candidate with more academic experience, more chose the male candidate, then ranked practical experience to be a more important factor than academic experience. However, when the same set of criteria was presented for reverse genders – meaning a male candidate with more academic experience and a female candidate with more practical experience – people still chose the male candidate, this time ranking academic experience to be more important than practical experience (Uhlmann & Cohen 2005).

This is a strong example of how unintentional bias can play a big factor in the hiring process when clear, concretely predefined recruiting criteria is absent. In many startups, the founders themselves make the hiring decisions instead of structured and experienced HR teams, and in most cases, the decision is made on a binary ‘yes or no’

[11] Website, therefore page citation not included.

basis, instead of more detailed, structured, consistent and standardized criteria sets (Thomas 2017).

I have examined how during the recruitment process, much of the gender stereotype created at the macro social level solidifies into a physical block, a barrier that actively keeps many qualified women out of tech startups. With fewer women applying to and getting into startups, this reinforces the stereotype of the society and also females' own self-perception towards women being unfit for the tech startup world.

4.5 Retention – Persisting Influence of Stereotypes after Entry

Even after overcoming all these hurdles and starting a job in the tech startup world, females often face countless daily situations in the working culture that deter them from staying longer in the company. The working culture prevalent in startups are also heavily stereotyped and stigmatized, discouraging many women from perceiving it to be a potentially attractive workplace in the first place.

According to European Startup Monitor, the average age of first startup founders in Europe is 29 years old. A 2015 U.K. report found that 56% of small to medium sized companies that had failed within 3 years was due to poor business management. In this study, while 89% of leaders at big companies were reported to have had management training, in smaller companies employing less than 24 people, only about one third of leaders had ever received management training (Chartered Management Institute 2015).

It can be deduced that founders' lack of leadership and management experience is a common factor in tech startups, which can in turn affect the overall culture of the company. In fact, studies have shown that many startups fail not because of the market, but actually because of the founders themselves (Gulati & DeSantola 2016), and often, startups go on to scale up more successfully when the initial founders have been replaced (Wasserman 2017).

In this section, then, I will examine how the overall culture of tech startups can go on to affect gender inequality, blocking and driving out women and continuously reinforcing gender stereotypes.

4.5.1 Working Style – The 24/7 Hacker

Frequently found in tech startups, or the stereotype thereof, is the single-minded 'hacker lifestyle' of its employees. While this is often due to the strong pressure in startups to quickly progress and react to the market, another factor at play can be the 'single-mindedness' of stereotypical male computer engineers, which has been frequently documented in research.

Margolis & Fisher (2002) reports how male Carnegie Mellon University computer engineering students differed starkly from their female classmates in how they "enshrine computers with a single-mindedness, burning passion for computing […] see it as a conquest. It's their hobby, work, one goal." The authors proceed on to call this tendency, frequently observed in male computer engineering students, as "dreaming in code", while for most female students, computer and programming tends to be just "one hobby among many" (Margolis & Fisher 2002:4-5).

Oftentimes, male business leaders also tend to obsess on his and his employees' time spent itself at work, rather than the quality of the output.

> *"It's all about who can fly more miles, how many weekends spent away from home. It doesn't promote an environment where people can work flexible hours." (Wittenberg-Cox 2010:41)*

Needless to say, this tendency contradicts with many women's need for flexible working time, or their need to allocate time to familial responsibilities. Studies have pointed out how intensive work rhythms often become big obstacles for women working in IT (Marlow 1997), and how despite its counter-productiveness, "the constant pressure on the project teams is often glorified and the evenings and weekends in the office are seen as inevitable and heroic, masculine activities" (Pätz 2011:84).

This has been a historic problem in the IT industry. Cringely (1992) describes the culture of Microsoft in the 90s, quoting from a female former manager who filed a gender discrimination lawsuit:

> *"At Microsoft, it's a 'disadvantage' to be married or 'have any other priority but work'. […] Employees were expected to be single or live a 'singles lifestyle' […] the company wanted employees that 'ate, breathed, slept and drank Microsoft,'*

and felt it was 'the best thing in the world.'" (Cringely 1992:114-115)

While some would argue that the situation is improving in tech startups, many startup founders still expect 50 to 60-hour workweeks from their employees (Bort 2016). In her book *Brotopia*, Emily Chang describes Silicon Valley startup employees who "worked eighteen-hour days, seven days a week" (Chang 2018:50).

This code of behavior still enshrines the myth of the "young, male hustler" (Ozkazanc-Pan & Clark Muntean 2018) and undoubtedly creates both actual pressure and external stereotypes against the working culture in startups. Women in startups report feeling pressured to be a "wonder woman – wake up at 5am to do boxing for two hours, work all day, have 5 kids, be juggling a number of networking events at the same time" (Bailey 2018)[12], which often influence the larger female talent pool to shy away from working in startups.

4.5.2 Working & Networking Culture – The Bro Club

Oftentimes, "powerful male networks" within male-dominated organizations create informal disadvantages for women in the recruiting, retention and promotion processes by isolating them in the working culture (van den Brink & Benschop 2012).

Women who work in fields like technology that are not traditionally attributed to their own gender tend to have access to "reduced social capital", which marginalizes them from "information, influence and solidarity benefits" (Sappleton 2009). Often, networking in the existing "Old Boy's Networks (Haynes 2006)" happens around after-work drinking sessions (Wittenberg-Cox 2010), which is not possible for women with family responses to join (van den Brink & Benschop 2013), nor is it something many women have an immediate interest in and are reluctant to join (Pringle et al. 2000).

It should also be noted, that the intrinsic motives for networking within the company may also differ between genders. Whereas women tend to seek social support through networking, men tend to use it for promoting themselves and to increase their "internal visibility" (Ibarra 1992, Forret & Dougherty 2004). Females seek out to build an open

[12] Website, therefore page citation not included.

relationship, whereas males tend to go to networking events to “accrue social capital to ‘spend’ later (Ozkazanc-Pan & Clark Muntean 2018:387)”.

As these differences add up, less women tend to participate in the Boy’s Club networking culture in tech companies. Consequently, women who do not participate in these male-centric networking opportunities often report a “lack of promotion and support (Pringle et al. 2000)” by their male seniors.

Funding, venture capital, incubators and accelerator cultures, which often compose a crucial part of startup life, are also not far from this Boys’ Club culture. It is a widely known problem that a very low percentage of VC funding goes to startups with female founders (Pinsker 2014). Female startup founders have more difficulties raising investment capital (Kanze et al. 2018) and are limited in terms of accruing “social, cultural, human and financial capital (Gupta et al. 2009:398).” Overt sexism becomes rampant when venture capitalists often question female founders about their family plans, or whether they will be able to juggle startup life with raising children, which isn’t normally asked to male founders (Bailey 2018). These factors all work together to further reinforce stereotypes that women are not fit for the startup world.

Another common problem regarding the working culture is the fundamental gender difference in terms of problem solving and communication methods. While women tend to favor cooperative, collaborative approaches of problem solving and communication, men tend to be “like countries, always competing” (Wittenberg-Cox 2010). A good such example is illustrated in *Brotopia*, from a recount by Jane Manning, PayPal’s first woman head of engineering, on early PayPal’s male-dominated engineering culture. She describes the resistance from her team of male engineers when she first came on board and tried to employ a bug-tracking system to reduce the frequency of errors she immediately noticed.

> *“There was a certain overconfidence among the engineers. I wanted a little more process that could have protected us from mistakes, something that I think women can be more sympathetic to. I do think there can be a sort of macho all-male environment of 'We don't make mistakes.'"* (*Manning cited in Chang 2018:52)*

Collmer (2001) also describes multiple accounts from both women and men working in tech, how due to the innate tendency of competitiveness, male computer engineers often view women who give feedback, pose questions or are high-performing as insulting or threatening.

A combination of these factors results in women in tech companies to feel the "Difference Taboo (Haas et al. 2016)". In order to 'fit in' with her colleagues, many women gradually erase their feminine identity and try to show "solidarity with the work-hard male culture (Dryburgh 1999 cited in Haas et al. 2016)". As Wajcman (2009) describes, while there is no such "degendering" process observed in men, women often need to change many important aspects of their feminine identity to become more 'masculine' to survive in these environments – which can bring prolonged levels of discomfort and a sense of unbelonging, impacting the quality and length of her career in tech.

4.5.3 Feedback & Recognition – Small and Big Gender Discrimination

Bias and gender discrimination continue in small and big scales as the female employee continues her career in tech. There is a stark imbalance in job types and the importance of jobs assigned to women and men within tech companies. Many women in tech companies are found in non-core functions such as marketing, communications, training, documentation or administrative support (Silicon Valley Bank 2018). Even those in tech roles often find themselves in "low-level software jobs" like QA or data-entry (Bath et al. 2008) or have a higher tendency to get assigned lesser-priority tasks or lower-visibility assignments that are detrimental for promotions (Thomas 2016).

When it comes to evaluation, women often receive stereotypically disadvantageous treatment. A case study in Deloitte & Touche revealed that while women got evaluated based on their performance, men got evaluated based on their potential – men are stereotypically viewed to be competent in tech and therefore "remain until the contrary is proved", while women need to constantly prove their abilities and keep outperforming in order to avoid negative feedback (McCracken 2000, Collmer 2001). This leads to unfair and biased performance reviews that affect job satisfaction, salary levels and retention rate of women in tech differently than men.

Smaller forms of discrimination continuously happen in women's daily life at work as

well. This can be called ‘daily cultural discrimination’, which compounds its way into isolating women further into a distinct minority.

Countless accounts of ‘the little things’ i.e. daily discriminations can be easily found online and offline. A 2017 survey called *Elephant in the Valley* (Vassallo et al. 2017) interviewed 200 women in the Silicon Valley area with more than 10 years of work experience. 84% reported having been “called too aggressive”, 66% “felt excluded from social or networking activities because of their gender”, and near 50% were “asked to do lower-level-tasks such as taking notes or ordering food”.

The list goes on and on - men who interrupt women in meetings, men who would wait until the more senior-ranking woman would have to cross the room to come to him and initiate introductions, men who automatically assume that the woman is an assistant or not a qualified developer (Collmer 2001). Comments that tell a woman she’s too ‘bitchy’, ‘bossy’ or ‘uptight’ or outright tell her to ‘smile more’, even if in a joking way, add up over time.

More incremental incidents i.e. getting credit for work taken away by a male colleague, being marginalized in meetings and being mistreated for standing up against sexism or gender inequality also happen frequently. The reason we don’t hear more about it is simple - in a survey conducted by Unilever Foundry in 2018, 82% of female startup founders reported that “to avoid looking uptight, they let inappropriate statements slide (Bailey 2018)”.

When daily discriminations are experienced continuously, they culminate to a stronger level of discomfort. However, desensitization also takes place and women often brush off daily discrimination as ‘small, trivial or one-time incidents’ and regard them ‘not serious enough’ to bring up to HR or to even define as a problem.

Andressa Chiara from *Code Like a Girl* is quoted in *Hire More Women in Tech* (Schoellkopf 2014), and well explains the impact of daily discrimination using an analogy:

> *“The mosquito bite metaphor works great for me here. One bite is annoying, a few bites are irritating, but a lot of bites are intolerable. It is easy to dismiss one or two inappropriate comments, a dozen gets very tiresome, but many is like death by a 1000 paper cuts.” (Chiara 2017)*

When daily discrimination continues to happen in the workplace and women are routinely silenced or encouraged to think that one-off-incidences can happen and should be tolerated, a corporate culture starts to take place, where overt sexism starts to be considered normal and easily overlooked. The likes of the sexual harassment scandal at Uber are the results of male-dominated companies, often combined with a "frat-house like (Chang 2018)" heavy drinking culture that have a higher propensity to lead to illegal or inappropriate behavior including sexual harassment. Such incidences unfortunately often get normalized at the intersection of technology and entrepreneurship (Williams 2017).

Elephant in the Valley (Vassallo et al. 2017) reports that among 200 women respondents, 90% had "witnessed sexist behavior at industry off sites and conferences" and 60% had "personally been sexually harassed or received unwanted sexual advances". Ann Toth, former Vice President of People & Policy at Slack, was quoted in 2017 by *Financial Times*:

> *"Companies that have these kinds of problems are not accidental. They are very male-driven, testosterone-fueled environments. We are seeing some blowback now." (Ann Toth, cited in Bradshaw & Kwong 2017)*[13]

4.6 Summary

I have so far examined what I call the 'Brotopian Cycle' in different stages of Media and Education, where the social gender stereotype against women in tech startups are created and internalized, and Recruiting and Retention within tech startups, where such stereotypes are often repeatedly reinforced and reproduced.

At every stage of this vicious cycle, women are systematically 'weeded out'. The 'Leaky Pipeline' is actually the result and not a reason of this vicious cycle of female underrepresentation in tech. The problem lies not in women but rather in the system and the social stereotypes we all unwittingly help to create and reinforce together (Wajcman 2009).

The impact this vicious cycle of stereotypes has on women is truly damaging. From an

[13] Website, therefore page citation not included.

early age and onto careers in adulthood, women are repeatedly being alienated by both the ‘nerd culture’ normative of tech (Turkle 1988, Margolis & Fisher 2002), and the ‘bro culture’ hailed today as the gold standard of entrepreneurship. Often, women who do enter tech despite all these stereotypes end up having to sacrifice their female identity to survive, by reproducing “attitudes and behaviours that are facsimiles of what men do” (Marlow & McAdam 2012 cited in Lewis 2014:334). This means a “social identity threat” that decrease women’s sense of belonging and interests to participate further in tech exists (Murphy et al. 2007).

Another damaging factor is the impact gender stereotypes and the vicious cycle has on women’s self-efficacy in tech and entrepreneurship. Bandura (1977) describes self-efficacy as the perception of an individual on their skills or abilities, and countless studies show that those with a higher self-efficacy tend to perform better in tasks, regardless of their actual skills and abilities (Kourilsky & Walstad 1998, Markham et al. 2002, Vekiri & Chronaki 2008).

Most women in tech over time often “doubt their basic intelligence and their fitness to pursue computing (Margolis & Fisher 2002)”. This is not unrelated to the so-called “Imposter Phenomenon”, how even high-achieving women often feel the need to be absolutely perfect, feel as if they do not deserve their success, believe themselves to be not smart and are afraid of being eventually “exposed” as not being smart (Clance & Imes 1978, Sandberg 2015). A combined effect results in a tendency in women to feel insecure and unsure about their abilities, which is then seen as a weakness and is often exploited by their competitive male counterparts.

Such problems in self-efficacy and threats in identity also has an impact on career and entrepreneurial intent, since the intent for entrepreneurship is correlated with the belief that one can succeed (Sexton & Bowman-Upton 1990, Cejka & Eagly 1999, Wilson et al. 2007). This then affects the female ratio in startups, as working as employees in startups also require higher entrepreneurial tendency (Neff 2012, Roach & Sauermann 2015). A study by Gupta et al. (2009) also found that regardless of biological sex, those who identified themselves as more similar to the male gender were more likely to have higher entrepreneurial intentions.

Although more women are starting to disbelieve these stereotypes, men are reported to be much slower in seeing beyond gender stereotypes in entrepreneurship (Schein

2001). As Bohnet (2016) writes, “unconscious bias is everywhere” and has a holistic impact – not only on women’s self-perception, efficacy and career intent (Langowitz & Morgan 2003) but also on the perception of the men around her. When even her closest family members who are male, e.g. her partner, father or sons, do not associate the female gender with the characteristics needed to succeed in an entrepreneurial setting, it will be less likely that she gets support and this will negatively influence her career decisions (Gupta et al. 2009).

5 What Can Startups Do to Break the Cycle?

5.1 Why Startups Should Care More

In 2011, EU Commission published the *Code of Best Practices for Women in ICT* and introduced a framework which tech (ICT) companies could follow to increase their female ratio, with action points in education, recruitment and retention (career development, return to work after leave) criteria (EWCT 2011). Gender inequality problem in tech is definitely not going unnoticed, and worldwide efforts have been implemented to break the vicious cycle.

While macro-level initiatives i.e. gender quotas, tax benefits or priority grading in state subsidiary programs for startups with female founders are definitely creating positive impact (Minniti & Bygrave 2004), it would be beneficial to examine more immediate, actionable solutions that can be implemented within the startups themselves. Since recruiting and retention that happen on the startup level are also important parts of the vicious cycle, this part of my research will focus on ways to solve defined problems at the micro, startup level, as it could potentially help to break the vicious cycle from within.

Due to their higher tendency to be interested in collaboration and cooperation, women tend to fundamentally understand how organizations function better (Cindio & Simone 1993) and also perform better in innovative firms, as their holistic approaches to problem solving and “emotional connectedness” often result in creative, innovative solutions (Faulkner 2001, Schnabel et al. 2011, Coad et al. 2017).

Also, startups in general are more likely than bigger companies to hire groups of

people that are traditionally discriminated, e.g. women, minorities or those who have fallen out of the labor force (Fackler et al. 2018). Moreover, various aspects of typical startup culture can be interpreted to be attractive to women. Majority of startups in Europe have a flat hierarchy structure of less than three levels (96%), offer informal opportunities for exchange of ideas between their employees (90%) and allow employees to make autonomous decisions even if they are not in an executive position (56%) (Kollmann et al. 2016). Startups tend to be less bureaucratic (Sørensen 2007) and tend to offer its employees a higher discretion in their work (Roach & Sauermann 2015). All of these are factors that could be favorable to women, as opposed to the traditional, stereotypical male-dominant corporate culture.

Many startup founders nowadays recognize the importance of gender diversity as a key factor for scaling up their business and sustaining growth. A Techstars (2016) survey of 680 startup founders in nine countries saw that 72% of the respondents felt that diversity is important. 81% believed that diversity "enhances creativity and innovation", and 67% said "diversity improves problem solving." However, only 12% were actually taking action by employing five or more either minority or women employees in developer positions – meaning that if the data had been only about gender inequality, the ratio would have been even lower. This finding is in line with the McKinsey (2018) report that state while most corporate leaders are increasingly acknowledging the importance of diversity, most "wonder how to make it work".

Therefore, an overall rethinking of potential, unintended gender bias in all phases of employment in tech startups is called for. Wittenberg-Cox (2010) proposes an updated way to view gender bias in female employment, as seen in *Table 1*.

Bias	**Updated**
Recruitment: Women are not attracted to our industry/company, only men apply	Industry/company has not adapted its image and communication to connect with women
Retention: Women choose to prioritise family over career	Modern companies will eliminate the issue of choice for both men and women, and make conciliation possible for both parents
Promotion: Women are less ambitious than men. Only men are asking for/accepting promotions.	Men and women are equally ambitious, but women expect to be promoted on performance, not because they push for promotion. Companies and managers need to review talent identification criteria

***Table 1**. Gender bias – Talent (Wittenberg-Cox 2010: 205)*

In the next sections, I will examine what actionable improvements can be made in terms of criteria specific to the startup level – namely, in recruitment and retention.

5.2 Recruitment

5.2.1 Diversity Awareness & Strategic Goal-Setting

First and foremost, developing an awareness across the founders, management team and the entire company about the importance of diversity and its advantages is imperative. Statistics show that many startups are far below average in terms of gender balance – therefore it is important to be transparent, to first acknowledge that there is an issue, and to set specific goals and KPIs regarding diversity and inclusion (D&I) in the startup.

Rethinking and discussing corporate values to examine whether they are harmful for diversity and initiating a discussion and incorporating these values into the company's recruiting strategy is recommended. Nolan Caudill, previously engineering chief of staff at Slack, is quoted in *Brotopia* about how Slack redesigned the company values to include "diligence, curiosity and empathy – a stark contrast to Uber's original core tenets, 'steppin' on toes', 'always be hustlin', and 'meritocracy'" and began a companywide effort to collect and analyze diversity data (Chang 2018:255).

The 2017 *Tech Leavers Study* conducted by Kapor Center which interviewed more than 2,000 individuals in the U.S. who had voluntarily left jobs in tech suggest that companies should "treat diversity and inclusion as a business strategy" (Scott et al. 2017). Setting KPIs, creating overarching programs across the entire company instead of just a few executives, offering training programs on diversity management is shown to have positive impact (Bailey 2018).

A Deloitte case described in *Harvard Business Review* also illustrates how determination and attention from top management can significantly reduce biased behavior in companies. In this case, a task-force team set to monitor career advancements of its female employees functioned on a 'transparency' basis, and everyone knew that the CEO and other high executives were paying close attention to the metrics. With this program in place, Deloitte saw more women getting high-visibility projects and mentoring opportunities. After eight years, the company did not have differences between male and female turnover ratios anymore and female partner

proportions increased almost trifold to 14%, the highest among major international accounting firms (McCracken 2000).

A famous example of setting an ambitious goal first can be found in Norway, where the then Economics and Trade Minister Angsgar Gabrielsen passed a law in 2003 that essentially forced 500 companies listed on Norway's stock exchange to ensure that women comprised at least 40% of their boards or be shut down (Fouché & Treanor 2006). Gabrielsen is by no means a feminist – he is quoted as having said "I am a conservative. I am practical, rational, and I want Norway to flourish (Wittenberg-Cox 2010: 197-198)". As a result of this strong measure, female ratio on Norwegian corporate boards jumped from 3% in 1993 to 43% in 2008 (ibid). While discussions prevail on up to how much this measure really changed gender inequality in the overall Norwegian economy, this showcases how gender equality and diversity measures can work well when strong KPIs are set with a strategic background, especially by an 'unlikely' initiator.

5.2.2 Understanding Female Candidates

When first stepping onto the journey for gender equality, well-intentioned male managers commonly make stereotypical mistakes. It is not enough to just recruit more women, or to put some artwork in the office space. *LadyGeek.org.uk* is quoted by Wittenberg-Cox (2010) as follows:

> *"Those that do fall into the clichés and stereotypes and end up pinking-up and dumbing-down their products and end up as, one woman said, 'treating them like a special needs case.'" (Wittenberg-Cox 2010:*296)

It is therefore important to understand the key motivation drivers for women who may be potentially interested in working in the startup realm, as they tend to differ from those of their male counterparts (McGowan et al. 2012).

In general, women tend to place higher values on different factors when they evaluate potential employers (Avery & McKay 2006) e.g. diversity, possibility of balance between work-family life, presence of colleagues similar to herself and other job factors (Thomas & Wise 1999), while men tend to regard high starting salary as the most important factor (Freeman 2003).

Unlike men, many women who choose to work in entrepreneurial settings do so because they enable more control over how they structure their time, compared to big companies. Mattis (2004) describes this aptly by addressing that female entrepreneurs who have managed to come out from the traditional 'glass ceiling' are not looking for "reduced hours". Rather, they are more likely to be looking for "more control over the hours they work." Familial obligations can never be considered out of the equation for females (Ahl 2004) and smaller entrepreneurial settings with the potential to have a bigger flexibility in terms of time usage is often more attractive compared to bigger companies (Marlow & Carter 2004, McGowan et al. 2012).

Other frequently mentioned factors are possibilities for self-development. In a 2016 survey by Female Founders in Austria, the biggest reasons cited by women to found startups was realization of self, to be one's own boss and possibilities of flexible time management. High income scored last for both groups, regardless whether she had already founded or wished to found a startup in the future (Seidl 2016).

Very often, the possibilities for recognition, autonomy and opportunities for promotion may be strong drivers for women who seek career options in startups rather than bigger companies. The typical large corporate environment suppresses flexibility of time management (Daily et al. 1999), but a bigger problem for women tend to be feeling "squeezed out" of big organizations and systems (Fielden et al. 2003, Winn 2004).

Being frustrated with gender-biased discrimination at bigger corporates in recognition and promotion (Hisrich & Brush 1985) has been long studied as one of the major stress factors that drive highly skilled and experienced women out of the traditional corporate systems and into the entrepreneurial job market. Researchers for a Deutsche Bank study were surprised to find that their female high-level executives were actually not leaving them to achieve greater work-life balance, but because they were offered higher positions at competitors that they wouldn't have been considered for had they stayed in the company (Ibarra et al. 2010). While flexibility and control over time is an important factor, recognition, autonomy and possibilities for promotion also have a strong impact on working women's career choices, especially to become entrepreneurial. Therefore, emphasizing high level of autonomy and potential for faster recognition may help startups to attract highly experienced yet frustrated female

workers (Stern 2004).

Many women whose needs match well with a career in startups are simply not aware of the possibility. Roach & Sauermann (2015) found that many students who had preferences for job characteristics that can be defined to be entrepreneurial and match well with careers in tech startups, e.g. “being able to make my own decisions”, “working on exciting, new technologies” and “creating new technologies that can solve real problems” had never considered the possibility of working at startups as “joiners”. The researchers assert that a wider awareness initiative to waken latent entrepreneurial interests in potential ‘entrepreneurial workers’ may prove helpful for startups.

Many women often have several reasons for not willing to found a company themselves and become the ‘female founder’, although they may have multiple entrepreneurial characteristics and be ready to work as ‘entrepreneurial workers’ in startups. As social stigma against changing jobs continues to weaken (Landrum 2017), the risks typically associated with joining smaller startup ventures are easily lifted, and benefits such as “higher work autonomy, flatter organizational hierarchy, and less bureaucracy than in established firms (Roach & Sauermann 2015, cited in Fackler et al. 2018)” can outweigh perceived risks when properly communicated.

For groups of people who have found themselves in discriminated positions i.e. due to gender or ethnicity, a career in startups might be especially attractive since there are potentially higher chances of being “first in line” within the smaller organization (Fackler et al. 2018) and thus bring higher possibility of recognition and a successful career development.

5.2.3 Optimizing Job Advertisements – Content and Channels

> *“The best way to confront unconscious bias is to force ourselves to be aware of how it is present all around us, even built into work lexicon we use every day.” – Deb Liu(2017)[14], VP of Marketplace at Facebook, Co-Founder of Women in Product*

As examined in the previous chapter, unintentional gendered wording can have a

[14] Website, therefore page citation not included.

disproportionate effect on the ratio of female applicants to a job ad. In this section, I will outline some actionable items for tech startups looking to optimize how their job advertisements are being written(content) and sent out(channels).

Wording & Length

Minimizing the use of male-biased terms and writing job-ads in “gender bilingual language (Wittenberg-Cox 2010)” increase female applicant ratios. “Gender bilingual language” aims to remove words and phrases that allude to previously examined gender stereotypes in both tech and entrepreneurship.

Rephrasing existing job descriptions with more ‘feminine’ characteristics and interests (i.e. communal goal congruity, collaboration, network and nurture; see *Table 2*) and highlighting the company’s core values can increase attractiveness of the job ad for the female applicant.

Old ‘masculine‘ language	**New gender bilingual language**
Exclusion	Inclusion
Superstars, success, individual heroes	Collective prosperity
Hunger for power	Thirst for new solutions
Competition	Collaboration
Opposition, fight, hardship	Supportiveness, learning, growth
Winners and losers	Winners and winners

Table 2. *Gender bilingual language. (Wittenberg-Cox 2010:321)*

Multiple helpful sources and tools currently exist online such as *Hire More Women in Tech*[15]*, Gender-Decoder*[16] or *JobLint*[17], which guide startups to monitor their use of unintentional biased or stereotypical language in job advertisements (See *Appendix 2, 3 and 4* for screenshot images).

Putting a stronger emphasis on communal group congruity aspects usually inherent in the startup’s business can also be beneficial. Highlighting the impact of the product or service that create change in the community, solves problems or overlooked

[15] Source: https://www.hiremorewomenintech.com - retrieved 5 May 2018

[16] Source: http://gender-decoder.katmatfield.com - retrieved 5 May 2018

[17] Source: https://joblint.org - retrieved 5 May 2018

inconveniences of people will attract more female candidates. Research has shown that “emphasizing communal goals does not appear to ‘dumb down’ […] but instead enriches” (Diekman et al. 2015). This means a short addition to the job advertisement that describe the purpose and vision behind the company can go a long way.

It is also beneficial to review the list of job requirements and try to minimize its length as much as possible. As discussed in Chapter 4, women often experience “Imposter Phenomenon (Clance & Imes 1978)” and tend to apply to jobs when they feel they meet 100% of the criteria. This in turn means that the longer a job ad’s required skillsets list, the chances of women applying decreases, while underqualified men may still apply and be hired.

Use of Images

Studies have shown that depicting diversity in a pictorial way (Thaler-Carter 2001, Avery & McKay 2006) is helpful for recruiting diverse candidates. When females evaluate potential employers, they are more likely to consciously search for cues that might tell them that there are other women already in the company (Rynes 1991). A good example is the careers page from Airbnb’s website[18] – on top of an active use of gender-bilingual language such as “inspires human connection”, “create, learn and play”, “together”, “we laugh a lot” and “we embody our values”, a relaxed office atmosphere is depicted, with multiple women and people of diverse ethnicities shown in the first photos one sees upon visiting the website (See *Figure 13*, *Appendix 5).*

Equal Opportunity Statements and Similar Text

For startups who are starting out on gender diversity improvement, it may be impossible to pictorially depict a diverse working environment. Even so, firms that admit their current status and also state their strong focus and motivation for improving the situation are valued more highly by women and minority job seekers (Avery & McKay 2006). Rau & Hyland (2003) found that job ads that included equal opportunity statements and expressly communicated a commitment to diversity was perceived as more attractive employers by women and minorities. While this is something many smaller companies tend to view as trivial and applying only to bigger firms, choosing to

[18] Source: https://www.airbnb.com/careers - retrieved 5 May 2018

include one statement can potentially make a big difference.

Women-centered Channels and Referrals

Unsurprisingly, placing the job advertisements in media that are specific to women or have a high concentration of female audience helps to increase diversity in applicant pools (Paddison 1990). Actively searching for and placing job ads in not only the usual startup job bulletins but also in online forums and social networks specifically for women not only increases chances of the job ad being seen by women, but also sends a signal to the reader that the employer is actively seeking to increase gender diversity (Wittenberg-Cox 2010).

Especially for women, word of mouth endorsement tends to have a strong impact on how they perceive the attractivity of potential employers (Collins & Han 2004). Pinterest saw a significant increase in its female employee ratio after adapting a referral program that simply asked their own employees to specifically recommend women and minority candidates (Chang 2018).

Getting the First Woman In

A *FundersClub* survey in 2017 revealed that U.S. tech startups with at least one female founder had more than twice the ratio of female employees in both executive leadership and engineering teams, compared to startups with all male founders (Steiner 2017, see *Figure 6*).

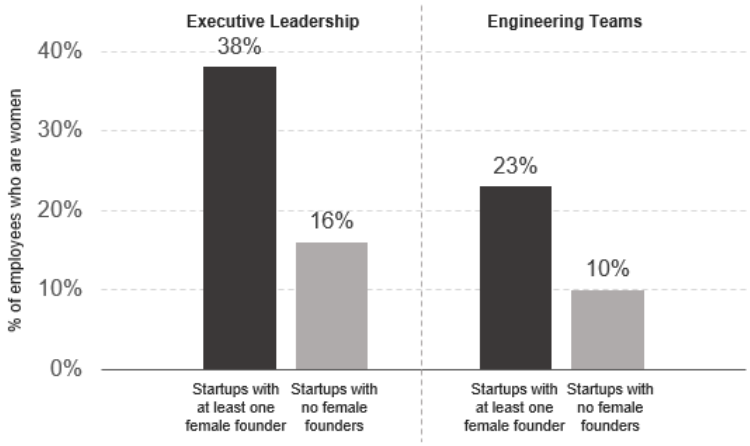

Figure 6. *Startups with women founders have higher female ratios. (Steiner 2017)*

This is in line with the Techstars (2016) finding that 96% of minority women founders

were heavily interested and involved in increasing diversity in their startups, which sinks to only 59% for all other founders. Another simple reason is that women actively look for companies where there are other women already working and tend to avoid male-only companies due to concerns against discrimination (Chang 2018). While it may be hard to get the first woman in, combination of tactics such as referrals and word of mouth will gradually make gender-diverse recruiting easier over time.

5.2.4 Interview and Hiring Processes

After optimizing job advertisements and the way they are sent out into the world, startups should check whether their interview and hiring processes are not also blindly following 'industry norms' generally considered to be effective, and therefore tainted with gender stereotypes.

Interview Methods

In the previous chapter, I have discussed how the common method of 'whiteboard interviews' can be especially detrimental to female job seekers in tech, by simulating an unnecessarily adverse, competitive situation which does not correctly correspond to the type of challenges the candidate will actually face at work.

Unless the actual job description of the position in question is similar to a public coding demonstrator where she will always have to code without the use of a computer in front of scrutinizing male opponents, whiteboard interviews or similar varieties such as tests where applicants should 'code on paper' do not accurately measure the candidate's actual skills.

Slack is often regarded as a success case to solve this problem, where coding tests are given as "take-home assignments". Airbnb gives candidates an on-site project to work on, which the applicant can take a few hours to finish and can also ask questions to the team during the task. Personal preferences depending on backgrounds or circumstances may vary, therefore when possible, it could be advisable to offer options of interview formats. Taking actual parts of currently used code in your company, deleting some parts and using that as a test problem is also better than using random algorithms. All of these tactics suggest the benefits of the interview and test mirroring actual challenges the candidate will face once hired as close as possible, to avoid a

biased interview process (Thomas 2017).

Evaluation Criteria

Often, startups make hiring choices based on the founders' gut-feeling, which may lead to unconscious bias. On the contrary, research shows how deciding on very concrete criteria before the interviewing process can significantly decrease biased hiring results (Uhlmann & Cohen 2005).

Instead of the usual 'hire/no-hire' vote, Slack employs a set of evaluation criteria that consists of more than 30 predetermined factors (Thomas 2017). Adapting a more systematic, transparent approach may have a positive impact on reducing common hiring biases, i.e. mistaking males' inflated confidence as competency (Dunning et al. 2003), male recruiters unconsciously scrutinizing female candidates more strictly (Rivera 2016) or the decision being disproportionately biased to match the personal preference of the CEO (Thomas 2017).

Elena Grewal, interim head of data science at Airbnb, reports having seen the female ratio on the data science team grow from 15% to 30% since realizing that a disproportionate amount of women were being filtered out at the coding test stage. Airbnb defined a clear guideline of skillsets they were looking for and employed a consistent grading system, then automatically moved applicants up to the next round if they had met those guidelines (Lien 2016).

Accountability & Transparency

Humans are by nature susceptible to biases, but biased decision making tends to decrease significantly when an accountability check is put in place – meaning, when we know that other people can see our decision-making processes. A 1983 study in Israel saw, for example, that when trainee teachers were given same essays with different ethnic names, they were more likely to score essays from students with minority ethnic names much lower (an average D, compared to the control group B). However, this stark difference completely disappeared when they were simply told that they would be discussing their grading decisions with peers afterwards (Kruglanski & Freund 1983, cited in Dobbin & Kalev 2016).

Increasing transparency and social accountability helps to reduce biased decisions and

even reduce pay gaps by race and gender (Castilla 2015). Adapting a pre-defined scoring card, which should be discussed openly and also be shared to other female members of the company, can be an effective method of implementing this theory to practice.

Google adapted a so-called "Revisit Committee" around 2008, where if a female candidate had 'failed' an interview round, a different committee including women engineers would review her scores again – ensuring that "women engineers did not fall through the cracks" (Chang 2018:77).

It may be worthwhile to adapt a 'Track Negatives' approach, on the candidates that the startup decides not to hire (Thomas 2017). This means following the career paths of those candidates that the company had decided were not a good fit i.e. over social media channels and providing a chance for the startup to reflect on their decision making patterns, and on whether biased judgments might have taken place. Trek Glowacki, an American software engineer at Chicago-based startup Popular Pays, wrote:

> *"I've been Twitter following the careers of people we interviewed but passed on […] turns out we were almost always wrong. […] We passed on so many good people." (Thomas 2017)*[19]

5.2.5 PR & Communication

Organization Impression Management (OIM)

OIM refers to all types of actions a company takes to influence public's perceptions of the company (Elsbach et al. 1998). Surprisingly often, startup founders underestimate the importance of OIM and how it can influence both potential candidates' application rates and employee retention rates (Avery & McKay 2006).

In *Brotopia*, Emily Chang (2018) recounts her interview with the then-Slack's CEO, Stewart Butterfield, on how whenever he tweeted about the importance of diversity, job applications from diverse candidates suddenly spiked. With so many startup founders

[19] Website, therefore page citation not included.

being active on social media, self-publishing blogs and public speaking conferences, this is not difficult to implement, as soon as gender diversity is recognized as a strategically important goal for the startup.

PR & Sponsorships

Another possibility to communicate the startup's focus on gender equality and diversity is through PR & Sponsorships. Many Silicon Valley tech companies like Google and Facebook are now posting their diversity metrics online, although they are yet far from ideal (Dobbin & Kalev 2016). An open acknowledgement of the problem often motivates the company to constantly pay attention to its improvement.

Sponsoring events, initiatives and organizations that have direct associations with women, female entrepreneurs or females in tech can further not only send a strong public signal that the startup takes diversity seriously, but also have the effect of being present at the venues where potential candidates gather (Avery & McKay 2006). Sponsoring does not have to be monetary – in-kind sponsorships, talent donation i.e. consulting or mentoring hours, free promotion or endorsement of the event or initiative through the startup's owned channels and media partners, or being speakers at such events are good examples of how a startup with limited resources can increase their public presence and communicate their focus on diversity.

5.3 Retention

5.3.1 Culture Overhaul

After passing through all these hurdles to get more women in, the more important question becomes retaining female employees for longer periods of time and creating a virtuous cycle of referrals through existing female employees.

This is not a simple task, albeit an important one. The *Tech Leavers Study* (2017) revealed that "unfairness at work" was cited as the top reason for women and minorities in tech to leave their companies, and that this problem was more pronounced in the tech industry than any other industries. The study points out how this not only costs the companies huge financial loss in employee replacement costs, but also causes a damage to their reputation, especially among prospective job candidates who are women or minorities.

EU Commission also declares the importance of not only recruiting women into tech but encouraging them to “stay in the sector”, develop their careers and “return to work after leave” to achieve gender equality in ICT (ECWT 2011).

This usually means a complete rethinking, a total “culture overhaul” that needs to take place. Carnegie Mellon University’s case (See *Figure 7*) has been well documented in Margolis & Fisher’s book *Unlocking the Clubhouse* (2002). Through a holistic effort that; i) completely revised enrollment programs and entry points, ii) created a female-positive learning environment with less focus on numerics and competition, iii) implemented mentoring programs, women-specific groups and networks and iv) communicated the wider impact of the subject on the community and society, female student enrollment in computer engineering increased from 7% to 40% in just 5 years.

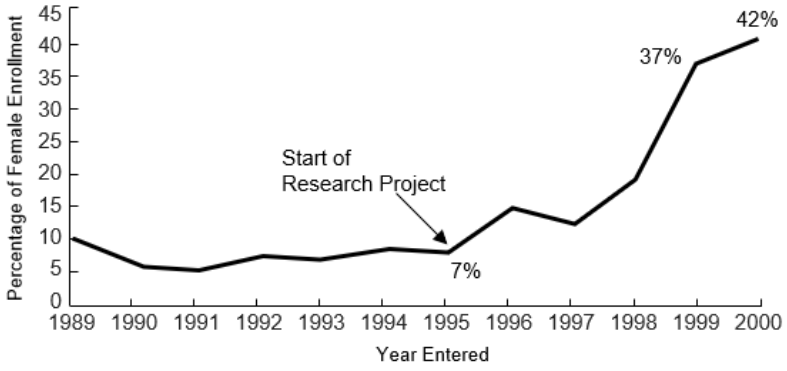

Figure 7. *Carnegie Mellon University School of Computer Science Female Enrollment. (Margolis & Fisher 2002)*

In the next sections, I will examine how startups could implement such ‘cultural overhauls’ highlighting the most critical factors for employee retention, namely Feedback & Recognition, Working Culture, Training & Mentoring and Companywide Engagement.

5.3.2 Feedback & Recognition

Standardized Feedback Loops

Often, startups have a haphazard, unstructured way of performance reviews, salary negotiations and feedback loops that snowball to an unintended, disastrous result over time. Women tend to hesitate more often than men to ask for salary raises and feedback for fear of being viewed too aggressive and thus jeopardizing their

performance review (Babcock & Laschever 2009). Therefore, when feedback loops are not standardized and happen sporadically, many female startup employees end up with unfair wage gaps and emotional frustration that build up over time.

Many women cite 'listening well' as core traits they look for in senior management, and one of the best ways to do this is by installing standardized feedback loops (Hull 2016). On top of daily interactions with employees, startup founders can benefit from implementing a companywide performance / salary review plan early on, even when it seems too structured and 'corporate'. It is never too early to implement feedback structures that is consistent for every employee, which provide fair chances for every employee at getting and giving feedback and plan the next stages of their career – even more so for female employees.

Actionable Feedback

How to exactly offer constructive feedback is the next question at hand. Correll & Simard (2016) analyzed over 200 samples of performance evaluations from tech companies and found that while men received more detailed, granular, actionable advice, feedback towards women was often very general and vague (e.g. "You had a great year").

What's worse, a *Fortune* article revealed how high-achieving men and women tend to receive different types of feedback. While high-achieving men rarely received negative feedback if any, high-achieving women often received negative feedback that had to do not with her performance, but with her communication style (i.e. "You come across as abrasive sometimes", "I know you don't mean to, but you need to pay attention to your tone", "Sometimes you need to step back to let others shine") (Snyder 2014)[20]. The satirical cartoon from *Cooper Review* in *Figure 8* illustrates this bias well – assertive women are more likely to be perceived as threatening and thus reviewed negatively, often just because of their gender (Cooper 2018).

Ensuring startup owners and all managers to provide detailed, actionable feedback on work performance to female employees and actively avoiding unnecessary feedback on communication styles may decrease unintentional gender-biased discrimination at

[20] Website, therefore page citation not included.

the review and feedback stage.

Figure 8. *Different attitudes to assertive male and female leaders (Cooper 2018)*[21]

Visibility Projects

Often, women in tech companies are either placed in low-priority positions or get assigned low-visibility projects within the company (Simard et al. 2008). This is problematic, given that senior Silicon Valley tech leaders regard visibility, rather than tech competence, leadership skills or business performance, as the most important factor for promotion (Correll & MacKenzie 2016).

It is imperative for male startup founders to be actively aware of this bias and consciously try to assign females on high visibility projects as team members, and 'giving them a chance'. Multiple female interviewees for this research echoed this sentiment, e.g. "give her a try and you'll find a gem," indicating how stereotypical bias in male founders could be blocking rational assessment of female employees' potential.

Management by Objectives (MBO)

MBO is a term originally coined by Peter Drucker (1959), on how performance, based on achieving pre-defined targets and goals, should be the main criteria for reward. Wittenberg-Cox (2010:251) reinterprets this to fit the modern times, as to mean

[21] Reproduced with permission from the author.

rewarding based on “performance, rather than presence.”

This can mean multiple things – such as flexible time or remote working (working from home) possibilities while each employee makes sure to complete his/her given task.

> *“Flexibility is not just about time – it is about really understanding that you give people the means to enable them to work from wherever they are. […] For a woman, this is a massive difference. It is* the *difference. They feel valued and appreciated – working in an organization where you feel you are equal.” (Wittenberg-Cox 2010:252-253)*

The important aspect to note here is how much even just the possibility of autonomy and flexibility increases women’s perceptions of feeling appreciated at work (Wajcman 2006, Wittenberg-Cox 2010). Discriminating women because of her different flexible time management styles or childrearing obligations, having flexible-hours or a remote-working practice ‘unofficially’ in place, recruiting only full-time or ‘single’ female employees are all practices that can be improved and optimized to tap into a wider, highly skilled talent pool.

5.3.3 Working Culture

Gender-Respectful Culture

Some of the more obvious female-unfriendly “bro culture” aspects common in tech startups can often be toned down to be more gender-respectful. Ozkazanc-Pan & Clark Muntean (2018:393) suggest starting with small steps such as “not holding meetings at ‘local dive bars’” and “having meetings at different times of the day” in consideration for women who may have family obligations.

Emily Chang (2018) describes the case of Slack, about how their ‘atypical’ way of treating working culture helped them to become one of the most gender-balanced Silicon Valley tech companies.

> *“When I asked [Anne] Toth [- Slack’s first female executive who went on to lead its HR division] if there were any Ping-Pong tables at Slack, she rolled her eyes. ‘We have an ethos here: Work hard and go home', she said. That motto is written on posters that can be seen hanging all around the office, which is*

> *generally empty by 6:30pm. 'There is very much a sense here that if you want to play Ping-Pong, you can do that somewhere else.' The message is that this is a place for grown-ups, and many grown-ups have families." (Chang 2018:262)*

A gender-respectful culture may naturally decrease daily discrimination and, in extreme cases, workplace sexual harassment. Installing gender-respectful culture also entails that in the case of extreme violations, employees have a functional, designated channel to report the incident unlike in the case of Uber, where the HR department repeatedly ignored employees' claims and failed to take immediate action (Mannes 2017).

Peer Community

Women who are in male-dominant domains such as the tech industry often benefit greatly from communities and designated peer groups that help build a sense of cohesive belongingness (Wasburn & Miller 2006, Vekiri & Chronaki 2008).

A good example of this implemented in startups is the case of Square, where new female engineers are intentionally placed in teams where there are already other female engineers (Chang 2018). Such strategy of course only works if there is more than one female employee in the startup – this then means that for the first female employee, ample additional support, active mentoring and providing external peer networking opportunities should be provided to ensure the start of a virtuous cycle.

5.3.4 Mentoring & Training

Mentoring Framework

Many studies have found that encouraging and helping to build both internal and external women networking/mentoring frameworks create role models and effectively keep women from falling 'out of the loop' (Shapiro & Levine 1999, Wasburn & Miller 2006, Apergis & Pekka-Economou 2010).

Not only does having a mentoring framework within the startup have positive impacts for women themselves, it also helps significantly to decrease gender biases in the male mentors (Dobbin & Kalev 2016). Due to a cognitive dissonance effect, mentors often

started to believe that “anyone I sponsor must be deserving” and provided more opportunities for career advancement or growth that he might have otherwise not considered (ibid).

Because males often tend to find mentors on their own, when an official mentor-mentee pairing framework is put into place, women or minorities who otherwise would have not received mentorship from a senior strongly benefit from them (Dobbin & Kalev 2016). Assigning every junior employee to a senior mentor, regardless of their gender, can positively impact gender imbalance in startups.

Training Opportunities

In previous chapters, I have examined how constant threats to self-efficacy exist for many women in tech startups. This can be mitigated by providing ample training opportunities in both tech and entrepreneurship skills, internally and externally.

Bandura (2001) suggests the use of education, including “mastery experiences, modeling, social persuasion” as tools to increase self-efficacy. Enabling continued tech training in a “non-competitive environment which encourages mutually supportive dynamics” help to strengthen confidence and self-esteem (Sørensen & Lagesen 2005:9). This also connects well with one of the strongest motivations for joining startups – self-development and continued learning. Many female non-tech startup employees interviewed for this research also indicated their appreciation of being able to learn more about programming – often it was considered “fascinating”, something that helped them to “understand the company better” and ultimately increase their sense of belongingness while providing opportunities for self-development.

Not only technical training, but also entrepreneurship and business education possibilities are important especially for females, due to their “observed self-efficacy bias (Wilson et al 2007)”. Negotiation skills, presentation skills and other basic business skill training is often overlooked in small firms but are greatly beneficial, especially for female employees. Providing possibilities and encouragement for external training opportunities can also have a long-lasting positive effect.

5.3.5 Companywide Engagement

It goes without saying that it is not enough to just provide a female-friendly environment

for female employees in startups, where male employees dominate and influence the culture and its stereotypes day after day.

Foust-Cummings et al. (2008) found that women working in tech rated their supervisors to have lower communication skills, receptiveness to suggestions and availability for feedback, compared to women who were not working in tech. It is common for managers in tech to receive very little training on leadership skills and are rather promoted due to their technical capabilities (Thomas 2016). This can easily lead to more managers in tech startups making biased, stereotypical interactions with their employees, which can harm the entire company culture.

Dobbin & Kalev (2016) point out that many corporate diversity programs often unintentionally backfire due to the ‘forced’ nature of them, which often strengthens the cognitive bias in male employees. They suggest that, however, when all diversity measures are put in place with the utmost priority in engaging the existing employees, the results differ significantly. Including the entire company to become ‘naturally’ engaged in the topic, i.e. designating male employees to go on a campus recruit event with the specific intent to search for high-potential female candidates, including male mangers to devise up a diversity scorecard and be in charge of updating it, hosting company-wide discussion sessions to search for solutions together are some examples how diversity engagement could be increased throughout small startups.

6 Case Studies

6.1 Method of Research

To test the validity of literature research and to obtain more in-depth contextual understanding of real-life examples in Austrian tech startups, a qualitative research method was implemented. A total of eight females currently working in tech startups (with employee size ranging from 5 to 70) were interviewed face-to-face. Interviewee job types consisted of a balanced mix of founders (3), non-tech employees (2) and tech employees (3). Interviewee age range differed from 25 to 45, and familial status varied per person. Interviews typically lasted approximately an hour. Digital audio recordings of all interviews were created.

Name	Gender	Company Name	Job Position	Background
Tina Deutsch	Female	Klaiton	Founder	Business
Klaudia Bachinger	Female	WisR	Founder	Business
Tanja Sternbauer	Female	Female Founders / Startup Live	Founder	Business
Karin B.*[22]	Female	Tech Startup 1*	Employee	Tech
Barbara A.*	Female	Tech Startup 2*	Employee	Tech
Stephanie J.*	Female	Tech Startup 3*	Employee	Tech
Sabine M.*	Female	Tech Startup 4*	Employee	Business
Lisa D.*	Female	Tech Startup 5*	Employee	Business

*Sophie N.**, Marie V.** & Anna Z.** were double-aliases used for specifically sensitive or identifiable quotes given by any of the above interviewees, assigned in random order, to minimize risks of internal confidentiality.*

Table 3. *List of Interviewees.*

In order to ensure anonymity, interview verbatims have been masked with pseudonyms for those interviewees that requested confidentiality. Potentially identifiable types of information were masked or slightly altered to an extent that does not change the context, and verbatims were deconstructed from single narratives and regrouped into similar topics. Minimizing risks of internal confidentiality (Tolich 2004) was important, given the relatively small number of females in tech startups in Austria. In some sensitive cases, different pseudonyms were used for the same person to further ensure confidentiality (see Saunders et al. 2015). In the case of the interviewees who agreed to be identified, a full list of their names can be found in *Table 3.*

6.2 Interview Results

6.2.1 Motivations for Working in Startups

When asked what their motivations were for working in or founding startups, higher autonomy, appreciation and possibility for self-development were mentioned by all interviewees, regardless of job type or position.

[22] Names with asterisks(*) are pseudonyms, used for interviewees who requested anonymity.

*"There is no fixed job description. I feel like I'm much more valued here than in the bigger companies, and all of my input is very much appreciated. I can work from home, work from 2 to 10 [if I wanted]. In general, you have a lot more control over how you want to structure your work." – Sabine M.**

"Startups offer a completely different learning curve, which is much steeper and broader. In bigger companies, it takes much longer to understand how the entire system works, but in startups, a couple years' exposure helps you understand so much more about business." – Tina D.

"I can really design my life however I want. I don't think I could ever imagine asking someone for vacation, or if I can go home earlier today." – Tanja S.

*"In startups you can try many things and try different positions. Of course there are risks, but you can always find a new job afterwards, once you're in the scene. And who has one job for all their life anymore?" – Stephanie J.**

*"I like the atmosphere and the laid-back culture. I would hate it if I had to wear a business suit every day and work 9-5 or longer, and when the hours I put in are what matters to get promoted." – Lisa D.**

Interviewees who were employees in startups usually had lower risk propensity but shared similar creative and curiosity traits with founders. This supports the literature regarding entrepreneurial workers or "joiners" sharing entrepreneurial traits to a varying degree.

*"I'm creative, proactive, ready to help. I always have new ideas, very detailed ones, but I've never been able to really start my own company. But I'm interested in developing myself continuously and in personal growth. I view myself as a career woman and wish to stay so." – Sabine M.**

*"I try to avoid doing the same thing every day. I don't thrive in environments where I always have to follow the same procedures. But I don't really have the drive to create my own business." – Lisa D.**

*"I don't plan to ever be a founder myself, because I need a salary and I can't really afford to fail." – Barbara A.**

6.2.2 Common Challenges Faced Working in Startups

Founders' Lack of Leadership & Management Experience

One of the most universally cited challenges faced when working in startups was how the CEO or founders' lack of leadership or management experiences shaped the company's working culture and impacted the employees' lives.

> *"The CEO was a visionary, but he had no appreciation for the people that worked for him. You need to talk to people, praise them, live by example and give open feedback – he did none. People hated working with him and soon enough, the company went down. If I'm a 24-year-old CEO who's only programmed computers my whole life, how should I know how to deal with women?" – Sophie N.***

> *"Our CEO, all he does is work, his life is basically the company. All of his waking hours are spent on working for the company, and he has never ever gone on a vacation since he founded the company. Since he is making so much sacrifice for the company, it feels like he also expects all of his employees to also make sacrifices." – Sabine M.**

> *"Young guy CEOs tend to promise unrealistic things to clients or have no humbleness. Often, they also don't know what the basic labor laws are and I need to tell my own CEO what my rights are." – Barbara A.**

> *"'Failing Culture' is not so ideal in my opinion. Of course, when you're young and have rich parents and you live in a house that your grandparents bought, or if you're running on investors' money, it's not your money so you don't really care if you fail. But that's really irresponsible if you consider the employees working for you. Often, for us, it matters a lot when you fail." – Marie V.***

> *"The founders, all men, are like geniuses in coding, so they sometimes get very frustrated and they can get impatient about things. It feels like they usually don't understand why things can't get done quickly, or maybe that an employee just couldn't say that they have tons on their plate right now. They're getting much better and trying really hard, but they used to be very quick to get angry, place blame on people and sometimes even yelled at people." – Lisa D.**

*"This one guy was really emotional. I also have emotions, but I'm keeping it out of work. You need to be able to handle it, because being a nice colleague is also a part of your job. Maybe I was like him when I was 14 but I grew out of it. He hadn't, and we all had to change our ways to fit his moods." – Stephanie J.**

Unintended Sexism

There were no interviewees who talked about extreme incidences like sexual harassment, and most seemed to agree that working in startups in Austria is not as stereotypically bad as media tends to portray them. However, all recounted small, daily incidences that each regarded as a one-off, passing incident or not meant with harm, but did make them feel uncomfortable.

*"There was a CEO who used to be very condescending to women. He told me once, passingly, that he can do everything better than a woman. He said it like a joke, but I think when daily sexism like this continue, many women quit that job soon, and of course would never recommend that company to her friends." – Barbara A.**

*"Once [my CEO] told me, although casually, that I should smile more. I don't smile when I'm concentrating at work. It did make me reflect on myself to try to smile more, but I wondered if he would have said the same thing to my male colleagues. I thought, probably not." – Karin B.**

*"There's some daily stuff. Junior developers tend to ask my male colleagues questions for help, rather than mine. I don't try to be harsh, but it does happen, and it feels strange because my skills are also very good." – Stephanie J.**

"As a female founder, it was difficult to find a technical co-founder. When I pitched my idea, many men sort of cocked their head to one side, looked at me as if they were thinking 'Awww, that's a nice idea from a young girl' and underestimated me often. The perceptions would definitely change once I started telling them about my experiences, but before that I always felt underestimated, especially because I look quite young." – Klaudia B.

"In one company, I thought I should be compensated more. I had done my research and knew what the going rate was, and I had already been in the

*company for quite some time. When I started the salary negotiation process, though, one founder actually said to me, 'Do you actually think you can get a raise because you're a strong woman or something? I know you're a good developer but tell me one reason why I should give you a raise.' This completed my decision to leave the company." – Stephanie J.**

Bro Culture

Similar to daily sexism, albeit not intended to be harmful, bro culture still exists, perhaps naturally, when the workplace is dominated with men.

*"Every day at a certain time, the 'Workout Wheel' was turned and everyone would suddenly get up and start doing push-ups and workouts in the office. Of course, then they would get sweaty, then they all took their t-shirts off. Imagine ten men sweating with their t-shirts off in the office before lunchtime. I was the only woman in the room, I put on my headphones and didn't participate." – Anna Z.***

*"When I first started, I saw only the male sign on the bathroom door and wondered if only men were allowed to use the toilets – until I opened the door and understood that there was only the male urinal in the main bathroom." – Sophie N.***

*"I don't really enjoy drinking anymore, I think I'm over it. But there seems to be almost no other way to have a good time with your colleagues in this company if you don't participate in the drinking. To be honest, although I like my colleagues, you see your colleagues most of your day. I'm not really eager to see them after work as well, I need my time." – Stephanie J.**

*"I have a family, and I actually got married because I like to see my husband. I value my free time, I don't hang around at the company when I don't have to. For many of these young founders, it's completely the opposite." – Sophie N.***

"There was once a team-building event, which was supposed to create teamwork so everyone got to know each other better. The fun parts of the team-building were video games and card games. I understand, that when the majority of the team is male, that's probably what you find fun. I went home

*early because I couldn't really connect. Maybe because I'm not a developer, it's not really necessary to consider me." – Marie V.***

*"A friend of mine interviewed for a startup and turned down the job offer, because the interviewer stared at her breasts the entire time. She wasn't even wearing revealing clothes! He was super shy, and he was building a really amazing product, but she felt that she definitely couldn't work in that environment." – Anna Z.***

*"It's the small things. A good example is when you go into their bathroom and they don't have a trash bin in the women's stall. Many men simply don't understand how really uncomfortable it can be for women [to bring their trash out of the toilet]. When I see those things now, I tell them immediately about it. When a startup already has some women but it's still like that, it probably means they don't have a listening culture." – Sophie N.***

"Nerd" Culture

Another aspect that was mentioned often was the 'nerd' culture. This is different from 'bro culture' in that it is usually understood to be a trait that's common in male computer programmers, and therefore not harmful. However, it also posed a certain level of cultural adaptation challenge, or 'getting used to', for the female employees.

*"The one stereotype that really is true is the guys I work with in my team. They are really nice people, but really shy. They don't really ever talk to me until I make it happen – then they don't stop. We're like a bunch of awkward peas in a pod. Once there was an office party. I intentionally went to a table full of developer guys to talk, and I happened to comment on the [beverage] that one of the guys was drinking. After that, for months our conversation was only about [beverage] – I mean I like [beverage] too, but I can talk about other things as well! So it can be very frustrating, especially if, as a woman, you're used to making immediate friendship. You have to make extra effort." – Karin B.**

"I used to be worried about the lunches, but it's surprisingly ok, although it's hard to talk. I'm an awkward person, and most are also awkward people. Common topics at lunch tend to revolve around tech, what's happening in the tech industry, which I'm not very familiar with. Even when we talk about

*something other than tech, it usually tends to veer back towards code." – Lisa D.**

Informal Culture

Another frequently mentioned topic was how, since small startups tend to begin within friend-circles and start to grow from there, the culture remains largely informal, which can also sometimes hinder professionalism. It was interesting to note two different interviewees mention that they had felt like the mother in the startup – both implied positive connotations of being able to be the emotional, caring, understanding figure in the company, but also negative connotations of having to take on often gender-discriminatory responsibilities that were outside her job requirements, and having to be the person who was "always understanding."

*"All of the employees are also more like, based on a friendship, rather than on a contract basis. It makes it even more difficult to separate work and private life." – Sabine M.**

*"The fact that the environment tends to become really like a friend circle can make it very difficult to talk about serious things, or to really disagree. It feels like you're fighting with your friends. When you want to leave to another company, it even feels like a breakup, and I have seen people cry, some are really heartbroken." – Barbara A.**

*"The office setup is very much like a house anyway." – Lisa D.**

*"As a woman I'm somehow expected to do so much of the 'housekeeping' work, even though that's not a part of my job description. I'm very understanding of everyone's situation, so I don't complain, but sometimes, small things like cleaning up cups and plates… If I don't do that, no one else does it. I sometimes have to go pick up private packages for our CEO, and he didn't specifically ask me to do that, but it's somehow automatically assumed that I would take care of it, and no other guys ever do it. I feel sometimes like it's because women tend to understand other people's situations better and can be more compassionate. There's no hard-cut defined roles for everyone, so the women end up doing them. I sometimes feel like I'm the mother in the company." – Anna Z.***

*"I felt like I was the mama in the company. On the one hand, therefore it is easier to talk to your founders, but sometimes it can be very frustrating." – Barbara A.**

*"It frustrates me that in the end, you have to be the nice person as the woman. Some of my male ex-colleagues had this strange 'I am this type of person, so deal with it' mentality. To be honest, I'm not a sweetheart either. But at the end of the day, in the office, there are people who know how to be understanding and care, and people who don't. When you're the one who knows how to care, you're the one who always ends up working around them and they get everything they want. It gets really annoying." – Stephanie J.**

6.2.3 Opinions Regarding Recruiting in Startups

Job Ads

Making job ads approachable was a common topic addressed. Job titles were a well-known problem, but an interviewee also pointed out the need to make compensation packages more easily understandable, as they tend to be more complex than other companies.

*"When you're recruiting and want to get more women in, you need to make it look more approachable. For example, for some jobs, you don't even need to have a degree for that but they write something like 'Conversational UI Artificial Intelligence ML' then it looks intimidating and women don't apply." – Stephanie J.**

*"For me, what you get in the compensation package was always most confusing, like stock options and payout plans, and they are so common in startups. […] Give, like, a calendar plan of how the payout will work out so it's easier to really understand. My company did this and I was immediately attracted to them because of it, it shows you care. In [a previous company], it was super non-transparent, I never knew when will I get my raise. Women tend to think more about stability, and we go into details more. So you have to make it more approachable this way." – Stephanie J.**

"When I search for new jobs, I avoid all jobs that say things like they're looking

*for Keyboard Ninjas." – Barbara A.**

*"There are job ads out there that look for superstars or whatever – that feels like an idiotic way to recruit, if you want to recruit people who are over 15. You just don't sound serious enough." – Karin B.**

"Male founders should always ask the woman in the team to look over their job ads. Or at least their woman friends, if they don't have women employees." – Tanja S.

Interview & Hiring Process

Interview formats that were less competitive were clearly preferred. Many interviewees recounted feeling "valued for the person I am" as strongly positive signals during the interview process.

*"You always have to do tests if you're applying to be a developer. One of the worsts I had was when I had to write the code on paper, while everyone was watching me. It was actually a super easy algorithm, but I completely messed up. The timed ones are even worse – you only have minutes to solve them, and I feel like they're probably made with a one-size-fits-all approach." – Karin B.**

"Interview formats should be less competitive. Female coders are refusing to do coding competitions, because they perform much weaker under public pressure and competition. At the programming training company that I used to work for, I noticed that a lot of women asked for separate, women-only classes. They preferred learning methods that would let them solve problems together, cooperatively." – Klaudia B.

"I run two different but similar types of incubator programs. Startup Live is a very short, impactful, competitive approach with mixed genders. Female Founders is only for women and offer mentoring programs. Very often, women with startup ideas that could fit perfectly to Startup Live apply only for Female Founders. They feel that they don't want to participate in the overtly competitive program." – Tanja S.

"When I was first interviewing for programmer jobs, […] it seemed like some

*men felt insulted, taken over by newbies, when I said I had taught myself. One guy was 20 minutes late to the interview, hadn't read my CV, then made fun of me for thinking that it would be ok not to own a [brand of computer]. I don't think I would have been comfortable working for him at all." – Karin B.**

"Many male founders tend to have a list of boxes to tick for interviews, and they just rush through them. I try to listen more and see the person as a whole, regardless of what they have done in their past jobs. Our first female employee used to be a kindergarten teacher before, but now is a great tech employee at our startup. People want to be appreciated for what they do and who they are, and you cannot see people as a whole if you don't care about it enough." – Klaudia B.

*"The founders of this company, even at the interview, seemed to really like me for my motivation of teaching myself how to code, rather than look down on me because of that. They valued the person behind me. There was a test, but it was a mini project and they told me I could even take a week if I wanted, that was fine. When I first joined, of course I felt insecure – but they tried hard not to make me feel the gap." – Marie V.***

Hiring Channels

Word of mouth of women was frequently mentioned as a channel startup founders need to utilize more, especially since it tends to have a snowballing effect when the working environment was deemed positive for women.

*"If you have a job posting, spread it out to your friends who are women. At our company we usually just post them on our [social media] channel, but 80% of our followers are male." – Sophie N.***

*"Many jobs in startups are recruited through word of mouth. It's like an ecosystem of its own. There are a lot of job platforms for startups, but most people don't actually get jobs like that. That's why it's important to get women to spread the word to their friends and friends of friends if you want more women in." – Stephanie J.**

"It's always the most tough to get the first woman in, because a lot of women do

not want to work in a 100% male environment." – Klaudia B.

"Get one woman in – she will acquire the next. You also need best friends in the team, so place women together in teams." – Tanja S.

*"Because it was so cool to work there, all the female programmers at the startup would talk about their company to their friends, and more and more friends came in through word of mouth. That's how we had probably the highest female developer ratio in all Austrian startups. There, it really felt like the product was everyone's baby. We all really cared a lot for the product." – Marie V.***

6.2.4 Opinions Regarding Retention in Startups

Onboarding

Onboarding is often mentioned as a critical phase where the female employee decides her 'fit' with the company. Minor incidences such as 'forgetting to do introduction rounds' can have detrimental effects for women who tend to feel uncomfortable initiating unsolicited introductions. Often, a good balance of a longer guidance period combined with feelings of autonomy were regarded as signs of being valued by the company.

*"Whenever someone new joins the company, they do an introduction round. But when I first joined, that sort of slipped through the cracks, so that was quite awkward for me for multiple weeks. Only after a company event where everyone had a chance to talk openly, I felt like I finally got insight into the company." – Anna Z.***

*"One startup I worked at had a very high female programmer ratio. The secret, I think, was the CEO. He was a guy but was very relatable and always ready to help. When I first joined as a programmer, he took one month of orientation time, sat with me personally and showed me how everything was done – he really invested time in me. He gave the sense of really caring for his team, and that I could talk to him about whatever problems I faced, without worrying that he would laugh it off." – Sophie N.***

*“I like my company, because when I first came on board, they gave me a lot of guidance – I didn’t feel like I was just thrown into the water with sharks. It was possible to learn but also have ownership, because my bosses were not micromanaging me like [my previous company].” – Lisa D.**

Open Communication Channels & Feedback Culture

In line with the positive onboarding experiences recounted above, the importance of open and transparent communication, structured feedback channels and immediate response to complaints were regarded valuable.

“My best startup experience was when the team grew from 6 to 250 people in a short time and exited successfully soon. Everyone had an honest relationship with the founders, and with each other.” – Tanja S.

*“Do not be condescending. Don’t make people feel like they are ignored or have to fend by themselves.” – Karin B.**

*“Having performance reviews was very rare. It happened maybe once every half year if it did happen. When I asked questions because I was genuinely curious, they usually thought I was criticizing them. They took it really personally.” – Stephanie J.**

*“It’s really important to know if there will be someone I can go to, in case there are any problems. It can’t be the founder himself, because often the founder himself could be the problem.” – Barbara A.**

*“I don’t want to have to worry about being labeled as the sensitive female. You have to feel comfortable bringing up issues with your senior.” – Lisa D.**

*“There was once a male colleague who was acting very inappropriately to female colleagues, and in general being very creepy. When we brought that up to the CEO, he investigated then fired the guy immediately. That was really nice to know that when something wrong happens, an action will be taken right away.” – Karin B.**

“What I really like about my founders it that they actually really try to get a lot of leadership training from external coaches and sources, about how to be a better

*boss. It shows that they really acknowledge the problem, and they're actively trying to improve themselves in it." – Sabine M.**

"Imposter Syndrome"

All interviewees told varying versions of feeling less secure or confident than men, and this impacting their own behaviors as well as the males around them.

"A male founder once joked to me, that he wants to recruit more women, because they are cheaper. We have this thing with perfectionism. Girls are taught to be perfect and not to fail, guys can be adventurous and be crazy. Detach yourself, get rid of perfectionism. If you're a woman, do not undersell yourself and don't agree to unfair salaries. Actively look for female founders, be brave to apply, don't see yourself in victim positions, just try to do something and create a difference." – Klaudia B.

"Many female founders I've worked with tend to need a lot more time. They want to be better prepared and know everything and then do it really well. They don't trust themselves enough. You have to often push them, whereas guys just go ahead and do it. Of course, there are always struggles when you're doing a startup. But when that happens, women always tend to see themselves as the problem and look at what they've done wrong. The guys always say that it was something external – even like, it was the company's problem, not himself." – Tanja S.

*"Many women, unless you have a perfect plan, you don't go for it. Men usually have no trouble saying that they're awesome. But for women, unless they're actually in some really top position, they never say that." – Stephanie J.**

6.2.5 Best Practice Cases

In this section I record excerpts from two female founder-interviews that were not quoted in the previous sections, as examples regarding the importance of flexibility, role models and communal values in increasing female ratios in startups.

Best Practice: Flexibility

"In our startup, two thirds of the employees are females. I think this was possible because we do not focus at all on the hours but on the output. 90% of our employees are working part time, which means 30 to 35 hours per week. In reality, this is not too drastically different from 40 hours. However, during the last few years I realized that for many women, even 'just knowing that the possibility of flexibility is there' makes a big difference. I strongly believe that productivity and output have nothing to do with hourly input.

Other startups normally tend to brag about the 90-hour workweek. If you go to [a startup accelerator], you only see men walking around. There are foosball tables. The entire community is very intense and pride themselves on putting in long hours. We intentionally stayed out of that scene, because we wanted to have the possibility of shaping our own culture.

It helps a lot to write job ads differently. We talk about our code of conduct and mention what our vision and intentions are. In the early stage of our company, we spent a lot of time thinking about the culture and leadership. I am married and have children myself and had to fight a lot of stigma associated with mothers going back to work soon. I wanted to show that it is possible, to combine the mindfulness approach and high performance-orientation.

We take a lot of care in onboarding people we newly recruit. We have walking meetings in the park and really watch out for each other. But that doesn't mean that we are laissez-faire. We are very strict on goal orientation and sustainability, and I think our female ratio shows how that really is possible.

I think women should demand culture changes, and make sure it becomes clear. System change only comes with a critical mass - so create that critical mass."

– Tina Deutsch, Co-founder & Managing Partner, Klaiton[23]

[23] See: https://klaiton.com - retrieved 29 July 2018

Best Practice: Communal Values & Role Model Effect

"I am the Founder and CEO of WisR, a seed-stage startup that reconnects silver agers to the job market. We tend to get a lot of female job applications, on average about 50/50. I think it's because two of the co-founders, CEO (myself) and the CFO, Carina, are both female and quite active in the startup scene. We're the 'female faces' of the startup and we both tend to talk quite openly and honestly about our vulnerability and challenges, which not a lot of male founders do. Many women come up to us after these talks to tell us that we're role models, and I think that's very important.

In our company, we have role models too. Our CTO Martin, for example, has two kids. He makes sure to spend time with them, so by doing that, he is showing to everyone, especially to women, that it is possible to work in a fast-paced startup but also be there and have time for your family.

What is also interesting is when we only look at the 'initiator applications' - the people who apply on their own and not as a response to a job ad - the female application ratio spikes up to almost 100% women. I think most of these women are intrigued by the social and impact topic of WisR, and they often genuinely feel very passionate about it.

Authenticity is a very important value in our startup, and I think this tends to attract women a lot. We spent a lot of time discussing our values, and they are authenticity, courage, humbleness and leadership. I think authenticity also means that when you have these values, they should be consistent both internally and externally. You can't ask your sales team to go to strip clubs for beer with your clients and expect to have an authentic culture internally.

People want to be appreciated for what they do and who they are. I think with the culture of authenticity and trying to look at the person as a whole, we are being able to do that."

- Klaudia Bachinger, Founder & CEO, WisR[24]

[24] See: https://wisr.eu - retrieved 29 July 2018

6.2.6 Summary of Interviews

All interviewees, regardless of their job position, exhibited to some extent 'entrepreneurial traits' and worked in or founded startups to have more control and flexibility in both their career and their life, and also for self-development. The most frequent causes for discomfort or feelings of discrimination mentioned were young male founders' lack of leadership or management experiences.

Severe cases of sexual harassment were not mentioned by any interviewee, as general assessments of male colleagues were "very nice and don't mean any harm". However, unintended, small daily sexism that stem from bro and nerd cultures mixed in an informal environment under weak leadership/management sum up to have a compounding effect, reinforcing stereotypes and hindering more women from joining the startup workforce.

Phrases such as "approachable", "open and transparent", "encouraging", "appreciative", "values" were consistently used by all interviewees to describe a positive or ideal startup recruiting and retention practices.

I will close this section with two quotes from interviewees who stressed the importance of gender equality discussions within the startup space.

> *"I don't agree with founders who say they don't really have time early on to think about diversity in their team, since they have to focus on the product. When they have a team that's essentially all the same people building a product, they're building a product that would be awesome only for people like themselves, which is actually a very, very niche part of the entire population." – Barbara A.**

> *"I also used to think that everything was ok and it was the norm, and when you're there, you don't notice these things that happen all the time. However, after you notice once, you can't stop. There are things that happen around you that are not ok. So you have to do something about it, otherwise it'll go on forever." – Stephanie J.**

7 Summary & Conclusions

7.1 Summary

In this research, I addressed the problem of gender inequality, namely the low female employment ratio, in technology startups. Social movements i.e. #MeToo campaign that advocate gender equality are now in public spotlight like never before. Tech startups, regarded as one of the most innovative industries that will shape our future, fall surprisingly short when it comes to female founders and female employee ratios. *Financial Times* article from 2017 that analyzed data from 500 Silicon Valley startups found that the average female ratio in startups with lower than 100 employees is a meager 17%, with stronger chances of it nearing 0% the smaller the startup size (Bradshaw & Kwong 2017).

Through existing literature research encompassing entrepreneurship, sociology, psychology and gender studies, I attempt to understand the structural 'Brotopian Cycle' that underlies the general social discourse, effects individuals' attitudes and behavior, and in return work to continuously reinforce the existing social gender stereotypes against women in tech and entrepreneurial women, based on the broader definition of entrepreneurship that regard not just founders but also employees working in innately high-risk startups as "entrepreneurial workers (Neff 2012)".

The research examines each stage of the 'Brotopian Cycle' in closer detail. The term "Brotopia" is borrowed from the title of technology journalist Emily Chang's book, *Brotopia - Breaking Up the Boys' Club of Silicon Valley* (2018), which describes the author's in-depth look into gender problems inside current high-performing tech startups in Silicon Valley and inspired this research.

My description of the vicious cycle starts at the macro societal level, of how "Media" creates and reinforces gender stereotypes in technology and entrepreneurship. Next, I discuss the role of "Education" - how even at an early age, girls tend to become subjects to gender stereotypes through unwitting parents and education systems then internalize them. Afterwards, I turn the lens to startups themselves' roles within the vicious cycle. Even when a woman has successfully overcome previous stages and reached a point in her life to choose careers, common recruiting and hiring practices in startups during the "Recruitment" phase intentionally and unintentionally 'weed out'

more women candidates than necessary. Finally, even when the woman candidate has been hired, multiple cultural and structural norms common in small startups create challenges for “Retention” of these female employees.

The next chapter discusses ways how startups could tackle this problem and actively break one of the key links in the vicious cycle. Actionable tips are discussed for two major stages, namely “Recruitment” and “Retention” and are summarized in a checklist in *Figure 14* (See *Appendix 7*). During recruitment, startups must have higher awareness about the importance and benefits of diversity and create strategic goals to attain. Common motivators for women who join startups need to be understood, namely more control, flexibility and autonomy over their careers and lives, and also stronger needs for self-development, recognition and appreciation. Job advertisements, both in content and in channels in which the advertisements are placed, can be optimized to minimize unintended gender bias and increase attractiveness to the female audience. Interviews and hiring processes can be optimized, in its methods, evaluation criteria, accountability and transparency. Communicating about the startup’s commitment to diversity over various channels is also recommended.

To improve retention of female employees in startups, a complete ‘culture overhaul’ needs to be implemented. Feedback, reviews and recognition structures need to be standardized to provide more actionable and unbiased feedback, and practices such as managing by performance rather than presence and encouraging or developing peer communities and mentoring/training frameworks are recommended. Moreover, engaging the entire company and especially the managers, instead of only focusing on the female employees or regarding it as a problem for only a part of the company to solve, is more likely to ensure a successful outcome in improving the gender imbalance in startups.

The next chapter recorded verbatims from qualitative face-to-face interviews I conducted with eight women who are currently working in Austrian startups as either founders (3) or employees (5). Most of the findings from field research correspond to theoretical research results. Extreme problems such as sexual harassment or overt discrimination were considered infrequent. However, lack of leadership and management experience of young male startup founders was the most commonly addressed problem that created and/or neglected stereotypical gender-bias problems

in tech startups. Openness, transparency, authenticity and approachability within a structure that enabled recognition and appreciation were strongly valued by these ‘entrepreneurial women’.

7.2 Implications for Further Research

While much of the connection between gender studies and tech or entrepreneurship tend to focus on female founders, not much research has been conducted in a wider view including female employees, or female ‘entrepreneurial workers’. A quantitative research to further test various hypotheses introduced in this research would be beneficial to understand the problem in a wider perspective. For example, the relationship between management and leadership experience of founding teams and diversity issues in small companies would shed valuable insights into creating effective training programs and other measures for startups.

It may be also interesting to examine how advancements in technology may be either weakening or still reinforcing the vicious cycle on a macro level. Much of existing research on the relationship between women and tech regard limited access to computers at an early age as an important factor that shapes gender stereotypes against tech for girls at an early age. However, in an era when computers are being replaced by smartphones and children have much earlier and more frequent access to technology via smartphones, a comparative or longitudinal study examining the effect of such advancements in technology on gender stereotypes could shine new perspectives into this field.

Same logic can be applied for the expected proliferation and increased importance of social networks, artificial intelligence and natural human-computer interaction. What Donna Haraway (1991) optimistically described in her “Cyborg Metaphor” has not materialized in the form she envisioned, but instead are taking on new forms that may completely shift the way women participate in tech, due to its closer resemblance to traditionally ‘feminine’ characteristics (Bath et al. 2006). While the effect and results of such new advancements in technology are still too early to examine, it may be worthwhile to study how stereotypical gender bias may again manifest itself into potentially promising areas in tech, thus helping to shape the next generation of technology education and workplaces to become more gender-balanced and fair for all.

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Appendix

Appendix 1

PHP Jedi

XXX Solutions Published: May XX 2018

If you feel like a PHP Jedi, or you feel you are on the path to becoming one, join the XXX Force you must!

This is you:

- Your life begins and ends with a slash.
- You feel like you have a mission, not just a task.
- You understand iterative development and a day without pushing code makes you sad.
- You're not afraid to crack open an existing code base and bend it to your will.
- "Self Starter" is your middle name. You can take or come up with a high-level idea and run with it.
- You have a real understanding of building products that work at web scale.
- You can't imagine your life without a whiteboard, open-source boards and definetly CODE.
- You know the importance of being part of a universe where all the departments need each other and work together for a mutual goal.
- As a software craftsperson you will advocate and practice pair-programming, test-driven development, refactoring, collective-code ownership and continuous integration.
- You are an international team player.
- You are eager for knowledge.
- You have lots of stamina and you get bored if you have nothing to do.
- You are hands-on and proactive.
- Fluent english is a must.

Experience:

- You have a solid understanding of the web technology stack.
- You have 3+ years experience building software that works at web scale.
- You have experience and understanding of OO principles such as SOLID.
- You are well versed in clean code and practices such as code by intent.
- You are experienced in applying design patterns and maintaining simple designs.
- Your life guideline is "Less is More".
- You have experience working within a multifunctional team and collaborating with your peers.
- You have strong experience in PHP.
- You have an streamlined debugging process.
- You feel nervous if you don't write tests.

We will be impressed if:

- Twig.
- Composer.
- Rabbit.
- Pimple.
- Docker.
- ES6.
- WordPress.
- ElasticSearch & Kibana.
- You are familiar with parallel code execution.

This will be you at XXX:

- Be part of an elite swat team working on a brand new product built from scratch.
- You will have a very strong knowledge of PHP and significant experience in coding.
- Continous Integration and Deployments at scale impacting millions of users and thousands of customers.
- Automation.

This will be you as part of the XXX team:

- Working in an international, multicultural and talented team and enjoying our sunny terrace.
- We have more than 26 nationalities so you will not get lost in translation.
- Flexible working-time.
- Free commodities (coffee, tea, juices, etc).
- Ping-pong, Mario Kart and foosball tournaments.
- Team building events!
- Transport, restaurant and kindergarden tickets.
- Training, books and all you need to feel empowered.
- And, a Referral Bonus if you bring other talented people like you.

Figure 9. *Job advertisement for a back-end developer position at a tech startup.*[25]

[25] Source: http://www.eu-startups.com/job/php-jedi-2 - retrieved 6 July 2018, text unedited except using pseudonym XXX to substitute for the company's actual name, therefore spelling and grammar errors were left uncorrected in its original form.

Appendix 2

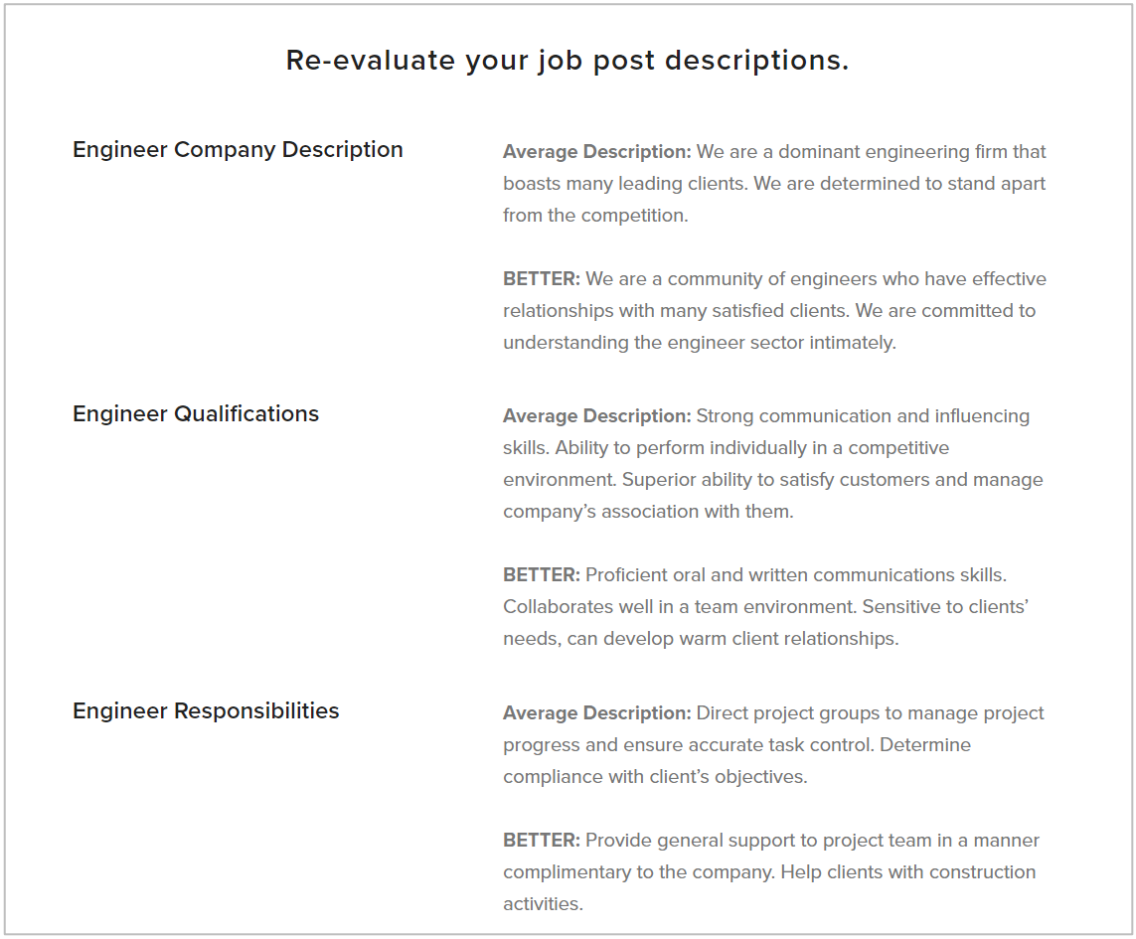

Figure 10. *HireMoreWomenInTech.*[26]

[26] Source: Screenshot from www.hiremorewomenintech.com - retrieved 5 May 2018

Appendix 3

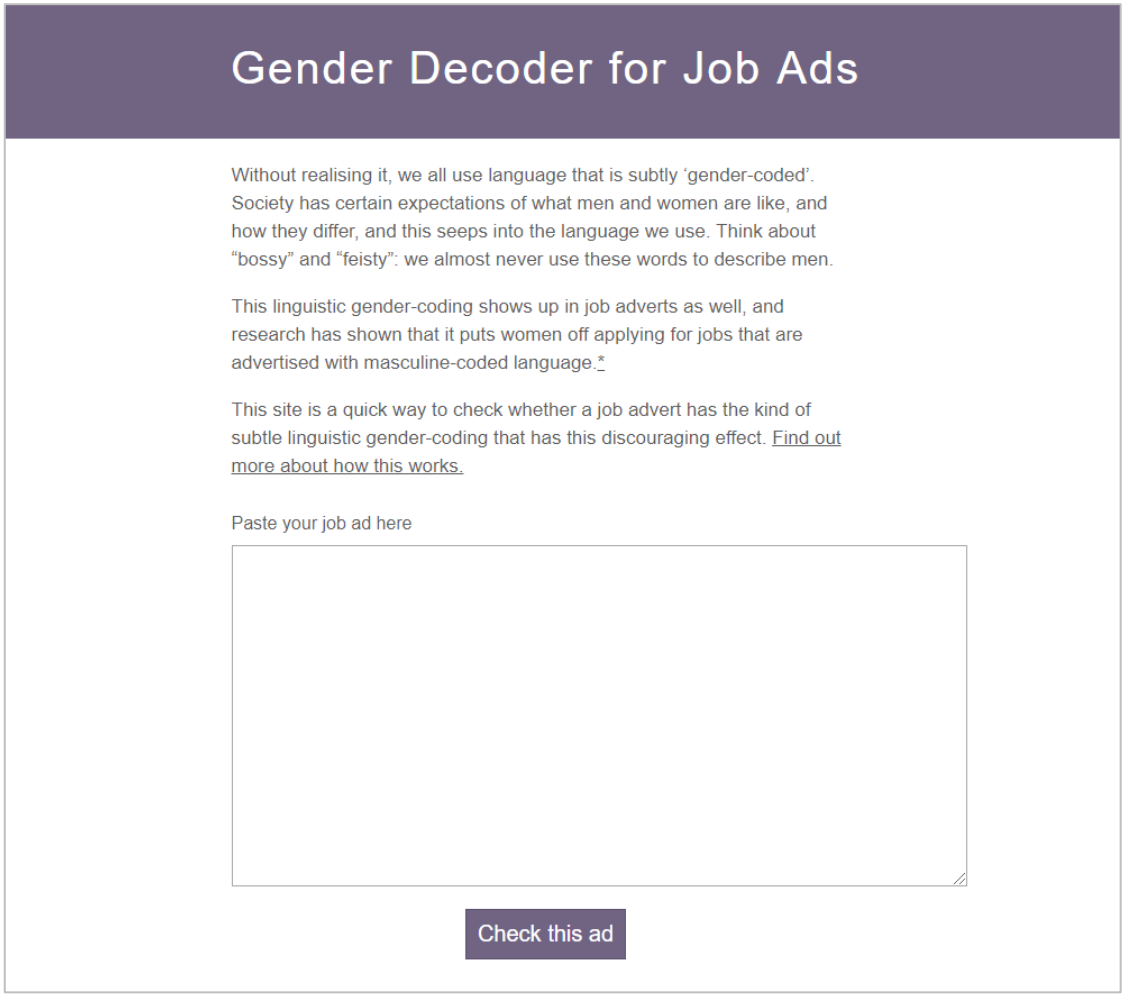

Figure 11. *Gender Decoder.*[27]

[27] Source: Screenshot from http://gender-decoder.katmatfield.com – retrieved 5 May 2018

Appendix 4

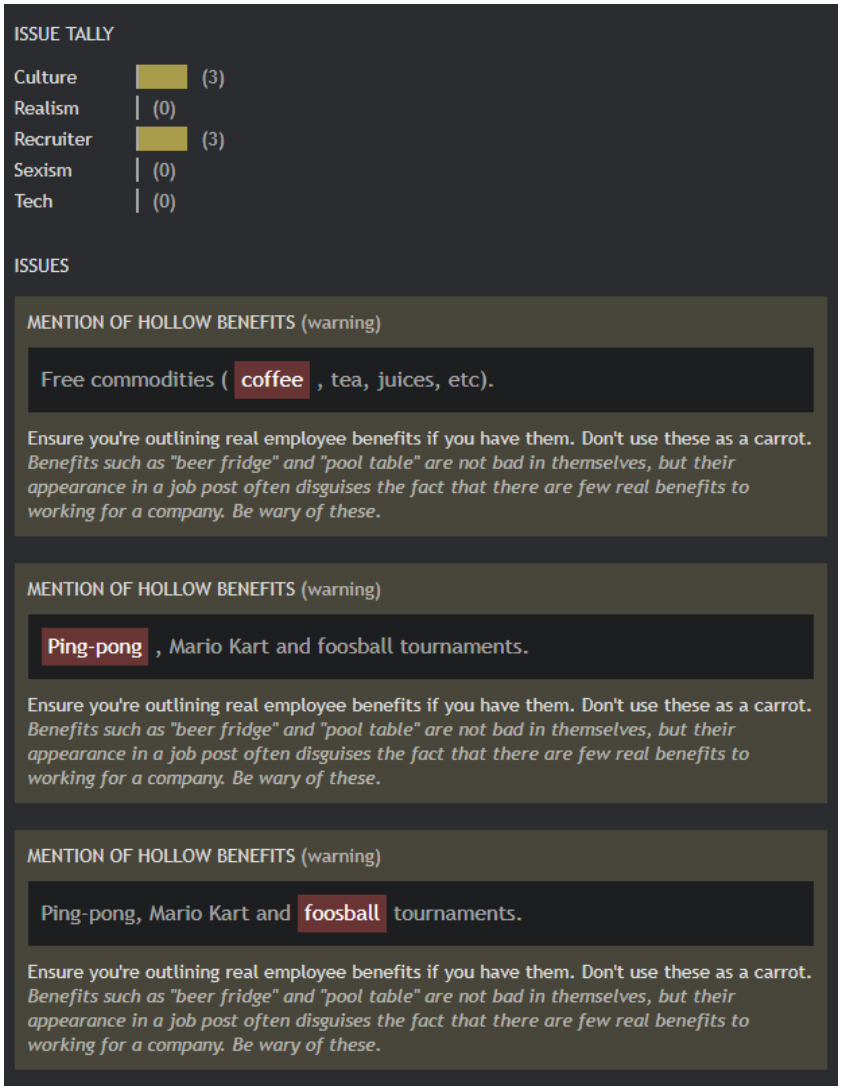

Figure 12. *JobLint.*[28]

[28] Source: Screenshot from https://joblint.org – retrieved 5 May 2018

Appendix 5

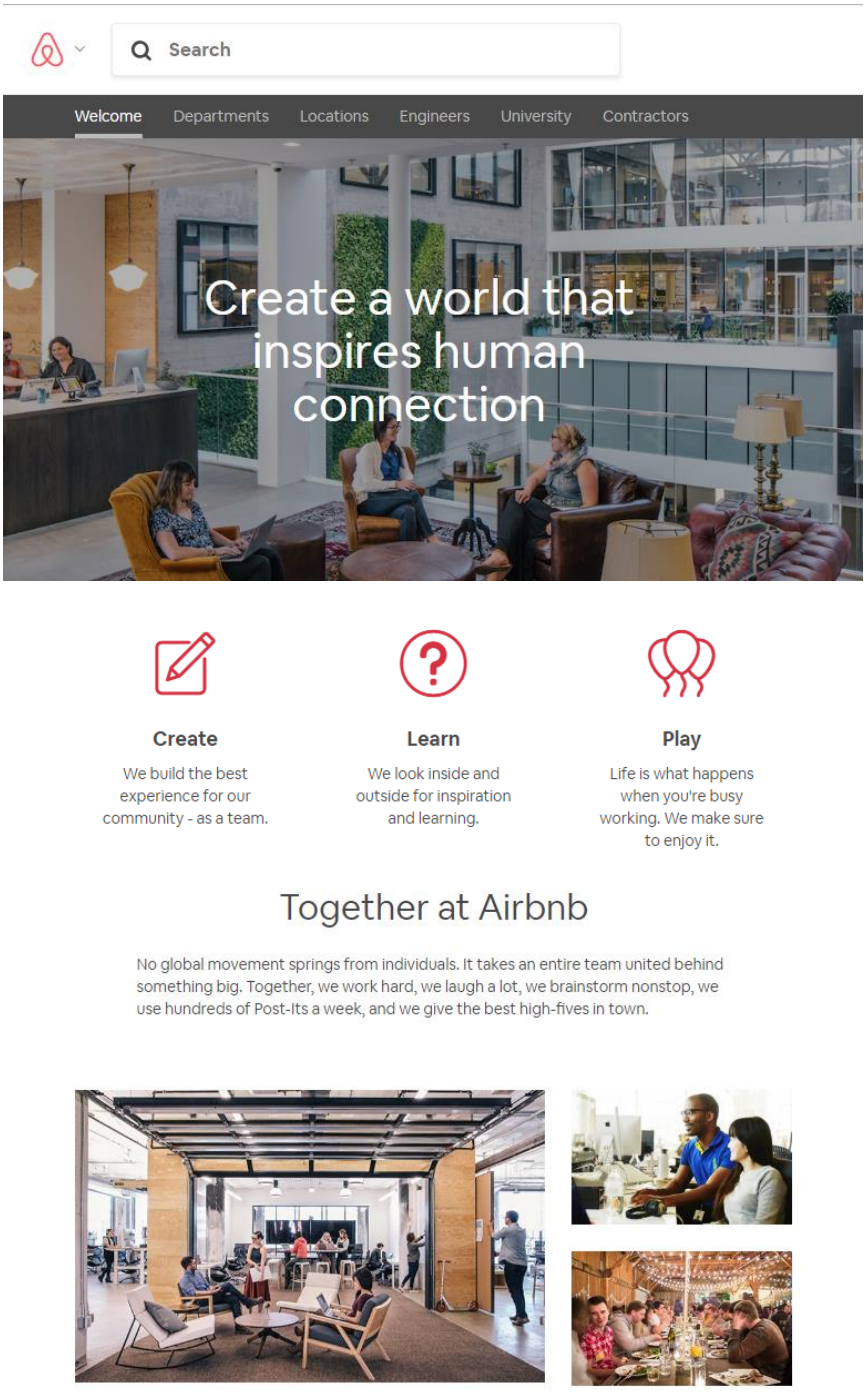

Figure 13. *Airbnb Careers Website.*[29]

[29] Source: Screenshot from https://www.airbnb.com/careers – retrieved 5 May 2018

Appendix 6

Loose Qualitative Interview Guide

1. Please give an introduction of yourself, focusing on your background and career.

2. How would you describe your personality? What would be some words that best describe you?

3. Please describe how you came to work in the startup field. Was it an active choice that you specifically looked for? What were your reasons for deciding to work in (or found) a startup?

4. Please describe how you came to work in your current company. What were the factors that most attracted you? What were some factors that you had doubts about?

5. Have you worked in other startups before? If yes, please describe why you changed jobs, and please describe the job change process.

6. Please describe the recruiting and hiring process you experienced at your current or previous startups. How were they positive or negative? Please give examples.

7. Please describe the working and networking culture in your current and previous startups. How are they positive or negative? Are they different or same to your expectations or doubts?

8. Please describe the review and reward process in your current and previous startups. How are they positive or negative?

9. Please describe your founders/management. What are they like? What are their positive traits? What are some negative traits they need to improve in your opinion?

10. Have you ever felt uncomfortable or unfairly treated in your company (or working in startups), which you might assume were because of your gender? Please elaborate.

11. (Employees) If you could give an advice to startup CEOs how to recruit more women, what would it be? (Founders only) What do you think are some strategies that work well for you in regards to having/recruiting more women in your startup?

Appendix 7

Gender Equality Action Items: A Checklist for Startups

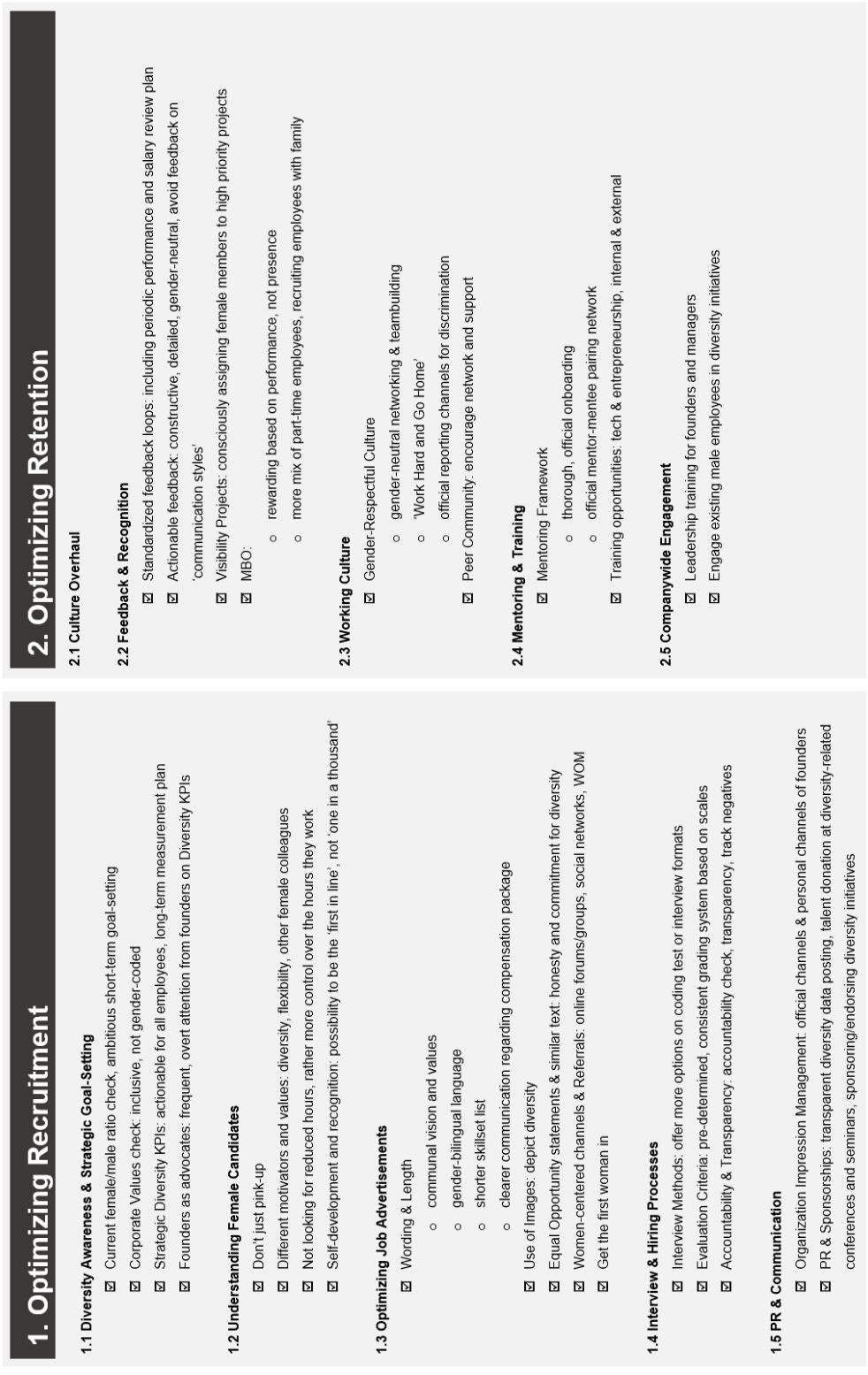

Figure 14. *Gender Equality Action Items: A Checklist for Startups*