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She's Geeky: The Performance of Identity among Women Working in IT

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ABSTRACT
This paper offers a critical examination of the ways in which female IT professionals take up a geek identity. Since the postwar period, computing has been associated with masculinity. During the 'dotcom' boom of the late 1990s, the label of geek shed some of its negative connotations, and by extension became more amenable to being taken up by women who are passionate about technology. In 2007, I attended the first She's Geeky 'unconference' in the heart of the Silicon Valley for the purpose of recruiting participants for a small qualitative case study. Six female IT professionals in 'mixed-skill' or 'hybrid' positions completed the study. Drawing on poststructuralist gender theory, I argue that the female geek needs to be understood as a hybridized alternative feminine identity. My analysis of the data demonstrates that identifying as a female geek is connected to childhood tomboyism and involves a complex negotiation of normative masculine and feminine identities, a process that both challenges and reinforces gender norms.

KEYWORDS
Technology; women in computing; gender performance; geek identity; feminine identity.

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INTRODUCTION

Although the concept of binary code is now attributed in part to Ada Lovelace for her work on the Analytical Engine in the 19th century (Plant, 1997), and women were the first computer operators (Light, 1999), computing became the domain of men after the Second World War. In the ensuing decades, computer scientists have simultaneously been associated with both hegemonic masculinity as masters of the machine (Hacker, 1990; Webster, 1996) and failed masculinity as nerds and geeks (Hapnes and Sorensen, 1995; Margolis and Fisher, 2003). Representations of the second group in popular culture are the most common. Some well-known examples are the computer science students Lewis and Gilbert in the 1984 American film, *Revenge of the Nerds,* and the 'lone gunmen', the trio of conspiracy theorists/ computer hackers who provided expert technical assistance to FBI Special Agents Fox Mulder and Dana Scully in the American television series, *The X-Files* (Fox: 1993-2000). The dotcom boom of the late 1990's turned Lewis and Gilbert's fictional triumph over the jocks and frat boys into a form of reality: the bespeckled social misfits once ridiculed for their obsessive interest in technology were being wooed by venture capitalists.

More recently, the label of geek has begun to be appropriated by women. In 2008, I conducted a small case study with six female IT professionals who attended the first unconference of an organization called She's Geeky.[1] I wanted to learn more about the ways in which women who work in IT identify as geeks, about which very little has been written. Based on my analysis of the data, I suggest that the female geek is an alternative feminine identity that may well have its roots in childhood tomboyism. Identifying as a female geek involves a complex negotiation of normative masculine and feminine identities. I will begin with a brief outline of computing culture and its masculinist associations, followed by discussions of theory and methodology. I will then present data samples that demonstrate the ambivalence of the participants' gender performances. On the one hand, they challenge normative femininity; on the other, they are unable and/or unwilling to unequivocally take up masculinist geek norms.

TECHNOLOGY, GENDER AND THE FEMALE GEEK

Social constructionist feminist scholars make the case that technology is imbricated with masculine culture (Gill and Grint, 1995; Wajcman, 2004; Rosser, 2006), an association which Cockburn (1992) traces back to the Iron Age (8th-9th century CE). As noted in the introduction, the first 'computers' were in fact the women who performed computations and ballistics calculations during World War II. Most of the women hired had college degrees in mathematics and not only learned by trial and error to program the ENIAC but crawled around inside the machine's giant frame dealing with hardware issues, such as bad joints and tubes.[2] Yet, they were classified as paraprofessionals or as support staff, and their work was dismissed by the engineers as routine and boring (Light, 1999). Mahoney (2001) speculates that beyond the ideological and economic pressures on the 'ENIAC girls' to return to the home and raise families after the war, men had discovered that programming "was

a challenging, creative intellectual exercise that promised rewards and reputation" and states that by the 1950s, programming was a veritable "hard drinking boy's club"(p.170).

The first Computer Science degree programs were established in the early 1960s. For the almost exclusively male students enrolled in such programs at Harvard, Stanford, MIT and Carnegie Mellon, "hacking was a holy mission....Brain power was focused on finding the perfect algorithm, and the emotional realm of life rarely explored" while time spent with women was dismissed as "inefficient" and "wasteful" (Margolis and Fisher, 2003, p.66). Similarly, Woodfield (2000) defines hacker culture as highly competitive, individualistic, and as emphasizing mind at the expense of the body: "Virtue and positioning within the status hierarchy are determined almost exclusively by computational expertise, and those in possession of the cutting-edge machines and techniques are the leaders in this recast moral universe" (p.17). Despite these claims, discourses of hacker masculinity have never been able to secure hegemonic status. As early as 1976, Joseph Weizenbaum, a computer science professor at MIT, offered a harsh critique of hacker culture, referring to the "bright young men of disheveled appearance" as "computer bums" and "compulsive programmers" (quoted in Margolis and Fisher, 2003, p.66).[3] Outside computing circles, the young men described above were dismissed as nerds and geeks with no social skills. The rapid spread of internet and web technologies largely changed that perception. As *Wired News* reminded its readers when announcing their annual Sexiest Geeks contest, "geeks are not just computer nerds. They're dedicated to the point of being obsessed, so smart they scare you, and hot in a possibly undefinable way" (Philipkoski, 2007). Moreover, the label was no longer exclusively bound up with technology. "To be geek" claims McArthur (2009), "is to be engaged, to be enthralled in a topic, and then to act on that engagement. Geeks come together based on common expertise on a certain topic" (p.62). For example, many of the statements from Beaudoin's (2010) *The Geek Test*, a tongue in cheek online quiz, are related to being a media fan ("I have been in a fan club or on their mailing list"; "I have been dumped at a Star Trek convention"; "I have waited in line 12+ hours for movie tickets").

The underrepresentation of women in both postsecondary computer science programs and the IT industry, despite almost forty years of efforts by feminist and liberal educators, foregrounds the power and persistence of the long association of masculinity with technology, and of masculinity with computing in particular. Gadalla's study (1999) of enrollment in undergraduate computer science degrees in Canadian universities revealed a healthy increase in the numbers of women from the late 1970s through 1984. The trend quickly reversed, however, dropping from 34 percent to 20 percent by 1995. Statistics in the United States and the United Kingdom reveal a similar trend (Woodfield, 2000). Large scale changes to the IT industry came about in the mid 1990s, resulting in the creation of a range of 'hybrid' (Woodfield, 2000) or 'mixed-skill' positions (Roan and Whitehouse, 2007), that is, positions that require excellent communication and interpersonal skills as well as technical skills. Women without degree programs in computing were able to gain entry to the IT workforce (Woodfield, 2000, Scott-Dixon, 2004). According to Ramsey and McCorduck (2005), however, women still only make up between 20 and

30 percent of the IT workforce.

There is almost nothing in the literature on women in computing that addresses geek identification beyond arguing that the culture created by men who identify in this way is unwelcoming and even hostile to women (see Varma, 2007). Earlier studies indicated that female computer science students held negative views of geek culture and behaviours. The Norwegian female students in the Hapnes and Sorensen study (1995) referred disparagingly to the male students as "key pressers." Two thirds of the female students at Carnegie Mellon, as opposed to one third of the males, told Margolis and Fisher (2003) that they had broad interests and did not spend all their time in front of a computer. As a result, it is difficult to pinpoint the moment at which women with interests and/or careers in IT began to self-identify as geeks. Newer data from a 2002 study at Carnegie Mellon noted a "transitional culture" in which some of the female participants "seemed to be constructing a new identity that was both 'geeky' and feminine" (Blum and Frieze, 2005, p. 112).

A search of the web reveals a few references to the female geek. The Geek Feminism Blog (2010), for example, states that its purpose is "to support, encourage, and discuss issues facing women in geek communities, including science and technology, gaming, SF [science fiction] fandom, and more. (Yes, we take a broad view of geekdom)". It has its own wiki, which includes a timeline of geek feminism.[4] It includes two specific references to events/activities specifically for female geeks: Girl Geek Dinners started by Sarah Blow in 2005 in London, UK and She's Geeky, started by Kaliya Hamlin in 2007. Their first event was the unconference I attended in October 2007 in Mountain View, California.

IDENTITY AND GENDER PERFORMANCE

Drawing on poststructuralist feminist theory, I argue that gender is produced within a heterosexual matrix in which masculinity and femininity are established as the poles of intelligibility (Butler, 1990). In Western culture, these poles are not valued equally: femininity has long been measured against the yardstick of what Connell (2000; 2005) refers to as the hegemonic masculine ideal (aggressive, rational, virile and heterosexual), and found to be lacking. Following from my discussion in the previous section, men have been positioned as active producers and expert users of technology, and women as passive and often incompetent consumers (Oldenziel, 2001). Masculinity *within* computing culture is associated with traits such as authority, expertise, intelligence, intensity, individualism and competition. Outside computing culture, until recently, it has been perceived as a failed or subordinate masculinity, with obsession, passivity, impotence and antisociality being the prominent traits. What both have in common is their oppositional relation to femininity. In addition to the traditional linkages to domesticity and nurturance, the feminine ideal embraces socialibility, empathy, dependence and compliance (Kimmel, 1996).

According to Butler (1990), when one identifies with a gender, one identifies with a set of norms. This process is *performative* and corporeal. Her oft-quoted definition of gender performance is worth repeating here: "Gender is the repeated stylization of the body, a set of repeated acts within a highly rigid regulatory frame that congeal over time to produce the appearance of substance, of a natural sort of being"

(p.33). Thus being a geek is not something that one is, but something one does through actions and words. If the regulatory frame is as rigid as Butler claims, how is it possible for women to take up a geek identity? The answer, Butler argues, lies in the instability of gender performances:

> They are always beset by ambivalence precisely because there is a cost in every identification, the loss of some other set of identifications, the forcible approximation of a norm one never chooses, a norm which chooses us, but which we occupy, reverse, resignify to the extent that the norm fails to determine us completely. (p.126-7)

This 'failure' has also enabled the formation of alternative subject positions through repeated resignifications of these gender norms. While such performances can be emancipatory, the pressures exerted by these norms cannot be underestimated and are fraught with ambivalences and losses.

The female geek is an example of what I call an emergent, hybridized alternative feminine identity. Intelligible alternative subjectivities for women emerged as a result of second wave feminism and involve the incorporation and appropriation of aspects of masculinity. As Walkerdine (2006) argues, "the performance of contemporary femininity may demand something in fact even more convoluted and complicated" than contemporary masculinity because of its direct engagement with its ideals (p.522). "Contemporary femininity," she points out, "demands practices and performances which bring together heroics, rationality, etc. with the need to maintain a femininity which displays care, co-operation, concern, and sensitivity to others" (p.520). Hence the female geek must negotiate complex and even contradictory sets of positions related to displays of technological expertise as well as dress and appearance in both work, domestic and social spaces. The woman who wears "lace and frills" to the office will not be perceived by male colleagues as a legitimate technological expert, yet the women who strives to become 'one of the boys' will be perceived in a negative light by other women and men outside the workplace (Kvande, 1999). The female geek is thus unable to establish the same kind of contiguous relationship with technology as the male geek precisely because to do so would mean a loss of femininity.

METHODOLOGY

This study is situated in what is known as the critical paradigm of research (Kirby *et al.*, 2006; Willis, 2007; Hesse-Biber and Leavy, 2011). Informed by postmodern and poststructuralist theory, this approach presents a direct challenge to positivist empiricism and its claims to scientific objectivity. It recognizes that knowledge is produced, and that its production cannot be separated from sociopolitical workings of power (Haraway, 1988). (Foucault (1980) talks specifically about *regimes of knowledge/power*). Positivist research presents its findings in absolutist terms, passing them off as objective and using measures of reliability and validity, when they are claims infused what Foucault (1972) called in earlier work, "the will to truth." The alternative is not relativism and a lack of rigor, as has been argued, but rather reflexivity and recognition that one is an invested producer of "partial knowledges" (Haraway, 1988). My investments as a feminist scholar are outlined in

the previous sections, my starting point for this project being the recognition that, historically, women have been alienated from technology and that contemporary normative discourses discourage women from developing and pursuing interests in computing and IT.

Critical feminist research in particular is also concerned with addressing unequal relations of power between the researcher and the participant (Harding, 1987; Cameron *et al.*, 1992; Kirby *et al.*, 2006). Rather than positioning myself as the sole producer of knowledge, I provided the participants with drafts of work based on my analysis and invited comments and suggestions. The feedback was generally constructive and insightful; one participant, however, decided to withdraw from the study after reading the draft of a paper that focused on the career pathways of female IT hybrid workers. Ultimately, she did not feel comfortable with her experiences being looked at closely through a gender lens. In the end, we need to recognize that all texts presenting qualitative research are productions "overinvested in secondhand memories" (Britzman, 1995, p.134). Interview responses are not unmediated evidence of social experiences but representations of those experiences, constructed first by the participants themselves and then by the researcher in the analysis of the data and the presentation of the findings as a coherent text.

This study is primarily a narrative case study. As Gallant (2008) points out, "the value in stories about particular people in a specific context is especially useful...where the body of published research is limited" (p.247). Moreover, the thick descriptive data allows the researcher to makes connections to larger social processes and practices (Hesse-Biber and Leavy, 2011). Not surprisingly the sample sizes, unless one has a very large research budget, are often small. Slater, for example, produced life histories in collaboration with four black South African women who, under apartheid, had experienced urbanization (referenced in Hesse-Biber and Leavy, 2011). To sum up, the strength of such an approach is the detail that cannot be obtained from a larger more representative sample. The downside is that the findings are not generalizable and may be dismissed out of hand by mainstream researchers.

Given the focus of this study, my objective was to build a topical life history with each participant. Kirby, Greaves and Reid (2006) describe such a history as "similar to a life history except that only one part of a person's experience is described" (p.160). Given that the participants and I all lived in different time zones, I asked participants to describe their lifelong relationship to technology in a series of email exchanges. I then conducted follow up telephone or Skype interviews that ranged from 50 minutes to two hours. These were semi-structured in that I asked participants a few broad questions about their career paths, experiences in the IT workforce, as well as about their identification as female geeks.

DEMOGRAPHIC SNAPSHOT

As of April 2008, when the data collection ended, two of the six participants classified themselves as Technical Writers. The others classified themselves as follows: PR Manager, Project Manager, Technology Futurist and Technology

Engineer. These positions can be classified as hybrid or mixed-skill. It is notable that none had undergraduate degrees in science or the applied sciences. All but one had a BA and two had master's degrees. Four lived and worked in the South Bay area, three working for companies that included a startup, Mozilla and TiVo. The other was self employed. The remaining two worked for software development companies in Canada and the UK. Four were American, one Canadian and one was from New Zealand. They ranged in age from 27-42. I have provided this anonymous demographic snapshot to protect confidentiality. Henceforth, I will identify each participant by her chosen pseudonym: Angela, Heather, Iida, Katarina, Liz and Rachel. Similar to Gallant (2008), I have chosen to include an extensive number of direct quotations "in an attempt to foreground the voices of the participants" (p.252).

TECHNOLOGY AND TOMBOYS

"Sugar and spice, and all things nice, that's what little girls are made of". These lines from the nursery rhyme dating back to Victorian times still serve to inform normative femininity for young girls from Anglo-European cultures. One alternative identity on offer is that of the tomboy. Based on her review of the literature, Carr (1998) makes the case that a "substantial minority" of American women considered themselves tomboys when they were growing up. According to Devor, the behaviours that constitute a tomboy performance include "rough-and tumble play or intense energy expenditure; preference for stereotypical boys' toys and male playmates; lack of interest in clothing and adornment; lack of interest in infants, motherhood, and marriage; and an interest in career for later life" (cited in Carr, 1998, p.531). Iida, Katarina and Angela described themselves as tomboys and the others performed a tomboy identity in relation to play.

Iida's favourite toy was a metal toy car. She played with Barbie and other dolls with another friend, but what she enjoyed the most was arranging the furniture in the doll house: "I quickly became bored of the doll house whenever I exhausted configuration ideas"

> I also spent a lot of time with my Grampa as he worked on his snowmobile and car.... As a child, I spent a lot of time outside and enjoyed nature. I observed bugs, grass, plants, etc. I used to wash the dog on the shore, go fishing, clean and prepare fish, drive snowmobiles.

In her community, make-up and dyed hair were frowned upon as immodest, though Iida herself just saw them as "impractical".

Katarina's "best friend" was her younger brother and together they would play with her dolls and "his cars or marbles or collector stickers (pictures of famous soccer players)":

> We played with Lego, puzzles, cards and Monopoly, hide and seek, and were often a loud menace with all the shrieking, tickling and laughing during our wrestling matches. I was usually the instigator, and also the

> one who got blamed for everything.

When Katarina played with other children, it was usually with girls but she did play "war games" with the neighborhood boys as well. She loved books, sports and, above all, adventure:

> My brother was not nearly as brave as me, and so the opinion was that I was too much of a tom-boy and that personality wise I took after my dad, while my brother who was calm and shy (girly according to local standards) took after mom. My brother resented being called girly, but I didn't care about what my parent's views. Adventure was fun, and no one was going to stop me.

Rachel described a similar relationship and pattern of play with her brother: "We played dolls, house/families, cars, war games, cowboy games, adventure games, building stuff with lego, art, writing stories, everything. I suppose I was a bit more into dolls than him". Angela remembered playing "with whatever was around be it barbies or building blocks".

> There was lots of Fisher Price, lots of legos, lots of Richard Scarry - pretty gender neutral. My sister and I had a pretend kitchen set. When my brother was old enough, he took it apart with a wrench so I guess there were some gender dynamics at play. Overall though, it was whatever was around. Lots of arts and crafts projects. Lots of baseball outside with the neighbor kids. Lots of riding bikes.

Similarly, Liz also spoke of "legos and a climbing dome" as well as "lots of action figures". She also decided at five or six that she hated pink. Heather noted that she was never interested in dolls, but preferred reading and doing puzzles as pastimes.

Technology is not linked to tomboyism in the literature, but a connection needs to be considered. Studies show that boys develop intense interests in technology and acquire technological skill sets outside the classroom long before they enter university programs in Computer Science or Engineering. Hapnes and Sorensen (1995) found that the male computer science students they interviewed had developed a keen interest in computers between the ages of 10 and 12.[5] Before that, they had played intensely with mechanical or electronic sets (e.g., train sets) and developed a taste for 'tinkering' by taking apart and reassembling radios and watches. While none of the participants in the study could be considered 'girl geeks', four of the participants talked about household and personal electronics such as stereos, television sets and/or VCRs and the relative ease that they felt in using and at times troubleshooting them:

> It seemed pretty obvious how all of these things worked and I assembled the red cord and black cords into their respective speaker hook-ups on the stereo but didn't know anything about different electrical current flows.
> (Heather)

> I certainly wasn't afraid to get stuck in and trouble-shoot things like the video player later on when they appeared.
> (Rachel)
>
> When they were new, we would always understand how to use them faster than our parents. I guess I was tasked with set up and making them work a bit more than my other siblings but this is primarily because I always seemed to have a magic touch with gadgets. I think in some ways this is still true.
> (Angela)
>
> Mom's a bit of a slow adopter -- we didn't get a VCR or CD player for several years after each became available. I definitely helped set them up and make 'em work, to the extent I could.
> (Liz)

The point at which the participants developed interests in computers depended on their age. Angela was four when the family got a computer and she recalls "playing frogger, digdug and decathal". Liz's father was a technical writer who also programmed computers: "He wrote a basic math program game for me to play when I was little". The other participants were pre-teens or young teenagers when their families acquired a home computer. Heather's father bought her a small computer that needed to be hooked up to the TV: "I never got too interested in it. I was unsure of how to hook it up to the TV and it seemed inconvenient/uncomfortable to try to figure it out there in the family room rather than in the privacy of my own room". Heather's rejection of highly normative feminine play with dolls did not correspond to a taking up of the normative masculine role of the 'tinkerer', who wouldn't be concerned about his activities being observed by other family members. Heather's ambivalent performance is similar to that of Rosie, one of the girl gamers in Walkerdine's (2006) study. Whenever she 'killed' another player in the game, she performed an exaggerated squeamishness, an act which served to distance herself from normative masculinity.

Katarina grew up in an Eastern bloc country where "computers were rare and only owned by the relatively wealthy". It was her younger brother who finally convinced their father to purchase a Commodore after a year of "nagging and begging" and they played some games together. Rachel's first experience with computers as a young teenager also involved gaming: "We played video games on the television, really primitive ones like the one where you play tennis, with just a couple of cursors hitting a round dot over a line. We loved it". Although playing computer games is associated with geek masculinity, a game like the one described by Rachel fits into the 'androgynous' category, along with abstract-pattern, explorer or puzzle games (Cassell and Jenkins 1998). War games or 'first person shooters', on the other hand, are exclusively marketed to, and predominately played by, boys and young men. Hapnes and Rasmussen found that many teenage girls don't play computer games because they do not want to be labeled "asocial computer nerds" (quoted in Oksman, 2002, p.96).

WHO'S GEEKY?

Obviously, not all tomboys grow up to be geeks. As Carr (1998) points out, girls are expected, and indeed pressured, by parents and peers to stop behaving like tomboys by the time they reach puberty. Katarina was the only participant who overtly rejected her tomboy/geek identity to perform a highly normative femininity as a teenager:

> My brother did try to get me interested in his computer. He would come to my room and tell me that he has figured out a new way to do something on the computer and he would be all excited. However, I was only interested in boys and make-up, and I could not really understand his excitement over a boring-looking box, especially when compared to all the drama and intrigue that accompanied dating boys at that time.

Carr (1998) argues that many tomboys do not actually abandon their interests and skills as much as they "merely adopt a more feminine performance" (p.530). This strategy more accurately reflects the experiences of the participants. As Heather grew older, she played Atari games at a girlfriend's house but noted that the boys played far more intensely and for longer periods of time in arcades and in convenience stores. It never occurred to her that playing such games more extensively would have been a good use of her time:

> In retrospect, I wish I had asked teachers or the nerdy boys how I could learn how to use the computers. Had there been a computer club, especially positioned as a place to learn about computers, I probably would have gone to it; it seemed that the boys who liked computers already knew how they worked.

Heather's regret is founded in the belief, which is also held by a number of scholars, that as a result of extensive gaming, boys learn valuable computer skills that lay the ground work for future careers in computing and IT (Cassell and Jenkins 1998; Oksman, 2002; Margolis and Fisher, 2003). As for Rachel, she did play arcade games popular at the time she was a teenager, such as *Space Invaders,* but she still distinguished herself from "the geeks who went and used the [school] computers in their break". Choosing a career in IT is another indicator that childhood and adolescent interests and experiences with technology have been retained. As is typical of mixed-skill IT workers, the participants followed non-traditional career pathways, meaning that they did not obtain an IT undergraduate degree (Scott-Dixon, 2004; Bartol and Aspray, 2006; Leventman, 2007). As a result of different educational backgrounds and IT training, they had different levels of technical competencies.[6] Heather's observation that "being geeky or being a geek is an identification that may be totally different from how technically capable people actually are" turned out to be accurate.

Katarina, who had the most formal training with a certificate in software systems and held the most technical job (Technology Engineer) was the most ambivalent

about identifying as a geek. In her first email to me, she stated that if I were looking for "real geeks" for my study, she did not qualify. She also referred to the label as "inaccurate and misleading. Many of the people I've worked with are quite hip. I would call them 'tech wizards' rather than geeks". Interestingly, she did not refer to herself in this manner, although she did joke that "I guess I can consider myself a geek because I can get really excited over figuring out why something has failed in a Unix deployment". Still, she was careful to distance herself from the pejorative geek trait of obsession, indicating that her performance of geek identity had boundaries: "When I go to work, I get my dose of problem-solving and trouble-shooting. When I get home, my brain is usually tired. … I like to have balance in life". This last claim needs to be understood in terms of a negotiation of masculine and feminine interests and investments, as will become more obvious in the next section.

Four of the other participants reported no discomfort with the label of geek, although unlike Katarina, they emphasized a deep interest in and passion for technology as opposed to performative competencies. Angela, who majored in Communications but did a minor in Computer Information Systems, had the following to say:

> I'm geeky in that I probably have a higher than average threshold for conversations about technology, interest in technology, desire to learn about technology....I really have a strong interest in disruptive technology... Napster is really interesting to me, things like bit torrent are really interesting....I like watching entire industries that have existed for a really long time, scramble to keep up with 16 year-olds.

The reference to "disruptive technology" suggests an identification with the non-conformist, hacker geek. She then subdivided the category of the geek by gender: "Your design geeks are more likely to have females represented whereas your chip hackers are more likely to be male.... Certainly what I do [PR manager] is much more likely to be female than it is to be male". Her use of the term chip hacker implies a masculine standard of geekdom (hard skills) against which the soft skills of the design geek are measured and found to be lacking. Her education and subsequent experience as a database administrator meant that her technical knowledge was greater than most of the female technical writers she worked with, making her feel at times like a "square peg". Thus Angela occupied the not always comfortable 'third space' (Bhaba, 1994) in between the chip hacker and the design geek.

Heather, who left an established career in high finance to run her own consulting business in technology trending identified as a geek despite having a "meager" skill set:

> I like to explore and use new technologies in creative ways. I like to create it and sometimes I create it directly and sometimes I work with programmers to create it to bring my ideas to life. I believe that I can have an impact no matter how meager my technical skills might be. I

> believe that I and anybody can use their imagination and create a new use or a new technology.

That said, her decision to identify to others as a geek depended on the context:

> If I were around people who were not at all technological, then I might self-identify as a geek.... More often though, I'm in audiences of people that are much more technical than I am, perhaps much more geeky, so it would be strange for me to say, 'oh, I'm a geek also.' I would not try to compete with them technically.

Heather also stated that some of the female IT professionals she had contacted about the She's Geeky conference felt that they weren't "geeky enough" to attend. Heather attributed this reaction to women being "more literal" and therefore more likely to "evaluate labels more specifically to themselves in a way that men might not…. Is it me? Am I a geek? Will I be called upon to demonstrate my technical capability?" I would argue that this fear of not measuring up to the masculine standards of technical expertise and mastery is a marker of the ambivalence associated with performing female geek identity.

Liz, a technical writer with a master's degree in communication, was nonplussed about her standing as a geek: "I consider myself to be a low-level computer geek meaning someone who… knows a lot about computers and finds them interesting and actively tries to learn more about them". She repeated several times in producing her topical life history that she was not "smart enough" to have been a programmer, although when I pushed her she admitted, "I strongly suspect I'd be a great programmer if I were sufficiently interested. It's a lot easier to say I'm not smart enough, even though it's probably not true at all". Her example of performing a geek identity was shopping at Fry's (a US-based chain of electronics stores): "I could see people look at me and look at my basket and [thinking] 'oh my god, a girl who's doing stuff with operating systems'".

Iida, also a technical writer, was keen on further developing her technical skills and eventually taking up a more technical position. She talked about her interest in and use of Ubuntu, an open source operating system (OS) derived from Linux. She confirmed my understanding that there were very few women involved with Linux but that there was a mailing list for women called Ubuntu Women, of which she was a member. Yet she also downplayed the amount of skill involved, describing Ubuntu as "available to any old user," in contrast with Debian, "the developer's OS". She referred to Debian users as "arrogant" and "not fans of new users".

Rachel, who came to her position as a Project Manager for a software company from a career as a librarian, defined geek less positively than the others:

> Somebody who is far down the autistic spectrum in terms of being very good at categorizing, systematizing and being very good at focusing intensely on rational logic-oriented tasks to the exclusion of everything else and maybe not so good at the social stuff.

She then spoke of her own partial identification:

> I'm a systematizer, I score very highly on that due to the kind of tests that they have but I'm also extremely good at social relationships and intuiting what's going on with people and all that. So I have this weird sort of double thing when I'm in my geek world with the boys, I can communicate with them on their level but I'm also processing on this non-geek level which makes it very uncomfortable for me sometimes.

This discomfort led Rachel to refer to herself as a "fringe dweller" in the "geek world" dominated by men.

On the subject of geek identities that did not involve computing and, by extension, were not directly linked to hegemonic masculinity, the participants were far less equivocal. Iida referred to herself as a "grammar geek" and talked about her love of language and the importance of clear and effective writing. Angela noted that "in the Bay area, pop culture and geek culture kinda go hand-in-hand" and Liz saw herself as geeky in a number of areas:

> I'm also something of a movie geek. I'm a literature geek. I'm a Web geek… I'm emphatically a Lord of the Rings geek. I think I've met fewer than half a dozen people who know more about Lord of the Rings and Tolkien's universe than me.

In addition to identifying as a librarian geek ("or a librarian nerd"), Rachel also forged a link between geek identification and bisexual identification. Specifically, she referred to the bisexual community as "geek central" and talked about feeling "a sense of coming home" when she attended an annual convention for those who identify as bisexual. She humorously described, but also critically reflected on, her very deliberate librarian-geek performance:

> There's a certain style as well that librarian geeks have which I also identify as a bi-sexual style - maybe quite a sharp suit but with really cool shoes that are also flat-heeled and really funky glasses. Work the glasses, girl, that's it! I've got glasses on at the moment that are chrome on the front and pink with diamonds on the side so when I saw them I thought those are my glasses because from the front I look like a total geek, from the side I look like a girl.

Negotiating Normative Femininity

Not surprisingly, the participants raised issues of appearance and fashion in relation to feminine identities. Since the 1970's, feminists have been writing about the ways in which the female body is both idealized and objectified in a patriarchal society (Greer, 1970; Steinem, 1983; Coward, 1985; Wolf, 1991). Drawing on Foucault, poststructuralist feminists argue that women's bodies are disciplined not only by others but by themselves (Bartky, 1988; Bordo, 1995). The participants generally rejected a highly normative feminine style of dress. Liz joked that one gay male

friend described her as "one of the butchest women he's ever met". "Comfort," not fashion, is her "guiding rule" for clothing. Yet, Liz did not reject heteronormative standards of beauty and attractiveness: "I finally realized that the unisex t-shirts make me look like a sack of potatoes". Angela's dislike of traditional feminine dress, which began when she was a teenager and her aforementioned dislike of pink was at its strongest. When she went to the Gap with her sister, "she would go to the right which is where all the dresses were and I would go to the left which is where all the men's clothing was". It was only after she graduated and starting working that she began to wear skirts and dresses, though she noted, "I'm probably still a little bit of a tomboy, you know". Iida was interested in fashion, but not in a conventional sense. She made her own clothing because she did not like the choices available for women in their thirties who don't want to look either "totally career oriented" or like "a mother". Katarina echoed Liz's desire for comfortable clothing, particularly at work, adding, "I don't want the men to look at my boobs. I want them to focus on what I'm saying, right?" When she went out in the evening, she chose clothing that made her look "sexy". In light of her previous comment on not being interested in spending time on the computer after work, Katarina's approach to managing an alternative feminine identity involves clearly demarcating geek performance from feminine performance.

Rachel recognized her own privilege in relation to normative beauty ideals:

> I was born with a sort of genetic structure that somehow came out looking attractive according to the norms of my time….I've been really close now for 20 months to a woman of my age who's never had that, who's looked butch since the day she was born….I see how that's affected her and how it still affects on a daily basis.

She then expressed her concerns about losing that privilege:

> I feel like I could get away with it more when I was younger, I mean, get away with not having too many sanctions on being less feminine because I was young and pretty….I naturally had some of the attributes that are seen as feminine, i.e., youth and springy boobs and cool face… Society's idea of femininity is basically women showing their submissiveness to a masculine sort of dominance…. I always felt totally confident. I knew exactly what to wear, exactly what mix of professional and bohemian as well as not too feminine but a little bit feminine. Now I can feel the invisibility encroaching, the invisibility of a middle-aged woman and I'm feeling anxious about what I can get away with.

Rachel's reflections on aging and a loss of power are in line with contemporary feminist scholarship. Wolf (1991) argues that youth and beauty are integrally linked. "Aging in women," she points out, "is 'unbeautiful' since women grow more powerful with time" (p.14), thereby threatening the patriarchal order. Wolf cites the case of news anchor Christine Craft, who was fired by the American network who employed her for being "too old". In contrast, the sense of power that beautiful women may feel they have over men is illusory. Brownmiller (1986) warns that "women who

reply on a feminine strategy as their chief means of survival can do little to stop the roaring tide of maturity as they watch their advantage slip by" (p.236).

Beyond appearance, the participants generally distanced themselves from other traits and behaviours that they perceived as stereotypically feminine. Both Iida and Liz emphasized the value that they placed on independence and self-sufficiency. Iida found it particularly frustrating that women in technical writing did not demand salary increases for fear of appearing "greedy". Heather's rejection of normative femininity is highlighted in her experiences of the women-only book clubs to which she used to belong:

> The books read are not actually that interesting. They're more emotional, you know, a nice story and whatever but that's not necessarily always interesting to me. And people never read the book, they just talk about men at the book club which I also don't like [laughs].

She also felt that she had wasted too much leisure time in the past on "romantic pursuits". The romantic storyline, as Davies (1990) points out, is integral to normative femininity.

The cost of performing an alternative identity and occupying a 'third space' was apparent in two of the participant responses. Iida felt alienated to some degree from other women as a result of her in-depth knowledge of and interest in technology, but at the same time she missed being able to socialize with female friends without the presence of men as she used to before she moved to the South Bay area: "It's something that I have to actively seek out just because of the ratio of male to female friends". Similarly, Heather disliked "a lot of stereotypical aspects of men", but did not identify with most women either. That said, she strongly identified as a feminist, another alternative identity: "I can't believe how women aren't. [Feminists] are generally perceived as strong and unfeminine in the culture but I find that perfectly acceptable and fabulous".

CONCLUSION

As I noted in the section on methodology, one must exercise caution in making generalizations based on a small case study. Still, the important first steps in mapping out the complexities of female geek identification have been taken.[7] As the data samples presented demonstrate, the participants' gender performances were both normative and oppositional, requiring a renegotiation of femininity and masculinity that sometimes placed them in the not always comfortable third space. The participants all had lifelong relationships to technology but unlike the male geek, none were child 'tinkerers' driven and encouraged to follow a clearly defined path to become 'masters of the machine'. Yet they all identified as tomboys to a degree, a finding that suggests that it is easier to take up an alternative feminine identity as an adult if one has already resisted feminine norms as a child and/or as a teenager. A large multi-site study conducted by the New Jersey Institute of Technology makes the tomboy-technology connection even more explicit. Thirty three per cent of the female engineering students stated that they had been

tomboys, followed by 29% of female students in math/science, 25% in the social sciences, and 20% who studied humanities. (Schiff, 1997).

The participants' geek identifications as adults were equivocal, ambivalent and context dependent. They were at risk of being assessed by themselves and others as either too geeky in relation to non-technical women or not geeky enough in relation to male IT experts. In the absence of a value judgment, their passion and skills set them apart from both other women and men, Liz in the electronics store and Angela in the PR department being cases in point. The same pattern of ambivalent identification also occurred femininity. No one identified as a 'girly girl', yet no one wanted to be appear or act unfeminine in accordance with heteronormative standards of beauty. Thus they engaged in a careful negotiation of femininity, seeking out the right type of clothing (which in Iida's case involved making her own), and social networks (Iida's planned move; Heather's failed efforts to find a suitable women's bookclub). It must be stated, however, that these ambivalent performances did not signify a lack of overall confidence in their abilities or a lack of satisfaction with their careers or personal lives.

It is also important not to 'paper over' differences in how the participants performed a female geek identity. Some were geekier than others in terms of interests and technical competencies. Similarly, their level of investment in normative femininity varied. Katarina, Liz and Iida all talked about shopping for, installing and/or working with Unix or Linux OS, but they did not claim the label of geek in the same way. Katarina had the most technical skill set and held the most technical position, yet she expressed the strongest interest in normative dress and leisure pursuits. She relied on a strategy of compartmentalization, performing geek identity by day and feminine identity by night. In contrast, Liz's performance was the most consistently geeky in terms of her job (technical writer), leisure activities (shopping at Fry's) and her 'butch' appearance. Rachel and Heather had the most life and career experience and were the most reflective and reflexive about their gender performances. They also strongly identified as feminists and thus were doubly invested in alternative femininity.

To sum up, preferred cultural meanings of masculinity and femininity have shifted over the past forty years, in no small part because of the feminist movement. White, middle class women like the participants are now in positions to challenge gender norms in a number of ways, one of which involves loosening the masculinist grip on technology. Shot through with ambivalence, the female geek is nonetheless in the process of becoming a *legible* identity and as such has the potential to be taken up more easily and with less ambivalence by the next generation of girls, particularly those who identify already as tomboys.

ENDNOTES

1. An unconference is a term primarily used by the IT community to denote an organized gathering in which the format and topics of discussion are determined by the participants.
2. ENIAC stands for Electronic Numerical Integrator and Computer. Financed by the US Army, it was housed in the Moore School of Electronic Engineering at the

University of Pennsylvania.
3. An empirical study of Norwegian computer science students presents hacker culture as more complex, even if no less masculinist. Hapnes and Sorensen (1995) found that the self-defined hackers did not work in isolation or in competition but in fact built social networks and collaborated among themselves. They were not so much hostile to women as puzzled by their lack of interest in computing.
4. It is telling that the contributors trace its origins to feminist engagement with science fiction in the 1970s and not computing.
5. Given that the study was conducted in the early 1990s, the interviewees are likely describing their experiences with the "first generation" of home computers in the early to mid 1980s. With so many more homes having computers today, that interest would likely have developed at an even earlier age.
6. For details on the participants' career pathways and technical competencies, see Bury, 2010.
7. The next logical step in investigating female geek identity would be a larger scale ethnographic study using participant observation.

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