



Legacies of craft and the centrality of failure in a mother-operated hackerspace

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Daniela K Rosner and Sarah E Fox

University of Washington, USA

Abstract

Popular portraits of hacking have often relied on histories of hobbyist engineering culture rooted in tales of middle-class, college-educated, and often male technologists. Since 2012, members of a mother-operated hackerspace in the East Bay of San Francisco, California, have countered these narratives, revealing hackerspaces as sites with which to refigure masculine claims to innovation and progress. Drawing on critical craft studies and studies of therapeutic culture, this article examines the workings of Mothership HackerMoms and its series of workshops called Failure Club, a project motivated by a desire to support women’s creative pursuits with the onset of motherhood. By integrating feminist legacies of craftwork with the centrality of failure — exposing personal failures and failures to transform hacker cultures — members not only energize new modes of hacking activity but also hack the very ontology of hacking.

Keywords

Craft, creativity, failure, feminism, hackerspaces, hacking, making, motherhood

Introduction

Sho Sho Smith and Samantha Cook had barely opened “the first women’s hackerspace” in 2012 when organizers of the San Mateo Maker Faire asked them to speak. They were sitting in an empty space, creating nothing in particular, and skeptical whether their idea

Corresponding author:

Daniela K Rosner, Human Centered Design & Engineering, University of Washington, M/S 352315, 428 Sieg Hall, Seattle, WA 98195, USA.

Email: dkrosner@uw.edu

would interest a crowd of engineering hopefuls. Yet, taking the stage at Maker Faire a few weeks later, they stood corrected: although the promise of gender parity for mothers seemed an unusual fit for a technology-focused event such as Maker Faire, Smith and Cook appeared to have come to the right place. To an audience of enthusiastic fans, they introduced their project to support what one described as “doing and thinking mothers.” They called it Mothership HackerMoms.

Like other hackerspaces, HackerMoms supported creative do-it-yourselfers in sharing tools, knowledge, and community. They offered member-based access, nearby public transport, and facilitated workshops for learning new tools. Unlike that of other hackerspaces, members’ focus was not primarily hobbyist engineers. They built HackerMoms to serve mothers. Although as hobbyist engineers, writers, illustrators and artists these mothers could ostensibly join any other “traditional” hackerspace, members of HackerMoms claimed those sites became unaffordable or unmanageable without opportunities for childcare. The HackerMoms environment promised not only childcare but also a safer space to breastfeed and express milk, a sliding scale for membership dues, and access to a community of restless and curious moms. “It’s about fracking time,” Cook asserted on stage at Maker Faire (Smith and Cook 2012).

This article explores the rise of women-operated hackerspaces through the workings of Mothership HackerMoms and its series of workshops called Failure Club, a project motivated by a desire to support women’s creative pursuits in the face of today’s widely accepted narrative of “having it all,” often described in the United States as women’s ability to maintain professional work with the onset of motherhood. Members use the hackerspace and its Failure Club to reframe what it means to hack by drawing together legacies of craftwork with the centrality of failure. Accounts of hacker cultures often highlight bug fixes (Coleman, 2011; Nafus, 2012), portraying failures as integral to the inventive, creative process of design and engineering (Petroski, 2006). Mothership HackerMoms began to address failure differently from these productivist tendencies. In addition to viewing failure as central to achievement, members identified personal failures and failures to transform hacker cultures, formulating failure as a moment for reflection. To make this argument, we examine two empirical contexts of failure: first, failure as members conceptualize it in the Failure Club project of narrativizing the self; and, second, failure as expressed from the outside through online “hate mail.” By tracing how members redefine failure we show how HackerMoms became a site of resistance: hacking the very ontology of hacking.

This view of hacking builds on two streams of research emerging within technology studies scholarship. On one side, scholars draw connections between countercultural design practices of the 1960s and modern-day technological advancements (Markoff, 2005; Turner, 2006). In his study of the Burning Man festival, for example, Turner shows how bohemian art worlds serve as a cultural infrastructure for San Francisco Bay Area information technology (IT) industries like Google (see Turner, 2009). Expanding on this work, Rosner and Turner (2015) find vestiges of Buckminster Fuller’s strategies for comprehensive design within the pop-up amateur repair collectives of Northern California. Organizers promote cultural change using the tools of industry — taking up the masters’ tools to defeat the master. While organizers of repair events reject established modes of mass consumption, they posit device-level electronics repair as mechanisms for envisioning new people and societies.

On the other side, scholars couple the category of hacking with broad social change, including end-user innovation (Von Hippel, 2005) and the “public creativity” afforded by the world’s educated elite (Shirky, 2010, p.212). This research frames hacking as a new mode of technical education and participation in an age of high-technology achievements (see Benkler, 2006; Jenkins, 2006). Critiquing such claims as sensationalist, recent work identifies a problem of demarcation by which people control access to technical agency and who counts as innovative (Irani, 2015; Lindtner, 2015), illuminating different and multiple hacking histories. Gabriella Coleman (2011), for example, compares the protest movement Anonymous and the whistle-blowing project WikiLeaks to clarify the varying political sensibilities and practices from which hacking develops. Still others link hacking with masculine narratives of rebellion, pointing to a degree of boyish revolt associated with electronics tinkering and disassembly (Ames and Rosner, 2014).

Here, we extend both lines of argument to offer a counter-narrative of hacking grounded in legacies of craftwork that disrupt conventional ontologies of hacking wherein hackers get distinguished from non-hackers. Since the rise of early sites of computer hacking like the Chaos Computer Club, a German technology collective founded in the 1980s promoting open information infrastructure, the term *hacking* has fit aspirational ideals of technical cleverness and creativity perpetuated by engineering cultures. Women-operated hackerspaces have opened an alternate view: enlivening connections between hacking and histories of women’s craftwork rooted in a feminist politics of fracture (Barad 2007; Haraway 1988). In this politics, radical creativity often rests on failures and breakdowns (Suchman and Bishop, 2000; Star & Strauss, 1999; Suchman, 1995). We draw on feminist science studies (Suchman 2006; Nakamura & Haraway 2003), critical craft studies (Adamson 2010; Lippard 2010 [1978]), and Eva Illouz’s (2008) work on therapeutic culture (Illouz, 2008) to examine the kinds of relationships hackerspaces promise women through the creation of new physical and conceptual boundaries. Craft historian Glenn Adamson (2010) argues that a central outcome of the 1970s Feminist movement was the increasingly common use of craft techniques in contemporary art. Craft, according to Adamson, became “a strain of activity that responds to and conditions the putatively normative experience of modernity, in many and unpredictable ways” (Adamson, 2010: 5). It was not outside modernity “but a modern way of thinking otherwise.” In the writing that follows, we show how a logic of failure became a means for “thinking otherwise” about the hacking ethos.

We chart people’s daily practices drawing on 7-month involvement in Mothership HackerMoms complemented by interviews and ethnographic observations of the daily practices of makers and artists in the San Francisco Bay Area. During this time, we examined the social organization of HackerMoms and its implications for recent developments in new media cultures. We engaged in informal conversations with roughly 40 participants in other women-organized hackerspaces and conducted extensive formal interviews with 23 participants, including leaders of HackerMoms, participants in three adjacent hackerspaces, organizers of four “feminist” and women-organized hackerspaces groups with strong links to Silicon Valley (San Francisco Double Union, Seattle Attic, Portland Flux, and Oakland LOL Space), and leaders of related endeavors such as the Fixit Clinic, Usenet group, and the Flaming Lotus Girls.¹ Finally, Rosner became an

“angel” member of Mothership HackerMoms from January through July 2013 (a category of membership awarded to non-moms, including men).

A mother-operated hackerspace: what is it? How did it develop?

For many, hackerspaces comprise membership-based, non-commercial sites where people can hang out, collaborate, and learn from one another. If the “first wave” of hacker culture comprised what Stephan Helmreich (1998: 51) has called “computer aficionados obsessed with building and understanding unruly systems,” members of hackerspaces might represent a solid “second wave.” People gather in workshops and garages that feature computational tools like laser cutters, 3D printers, and microcontrollers and allow for experimentation with, and development of hardware and software. Recent research has focused on hackerspaces as grassroots organizations for producing ad hoc, self-made tools (Toombs et al., 2014) and as homes for emerging technical entrepreneurship (Lindtner et al., 2014).

Founder Sho Sho Smith built HackerMoms to identify with this ethos, what she called “true creativity”: making without a purpose or necessity, without people trying to elevate themselves or their career.² Although she has admitted that she first associated hacking with criminal activity, she soon found it essential to the kind of life she desired. She recalled accompanying her electrical engineer brother to Noisebridge (an established San Francisco–based hackerspace) and watching members’ reactions to the circuit boards he had designed. “They would all go completely nerdy,” she explained. “There was this joy and curiosity, this exuberance.” She craved that for herself elsewhere. She knew she wasn’t going to join Noisebridge, finding it both messy (“completely offensive to all my design sensibilities,” she once remarked) and unapproachable (“I was into all the soft stuff and [Noisebridge] was into the hard stuff,” she explained). Yet, Smith observed a certain energy missing from the worlds she inhabited as an artist and a writer.

Smith was 38 years when she founded HackerMoms. She spent most of her life as a self-described introvert and “militant anti-breeder” more preoccupied with big ideas. She recently transitioned her career from corporate to freelance writing and sought intellectual support through those less structured times. To do this, she invented a motto: “be a pattern for the world.” The pattern would be different from that of more “traditional” spaces. She remembered Mitch Altman—the co-founder of Noisebridge and celebrated hacker—recommending that she did not create the space to please everybody, but create the space to please herself. Smith didn’t need to participate in spaces “so full of guys that it’s practically a meat market,” she explained. “I felt that we moms needed help figuring out how to balance being a perfect modern mother” (Smith and Cook, 2012). As we’ll see, the idea of ‘a perfect modern mother’ reflected aspirations to excellence that came with socioeconomic privilege.

A former poet and copywriter for Pottery Barn, Smith had worked within creative industries for some time. Prior to HackerMoms, she had belonged to the group “Idea Land,” a mostly “talk group” for people interested in sharing their ideas and goals. Even within this group, she felt frustrated by the lack of doing and the limitations that came with her new responsibilities as a mom, limitations that other people in the group didn’t

seem to have. In 2011, after conversations with her hardware hacking brother, a founder of a Tokyo-based hackerspace, Smith put the pieces together: motherhood, creativity, and hackerspaces (Smith, 2013: Interview with Daniela Rosner, 23 August). Smith described a feeling of relief in meeting other mothers she could be herself around: “I don’t have to pretend anymore. [I can be] my greasy, sticky, spit up on, but interesting and hopeful self” (Smith, 2013: Interview with Daniela Rosner, 23 August). The icebreaker for meetings became what they called *craft aperitifs*, small projects that kept their hands moving. These events invoked a particular idea of “craft” that we elaborate later, one that drew connections between women’s contemporary milestones and feminist histories of handwork.

Nine months after Idea Land, and following a successful art show to help fund HackerMoms, members raised enough money for a deposit on a storefront at the Berkeley–Oakland border. The site offered 1000 ft of open space in walking distance of public transportation. In the exchange at Maker Faire described above, Smith summarized the goals of their enterprise:

Mothership HackerMoms is born out the dark, unromantic, slightly humiliating side of modern motherhood. You have advanced degrees, looks, career, money, travel, great sex. Then marriage, kids, domesticity. And that former you is an illusion. [...] You lost yourself. You want what those feminists promise, dammit: that you could have it all.

Smith’s notion of “having it all”—linked to “advanced degrees” and financial achievement—prefigures a degree of socioeconomic privilege represented by the HackerMoms project. During our visits, members paid US\$60 for monthly dues, and the composition of the group tended toward White members (although active members included nonwhites; Smith, a first-generation Chinese-American, for example).³ The HackerMoms space sat at the border of Oakland and Berkeley where storage units and liquor stores once stood. Bakeries and gift stores now lined nearby streets, catering to a growing number of upper-middle-class residents, subtly reproducing class positions and exclusions.

Yet, as we discuss in the article that follows, “having it all” also encompassed a type of failure embraced by members of HackerMoms, destabilizing the categories of motherhood and hacking. For this particular (well-educated, middle class) set of East Bay residents, Smith and Cook offered a fresh approach to creative work through hacking, using it to reframe a concept of “modern motherhood” whereby they felt women lose agency to act upon the world. They positioned art and craftwork as sites with which to rework the disruption, confusion, and potential empowerment introduced by motherhood. Comparing HackerMoms to other mom’s groups, Smith saw little overlap in agenda: “I think here we’re more about breaking rules than following rules, and there you kind of follow rules,” she described (Smith, 2013: Interview with Daniela Rosner, 23 August). HackerMoms became explorers of alternative resources and communities, aligning their work with that of other hackerspaces, but also finding it wasn’t always a clear fit. “Co-working is about your living, your money-making life,” Smith explained. “And HackerMoms is about the rest of your life. Like all the other parts that get neglected when you’re trying to make money. And, for us, as mothers, the differentiation is not so clear anymore” (Smith and Cook, 2012). This particular group of largely middle-class,



Figure 1. The Mothership HackerMoms logo (left); the cover of the first *Ms.*, an American feminist magazine launched in 1972 (right).

Source: *Mothership Comes Full Circle*. Mothership Hackermoms. <http://mothership.hackermoms.org/2012/01/mothership-comes-full-circle/>

college-educated mothers saw their lives as multifaceted. Members strove to recognize this layered condition of identity, community, and career — “and not separate it like the rest of the world wants us to do,” Smith declared (Smith, 2013: Interview with Daniela Rosner, 23 August).⁴

HackerMoms’ funding campaign on kickstarter.com sparked a flurry of interest, particularly among participants in women-in-tech mailing lists and at women-oriented IT conferences like AdaCamp. Soon after HackerMoms opened its doors, organizers of the Seattle Attic launched what they called a “feminist hackerspace,” a material response to the male-dominated technology community of which many of the members were professionally affiliated. Inspired by subsequent conversations at the 2013 AdaCamp in San Francisco, participants began feminist hackerspaces later that year in San Francisco (Double Union) and Portland (Flux).⁵

HackerMoms’ geographic location and social position contributed to their financial success and media attention. One member of HackerMoms described,

It feels like it’s like what colonialism was ... but that on a small scale. These sophisticated people come ... it’s like that it’s an inexorable force in the world. And I’m a part of it of course because I’m educated and white and cultured in a different way.

Few other women-operated hackerspaces enjoyed the same kind of economic stability as HackerMoms. For example, Liberating Ourselves Locally (LOLspace), a people-of-color-led makerspace in nearby East Oakland who describe their space as “gender

diverse,” largely depended on donations and a daytime tenant to cover the cost of rent. Subletting the space allowed organizers to avoid asking members for a fee, but also meant that members could not access the space during the day. Calling their setup “not entirely sustainable,” LOLspace co-founder, Jen-Mai Wu, explained that if a daytime tenant moves out, “we would have a big problem” (Wu, 2014: Interview with Sarah Fox and Rachel Rose Ulgado, 20 February). Wu noted variance from other spaces that have started mostly out of an interest for hacking and making things in a shared space: “everyone who has been involved in organizing the space is a social justice activist, and that is often social justice outside of tech, so that is a little bit different” (Wu, 2014: Interview with Sarah Fox and Rachel Rose Ulgado, 20 February). Organizers’ interests lay in serving their community, which was localized to the neighborhood.

Like for HackerMoms and LOLspace, not all members of these groups focused on learning and practicing technology development. While the majority of Seattle Attic members worked within IT industries, several members’ professions fell under customer service. In Portland’s Flux, 7 of 12 members identified as programmers. As our work continued, we found these affiliations with IT industry shaped how members participated in (and pushed back on) cultures of hacking and engineering.⁶

Since HackerMoms’ launch in 2011, women-operated hackerspaces have offered local residents a place to gather, share ideas, learn creative techniques, and grow professional partnerships in what some term an “emerging do-it-yourself (DIY) culture” (Levine and Heimerl, 2008; Powell, 2012). The development of HackerMoms inspired the formation of other women-centered and feminist hackerspaces, whose members have cited HackerMoms as a model (e.g. Henry, 2014). Yet, HackerMoms members did not take this view of hacking entirely without criticism; instead, they often discussed and even drew attention to the substantial “hate mail” they received since their inception. In following these developments, we show how the work of failure began to destabilize an established ontology of hacking, making room for feminist legacies of craft.

Hacking technological production

Before we describe the particular forms of failure developing within HackerMoms and the support they offered Bay Area hacker mothers, we wish to recognize the social and discursive forces behind the scenes. Broadly, two debates have animated recent accounts of IT development: the first concerns the role of technology in the rise of “participatory” culture, and the second focuses on the role of creativity in high-technology entrepreneurialism. Although some scholars have begun to link these accounts within studies of large IT firms (Florida, 2002; Turner, 2009), their entanglement remains largely under-explored among practices of amateur engineers.

Recent scholarship on the role of networked technology suggested links between social media and new forms of cultural production (Jenkins, 1992, 2006; Terranova, 2000). Henry Jenkins (1992), for example, charts the use of digital tools for cultural appropriation within fan communities. Through YouTube channels and blog posts, passive media consumers become active media producers: refiguring the plots, characters,

ideas, and values proffered by particular media outlets to create derivative works through videos or fan fiction. While technology has loomed large in these accounts, several scholars argue that this shift toward participation extends important possibilities for positively influencing daily life (Jenkins, 1992, 2006; Shirky, 2010). Others question the ability for a universal “participation” within new media cultures, suggesting people require adequate social and psychological resources, including time, for engagement (Irani, 2015; Turner, 2009).

Alongside questions of participation, technology pundits generally ascribe to the idea that notions of creativity have become integral to high-tech entrepreneurialism. Kelley and Kelley (2014) argue innovation depends on the establishment of individual and collective “creative confidence,” which they summarize as “the belief that we are *all* creative” (p. 1). Kelley and Kelley analogize this belief to a muscle that depends on the nurturing of effort and experience but can weaken if under-used. This argument resembles that of the 1980s “hacker” ethic, which popularized claims about the creativity computers can engender in books like *Hackers: Heroes of the Computer Revolution* by Levy (1984). In other work, new media scholars suggest that enabling a creative imagination within organizations will not yield universal value (Irani 2015, Lindtner 2015). When hacker creativity manifests as “innovation” in the sphere of commercial enterprise, it challenges how transformative a process of “unleashing the creative potential” may in fact be. Studies of the development of manufacturing across Silicon Valley have highlighted surprising economic and cultural hurdles an attention to creative outputs has helped bring about, including the degradation of geographic stability and job security (Neff, 2005; Saxenian, 1994).

While far-reaching, this work largely accounts for narratives of hobbyist engineering culture driven by men. Focusing on emerging gender hierarchies within new media cultures, feminist scholars have drawn attention to overlapping concerns for gender and hacker identity underlying technical work. Christina Dunbar-Hester (2008), for instance, has explored radio media activists’ attempts to broaden political participation while still reinforcing gendered demarcations. Participants in these groups celebrate technical expertise over skills that resonate with mainstream practices and ideals (like advocacy). Drawing out similar relations, Ellen Ullman (2012) uses her personal account of writing assembly language to argue that work closer to the machine helps (often male) programmers maintain a higher status in computing cultures. In her examination of the largely male free/libre open-source software (FLOSS) community, Dawn Nafus (2012) extends this argument to hacking discourse in what she terms a “pushyocracy.” FLOSS members’ open scrutiny and “highly masculinized, aggressive online talking” shaped the perceived worth of individual contributions to expose “both the material aspects of computing and the social identities that people create for themselves through engaging with programming [...as] cultures made by and for men” (p. 671). Such arguments pose the imagery and cultural discourse of IT development as restricting women’s access to technological tools and know-how. This work invites critique of conventional technology and gender studies in which scholars have treated technology as “open to interpretation” but gender as a stable category (Mellström, 2009). In this, women’s substantive contributions to technology development go under-acknowledged and “the question of whether women can be considered insiders or outsiders of IT design also has to do with how ‘IT design’ is defined” (Sefyrin, 2010: p. 709).

One way out of this difficulty is to examine aspects of engineering cultures made by and for women. In the pages that follow, we follow strategies for countering masculine narratives of innovation and progress by examining the work of HackerMoms, a hackerspace that relies on different histories of hacking labor. Craft figures strongly in these histories, which stress the role of homemaker as laborer (Adamson, 2010; Cowan, 1983; Strasser, 2000). By claiming this labor as part of hacking cultures, the hackerspace members we discuss locate women's work at the center of new media industries.

Ideological legacies of craft

Our examination of "hacking" at Mothership HackerMoms highlights tensions between "high-tech" industries and "low-tech" craftwork familiar to studies of hobbyist engineering culture (Gelber, 1997; Haring, 2007; Henderson, 1999; Jungnickel, 2013). Putting questions of gender aside, Gabrielle Coleman (2013) positions hacking as a convergence of craft and craftiness, wherein ideas of cleverness and skill intersect through humorous code. Pleasure stems from outwitting constraints and demonstrating ingenuity through a clever prank. We began this study with the suspicion that social and technical innovations would similarly emerge out of interactions between HackerMom members and the tools with which they skillfully worked. But we soon saw that they applied the label 'craft' differently. Their definitions came out of a fervent interest in independent craft, or "indicraft," signaling an effort to "preserve feminine heritage" in the words of two participants and documentarians (Levin and Heimerl 2011, p.x). Amid rapid growth in tech startups and hackerspaces in Silicon Valley, California in the early 2000s, indicrafters applied old sweaters and scarves to cover public lamp poles or trees as acts of "yarn-bombing", and joined pop-up knitting circles often reserved for the "knitterati," or the knitting elite. While the celebration didn't last long, as evidenced by the rise and fall of O'Reilly Media's *Craft* magazine⁷, Hackermom members strove to make change. "It's really a cultural thing the gender stuff," Dale Dougherty, Editor-in-Chief of the then out-of-print *Craft* magazine, explained of the magazine's demise (Dougherty 2013). "And it's really hard to hack culture." But Hackermom members wanted to try. They had taken up the practice of hacking within a rich conceptual framework grounded in concerns for histories of women's labor.

This rubric represents the legacy of two distinct gendered meanings built into the single word 'craft' by artisan communities (Adamson, 2010; Lippard, 2010 [1978]) and progressive era domestic DIY activity in the United States (Gelber, 1997). The first concerns feminized connotations positioning the quotidian as the place where power relations can be voiced and contested. Feminist writing of the 1960s and 1970s exposed the historically gendered nature of craft and its ties to domesticity. According to art historian Glenn Adamson (2010), this scholarship reframed amateurism not as an acceptance of circumstance they needed to transcend but as a mechanism by which to judge the degree of gender prejudice. Feminist art historian Lucy Lippard (2010 [1978]) has argued that the category of craft even made possible the recognition of more female artists, expanding the realm of fine art to include quilts, textiles, and forms of material rehabilitation. Rehabilitation, Lippard claims, as a type of "inventive" patching (e.g. remaking clothes and recovering old furniture) becomes a mending of objects and public dignity.

This contrasts with a second reading of craft typified by the masculine imagery of *The Craftsman*, a Progressive Era magazine depicting male artisans in leather aprons presenting products of their own making (Gelber, 1997: 74). Tracing developments in home improvement in the United States, historian Steven Gelber (1997: 70) shows how women's roles in DIY activity of home repair became undermined by what he calls "the half-pound rule" where women were seen as generally unwilling to use heavy tools. Ruth Oldenziel (1999) has further developed these links to craft traditions in her examination of technology (and what gets called technology) as a long-standing masculine political category. Oldenziel describes Victorian women writers' use of the literary genre to develop stories around engineering, a typically male genre: "deliberately choosing the engineer as the protagonist for her novel, she chose to display her competence in a male genre for the purpose of casting it aside, thereby signaling a new relationship with her readers" (Oldenziel, 1999: 140). By the end of World War I, however, technophilia took hold of the (male) modernist imagination, framing women as instruments and men as makers. The skilled artist/craftman had mastery of machines and women (Oldenziel, 1999: 146).

Within modern institutional settings, craftwork reappears in the technical imagination of the organization. Lucy Suchman and Randall Trigg (1993), for example, have equated the work of technology development with socially organized craftsmanship: "the crafting together of a complex machinery made of heterogeneous materials, mobilized in the service of developing a theory of mind" (p. 144). Here, they build on Latour's (1986) concept of science as craftwork to describe the work of "crafting machines" that are capable of effectively engaging with humans and participating in social relations (Suchman and Trigg, 1993: 147). In particular, they identify "collaborative craftwork of hands, eyes, and signs" as the unit of analysis built into the organization of production and use.

Arguably, the most explicit connection between engineering and craftwork developed decades earlier, at the genesis of modern computation. Feminist scholars of technology and labor often reference the historical development of the term "computer" as it entered into common use in the United States. During World War II, *computer* generally referred to the (usually female) person executing code (Chun, 2004, p.33; Grier, 2005). Women with backgrounds in mathematics made the calculations necessary to analyze information drafted by men such as ballistics tables for new weapons (Chun, 2011: 29). Beyond the job title, these modes of computation exposed tools and practices associated with a particular kind of women's work, one that resonated with craft. Executing code entailed more than 'menial' labor, much like wrote domestic handiwork; to compute, female factory workers wove the core memory by hand — carefully moving long wires around rings — in what some termed the "little old lady method" (Wolfinger, 1994). Histories of craftwork have even shaped the computer itself. As historians of computing (Ensmenger 2010, Light 1999, Maly 2013) have suggested, programming has always been "women's work." Evidence includes the punch card mechanism Marie Joseph used in her Jacquard loom and Charles Babbage later fit to his analytic engine, the machine celebrated as the precursor of modern-day computers. A close analysis of visual and textual documentation from this period reveals that handwork practices overlapped with digital design innovations. Lisa Nakamura's (2014)

recent studies of “indigenous circuits” trace the roots of semiconductor technology to Navajo lands in Shiprock, New Mexico where Fairchild semiconductor built its plant in 1969. Fairchild presented Navajo women’s woven rugs as templates for computer chip designs, drawing visual correlations between woven geometric patterns and electronic circuit designs.⁸

As we discuss in the pages that follow, how technological processes have fit to the rhythms of “by hand” craft production has important consequences for envisioning both hacking histories and futures. The HackerMoms project examined here builds on the aforementioned feminist histories of craft to expose ideas of failure that contrast with productivist and masculine hacking pastimes. Specifically we examine the forms of hacking claimed by a group of mothers in the San Francisco Bay area to highlight the importance of personal failures and failures to rework hacker cultures.

Therapeutic resources at Failure Club

Today, craft processes have figured strongly in women-organized hackerspaces by adopting elements of a therapeutic discourse (Illouz, 2008). To understand these connections, we return to HackerMoms where a series of 14 meetings called *Failure Club* (FC) highlight concerns for vulnerability and their role in shaping members’ narratives of hacking. We first describe the structure of FC and an FC meeting where participants helped one member, Wendy Renz, frame her up-cycling work as a platform for entrepreneurship. We then discuss the specific form of “failure” upon which this FC project rests, a concept based on Renz’s experiences as a child. By exposing missteps, FC presents opportunities for using failure to coherently (and constructively) narrativize the self.

Just after Smith and Cook’s presentation at Maker Faire, a woman from the audience approached them to ask whether they had heard of “Failure Club,” series of webisodes created by the independent film director Morgan Spurlock (Smith 2013: Interview with Daniela Rosner, 23 August). The short videos follow people who propose to tackle momentous projects doomed to fail and watch them achieve aspects of those goals—the first episode depicts a young woman learning to become a standup comedian, for example. Within weeks, HackerMoms adopted this format with a group of 2, then 6, and later 16 members, presenting projects that ranged from writing a book to opening a business. Each session of FC comprised 14 weekly meetings wherein participants discussed their attempts to achieve a lifelong dream. Smith explained,

a fantasy in your head that has no bearing on your daily realities ... You wake up in a panic in the middle of the night and your soul is saying “you have to do something about this.” But of course you wake up and don’t do anything (Smith 2013: Interview with Daniela Rosner, 23 August)

These were the kinds of projects Smith wanted members to realize—projects that have an emotional component and seemed to need social support. If it’s something members could do on their own, “don’t bother coming,” Smith declared.

At the beginning of each session, participants posted their aspirations on a board in the center of the HackerMoms space. Some sketched out their fantasy worlds, while

others listed concrete aims in prose. One read, “I take care of me first” in bold, red, pink, and orange bubble letters, with a handwritten parenthetical: “and observe my guilt.” Above these messages, a typed sign proclaimed, “Failure Club, fail fast, start again,” a nod to the entrepreneurial emphasis of several projects. During most meetings, each participant would state her name, describe her FC project, and explain what she has accomplished or what progress she has made over the last week. Her turn would end with her outlining what she hoped to take on in the coming week.

A prominent feature of each meeting was the display of vulnerability, a concern reinforced by the copy of *The Underachievers Manifesto* by English author Neil Gaiman that hung on the FC wall: “I hope that in this year to come, you make mistakes. Because if you are making mistakes then you are making new things [...]” This statement (which also appeared in the footer of HackerMoms emails) foreshadowed the development of several FC projects. In one meeting, artist Wendy Renz started the conversation by updating members on her “up-cycling” projects. She had been making gates from broken or discarded pallets, transport structures most often used for shipping. She now wanted to sell this process to others. She told the group of her attempts to build partnerships with local businesses over the last week, many of which left her feeling terrified, her heart racing as she approached each store. Renz described having trouble finding partners that could give her the confidence to continue marketing her pallet production.

By embracing the kinds of failure performed at FC, emotional support and entrepreneurial work became one and the same. When Renz was getting ready to open her store, HackerMoms members helped her paint the space, hang lamps, and make her first chalk mural. In exchange, she gave members the walls of the store as a gallery, offering them a 100% of their sales. Later that year, Renz held a “table building workshop” at her space to replace the newly purchased CB2 hackerspace furniture that members found “poorly made.” Renz built a prototype, coordinated the low-cost purchase of supplies, and showed members how to do the rest.

These moments of exchange reminded Renz of her childhood. Renz grew up on a commune in New Mexico as part of the 1970s back-to-the-land movement. Her parents prided themselves on self-sufficiency through manual work and trade. Like her parents, she spent a lot of her time in HackerMoms chatting, whether in person or online, while her children danced around HackerMoms with those of other members. Now a competent carpenter and seamstress, she also traded skills and services with HackerMoms members and, in this exchange, felt a shared sense of responsibility. She became “less of a member and more of a partner” (Renz, 2013: Interview with Daniela Rosner, 18 April). While in some ways the world had changed since her commune childhood, HackerMoms felt familiar.

However, for all its connections to commune life, HackerMoms presented something more: an escape from long-standing gendered divisions of labor. Despite their counter-cultural values, Renz’s parents took on traditional gender roles. As scholars such as Fred Turner (2009: 76) and Bennett Berger (2004) have shown for Californian commune dwellers of the late 1960s and 1970s, this gendered labor pervaded commune life: the women cooked, crafted, and cared for the children while the men took care of building and repairing dwellings. When her family tried to teach Renz how to sew, she refused to learn, declaring it a despicable process of making women subservient to their husbands. Darning men’s socks meant reducing self-worth, she explained (Renz, 2013: Interview

with Daniela Rosner, 18 April). In response, she learned to chop wood and other physical outdoor tasks for it was the work that held prestige. Declaring these divisions of labor inherently unjust, Renz escaped to Hampshire College and later enrolled in a doctoral program at UC Berkeley. With motherhood, Renz described “slowly integrating into normalness” and beginning to learn “how to live in a heterosexual male-dominated society” (Renz, 2013: Interview with Daniela Rosner, 18 April). She took up sewing, gardening, and woodworking among other crafts. At HackerMoms, she created stuffed animals and pillows for other members’ children from discarded scraps of fabric. In her new business, she would enable others to create new objects from old and discarded parts. Through craft, HackerMoms became a link to the commune life she once rejected: preserving some of the countercultural ethos and handwork skills of her past while embracing them on new terms.

This reconnection with the past set in motion a process of introspection. Back at FC, when Smith asked what Renz was afraid of, Renz initially fell silent. Renz later explained that she didn’t like feeling out of power, as if she was “begging.” Another FC participant suggested Renz document how much work it took her to create her pallet gates, deterring people from thinking they can actually “do-it-themselves.” The club had helped Renz surface and make sense of disturbing life events alongside those of other members. In making this disruption more apparent and distributed, it also reaffirmed the practical value of her “amateur” craft skills within a familiar back-to-the-land consciousness (Turner, 2009). Fear and failure suggested opportunities for integrating new technological ideals within a more person-centric way of life.

Later reflecting on the gentrification of the HackerMoms’ neighborhood, Renz shook her head:

it kind of almost feels like technology or progress—inexorable. I don’t know how you can avoid it. [...] But it’s more of a class thing. It’s distasteful and hurtful in ways. Like racism is. But I don’t have a solution. And I’m not doing anything about it. I’m just part of it. (Renz 2013: Interview with Daniela Rosner, 18 April)

Here, Renz resigns herself to the inevitability of her role in the community: advocating for women’s rights while reasserting upper-middle-class values. Although relocating people without compensation seemed unethical, she highlighted what she called “fringe benefits” to the people hanging on in those gentrified areas. In drawing parallels between urban gentrification and “technology or progress,” Renz exposes the layers of privilege governing the HackerMoms project and the socioeconomic failures they engender.

Beyond the clubhouse: hacking as imposition

While stories of productive failure circulated widely within FC, other narratives permeated HackerMoms in more distressing ways. Outside HackerMoms, fathers, other hackerspace members, and non-mothers alike expressed heartfelt complaints about the HackerMoms project. Through conversations on email lists, online reviews, and comments shared on news media websites, this confrontation exposed a certain frailty around popular conceptions of hacking that gave HackerMoms additional opportunities for

reframing conventional, masculinized concepts of hacking. In the section below, we show how HackerMoms clarify their aims by describing what their space did and did not do for the women it served. They viewed this activity as fracturing the ontology of hacking: challenging who hacking reaches, what kind of labor hacking represents, and what hacking means for members' ideals of motherhood within and beyond FC.

Over the few months following increasing publicity of their Kickstarter campaign, HackerMoms received a smattering of what they called "hate mail," online comments, or email messages from interested citizens voicing reservations about their mission. Members referred to these commentators as "haters," "trolls," or "nay-sayers," reflecting some bewilderment around their motivations. After all, HackerMoms seemed like "a pretty innocuous bunch," one member explained, promoting creative space for women and children. During informal conversations at HackerMoms, stories circulated about people ignoring children in America (e.g. witnessing a child falling on cement in front of two people during a trip to Los Angeles) and people "bending over backwards" to accommodate children in Argentina and France (e.g. escorted from the back of a long line at the airport to the front). Smith rhetorically asked whether anyone complained when women demanded their own bathrooms. "I think that probably a lot of people did," another member said. The group saw outsiders' distress as revealing a general lack of concern for women and mothers.

As someone studying hackerspaces, I (Rosner) also became a target for airing these critiques. A handful of doubts came from IT industry professionals with some involvement in hackerspaces; others came from mothers who rarely used the term "hack." In processing this feedback, they also recognized their project as a powerful interventionist act: a social and political statement about the place of mothers and children in technology cultures.

Three general objections surfaced among these responses. The first targeted issues of "reverse-sexism." If mothers needed a place to safely work alongside their children, wouldn't dads need one too? This concern raised other questions of control: why create gendered boundaries around parental roles? Who deserved the right to carve these boundaries? One commentator seemed to answer these questions by noting sarcastically:

[HackerMoms] is awesome 'cause we desperately need more sexual posturing and division over gender in the hacker community. We definitely need moresexism [*sic*] and more racism. (Mothership HackerMoms, 2012)

HackerMoms advocates tended to respond to these attacks by highlighting the marginal status of mothers not only within hackerspace communities but also in society at large. For instance, as part a blog post response to the "hate" mail, another member of HackerMoms wrote,

The focus on mothers is essential. It is not a secret that men and women often seek out different means of support. Especially in a child's younger years, mothers often carry a larger burden of childcare, and life tends to revolve around the kid. (Mothership HackerMoms, 2012)

A second set of objections framed HackerMoms' membership policy as "anti-women." A mother of two and member of a neighboring (mostly male) hackerspace embodied this critique when she explained why she chose not to join HackerMoms:

I can mamma whatever with you people. But the way that's been put on a pedestal ... I think that's about them being a stratified group. How about the real working mothers in the world? No, these are middle to high-income women in an affluent part of the Bay Area. (Interview with Daniela Rosner, 16 May 2013)

A mother her whole adult life, this non-member resented the “fervent” motherhood focus. She chose to join spaces with public access, where she could bring students without having to clear their participation with other members. Relatedly, a non-member commenting on a *Boing Boing* article described HackerMoms as a critique of women without children:

I have to say I dislike seeing “women-centric” be defined by being mothers. Apparently I can't be a certified welder, artist, maker, builder and crafter and also belong to this space because I've decided that motherhood is one project I really don't want to tackle. I have no doubt that these forward-thinking women would welcome childfree women, but it speaks of the divisiveness that keeps moms and childfree women at odds with one another. (octochicken, 2012)

Responses to this critique often agreed with its underlying argument. As one member of HackerMoms wrote, “Unfortunately, because the sexism in society has invested so much in pressuring women to conform to a heterosexual/married/child-having life, non-moms, queer women, non-married/single women can perceive moms as part of that pressure. We are not” (Mothership HackerMoms, 2012). Although resistance to HackerMoms' “mother” rather than “women” focus typically came from other women, HackerMoms tried to align their project with women non-moms.

The last of these objections concerned the meaning of the term “hackerspace.” For some non-members, the rise of women-operated spaces became indicative of an effort to divorce hacking from its association with high-technology competencies like software programming and hardware development. At HackerMoms, many members like Renz used craft techniques to create objects and “hack” physical craft materials. From the perspective of those who saw HackerMoms as “anti-hackerspace,” celebrating craft and art making without computation rendered the concept of hacking ambiguous and insignificant. This concern often resonated with engineers and scientists like Renz's husband, a physicist, who confessed to her he did not consider her work hacking (Interview with Daniela Rosner, 18 April, 2013).

An exchange on the *Berkeleyside* online news outlet epitomized this debate. “That doesn't look very different than my living room,” a commenter (Anonymous, 2012) noted in reaction to a photo of HackerMoms members knitting around a table (Figure 2). “This is a ‘hacker space’,” the commenter continued, pointing to Techshop, a franchise of commercial fabrication workspaces. Amplifying ambiguity, another commenter responded in reference to Techshop: “They're a hackerspace in the same sense that a fitness gym is a hackerspace.” To these commenters, HackerMoms began to purposefully break conventional definitions of hacking to the point where the category no longer held coherent meaning.

HackerMoms advocates used this ambiguity to draw attention to connections between hacking and histories of women's work. Much like sewing, cooking, and interior decoration, which have historically occupied a women's sphere, the work of childcare has long



Figure 2. Early HackerMoms gathering (photo: Frances Dinkelspiel).

Source: Berkeleyside.com (<http://www.berkeleyside.com/2012/04/12/mothers-come-together-to-create-berkeley-hacker-space>).

remained a locus of unpaid labor (Lippard, 2010 [1978]). One HackerMoms member explained,

Unions are groups of people doing similar work who band together to protect themselves from labor exploitation. In our case, we don't have a sinister set of bosses trying to exploit us, instead we have a whole society that benefits from our labor and doesn't pay us. This is not about identity politics, or positioning ourselves in opposition to any other group, it's about protecting ourselves as a guild of workers. (De Leon, 2012)

Support for the labor of mothering and its devalued status became a crucial aspect of the HackerMoms project, turning their membership policy into a social and political contract.

In some ways, HackerMoms is a site for refiguring Margolis and Fisher's (2003) arguments from a decade earlier around male-dominated computing spheres. Examining women's condition in computer science education at Carnegie Melon, Margolis and Fisher argued for the need to open up the "clubhouse" of male engineering by finding effective ways for women to "dream in code."⁹ Rather than open its doors, HackerMoms expanded the clubhouse by highlighting its already unruly boundaries. Defending the HackerMoms mission, Bruce Love, a Berkeleyside.com commenter, described the HackerMoms project itself as "a really clever hack." Correspondingly, a HackerMoms member remarked, "when you avoid using the word 'hacker' you lend credence to hacking being a negative thing; by using it, you begin claiming the word as your own and reworking it." This logic of appropriation calls to mind Smith's initial purpose for assuming the hacking category: underscoring connections between hacking and women's work

through their mutual recognition. HackerMoms members “hacked” their situation to suit their needs, not necessarily creating new social structures from scratch. In the spirit of Love and Smith, they acknowledged the importance of hacking culture, not (only) devices (Fox, *et al.*, 2015).

Recognition through failure: crafting a conceptual framework

So far we have seen two forms of failure crop up at HackerMoms: productive self-defined failure and failure that is imposed upon HackerMoms from outsiders. Members air the self-defined failure at regular FC meetings where other members offer support and advice as well as their own stories of failure. In these situations, the audience is familiar and vulnerable along with participants. An important aspect of this type of failure is the opportunity of eventual success it presents. FC participants enjoy the journey, so to speak, while seeking out hopeful destination points. The imposed failure, on the other hand, is unsolicited and offered in brief comments from (faceless) people outside the group. There is no reciprocity and little opportunity for mutual vulnerability or growth, as with the club. In this case, the ideal destination point is prescribing to others’ notions of what constitutes success.

What unites these experiences of failure is a connection to histories of women’s labor and craft. In her feminist treatise *Making Something from Nothing (Toward a Definition of Women’s “Hobby Art”)*, art historian Lucy Lippard describes the craftspeople who dreamt of unrealistic socialist Utopias—societies improved by cheap and beautiful objects but that landed them in capitalist consumerism (Adamson, 2010; Lippard, 2010 [1978]). Some aspects of women-operated hackerspaces pushed toward these goals: creating new symbolic artifacts (e.g. upcycled notebooks and pillows), while helping to build new businesses and commercial enterprises. Just as craft opened up the possibility for including more women in the cannon of “great” artists (Adamson, 2010)—expanding the realm of fine art to include handwoven baskets, quilts, and samplers—so did craft open up the possibility for including more women in hacker communities of high-tech new media cultures. While often evading structural issues that define motherhood, members refused to consign women’s work to the margins of history. By framing the work of women-operated hackerspace members as vital forms of hacking, they embraced the counterculture, but not the one most prevalent on the *plaza* at Burning Man, home of the San Francisco Bay Area digerati. They instead embraced a personal counterculture, one based on their own family narratives—resurrecting a phrase widely celebrated within the 1970s Feminist movement: “the personal is political.”

Through missteps and breakdowns, HackerMoms drew attention to the social and organizational structures shared by many actively participating in women-operated hackerspaces. Showing and discussing their “hacks” became part of recognizing what Eva Illouz (2008: 20) would call a *cultural resource*, “a way for actors to devise strategies of action that help them implement certain definitions of the good life.” These strategic acts, in turn, enabled a particular “emotional style” (Illouz, 2008: 14) wherein participants formulated hacking as a technique for putting interpersonal relationships and languages of selfhood at the center of a cultural imagination. Emotional styles, for

Illouz, describe the cultural mechanisms for apprehending the particular meanings and ideas with which people become preoccupied. A prime example is therapy, which emerged between World War I and World War II to become broadly available by the 1960s and—with the rise of second-wave feminism—adhered to the idea that women should become more assertive (Illouz, 2008: 5). In FC, members established a new way of imagining interpersonal relationships and refiguring their potential in practice. They used a rubric of failure to elicit changes they longed for and negotiated according to the vulnerability and fear they faced. Members called upon these failures to procure a sense of agency in the domain of work and build coherent selves (Illouz, 2008: 20).

Before HackerMoms, members lacked an interpretive frame to account for the fractured identities brought on by motherhood. However, we found that, much like a therapeutic discourse (Illouz, 2008: 20), the rubric of failure claimed by HackerMoms filled this gap in three ways. First, it guided members through risky social relations, as we found with Renz's fear of feeling judged. Second, it helped members make sense of their social experience, as we saw in Smith's discomfort with becoming a mother. Finally, it circulated among broader social networks, as we observed through "hate mail." Failure, in this way, became a common cultural resource that members could use in the framework of daily life to manage their social relations and different realms of work.

It was through failure that we saw a productive reworking of female agencies. Through "inexorable" gentrification and expressions of socioeconomic privilege, members of HackerMoms did not contest common upper-middle class understandings of women's choice to "opt out" and work toward "having it all." While frustrating and disruptive, the transition to motherhood held possibility. Members did not deny current male distributions of power. Instead, by enrolling the intimate discourse of Failure Club, and by exposing failures to transform hacker cultures, they sought to reveal how the cultural category of failure could complicate traditional models of social hierarchy. HackerMoms built on the language of hacking, and its emerging discourse of digital production, to define and legitimate women as hackers and, accordingly, relevant actors in high-technology markets. To accomplish this, members accorded feminized emotional and craft-based skills the same respect as accorded to computer engineering competencies within more "traditional" (predominantly male) hacker collectives.

Conclusion

As the hacker mothers of the San Francisco Bay Area continue to work toward safer, more equitable, and more child-friendly ways of life, they embed themselves ever more deeply into the heart of engineering worlds and the socioeconomic privilege those worlds represent. For these women, the values and practices of everyday life intertwine with technical labor. In the 1970s, theorists like Dick Hebdige, Henri LeFebvre, and Michel DeCerteau took up everyday life as a site for radically re-imagining social life. The potency of domesticity and the social status of quotidian craftwork became a key precursor to contemporary Feminist thought. Today, it has reemerged in the work of modern-day hackers.

By designing hackerspaces to serve domestic and familial needs, and by surfacing a new emotional style through failure, members of women-operated hackerspaces are

actively negotiating the terms by which they make themselves heard within computer engineering cultures (Fox, *et al.*, 2015; c.f. Suchman, 1995). This “oppositional positioning” (Haraway, 1988: 586) relieves them of expectations to hack in the same manner as men, women, or mothers. Donna Haraway has criticized the tendency for analysts to historicize high technology in terms of “universalist” categories positioned as culturally neutral (c.f. Nakamura and Haraway, 2003). Calling on craft discourses of the 1960s and 70s, hacker mothers take up this argument by asking what kinds of hacking emerge and transform through failures. Exposing a politics of difference — destabilizing the category of hacking — they not only build new material circumstance for the artists, makers, mothers and fathers within these spaces, but also position their work as relevant to the acts of “world-building” just beyond it.

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Notes

1. As we detail in other work (Fox *et al.*, 2015), definitions of “feminism” vary widely both within and across “feminist” hackerspaces and include concerns for intersectionality and transgender issues (c.f. Hendry, 2014).
2. This characterization of hacking is reminiscent of Richard Sennett’s (2008) definition of craft (p. 9) as “the desire to do a job well for its own sake,” a connection we will develop throughout this article.
3. Not everyone could become a full member of HackerMoms. Membership at HackerMoms entailed three tiers: “supporters,” “angels,” and full members. While anyone could be a supporter or angel, only mothers (“of any gender”) could enroll as full members. Full members included low-income, transgender, and gay moms. Non-moms organized HackerMoms workshops and pursued collaborations with HackerMoms members. Supporters paid US\$10 monthly dues to remain on the HackerMoms email list. Angel members paid US\$30 monthly dues to access the space when others were present. (I, Rosner, a woman and then non-mother, became an angel.) Full members paid US\$60 per month for full access to the space, including a key to the space, voting rights, access to all HM programming, such as failure club, access to listserv and email group, 20% discount to workshops and events, and most importantly, access to drop-in childcare while using space. Existing members carefully vetted applicants for full membership by calling three references and asking for details on the applicant’s current projects, motivations for joining the group, and kids’ ages, names, and “known issues.”

- Existing members described the process taking some time—sometimes several weeks.
4. This concern for multifaceted identity may be most visible in the HackerMoms logo (Figure 1), which depicts a Buddha with outstretched tongue and bright pink hair extending six arms holding a paint brush, laptop, camera, drill and, of course, baby. The figure closely resembles an illustration on the cover of the first *Ms.*, the American feminist magazine launched in 1972.
 5. In a recent blog post, members of Portland Flux announced their financial reasons for closing their doors: <http://fluxlab.io/2014/07/23/flux-close-outclean-out-tonight-tomorrow>
 6. For a recent discussion of feminist hackerspaces, see Fox et al. (2015) or Toupin (2015).
 7. The computer book publishing company O'Reilly Media launched *Craft* in 2005 as a “sister” magazine to *Make* (Dougherty 2013). Both offered project-based articles celebrating a renewed interest in handmade goods with a technological edge. In *Craft*, soft iPod cozies accompanied hand-stitched robots; in *Make*, instructions to make your own Thermite followed air rocket gliders. This contrasting subject matter pointed to gendered legacies of production that continue today on the covers of *Make*, as highlighted in recent high profile criticism (Buechley 2013). In 2008, *Craft* shut down print operations. O'Reilly's budgetary limitations prompted the company to consolidate their resources to focus on *Make* (Dougherty 2013).
 8. Nakamura (2014) argues that this capacity to produce one design in yarn and another in metal appeals to “a romantic notion of what Indians are and the role that they play in U.S. histories of technology.”
 9. Olin College engineering Professor Debbie Chachra (2015) recently reignited this argument in the context of “Maker culture” broadly, claiming that it overlooks “an invisible infrastructure of labor—primarily caregiving, in its various aspects—that is mostly performed by women.”

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Author biographies

Daniela K Rosner is an Assistant Professor of Human Centered Design & Engineering at the University of Washington (UW) where she co-directs the Tactile and Tactical (TAT) Design Lab. Rosner's research deals with the tensions between design-as-intervention and design-as-inquiry by examining surprising connections between emerging cultures of digital production (e.g. hobbyist fixer groups and independent craft collectives) and broader developments in science and engineering. Her work has been supported by multiple awards from the US National Science Foundation, including an NSF CAREER award. She received a PhD at UC Berkeley's School of Information, an MS from the University of Chicago, and a BFA from RISD. Before joining UW, she conducted postdoctoral work at Stanford's Program on Science, Technology and Society (STS).

Sarah E Fox is a PhD candidate working in the Tactile and Tactical (TAT) Design Lab at the University of Washington, where she conducts a broad range of research at the intersection of design intervention and inquiry. She holds a Master's degree in Digital Media from the Georgia Institute of Technology, where she was a part of the Intel Science and Technology Center for Social Computing. She has worked with the Human Experience and Design group at Microsoft Research and the Interaction and Experience Research group at Intel Labs.