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From "geek" to "chic:" Wearable Technology and the woman question

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A dress that responds to breathing patterns to detect threats and defend the wearer's personal space (see Svakja, 2014). A ring that signals only those incoming calls you *want* to take (see http://ringly.com). An "intimacy dress" that becomes transparent when the wearer becomes sexually aroused (see Campbell, 2013). A pin that wards off would-be attackers with loud noises and flashing lights. Welcome to the world of wearable tech fashion.[1] While some claim the phrase is still an oxymoron, fashion is on the brink of bringing wearables to the mass market, with internet-enabled and sensor-equipped clothing, jewelry, or e-textiles, poised to become a mainstream phenomenon. With worldwide sales predicted to reach $53.2 billion in 2019 (see Datamation, 2014), the hype has been fierce. High-profile collaborations between fashion houses and high-tech companies made headlines,[2] while in the resulting do or die market, some saw wearables as fatally "gimmicky" (Gilbert, 2014). Wearable technology is not going away, however.

Consumer-oriented, mass-marketed wearable technology has the potential to advance social technology and mobile computing in ways that trouble basic assumptions about bodies, technology, and gender, opening up new possibilities for how bodies are gendered. As wearables are normalized by fashion, the transition from "geek" tech to "chic" tech raises important questions regarding how the technologically enmeshed and gendered body is imagined. Will gendered assumptions about technology and the body impoverish this imagination, or can these new technologies realize their disruptive promise to upend entrenched stereotypes?

Wearable tech's potential to change our social world is immense. Its ethical deployment depends on research aimed at highlighting how cultural attitudes might potentially be smuggled into wearable products, in the name of what the market "wants."[3] The present moment begs for insight and analysis to guide the development of devices away from sexist assumptions that are damaging to women, and to encourage more ways to use these new technologies to enhance as many lives as possible.

What is wearable technology?

Arguably, wearable technology is nothing new. From the pince-nez to eyeglasses, prosthetic devices and wristwatches, technology has been worn in many forms. Some scholars date the origins of fashionable wearable tech back to the 18th century chatelaine, a waist-worn device aimed at keeping tools handy (sewing needles and smelling salts for the ladies, scissors and thermometers for a nurse). Originating in utility, the chatelaine evolved into a fashion statement in the 1700s, before falling out of favor as the handbag grew in both size and popularity (Oatman-Stanford, 2013). The current crop of wearables builds on this history, but their networked, bio-sensing code-emitting nature is entirely new, as is their ability to make the human body a node in the Internet of Things (IoT), allowing machines to "see" and network with the wearer in novel ways.

Consumer-oriented wearable tech takes many forms, which fit roughly into the following categories: biometric, revealing/externalizing and connectivity in biometrics. The most common fitness and wellness applications include activity trackers, which gather data such as heartbeat, steps taken, and length and quality of sleep. Less common but emerging externalizing technologies sell themselves as tools for becoming a better version of you. The NeuroSky mindwave headband (see http://neurosky.com) for example, purportedly measures brainwaves to help you track and engage your brain to boost attention and focus. The Lumo Lift zaps you when you slouch, to promote better posture, kind of like having your mother in the device, reminding you to "stand up straight, dear" (see www.lumobody.com/lumo-lift). Wellbe, a wristband that senses and matches heart rate levels to specific moments, claims to help wearers pin-point stress triggers, and elevates mindfulness (Basile, 2015). While all of these devices are designed to be worn, being fashion forward is not particularly high on their list of qualities, tending more toward the "geek" than the "chic" in appearance and use.

Fashionable or "chic" techs currently on the market tend toward revealing and externalizing emotion and augmenting or controlling connection. CuteCircuit, one of the pioneers of wearable tech fashion, had one of the first haute couture runway shows during New York City's Autumn/Winter 2014/15 Fashion Week. Their creations emphasize sensitivity to the environment such

as the Twitter Dress, which displayed fans' tweets as the model walked the runway, and the "first ever iPhone controlled Haute-Couture dress," that changed color according to the volume of audience tweets (#makeitpink or #makeitblack).[4] Dutch fashion has been a hotbed of development, where designers are focusing on building electronics, microprocessors, solar panels, LEDs, and other interactive interfaces into garments.[5] Designer Anouk Wipprecht's spider dress, for instance, uses biosensors and microcontrollers to move the arms of the dress to mimic a spider's defensive or receptive stance. The response reflects the speed of approach, and the wearer's breathing rate (see Svakja, 2014). Another externalizing wearable tech is the somewhat cutesy Necomimi head band. Fuzzy cat ears read your brain waves and move up or down according to whether you are "focused," "in the zone," or "relaxed," making it a technology that allows you to literally prick up your ears.[6]

While externalizing emotions or tracking the whims of a crowd are popular in very specific settings, augmenting and controlling connectivity is fashion's favorite playground and space for innovation. The Google Glass may have been a fashion flop, but the connectivity and data retrieval it afforded is now being packaged into sleek jewelry, rings, necklaces, and bracelets. This connected jewelry subtly alerts the wearer to incoming messages or social media alerts, or affords online access in unobtrusive formats.[7] These devices aim at filling a perceived need for women to be constantly connected while being available for quality face-to-face interaction. Whether aimed at revealing one's inner state, or connecting the wearer to the outer world, wearable tech aimed at women explains a lot about the way they are seen by the fashion and tech worlds.

Le Geek, c'est chic

Unlike "geek"-oriented medical or fitness devices, which tend to be marketed as unisex devices, "chic" tech is aimed at the fashion consumer, who is presumably female, healthy, and lives well within the norms of current conceptions of femininity. The push to make these data-driven gizmos fashionable and "chic," however, raises the "woman" question, famously asked by psychologist Sigmund Freud, "what does a woman want?" Interrogating how wearable devices shape and are shaped by gendered ideas is of critical importance to navigating the social transitions bringing wearables to the mainstream. Cultural assumptions about gender are crucial to examining the emergence of new technologies and social practices they prohibit or allow. For years, research has shown that technologies can be explicitly or implicitly gendered. As feminist writer Anne Balsamo has observed, "myths about identity, nature, and body" rearticulate new technologies to socially and technologically reproduce gendered bodies in the course of their adoption (Balsamo, 1996: 15). Donna Haraway and others have famously noted

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the cultural anxieties raised by mixing the clean, masculine, rationality of technology with the messy, unruly, materiality of the female-associated body in the form of the cyborg (Haraway, 1990). Research has clearly documented how social media and information technologies are rife with the masculinist cultures from which they were born.[8] Since technology is unisex until you put it on a body, in what ways will wearable tech reinforce or disrupt assumptions about the gendered body? Scholarship in fashion studies speaks to this question, as it investigates the interplay between bodies, gender, and clothing technologies that serve to produce the gendered body both within and against traditional assumptions of what a man or a woman can or should be (see, for instance, Entwistle, 2015; or Steele and Katz, 2013).

As fashion normalizes wearable tech, the transition of masculine-identified technology into the feminine domain of fashion sharply highlights the question of how the implementation of these new technologies interprets and shapes gendered bodies. The way fashion brings gender to the realm of wearables remains under-studied, however. Research at the intersection of wearable technology and fashion has tended toward an uncritical cataloguing of practitioners' use of – and predictions for – new technologies, rather than examining the larger gendered consequences of their widespread penetration into the fabric of everyday lives (see, for instance, Quinn, 2010; or McCann and Bryson, 2009). Even Susan Elizabeth Ryan, in her thorough-going consideration of fashion with a capital F's influence on wearable tech, noted her analysis leaves "specific feminist theoretical analysis" of this important but under researched area "to future scholarship" (Ryan, 2014: 4). Scholarship is needed to critically interrogate how cultural understandings of the gendered body are influencing access to the inherent potentials of wearable tech. The enhancement potential in wearable tech is considerable. It can only be realized if the opportunity for this enhancement is not squandered by importing limiting and tradition-based cultural assumptions about gendered bodies into its design.

Innovators within the fashion/data/body space are a key resource for analysing how gendered bodies are being interpreted and shaped by these new technologies. To access this resource, I sought out early adopters, hackers, technophiles, fashionistas, and design freaks, employing both interview and participant observation to map how wearable tech is emerging as an everyday practice. Within this mapping and analysis of the field, I sought to "read" its artifacts, to uncover the latent cultural values they express. The research explores these questions: What are the cultural assumptions inherent in the design of wearable tech for the fashion market? How do these assumptions play out in the devices and their purpose? Are there notable exceptions? What can be done to foster a more inclusive climate, less governed by knee-jerk assumptions about what women want? My findings identified several themes regarding women and technology that thread through the field, highlighting some underlying metaphors used to establish relevance and meaning for these

devices. These themes emerged through focusing on the tacit assumptions about women and their needs made by the design community, and evidenced by the designs of the devices themselves.

Overall, I found three prevalent assumptions about women in the tech/fashion field. First, women are potential victims. Second, women want to achieve difficult-to-attain physical ideals of health and optimum fitness. Third, women need to be constantly available and connected virtually, while also paying close attention to achieving high-level face-to-face interaction with those they are with, thus staying fully connected and totally present, at the same time.

Who is "Woman 2.0"?

At an expo showcasing fashion as wearable tech, a panelist enthused, "we want to know who the amazing, incredible, Woman 2.0 is!"[9] The woman question is bedeviling many who seek to unlock fashion tech's enormous potential especially considering the historic construction of women as primary consumers. The "killer app" of fashionable wearable tech remains elusive, as initial forays into marrying fashion with tech have demonstrated a deep-seated cultural ambivalence about women and their needs, in both private and public space.

An apparent culture of fear, for instance, permeates many of the devices in development or now on the market. While accelerometers and email or phone message filters are a given, devices using body sensors and alarms stand out as an example of the cultural assumption that women need protection both from themselves, and from others. Fear of the uncontrollable female body and its urges were clearly in evidence in a well-publicized flop, when researchers at Microsoft developed a bra that would alert the wearer when she is in danger of overeating. In the ensuing media mayhem, Katy Waldman at Slate.com snarked, "What a sign of progress that technology now recognizes the holy trinity of womanhood, emotional instability, and concern for food and weight" (Wakeman, 2013).

It seems that if Woman 2.0 is potentially a victim of her urges to overeat in private, when she goes to work off those calories in public, she is also in danger. The assumption underlying the design of many devices is that she is always one step away from being a damsel in distress. Protection is central to many fashion device innovators, including Smart Siren Technology, Inc., whose SIREN ring offers a wearable tech solution for the independent woman. Billed as a "new brand of jewelry that offers women immediate protection when their personal safety is at risk," it emits a "shockingly loud alarm" that might "change the dynamic between attacker and target" (Yahoo! Finance, 2014). More subtle than the SIREN, but still aimed at the same goal, is a recent dress prototype that expands several inches when someone stands too

close (Bischof, 2014). Many other fashionable wearable devices coming on the market have a "safety" feature built in. One device boasts a button that, once pushed, sound alarms, flashes lights, and dials 911 – all while texting the wearer's friends to geo-locate her so that they might come to her rescue.[10] Whether susceptible to a snack attack, or a literal attack, the assumed potential victimhood of bodies gendered female is a telling illustration of broader cultural anxieties being reproduced within these new technologies, anxieties that feed into the identities these technologies are helping to construct.

Taming the unruly female body

In addition to the marked ambivalence about women in public spaces, wearables are raising important questions about women and "model" bodies. The "unholy trinity" of womanhood, emotional instability, and concern about food and weight sits squarely in the realm of negative body image. As personal electronic devices become ever more personal, worn on the skin, for instance, how will they feed into the drama of living the body within contested normative metrics? Will ubiquitous step counting become the new technology of shame, the role formerly held by the scale for scolding fat people, regardless of individual physiology (Nafus and Sherman, 2014)? If you have direct access to the biometric data tracking that jelly donut's effects, will you be any less likely to put it in your mouth? And if you do, will your body be even more out of fashion when the discipline to achieve a fashionably managed body has been built into algorithms that supposedly can whip anybody into shape?

Anthropologists Dawn Nafus and Jamie Sherman's work within the "quantified self" or QS movement, focused on people who wear devices that track and graph sleep, steps, mood, and intake to promote self-awareness and altered behavior. Their work highlighted the need for "soft resistance" to hard-edged algorithms producing the self as data, within the oceans of so-called "big data" becoming so prevalent in contemporary developed societies (Nafus and Sherman, 2014). While this idea of "soft resistance" stems from culturally mandated feelings of body unworthiness in the QS movement, how will the average woman navigate the algorithmic creep of the fashionably fit ideal embodied by the growing ubiquity of step counters, accelerometers, and biometric sensors commonly found in fashionable wearable devices? This algorithmic creep is already hard at work in the workplace. Bodily data is becoming valuable enough to prompt some to employ coercion to get at it. Sociologist of technology Deborah Lupton has documented an uneasy compact between employees giving up health data in exchange for needed insurance to corporations, employee-tracking enables them to reduce their healthcare costs (Lupton, 2014). Just as other forms of workplace governance have gone "freelance," so to speak, will this type of self-monitoring follow the path of branding – from commercial tool to self-imposed personal requirement

for success? The current transition to valuing the body *as* data seems to be driving much of the consumer electronics that are deemed "wearable" today, thereby laying the groundwork for just such a transition.

As wearables become the norm, they feed into the current cultural shift in emphasis from the tech functioning to bring a world of data *to* you, to *you* becoming a world of data. This question becomes particularly important as the popularization of wearable tech by fashion intensifies the datafication of the body, or the availability of the body as data. However wearables attract us to putting them on our bodies, they will have us awash in stats. At its inception, this notion seemed empowering. Early pioneers of wearable technology, such as the MIT Borg group, for instance, proudly wore their computers and used them to bring themselves immediately up to speed in conversations about research, helped themselves remember people's birthdays, and kept expert data organized and under their control. In the wake of the internet's shift from a tool for you to use to a tool for using *you*, however, scholars in the fields of media studies, sociology, anthropology, and communication are investigating how wearable technologies have the potential to turn us into data selves, a transition with broad implications regarding privacy, social connection, and bodily integrity (Horning, 2012; see also Crawford, 2014; Nissenbaum, 2014).

With bodily representations becoming more "datalogical" (Clough et al, 2015), fashion *does* have the opportunity to move away from disciplining the uncontrolled flesh of bodies to make them meet a standard. As one designer said of 3D printing and body scanning,

> You can't even think about factories in the same way again. Holding an inventory has shaped fashion in certain ways, artificially segmenting the market. Now you no longer have to design for the Chanel woman. You no longer make 10,000 shirts and then have to use an aspirational model or idea to get people to buy them. (Designer Francis Bitonti at the Decoded Fashion New York Summit, November 2014)

How will the new availability of granular data play into debates about acceptable body size, or "model" bodies? Will new levels of customization to fit clothing disrupt old assumptions about women's bodies and the fashionable ideal more generally?

As wearable tech feeds create a world permeated by data, mediations between the "represented" and "enacted" body take on a new tone.[11] As Brittany Fiore-Silfvast and Gina Neff have noted, data are not self-evident, but rather take on valences. In their formulation, "data valences" contain an "anticipation of value or expectation of performance within a particular ecology or system" (Fiore-Silfvast and Neff, 2013, 2015). How will the data valence of the fashionable body, currently made valuable within the economics of the selfie society, Instagram, and other phone-based imaging

technologies, morph and shift within the possibilities wearables afford? If one can be the star of one's own show 24/7, how might realtime life-streaming technologies, such as a camera you wear on your head and leave "on" all the time, exacerbate already existing issues associated with the pains and pleasures of micro-celebrity communication documented by Alice Marwick and danah boyd?[12] How will putting these tracking and recording techs onto our bodies intensify these demands?

In this respect, wearable technology could readily exacerbate what I've called "glamour labor" (Wissinger, 2015). Glamour labor is the work on body and self to produce a fashionable self, both online and in person. The notion of glamour labor raises the question of how the fashionable body, made valuable within the economics of social media, will morph and shift within the possibilities that wearables afford. As fashion and tech meet in the space of chic wearables, what does the future portend for the technologically enmeshed body, especially when it is gendered female by male designed tech? Why does it raise such deep-seated anxieties about women and control?

Geeks are guys?

In the "well trodden" issue of the masculinity of technology,[13] the simplistic version of the logic goes like this: If fashion = feminine, and tech = masculine, then fashion + tech = tech for women designed by men. In the emergence of the internet, feminist researchers found that despite the new technology's possibilities (after all, "on the internet, nobody knows you're a dog"),[14] it nonetheless became a site where "social practices are embedded, which express and extend the social construction of two asymmetrical genders" (Rakow, 1988: 57). Will fashionable wearable technology fall prey to the same problems? How are "myths about identity, nature, and body" getting rearticulated into these new designs (Balsamo, 1996: 15)? Is there a way to influence the design community away from these assumptions? As tech researcher Natasha Dow Schüll has observed, it is

> Not just the behavior, not just the person – but the design, the
> configuration, and the way that can constrain and direct and guide
> behavior in certain directions, and why it might be a good idea
> to regulate it. There is no equivalent to the FDA for technology.
> There should be researchers and policymakers in conversation
> about the intimate and even physiological ways that these things
> affect people. (quoted in Annechino, 2015)

The way technologies are designed contain implicit assumptions. Anthropologist Jamie Sherman observes that intimate data gathering implies an ideal body that is no longer explicit but rather imagined or performed

"within and through a body whose outputs are being quantified" (interview data). Can this body be "envisioned outside of cultural ideals? The visuals are implied but not articulated, as in, 'I want to run faster and stronger.' Does this mean you want a runner's body?" In an interesting twist, Sherman suggests that rather than "glue tech and fashion together," the aim should be to create something "where observers might say, 'what the hell is that for?'" (interview data), allowing more space for a design not aimed specifically at doing something pragmatic and thereby allowing more flexible constraints on behavior. Similarly, in my interview with tech fashion designer Alison Lewis, she argued that while "tech [is used] as a tool of creative self expression ... personal expression is not considered a value in my experience of the wearable tech world." She conceded that the perception of value is changing but there is a "big struggle going on over it – in terms of the values the tech itself expresses."

Can the values that tech expresses be attributed to the male oriented "geek" aspect of the tech design field? Functional utility does not exactly conjure up visions of a fashionable ideal. According to the female tech/fashion designers I spoke with, the well-worn issue of the masculinity of technology seems alive and well. One up-and-coming designer observed, "the tech field is dominated by 'brogrammers,'" or, as another pointed out, "Silicon Valley is a 'boy culture.'" One technologically accomplished jewelry designer noted, "People have 'questioned my ability'" with regard to the "technological aspects of my smart jewelry." A young fashion designer who'd won a competition to be a fellow at Eyebeam, a foundation dedicated to fostering experimentation in wearable tech, mused, "the programmers seemed to be wondering what this 'pretty little fashion girl' might want to do with these complex programming languages."

As fashion normalizes wearable tech, the transition of masculine-identified technology into the feminine domain of fashion sharply highlights the question of how the implementation of these new technologies interprets and shapes gendered bodies. As digital sociology researcher Deborah Lupton acerbically observed, the male-dominated nature of digital technology culture translates into "a certain blindness to the needs of women" (Lupton, 2015). A clear example of this problem noted by Lupton and others about the Apple watch was neatly summed up by a newspiece aptly titled "When will we get wearable tech for women right?" For all of its health monitoring prowess, the ability to track menstrual cycles was "suspiciously missing from Apple's health app" when it was first released (Bolluyt, 2015).

The idea that the tech world does not value women's needs translates into the look and feel of devices as well. According to a tech designer who works on the guts that run many devices, "People are trying stuff – they are going to market really quickly without much planning." The result? "There have been a few cases of just wrapping some plastic around some nerdy stuff" (interview data). For many, "fashionable tech" has been so nerdy up to this

point, it is not even an option. As one wearables newsletter declared, "Silicon Valley has always been the stomping grounds for tech's biggest thinkers, but fashion? Girl, please" (Mangalindan, 2015). Another observed: "today's elegant women will not be caught dead putting on a clunky wearable; the industry needs to rethink its function–first approach." Their tagline? "Because function needs fashion."[15] One pundit sourced the problem to the male·as end user model, where the "look, size, and choice of materials seem to first consider men, and then get cosmetically tweaked for the ladies" (Taraska, 2015).

Some trace these problems more broadly to the difference between fashion and tech cultures. One fashion/tech designer saw the value of function over form, rather than a bias toward male needs or desires, as a detriment to the full development of fashion/tech's potential:

> Fashion and tech are very different cultures. Is one masculine? Not necessarily, but the idea that the tech has to DO something is firmly entrenched. (interview data)

A male tech designer, who works on providing the means for enhancing wearable device functionality, also noted this cultural divide: "If they are coming from a fashion house, you will have a different perspective than if you come from an electronics design house." Yet, he went on to describe the problem in starkly gendered terms, citing the paucity of women on the tech side as the root of these problems with wearable technology. In his view,

> The companies focusing on the fashionable aspect of wearables need to get the right people involved in the design – not just some 'women sitting in a room,' not just paying for some research – if they are designing for women then you might want to have them involved and get their feedback. You need women on the team not just one but several. Sometimes they see things differently.

Leaving the well documented lack of gender diversity in the tech community aside, even when women are in charge of tech design, sometimes the need to make products meaningful draws on cultural categories that can easily veer into stereotypical territory.

Design dilemmas

Wearable technology has the potential to shape identities, in the intimate relation of wearing it on one's body. This intimacy calls out for questioning the tacit assumptions about women's bodies and needs, as made by the design community, and as evidenced by the designs of the devices themselves. In my research, I ask about designers' design philosophy, their intended customer,

and the goals of their devices, to look for signs of cultural ambivalence, and to pinpoint whether and how the gendered aspect of fashion is affecting how these technologies are deployed. I found that within the entrepreneurial sector of the fashion domain, there is a prevalence of stereotypes, including, for example, the information overloaded, hyper-connected "busy mom," or "millennial fashionista." This over-simplified view seems to characterize the imagined woman many say is their potential customer. Are these two the only options for Woman 2.0? What is limiting fashion world's interpretation of her needs?

The use of "types" is common in the fashion industry. They serve as a shorthand organizing device to speed workflow, and assume a good deal of tacit knowledge. In the modeling industry, for instance, types are used to organize casting calls. Agents will get requests for a "Bollywood" or "black black black" type of model, and will use these notions to organize who they send out for calls (Wissinger, 2015: 240, quoting from Sadre-Orafai, 2008: 150). Types perform a similar kind of work in fashion design. The type is used to help promote understanding of the brand. Asked about their target customer, one young fashion designer told me:

> Everyone has their kind of identity. Is she an uptown Eastside woman, is she like super chic, is she kind of earthy and lives in Williamsburg; different companies out there zero in on who their actual customer is. You are trying to get a loyalty and try to brand yourself and get these women who are loyal to you.

For this designer, the type makes the brand meaningful to customers. Similarly, a young woman who worked at a haute couture design house said that each designer has their "girl."

> We have a specific girl, we call her our 'girl.' It could be an idea of a woman, when you are designing something. It's a good starting off point. The designer I work for's 'girl' is like the 'cool' girl. She maybe dated a musician, or like, she skateboarded – she's super stylish. Both the designers had really cool girlfriends and they wanted to dress their friends so it starts off sort of simply in that way. (interview data)

The designer's type then gets fed through a mythos that informs the design on many levels. It does not pay to stray far from stereotypes, or gendered assumptions about what a woman wants or considers feminine.

The stereotypes of the "busy mom" or "millennial fashionista" tap into cultural assumptions about femininity, availability, and the emotional labor of human connection. Viawear's ad campaign for the "Tyia" model of their connected bracelets, plucks at working mothers' heartstrings:

Tyia is named for a busy therapist who, one day in 2012, silenced her smartphone, only to later learn she'd missed several calls and texts telling her that her 5-year-old had broken his arm. As a mother and a professional, balancing both work and home, this was a painful experience. (viawear.com)

Not only does the text resonate with the structural difficulties of being a good mother and a paid professional, the ad copy highlights the dilemma of living in a networked world – how to be "connected and available when we need to be," but also "fully present and in the moment." According to another ad campaign for a wearable designed to provide alerts to phone calls and incoming messages, their device protects against being "a slave to technology" (see http://kovertdesigns.com). The "millennial fashionista" type, chained to her device, is a common image. Kovert Designs' champion of "digital detoxification," designer Kate Unsworth, promotes the catch line "Forgoet FOMO [the Fear of Missing Out] and embrace JOMO [the Joy of Missing Out]" (vinaya.com). While the fashionista is not usually depicted as a mother, her desire to stay on her "communications game" highlights another uniquely feminine problem: women's apparel is frequently designed without pockets, an issue Ringly, a ring that vibrates alerts about texts and phone calls, handily addresses. Their video advert shows just how you can "escape from your phone," as a hands-free woman happily twirling in a pocket-less skirt nimbly responds to her vibrating jewelry by pulling her phone from her purse. Customer testimonials on the site report that Ringly helps them avoid "being rude," by letting them "keep the phone away without missing anything."

Discreet, seamless, subtle, and private are buzzwords employed to combat the perceived rudeness of the face-in-the phone problem from which so many "millennials" and "busy moms" seem to suffer. The need to return to face-to-face contact resonates with assumptions about femininity regarding emotional availability. Both women and men are suffering from technologically induced reductions in eye contact; attentiveness and availability to others' needs, however, are behaviors traditionally coded feminine (Gregoire, 2013). When the technological need for connection interferes with the human one, these devices purport to right the balance, and put a woman's focus where it should be, on family, friends, and work, not necessarily in that order, but with attention to herself significantly missing from that list. These devices allow the user to navigate the conflicting demands of a connected world, while satisfying cultural mandates to be polite, attentive, and available.

Is the male-dominated "geek" aspect of the tech design field solely to blame for these skewed views of women as end users of fashionable tech? Is the desire to return to face-to-face contact and emotional connection a gendered value or a human one? Is the desire to feel safe in the street gendered as well? Those trying to straddle the divide between wearable tech and fashion have thus far felt the need to tap broad cultural expectations of gender that shape

usefulness and value. Value is a recurrent theme mentioned by designers, and to understand this theme, Brittany Fiore-Silfvast and Gina Neff's notion of "data valences" is useful here. They explain that valences contain an "anticipation of value or expectation of performance within particular ecology or system" (2013: 1470). Arguably, these anticipations of value feed through the ecology or system of gendered notions of what a body is for, and what it can do. As wearables intensify processes of becoming "datalogical," value is found in maintaining a "liquidity of capacity" through practices of "self-appreciation," as social theorist Patricia Clough et al have observed (2015: 2). This "liquidity of capacity" is the goal of the kinds of glamour labor I documented in my previous research. Glamour labor is the work to augment one's glamour across social media platforms, while striving to embody this glamorous image in the flesh, in an effort to extract as much value from one's virtual connectivity and physical embodiment as possible. Arguably it is a from of gendered labor, and the onset of wearable tech is poised to intensify the demand for women's glamour labor – to be fully up to the minute on fashion trends, friends' updates, work demands, all while being fully present to whomever you may be with, and looking gorgeous and fit while doing it.

It is the push for "liquidity" that can either hem in or free the body via wearable technologies. What if the potential of wearable tech were not shaped by gendered assumptions? Could we get our bodies out from under cookie cutter assumptions of what a body is or should be for? Could we produce our bodies in some other way than in the hustle to be "seen," or "matter," to be connected yet available face-to-face, in the kind of social media and body control-on-steroids fashionable wearables portend? As tech innovator Billie Whitehouse observed on a panel at Pratt Institute's Brooklyn Fashion and Design Accelerator (BF + DA), "wearable tech's true potential lies not just in its ability to control us, as in 'here's your data from your day – *enjoy* – but in its ability to augment our experiences," for example, to extend our reach, connect us in new ways, and perhaps break down gender binaries, rather than cement them further.

Researchers raising questions about the profound effects of wearable technology on sociality and subjectivity have called for the need to examine "moral and economic reasoning, cultural assumptions, and institutional contexts constituting enhancements" (Hogle, 2005: 685). Pursuing this line of inquiry, can help digital sociology bridge gaps between traditional sociology and STS (science and technology studies), as well fashion, media, and women's studies, to help both designers and publics better prepare for understanding and managing issues raised by wearable tech. Investigations into these intersecting fields is becoming crucially important as advances in mobile computing and social technology deeply trouble basic assumptions about bodies, technology, and gender. Just like the internet before it, wearable tech has the potential to radically enhance many lives. It would be a shame to squander this potential

on short sighted devices that extend existing anxieties in ways that limit or control human potential, gendered or otherwise.

Notes

1   Wearable technology is any kind of device that can be worn on the body and interact with it. Common forms of interaction include lighting up, sensing body motion, reading sweat content, or physical prompts such as remote touch, shocks, or vibration. Wearable tech fashion implicitly assumes that the wearer is healthy and wants to look stylish. The huge range of wearable medical and fitness devices are not aimed at the fashion-conscious market, and therefore fall outside the scope of this discussion.

2   In the past year, fashion has become keenly aware of wearables. Intel's high-profile collaboration with Opening Ceremony and Barneys, resulting in the MICA bracelet, Tory Burch's chic take on the Fitbit, and the up-and-coming Cuff connective "smart" jewelry, are making managing one's personal data streams ever more fashionable, positioning the internet and social media-connected wearables for widespread adoption.

3   Please note that although the term "women" is used throughout, it is for stylistic purposes. The binary formation of "women's" versus "men's" fashion contains a problematic set of gender normative assumptions, assumptions this research is in part aimed at ferreting out, to interrogate how these binaries discipline bodies to reaffirm what is "normal" or expected. Although I am discussing the marketing of "women's" fashion, I seek to question the underlying gender normative assumption affecting a variety of bodies, queer and heterosexual, trans and cis, which thus far have not fitted into the established markets.

4   "Using the 'Q by CuteCircuit' iPhone app fans' tweets are tallied to change the color of the dress instantly while the dress is being worn on the red carpet," as noted on the CuteCircuit website (http://cutecircuit.com/pink-black-collection).

5   See www.craftingwearables.com/about.html, with thanks to Lianne Toussaint and Anneke Smelik.

6   "Your mental state is translated into ear movements," according to the website: www. necomimi.com/.

7   Such as Ringly (https://ringly.com/?utm_source=AdWords&utm_medium=CPC); Intel Opening Ceremony Barneys MICA (My Intelligent Communication Accessory) bracelet (www.intel.com/content/www/us/en/wearables/mica-smart-bracelet.html); Tory Burch for Fitbit (www.fitbit.com/toryburch); and Cuff jewelry (https://cuff.io/#), built entirely around the idea of safety, since, as their promotional video points out, "you never know what's around the next corner."

8   The recent kerfuffle about Gamergate is a prime example – see Hathaway (2014).

9   Decoded Fashion New York Summit (DFNY14), November 2014, New York.

10   https://cuff.io/ alerts a loved one with a distress call and the wearer's location. ROAR for Good provides similar functionality, but also emits a loud alarm when triggered (see www. roarforgood.com/).

11   When your interaction with the machine puts you into a "cybernetic circuit that splices your will, desire, and perception into a distributed cognitive system in which represented bodies are joined with enacted bodies through mutating and flexible machine interfaces" (Hayles, 1999).

12   It is called "Lifelogger" and it does exist, billed as a GoPro for everyday life. "Could this Small Stock be the Next GoPro?" (www.nasdaq.com/article/could-this-small-stock-be-the-next-gopro-cm413858); regarding microcelebrity, see Marwick and boyd (2011); see also Marwick (2013); boyd (2014).

13   As pointed out by Susan Elizabeth Ryan in her book *Garments of paradise* (2014).

14   An adage that began as a cartoon caption by Peter Steiner and published by *The New Yorker* on July 5, 1993.

15 "Richline, a leader in fine jewelry and the emerging category of FineWear Technology, announces the arrival of a new and robust blog, Wearable Style News" (see www.businesswire. com/news/home/20150812005333/en/Richline-Group-Introduces-Wearable-Style-News-Website#.Vdliks6fvdl).

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