SUPREMACY OR SYMBIOSIS? THE GENDERED AFFORDANCES OF DIGITAL VERSUS BIODESIGN TECHNOLOGY

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Context

This paper examines persistent structural power relations and hierarchies based in gender oppressions in wearable tech and biodesign. How do gendered power structures inflect designers' sense of do-ing – of design, of their sense of the body they design for, and the goals of their making? Technology design is supposedly as neutral as technology itself. Yet my findings indicate that not only the gender of the practitioner, but the gender of the practice itself, affected design outcomes.

Theoretical Framework

Calling on Neff et al.'s "gendered affordances," e.g. "social affordances that enable different users to take different actions based on the gendered social and cultural repertories available to … technology designers" (Schwartz & Neff, 2019, p. 5)*,* this study builds on critical race and technology studies' contention that the lack of diversity in science and design settings leads to biased or discriminatory design outputs (Benjamin, 2019; Broussard, 2018; Levy, 2015; Lupton, 2015; Marwick, 2015; Massanari, 2017; McIlwain, 2019; Nakamura, 2014; Neff & Nafus, 2016; Noble, 2018; Rosner, 2018; Sanders, 2017; Wissinger, 2017). Extending these analyses beyond design environments, it explores the gendered aspects of designing embodied technologies in wearable tech and biodesign, where bodies are sensed, perceived, and lived through communication devices, clothing, biometric gadgets, distributed networks, interfaces, and biological interdependencies. Additionally, it goes beyond digital design to biodesign, where living organisms are key to design production or functionality (for instance, weaving conductive protein nanowires into mushroom grown textiles, or incorporating microbes' active tendencies into a garment's wicking properties).

When gendered power structures affect design practice, critiquing its outcomes is crucial. Significantly, gendered inflections of my respondents' 'sense' of the body mapped onto paradigmatic concerns within conceptualizations of the trans- and post-human. By contrasting trans-human practices that idealize merging technology with the body, with post-human practices that imbricate humans with their environments to minimize harm to humans and nonhumans alike, I found clear links between gendered influences on technological design practice and outcomes that favor masculinist trans-versus feminist post- human design values.

Methodology

This paper draws from a multi-year study (2017 to the present) of the wearable tech and biodesign communities. It analyzes field notes from fashion tech summits, wearable tech conferences, trade shows, design meet ups, and biotech design competitions, as well as a 24-interview sample of fashion and tech designers, synthetic biologists, biodesigners, biofabricators, and wearables designers. Analytic themes drew from hand coding transcriptions and field notes.

Findings

The paper shares three main findings. First, gendered meaning systems affect who is considered an 'expert.' Respondents used clothing and language to 'signal' their status as engineers to be avoid being seen as an inconsequential rep from marketing. A biotech engineer claimed man talk helped telegraph legitimacy, saying, "None of us would call ourselves girly, but we all have to try to adopt how men talk about work and behave in meetings in order to be taken seriously as engineers or to be seen as an engineer at all. If people don't know you, they always assume you're in marketing."

Second, gendered assumptions influenced choices of design method, with less value given to feminine ways of making. These associations informed whether my respondents adopted coding versus knitting, data broadcasting versus data privacy, and visual versus haptic designs. They were open to ideas for technologies employing feminine-associated practices. A wearable tech designer I spoke to observed: "Knitting is really, really technical but [has] not [been] taken seriously. But it is real engineering."

Gender differences inflected working *with* materials as opposed to working *on* them; conceiving the body as organic versus the body as machine, while juicy or gross processes contrasted with dry and clean technologies; shaping both the concrete scientific practices and design outcomes my respondents described.

Finally, many contrasted their 'feminine' design practices with masculinist technologies designed for mastery of human foibles through digitization. Data privacy and treatment of bodily data, were key for designers, prioritizing feminine, haptic, and inward-looking goals. Regarding data exploitation in wearable tech design, a speculative wearables designer observed,

There's this bizarre thing going on with wearable technology -- technology is both invading our space and invading our bodies...it is a bit of an assault if you look at how we are data-fying everything. I mean, it's really sick, especially when we're talking about body data.

A female speculative designer observed, "I'm thinking about privacy, who's in power, who's vulnerable and…What interaction should we be aiming for?"

In sum, respondents negotiated material limitations and design exigencies where the masculine and feminine inflected design practices and outcomes toward either trans- or post- humanist ends.

Conclusions

Enmeshing the body with data gathering technology, or merging the body with technology, ostensibly to perfect it, can lead to damaging data exploitation. Exploring feminine associated low tech or crafty, environmentally friendly, or wearer centered designs, can produce gadgets and garment interfaces that are arguably less exploitative of human tendencies, and more symbiotic with natural resources.

While respondents did not use these terms, their sense of the masculine and feminine meanings and associations in the field, and their self-described practices, clearly telegraphed how trans- versus post- human concerns informed their design values. Feminist/feminine identified practitioners and practices tended strongly toward posthuman ends. Faced with oppressive, masculinist, trans-human oriented technologies, these designers asked key questions, and sought out alternative practices. Research interrogating the underlying bodily constructs informing on-body design, can give designers the tools they need to seek out and create more just and equitable embodied designs, which reject supremacy in favor of a more symbiotic future.

References

Benjamin, R. (2019). *Race after technology: Abolitionist tools for the new Jim code*. Polity.
Broussard, M. (2018). *Artificial unintelligence: How computers misunderstand the world*. The MIT Press.
Lanzing, M. (2016). The transparent self. *Ethics and Information Technology*, *18*(1), 9–16.
Levy, K. E. C. (2015). Intimate Surveillance. *Idaho Law Review*, *51*, 679.
Lupton, D. (2015, January 25). The cultural specificity of digital health technologies. *This Sociological Life*.
Marwick, A. E. (2015). *Status Update: Celebrity, publicity, and branding in the Social Media Age*. Yale University Press.

Massanari, A. (2017). #Gamergate and The Fappening: How Reddit's algorithm, governance, and culture support toxic technocultures. *New Media & Society*, *19*(3), 329–346.

McIlwain, C. D. (2019). *Black software: The Internet and racial justice, from the AfroNet to Black Lives Matter*. Oxford University Press.

Nakamura, L. (2014). Gender and Race Online. In M. Graham & W. H. Dutton (Eds.), *Society and the internet: How networks of information and communication are changing our lives* (First edition, pp. 81–96). Oxford University Press.

Neff, G., & Nafus, D. (2016). *Self-Tracking* (1 edition). The MIT Press.

Noble, S. U. (2018). *Algorithms of oppression: How search engines reinforce racism*. New York University Press.

Rosner, D. (2018). *Critical Fabulations*. MIT Press.

Sanders, R. (2017). Self-tracking in the Digital Era: Biopower, Patriarchy, and the New Biometric Body Projects. *Body & Society*, *23*(1), 36–63.

Schwartz, B., & Neff, G. (2019). The gendered affordances of Craigslist "new-in-town girls wanted" ads. *New Media & Society*, *21*(11–12), 2404–2421.

Wissinger, E. (2017). Wearable tech, bodies, and gender. *Sociology Compass*, *11*(11), e12514.