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Becoming Cyborg: On Deafness, New Materialism, and Pivoting a Research Agenda

Krista Kennedy | Syracuse University
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I've been severely and profoundly deaf since a bout of spinal meningitis when I was two. For much of my life, this bodily aspect and its many dimensions were not particularly interesting to me. In fact, I thought it was the least interesting thing about me, as did my parents, and getting accustomed to wearing a hearing aid and working through years of speech therapy as a child were simply practical matters. We never used the word 'disabled' to describe me. I underwent a mainstream education, skipped a couple of grades, went to college early and then dropped out, worked in restaurants, temp jobs, and call centers, and eventually spent nearly a decade doing high-contact business development, mostly through hours of phone calls each day. As I pursued a bachelor's degree at night, I realized that I much preferred the energy of campuses and classes to that of corporate life. Eventually, I decided to pivot and go to graduate school to pursue a master's and, eventually, a doctorate in Rhetoric, Scientific, and Technical Communication.

Once I got to doctoral work and started studying rhetorics of technology, deafness and its technologies weren't even a consideration as potential foci. I fell in love with authorship studies and intellectual property theory, eventually spending ten years writing a dissertation and a tenure book on radically distributed collaboration in encyclopedias, both 18th century and digital. My questions focused on the rhetoric and ethics of information ownership and circulation, which led me into archival research on communities that supported the development of encyclopedias and the ways they strategized and accomplished that support. Western materialist theorists—namely, Latour—were helpful for thinking through the ways that humans and technologies function together in these contexts, and I read and used Latourian theory as a scholarly tool, not as a way of living. The way that new materialism facilitates ecological examination of affordances and constraints (Gibson) was useful for thinking about networks of printers, writers, and presses.

I did in fact receive tenure and have continued with the usual duties of a research professor with a simultaneous path in administration at both department and national levels. It's been an interesting and challenging ride that's taken me to places I hadn't imagined I'd go when I was growing up in Arkansas: I've published in the US, France, and England, and delivered invited talks in Ireland and South Korea. I spent a year as an

NEH Distinguished Visiting Professor at a bucolic private college tucked away in the hills of New York state. I'm currently wrapping up a term as director of our doctoral program (ranked in the top five in our field), teaching undergraduates and doctoral students (and occasionally winning teaching awards), serving as a senior research fellow in one of our institutes (one of the most interesting ones), and working on a co-authored book (under contract to a top press). This is the tidiest, most polished version of my professional narrative, full of either academic braggadocio, plain facts, or both. It conceals many things.

There's a notion that floats around academia called the Shadow CV. It's the shadow of the long list of accomplishments that each of us totes around and submits for tenure, promotion, grants, fellowships, awards—a CV of the challenges, struggles, and failures that are invisible to those who aren't in the trenches of your career. While its uses are varied, political, and sometimes contested (Gawuga), it's a way of accounting for the vital junctures and achievements that aren't claimable on annual reports or valorized by the academy. While I'll spare readers an extensive accounting of these shadows that have shaped my career, there came a series of junctures about a decade ago that reconfigured my relationship with disability and then proceeded to rearrange my research agenda, theoretical lens, and eventually my understanding of how I move through the world.

The First Juncture

The truth is indeed that I didn't think much at all about deafness, either personally or conceptually or theoretically, until I was well along the tenure track. I had been recently diagnosed with advanced generative joint disease, which explained the increasing pain issues I was experiencing, and fell into a pit of depression at the thought of dealing with yet another bodily thing. I'd not encountered any information on the ways that pain affects cognition or the ways that being a d/Deaf listener requires extra cognitive effort. I didn't identify as disabled, had no accommodations in place at my job, and thought that my two physical factors—degenerative joint disease in one ankle that causes chronic pain and deafness in both ears—were separate issues, and that the chronic pain was much more of a problem than the deafness (still true in some regards, really). Instead, I was frustrated and increasingly depressed, wondering why I hadn't been able to make the progress I wanted to make on my tenure book, and increasingly worried about my ability to file my case within the constraints of my tenure clock. Finally, one of my senior colleagues and mentors sat me down and told me that I was going to need to file for an extension on my tenure clock sooner rather than later. I was horrified.[1] I met with my chair, then sat down to figure out how to make the argument. Because I hadn't sought treatment for depression and none of us were aware of the impact of chronic pain, the argument had to rest on deafness. And I knew nothing about deafness, other than how to live my life.

Faced with a short deadline for an incredibly high-stakes argument, I reached out to my friend, Tom Wright. Tom and I met in our doctoral program when he joined a

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[1] Nobody who needs extra time on their tenure clock should be horrified to ask for it. And yet, the enculturation of years of being an "A student," of pushing hard to reach goals, or of perfectionism can make it very hard to ask for more time. If you need more time, make the case for it.

cohort that was a few years behind mine. He was also deaf and we eventually discovered that we had remarkably similar stories: meningitis at an early age, mainstream educations, ways of being that didn't center deafness in the ways we negotiated the world. The difference, though, was that Tom had understood the utility of studying deafness far earlier than I and had written a master's thesis on improving deaf literacy expectations. He sent me a file of relevant articles and I searched for other statistics on the number of d/Deaf professors (I knew none then aside from Tom[2]), and I wrote the appeal over the course of one fraught, snowy weekend. It was successful and I gained another crucial year, but it also was the first factor that began to steer me from the research agenda I'd been relentlessly following for a decade.

Writing that appeal brought me face to face with the fact that deafness did in fact deeply influence my life as a professor. Professing requires hearing in very different environments and contexts than my previous career had, or even than being a successful grad student had. Professors are expected to attend meetings that feature rapid-fire, contentious discussions that frequently feature a range of accents from various regions of the US and other countries, and are often held in rooms with "inspirational" architecture that feature high ceilings which draw sound upward and large windows that bounce it around a room in ways that are sometimes unpredictable and always wearing.[3] CART[4] is helpful but lags behind the conversation, making it hard to negotiate turn-taking in real time. In my case, the added cognitive load of parsing all this on top of presenting information or engaging in discussion inevitably results in a migraine after a couple of hours. When coupled with the chronic pain that results from being on my feet for hours of teaching (because I walk up to students to hear what they're saying in my discussion-driven classes) and walking around campus, the result is being cognitively shorted out in ways that significantly lower my ability to process spoken language quickly. I learned that when I let this go on and don't rest sufficiently, I fall down at random moments. Taking care of my bodily needs can mean sleeping 10–12 hours a night for cognitive repair, and that plus my other job duties meant there was no quality mental time left for writing, since early mornings accommodated the course prep that couldn't happen in the evenings.

So I had to admit that deafness was clearly a factor in my life and career, one that imposes unavoidable constraints as well as affordances in the category of d/Deaf gain.[5] But it was still not one to which I wanted to devote an entire research agenda or a journal article or even to write about informally. I merrily planned a post-tenure agenda on

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[2] One of the consequences of passing is the absence of a community that shares your identity. I've written about this in Kennedy, "I Forgot I'm Deaf!" Happily, I've since found other d/Deaf faculty in my field and they are unfailingly brilliant and generous.

[3] *The Mind Hears* (https://themindhears.org), a blog for and by d/Deaf academics, has explored this issue extensively. See, for example, Caicedo, Ana. "Conquering Faculty Meetings (or Not…) When Deaf/Hard of Hearing." *The Mind Hears.* Nov. 19, 2020. https://themindhears.org/2020/11/19/conquering-faculty-meetings-or-not-when-deaf-hard-of-hearing/.

[4] CART stands for Communication Access Real-Time Translation, or live transcription by a human. It is rapidly being replaced by AI transcription, especially in online contexts.

[5] The concept of d/Deaf gain acknowledges deafness as a way of being in the world that offers valuable perceptions and insights. See, Bauman, H-Dirksen L., and Joseph J. Murray. *Deaf Gain: Raising the Stakes for Human Diversity*. U of Minnesota P, 2014 for a thorough exploration.

rhetorics of craft that would allow me to keep building on my reading of western materialist theory and extend my research on rhetorics of technology in a different direction.

The Second Juncture

A year or so later, my friend and colleague Minnie Bruce Pratt[6] commanded me to enroll in her famous Maymester seminar in Creative Nonfiction. This immensely popular class always filled the same morning that registration opened, and it filled with *everyone*: Writing majors in search of summer credit hours, graduate students who wanted to pursue an elective that fostered writing that was very different from most of their seminar papers, and even professors who were using the assignments to draft creative sections of articles or books. Minnie Bruce had been suggesting that I take her class for years and each time, I'd said no, not this year, I'm so tired, and I have to focus on this tenure book. But then the book was in press and one morning I woke up to an email from her that said, in effect, "You are taking this class this year. It will be the last time I teach it before I retire. I have saved you a seat and you will register for this class and you will write about deafness." The latter was news to me, but because I was out of excuses and had learned that it was generally a good idea to do what Minnie Bruce told me to do; I registered and showed up one cold May day, ready to dig in. The two weeks passed in a stream of twelve-hour days crowded with homework, writing, and class, and by the end, I had written eighty pages about deafness.

That was in 2015. I have not written about another topic since.

In the course of banging out those eighty messy pages, I realized how deep my own embodied relationship with technology is, given the fact that I wear hearing aids for an average of sixteen hours each day and have for nearly half a century. Details about hearing aids, audiological testing and audiology offices, the failures of batteries, and other aspects of this technology permeated my writing, which had moved at such a fast pace that it did not include much self-censoring and only paused for reflection during reflective assignments. As someone who is physiologically rather than culturally deaf,[7] I've used these increasingly sophisticated bits of technology on every day of my remembered life to navigate the hearing world, participating in verbal environments each day and never learning sign language beyond the basic alphabet. My careers as a business development specialist or as a professor would still be possible without them, but they would look quite different. I had intuitively known all this before taking Minnie Bruce's class. How could I not? But now I was face to face with it on the page. On many pages.

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[6] Pratt was an internationally recognized poet, activist, and educator who passed away in June 2023. She is much missed.

[7] Cultural Deafness (usually connoted through the capitalized D), describes folks who use sign language, socialize in Deaf communities, and attend Deaf schools such as Gallaudet. Hard of hearing or physiological deafness (usually connoted through the small d) describes folks who largely exist in mainstream environments and may have little or variable contact with cultural Deafness. Indeed, for most of my life I knew no other d/Deaf people.

The Third Juncture

The following spring semester, I taught the first iteration of what would eventually become my Persuasive Robots class. While our discussions began with automata tales from ancient Greece and China, they rapidly moved to modern and then contemporary periods, spending a fair amount of time on issues with robots, AI, or algorithms that we all face today. We began thinking together about cyborgs by watching the RoboCop remake and then reading Andy Clark's *Natural Born Cyborgs*. Clark suggests that far from the sort of visually dramatic human-machine integration depicted in movies like RoboCop, humans are already functioning cyborgs when we perform tasks like externalizing our memory on post-its or calendars. The students and I spent a lot of time discussing whether or not they thought this applied to them, and then I repeated a move I'd made before in my technology seminars: taking my hearing aids out, letting them be passed around the room, and asking the group if I was still their professor without my hearing aids. The usual reactions ensued: big-eyed stares, confusion, stammering. We worked through it, and then I asked them: "Am I a cyborg?" It was the first time I'd thought to ask that question, even of myself. Nobody was comfortable making the claim that I definitely was, not even me. But we kept coming back to it in the following weeks as they wrestled with the construction of the cyborg, and then I kept coming back to it long after the class was over.

Long-term wearers of today's algorithmically driven hearing aids enter into a symbiotic relationship with their aids, particularly with the multiple smart algorithms that separate syllables, reduce background or wind noise, minimize feedback, and in my case, compress high-range sounds down into my lower hearing range. Daily work with any hearing aids, but particularly AI-driven ones, shapes the wearer's abilities at a very deep cognitive level, working with the brain's neuroplastic nature to maintain or rebuild the auditory cortex. Keeping a healthy auditory cortex in turn contributes to mental health on a number of levels by encouraging real-time problem solving as I parse and participate in conversations. Being able to participate in conversations increases the likelihood of engaging in social interaction, which leads to the considerable benefits of being in community and reducing loneliness, which studies have shown are essential elements of flourishing and living a long, healthy life.[8] They also increase the wearer's likelihood of finding romantic partnership and engaging in economic participation, as I've written about elsewhere.[9]

At the same time that the algorithms are influencing these fundamental aspects of my existence, my use contexts and patterns consistently train the multiple algorithms of the aid, teaching them preferred sound levels, commonly encountered speech types, and acoustical dimensions of listening environments. This human-machine collaboration is ongoing, personal, and complex, and any disruption, particularly lengthy ones, will

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[8] For a roundup of recent research on this topic see, among others, Ross, Elizabeth. "What is Causing Our Epidemic of Loneliness and How Can We Fix It?" *Harvard Graduate School of Education*, 25 Oct. 2024, www.gse.harvard.edu/ideas/usable-knowledge/24/10/what-causing-our-epidemic-loneliness-and-how-can-we-fix-it; and *Our Epidemic of Loneliness and Isolation: The U.S. Surgeon General's Advisory on the Healing Effects of Social Connection and Community*. US Public Health Service, 2023. www.hhs.gov/sites/default/files/surgeon-general-social-connection-advisory.pdf.

[9] See, Kennedy, "I Forgot I'm Deaf!"

inevitably have a substantial impact on cognitive health. Consistent hearing aid use has been linked with reduced instances of dementia (Lin and Black), and maintaining an influx of verbal information strengthens the neural pathways needed for language processing, preventing the brain's neuroplastic nature from repurposing those pathways or closing them altogether. This close interdependence effectively transforms the wearer into a cyborg. Which means that I'm a cyborg, as is any disabled body that is directly interfaced with technology.[10]

As disability studies scholar and self-identified cyborg Jillian Weise contends, a disabled human wearing a compulsory medical device is in a completely different category than an able-bodied human who has opted to wear a device like a FitBit or to engage in biohacking. In theory, humans always have the choice to interface with a smart device or not. We decide to purchase and wear a FitBit or Apple Watch for biometric monitoring, possibly to keep an eye on exercise or sleep levels. Maybe your doctor recommended it or maybe you just felt it was a good idea. If you wear it and it enhances your understanding of your body and goals, then it's worked. If it flags a potential issue before it becomes a real issue, then it's a tremendous success. You decide to begin wearing it and you can take it off at any time. For Weise, such wearers are 'tryborgs' rather than cyborgs, wearers who do not truly experience what it means to be interfaced with and dependent on a medical device.

While the distinction between tryborg and cyborg is a useful concept that I rely on in both teaching and scholarship, I believe that the distinction is not as hard as Weise presents, just as the distinction between able-bodied and disabled bodies exists on a spectrum. For many bodies, aging is a central factor in that spectrum: what of the elderly person who lives alone, still gets around fairly well, but wears an Apple Watch because they want to be sure that someone will be notified if they fall? Or who has just a bit of arrhythmia that they want to keep a close eye on? They could ostensibly just take off the watch, but the cost would be higher for them than it would be for a weekend warrior who takes off their FitBit. The cost is still higher for those who interface with a compulsory medical device—that is, a device that is not really optional for maintaining one's body or its functions. Sure, I could decline to wear hearing aids. You probably have a relative who has in fact declined to wear theirs. In practice, though, would you decline a pacemaker that would permit you to live another 20 years? An insulin pump that would save you from organ damage while substantially smoothing out your days and extending your life by decades? A smart prosthetic leg like Weise's? Or, as in my case, a smart hearing aid that helps a physiologically deaf body go about its verbally-focused days as a professor, an engaged community member, a member of a family that only speaks English rather than signs? It's likely that you would not decline many of these things if you needed them.[11]

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[10] For more on the necessity of disability in the definition of the cyborg, see, Kafer, Alison. "The Cyborg and the Crip: Critical Encounters." *Feminist, Queer, Crip*. Indiana UP, 2013; Thomson; Weise.

[11] Hearing aids do have a low rate of successful adoption, although that is changing as people gain more experience with wearing objects such as earbuds throughout their lives. The 30.2% adoption rate of 2015 rose to 39.1% by 2022 (Jorgensen).

Another factor of being a cyborg is facing mundane mechanical problems: when these devices break, the consequences are immediate. “The tryborg is always distanced by metaphor, guesswork, and desire,” writes Weise, who wears a prosthetic leg. “When my leg suddenly beeps and buzzes and goes into ‘dead mode’—the knee stiffens; I walk like a penguin—the tryborg is alive without batteries. When I sound like a bomb in a liquor store, the tryborg hurries on, nonelectric.” When my hearing aid unexpectedly runs out its charge, I miss face-to-face meetings, text my partner instead of talking, and would find it substantially more difficult to teach my discussion-based classes. This isn’t something I necessarily experience as hardship, but rather as an inconvenient facet of regular life: being a cyborg means managing technological breakdown, much like having a body means skinned knees or being in the occasional sling or cast. The ups and downs of cyborg life are a way of being, as foundational disability studies scholar Rosemarie Garland Thomson noted decades ago: “For people with disabilities, such hybridization is often consonant with actual experience [rather than a metaphor]. The disabled person fuses the physically typical with the physically atypical. The disabled body is also often merged with prosthetics such as wheelchairs, hearing aids, or white canes. […] All persons with physical disabilities thus embody the ‘illegitimate fusion’ of the cultural categories ‘normal,’ which qualifies people for human status, and ‘abnormal,’ which disqualifies them. Within this liminal space, the disabled person must constitute something akin to identity”—the identity of the cyborg (114).

One of the most modern core differences between the tryborg and the cyborg is the nature of consenting to algorithmic data collection. Both experience algorithmic data collection, and indeed that may be the entire reason that most folks opt in to wearing fitness devices. In this case, if the wearer wants to stop collection, they could simply remove the device. The cyborg faces a different situation: their consent to integration with the device is driven by essential bodily needs or functions such as insulin or cardiac regulation. The data collected tracks their every heartbeat or the chemical results of every morsel consumed or the noise levels and voice tones of every environment and person throughout the day. Consent is far less meaningful when the wearer doesn’t have a real choice (Tschider, “The Consent Myth”; “Meaningful Choice”).

When I first began wearing a smart hearing aid in 2014, I was both fascinated and horrified by its geolocation functions, even as I benefitted from them.[12] My current AI hearing aids also track my steps and falls; the next generation of hearing aids will also likely be able to track blood alcohol levels through the thin skin of ears. I can revoke consent for some but not all of this data collection and even with consent, the manufacturer doesn’t disclose how and to what extent the information is de-identified, where it is stored and under what security conditions, or when and to whom it is sold.[13] Because of the high costs of a set of AI hearing aids—my current ones cost $5,000, paid for with insurance and research funds, and need to be replaced every four to five years—

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[12] See Kennedy, Krista. “Designing for Human-Machine Collaboration: Smart Hearing Aids as Wearable Technologies.” *Communication Design Quarterly Review*, vol. 5, no. 4, 2018, pp. 40–51, https://doi.org/10.1145/3188387.3188391.

[13] See Kennedy, Krista, et al. “Balancing the Halo: Data Surveillance Disclosure and Algorithmic Opacity in Smart Hearing Aids.” *Rhetoric of Health and Medicine*, vol. 4, no. 1, 2021, pp. 33–74, https://doi.org/10.5744/rhm.2021.1003.

the data collected is assuredly almost entirely based on white collar and middle-class or better environments, thus ensuring that even if the costs do eventually fall within the reach of working class wearers, the R&D will not have been based on the noisier work environments that they very likely encounter.[14]

For these and other reasons, being a cyborg carries risk of harm and is never outside the legislative realm and therefore the political realm. This has been true since the advent of smart prosthetics and is increasingly true today. The inability to revoke consent to data collection poses new risks in the era of DOGE,[15] when data is being collected, consolidated, and weaponized. If I attend a protest while wearing my hearing aids, will that geolocative data eventually be collected? Will it imperil me or others associated with me? A year ago, it wouldn't have occurred to me to worry about this particular aspect; now, the future implications are much hazier.

Thinking through these ethical and legal dimensions of cyborg life has transformed my research agenda: where before my fascination with data ethics focused on information compendiums, now I'm wending my way through questions about the ethics of algorithmic data collection in compulsory medical wearables. It's also required that I reconsider the ethics of my theoretical apparatus and broaden that lens. The ways that Western new materialism or object-oriented ontologies (OOO) apolitically flattens agency, rendering humans, technological components, and amoebas (among other things) as equal agents, became less useful as my agenda later turned to considering disabled bodies and their direct interface with technologies. As generations of disability studies scholars have argued, the disabled body has long been culturally constructed as having little or no political or economic agency (see, Burch and Rembis; Rose; Schweik; others) and assistive technologies carry with them very different rhetorical implications than popular gadgets. Consider, for example, the rhetorical differences between a motorcycle and a mobility scooter, and the different ways that those technologies interact with humans, funding, politics, and cultural constructions of agency. In search of materialist theory that accounted for agentic difference, my theoretical reading has taken a turn into feminist materialist theory and, lately, toward indigenous ways of understanding animacy and reciprocity. This literature is transforming not just my scholarship but also the ways I consider and relate to the animals and other nonhumans in my house, community, and the wider world. Ethically considering the entangled relationship between cyborg bodies and technologies has also led me to an interest in autoethnography as a rigorous research method (see, Kennedy and Long).

These questions about the cultural construction of the cyborg and the ethics and risks of algorithmic data collection have led my legal studies collaborator, Charlotte Tschider, and I to think extensively about a string of related questions: whether or not cyborgs should be a protected class, given the enhanced risk of harm they face; what

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[14] See, Kennedy, Krista, and Noah Wilson. "The Banality of Digital Aggression: Algorithmic Data Surveillance in Medical Wearables." *Digital Ethics: Rhetoric and Responsibility in Online Aggression*, edited by Jessica Reyman and Erika Sparby, Routledge, 2019, pp. 214–230.

[15] DOGE is the U.S. Department of Government Efficiency, launched at the beginning of Trump's second term. The department's ostensible goal has been broad cost cutting, but it has also undertaken unprecedented collection and consolidation of citizens' data.

appropriate privacy doctrine might involve for wearers of compulsory medical devices, and what ethical patient (and provider) education concerning algorithmic data collection might look like.[16] We're currently at work on a co-authored book titled *Cyborg Health: The Law and Ethics of Artificial Intelligence in Health Care.* This work, along with daily life in the professoriate, has also led me to sort through the ways my own cyborg life has developed over time and to explore the intersection of education, technology, deafness, and chronic pain. This trajectory has resulted in creative publications that are quite different from the academic writing that has been my bread and butter for many years: an essay,[17] a poem,[18] and that eighty pages that I drafted in Minnie Bruce's class has evolved into a creative nonfiction book project that I'm currently calling *Attuning: A Deaf Cyborg Education*.

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[16] See, Tschider, Charlotte A., and Krista Kennedy. "Legal Issues in Cybernetics and Robotics." *The Law of Artificial Intelligence and Smart Machines*, edited by Theodore F. Claypoole. American Bar Association, 2019, pp. 281–301; Tschider, Charlotte A., and Krista Kennedy. "Data Discrimination: The International Regulatory Impasse of AI-Enabled Devices." *Legal, Social, and Ethical Perspectives on Health and Technology*, edited by Motahareh Fathisalout-Bollon and Anna Berti Suman, Presses Universitaires Savoie Mont Blanc, 2020, pp. 147–168.

[17] See, Kennedy, Krista. "Being Seen Deaf, or, Pools as Borders." *Tendon Magazine*, Johns Hopkins Center for Medical Humanities and Social Medicine, 2019. https://hopkinsmedicalhumanities.org/tendon-magazine/being-seen-deaf-or-pools-as-borders/.

[18] See, Kennedy, Krista. "Being Ecological | Ecological Being." *Wordgathering: A Journal of Disability Poetry and Literature*, vol. 16, no. 2, 2022, https://wordgathering.com/vol16/issue2/manifestos/kennedy/.

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