

This article was originally published in the journal "Journal of Interdisciplinary Voice Studies" by "Intellect" and the attached manuscript version is provided by the Max Planck Institute for the History of Science for non-commercial research. The final publication is available via

https://doi.org/10.1016/j.hm.2017.09.004

Please cite as: Sterne, Jonathan (2019)."Ballad of the Dork-o-Phone:
Toward a Crip Vocal Technoscience." *Journal of Interdisciplinary Voice*Studies, 4 (2): 179-189

Please note that images included in this publication may be subject to copyright and republication requires the permission of the copyright holder.

VOICING

JONATHAN STERNE

McGill University

Ballad of the dork-o-phone: Towards a crip vocal technoscience

ABSTRACT

This piece elucidates the related politics of vocal impairment and vocal prosthesis through a close analysis of the Spokeman Personal Voice Amplifier, a.k.a., the dork-o-phone. Drawing from voice theory, disability studies and phenomenology, I present an analysis of the dork-o-phone in use and challenge the boundaries between disa-bility and impairment. In the process, I also show how vocal impairments and proth-eses ultimately give the lie to the idea that voices are self-sufficient and can exist without supplementation.

This work is licensed under Creative Commons Attribution Non-Commercial (CC BY-NC). To view a copy of the licence, visit https://creativecommons.org/licenses/by-nc/4.0/

Since waking up from a surgery in 2009 with a paralysed vocal cord, I have been living a decade-long experiment with my voice. In normal conversation, I may not present as disabled at all. Like certain smokers and singers, when my voice is 'bad' it can sound even 'better' to others – richer, more textured,

KEYWORDS

disability impairment prosthesis phenomenology assistive technology intermateriality

with more grain and more body. But my conditions of vocal life – talking for fun and for work – are more difficult than they were before November 2009. I wear out and blow out my voice more easily; I exert more energy in speaking, tiring me out; I lose control of my vocal tone; I have had to relearn the tech-nics of public address to suit a different body and constantly fight with old habits; and let us not speak of swallowing. I experience my voice as defective, but not fully broken. It is impaired because it is a faculty that *does not work right*. Yet it is also not clear that this impairment qualifies me as a person with a disability. Although I live it every day, I cannot give a precise account where the line between vocal impairment and vocal disability lies. Or rather, that line moves.

Years of living around disability, working with it and then reading and teaching about it have muddied the water. The social model of disability has been surprisingly unhelpful with thinking through impairment, which in many cases gets relegated to a kind of material substrate for the social construct that is disability, echoing other binaries that have been problematized, like sex/gender and epidermal colour/race. Theories like complex embodiment or the political-relational model of disability bring realities of bodily experience that are outside discourse - like pain - back into the fold (Siebers 2008; Kafer 2013). But for all their materialism, they have not yet offered a critical theory of bodily malfunction that would operate both within and without the cate-gory of disability. Alison Kafer (2013: 8) writes that 'drawing a line between impairment and disability makes it difficult to explore the ways in which notions of disability and able-bodiedness affect everyone, not just people with impairments'. As a phenomenon composed of both bodily and cultural reality, then, impairment is not normal, not necessarily disabled. It shares with disabil-ity theory the critique of norms and ableism. But it departs from disability theory in terms of its political motion. Many of the people whose experience might be addressed by disability theory reject the political category of 'disa-bled' for themselves (Kafer 2013: 14). Impaired is not a political category to which people belong – it is more like a description of malfunction or maladap-tion, whether from the point of view of a subject judging its own faculties - as in, my voice doesn't work right – or from the point of view of a person judging another person.

All this is a way of saying that my condition has 'theoretical implications'. For one, I am glad that in *The Audible Past*, I argued against the normative idea that a subject's voice defines it as unique or human (or worse, having a soul), taking Derrida's side in the critique of the metaphysics of presence (Sterne 2003: 17–22, 342–43; see also Derrida 1973: 70–87). Too often writers have treated the voice as a self-same phenomenon, a given of subjectivity, a ground for uniqueness and worldly presence. Derrida calls this phenomenon a meta-physics because it operates as a kind of spiritualism, 'even when it professes to be atheist' (1973: 77). More recently, Meryl Alper (2017: 2) has considered the ways in which disability amplifies and refracts the ideology in which speech serves as 'a powerful metaphor for agency, authenticity, truth, and self-representation'. While philosophers still argue that the subject's uniqueness lies in and is evidenced by *its* or *the* voice (e.g., Cavarero 2005; Dolar 2006), I now live in a body where my voice and its relationship to my subjectivity vary day by day, and sometimes by the hour. If a single subject like me has *voices* how can there be a single 'the voice' to theorize?

But I also live in an ideological world where the metaphysics of pres-ence – and the ideology of the voice as a psychoanalytic 'object' – does its

work whether or not I choose to believe in it. Thus emerges one of the core questions for a political phenomenology of vocal impairment; what happens to a subject when something that was stable becomes a variable, and that something is one of the mechanisms through which others infer the subject's subjectivity? Phenomenology loves its foundations, its tables, its transcenden-tal pretentions. As Sara Ahmed has shown, those foundations and tables are luxuries that come from somewhere, and that indicate points of power and privilege (2006: 43-44). I have the material privileges of the philosophers (and better gear), but not the agential luxury that affords the quiet contemplation of a table, a room or a blindfold to build my account of my own faculties and the access they provide to the world. A political phenomenology of impair-ment is therefore phenomenology minus one, minus unity, minus peace, minus a stable beginning. It is a phenomenology plus power, plus gear, plus policy – but only because those things were already there in the first place, just not recognized in the canonical phenomenologies (Berland 1984; Young 2005; Kuppers 2017). It must be founded on ambiguities, contradictions, frag-ments. webs: a subject who is somewhere and someplace, unsure of itself, a subject that oscillates between selfassertion and self-abrogation, between agential self-assertion and claiming its radical dependency and situatedness. Yet, as Simi Linton (1998: 139) writes, 'the explication of impairment should in no way be confined to experience that has a negative valence. A phenom-enological approach to the study of impairment will yield [a] rich array of descriptions of experience'. To be a phenomenology, and not just a recounting of experience, it must also reveal a rich array of conditions of possibility – and impossibility – for the experiences that it describes. A political phenomenol-ogy of vocal impairment thus triangulates from the interiorities and exteriori-ties that constitute the field of experience, and the conditions of its possibility. To accomplish all this, I must turn to institutions, gear and other people.

Out in the world, the thing that marks me most as a person with a disabil-ity is my attempt to compensate for it in institutional contexts. In this way, I am not very different from others with physical disabilities, and increasingly, certain mental or intellectual disabilities. My attempts to influence my envi-ronment through asking others for help, for instance, in the rider I provide for my talks, or in my requests for a stool on which to remain seated while lecturing in a class, mark me out as different and require me to declare that difference in relation to ableist environments that are putatively designed for 'everyone' who would have cause to use them. In terms of self-concept and self-experience, I am somewhere between impaired and disabled, or some-times both or neither. In terms of the perceptions of others, Hegel and his followers tell us that we do not get to make that choice; the politics and phenomenology of disability have an irreducible relationship to the politics of recognition.

A prosthesis also marks me out as different. In seminars and sometimes at parties, I use a small personal portable speech amplifier that I have come to call the 'dork-o-phone' (see Figures 1–4). Its real name is the Spokeman Personal Voice Amplifier, which is either a misuse of 'spokesman' or more likely an unsuccessful riff on 'Walkman', which, it must be noted, was not named the 'Listenman' or 'listen, man' – probably for good reason (see Hosokawa 1984). So rather than signifying the mastery of speech or the coolness of mobile music, the name represents the social oddity of speech amplification itself. The Spokeman is one example in a genre of such devices, a genre without a shared name or a defining brand, but whose names all point to a weird grey



Figure 1: Dork-o-phone top view with power, LED and mic in. Photo by Carrie Rentschler, used with permission.



Figure 2: Dork-o-phone rear view, with charging instructions. Photo by Carrie Rentschler, used with permission.



Figure 3: Dork-o-phone rear interior, showing wear, corrosion from aged rechargeable batteries and a hidden gain switch. Close to half the interior space is taken up with rechargeable AAA batteries; a 'power' switch sets the gain for the microphone. Higher gain is louder but is more prone to feedback. Photo by Carrie Rentschler, used with permission.

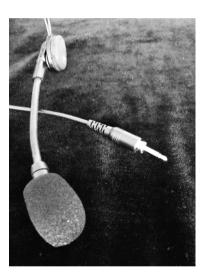


Figure 4: Dork-o-phone microphone in windscreen, 3.5mm mono plug. Photo by Carrie Rentschler, used with permission.

area of voice and techné: speech amplifier, voice amplifier, personal public address system, personal voice amplifier; Chattvox, Amplivox, Sound Pocket, Zavox, Zoweetek, Voicebuddy, Minibuddy, Soundbuddy, Zygo and so on. They are marketed to people like me, with vocal impairments, but a quick Internet search will also see them depicted in pictures of happy business people, teach-ers, exercise instructors and tour guides.

My dork-o-phone is essentially a transistor radio with no radio, attached to a small wearable microphone, that lives inside a vinyl pouch that can be hung around my neck. I own two Spokemans (Spokesmen? No, two

dork-o-phones!), each of which cost about \$300US total, although it seems that the prices have dropped. I am not sure why it costs that much, given what transistor radios go for these days. It could be an artefact of how medi-cal insurance works in the United States, but it could also be a question of the economy of scale (there is not a huge user base) combined with the small-ness and frankly impressive personal service of Luminaud, the company from which I bought them. I have had both my units repaired at least once. They are clearly not designed for the abuse that I inflict on them, although at the same time I have developed a respect for their durability and ruggedness. Other devices can be clipped to a belt, or are built into belts themselves, or can be laid out on a table. The simple question of positioning a speaker on the body raises the question of under what conditions a person has a voice to speak with and from where it truly comes (Alper 2017: 2). None of the waist-level or table-top speech amps worked well for me. Waist-worn tech-nologies go with the American predilection for standing while engaging in public or group speech, and they are not designed for interpersonal conversa-tion. For one thing, I am fat, and as you might imagine, all the people in the pictures selling these devices are skinny. For another, I have been known to speak while sitting down, and a voice coming from under the table is not an ideal prosthetic scenario. Ditto for standing close together at parties or sitting next to someone at a sporting event. The Spokeman simply worked best for me compared with other devices. The microphone that comes with it could be worn in multiple positions and could be wrestled onto my outsidethe-standard-deviation head. Its position around my neck and on a lanyard also makes it easy to manipulate and gives me a tiny supercrip power: I can speak in directions that I am not facing. For instance, once at a loud sporting event. I was able to hold it up to a friend's ear to vell in their ear while keeping my eves fixed on the game. Human mouths and eyes usually move together. I may also have been a bit preconditioned: the dorko-phone was not that far from the first Speech Amp I ever used, a loaner from my speech therapist made up of a speaker and a microphone that could be carried around, which may or may not originally have been marketed as a speech amp (see Figure 5).

In its black fake-leather-looking vinyl pouch, the dork-o-phone is a kind of reverse-fashion statement, possibly 'cool' in a crip-tech way, or a few steps beyond 'chunky jewelry' into 'Flava Flav Clock' territory (look it up, kids), but not cool in a high-tech way. This is why I call it *the dork-o-phone*. It is not all that dorky, but any coolness that it has is off-key, just as calling anything an 'o-phone' today conjures up visions of a high-tech future that belongs to the past, like vocoders in R&B music (Weheliye 2002). Prosthetic fashion – and by extension, the owner's affective relationship with the device – has often been the *last* concern for designers (Pullin 2009: xxxiii, 16–17, 41, 235). Where it has been a concern, it has been more about employing normative ideas of simula-tion or stigma avoidance, as in the mimetic appearance of prosthetic limbs, or the endless quest to miniaturize electronics for hearing aids (Mills 2011). Yet any user of a prosthesis can attest to its deep affective resonance both for the user and for others around it. As Vivian Sobchack writes, the fluctuating line between 'the' and 'my' makes for all sorts of give and take around meaning. In her case,

there is significant figural movement from metonymy to synecdoche, from *the* prosthetic viewed abstractly to *my* prosthetic leaning up against the wall near my bed in the morning to *my leg*, which works with the other one and enables me to walk.



Figure 5: Realistic Micro-Sonic Speaker Amplifier and Sennheiser Dynamic Microphone, aka, 'The Loaner'. This may have originally been a kludge, similar to those described by Bess Williamson (2019). Photo by the author, used with my own permission.

In my case, the dork-o-phone assimilates into my voice and action. Let us follow Sobchack's arrow of figuration: the voice as an impossible abstraction, my dork-o-phone charging up on my desk, my voice. What makes the dork-o-phone noticeable, and sometimes uncanny, is its proximity to the physical generation of sound in my diaphragm, throat and mouth. This is its defin-ing techno-cultural feature. It audibly and visibly marks my vocal system as in need of supplementation when it is supposed to be self-sufficient. It is weird because it is both a small distance from where it is supposed to be and too close to where it is supposed to be. This also marks its difference from Sobchack's leg: her leg is where her leg is supposed to be, whereas the dork-o-phone doubles the point-source location of my voice, which is now emanating from my mouth and from a speaker on my chest. (In honour of Derrida, please refer to this process of techno-vocal doubling as dork-o-phone.) The prosthe-ses present themselves differently, as subjects we adjust to them differently and our beholders behold them differently. Walking and speaking are both operations of faculties, but the diminishment of a leg does not invoke ques-tions about the metaphysics of presence; it asks after the unity of the body. Moreover, absent the prostheses, Sobchack's disability is visible to others. My impairment is audible... sometimes (see Figure 6).

On its own, voice amplification itself is not that weird for people in my social world: they have all experienced public address systems, microphones, speakers and are daily serenaded by a host of voices whose bodies are far away from their sites of resonance, even to the point of being sung to by the dead, or by purely synthesized bodies (Stanyek and Piekut 2010; Michaud 2017).



Figure 6: Dork-o-phone in its not-too-fashionable case, with lanyard attached. Photo by Carrie Rentschler, used with permission.

Semiotically, my dork-o-phone is closer to artificial limbs, hearing aids and cochlear implants than it is to eyewear. It raises questions for the uninitiated, rather than presenting itself as a fashion accessory (although glasses used to function in the same way). For example, an arrival at one of our house parties in 2011 looked me up and down right after I opened the door to greet him, then smiled, pointed and asked 'what the fuck is that?' I offered the shortest explanation that I have been able to muster – glasses for my vocal cords ('a cane for my voice' works well too) - and within minutes we were talking like nothing was out of the ordinary. This is how the assimilation works: pros-thesis is noticeable at first, but because the dork-o-phone hangs around my neck on my chest, my prosthetic voice is physically close to my physical voice, and over time the two blend into one. The principle upon which it works is not that different from placing dialogue on a centre channel in film sound (or the workings on monoaural sound): voices or sounds seem to be coming from particular points on the screen even when they are not. Michel Chion (1994: 69-73) describes this phenomenon as images 'magnetizing' sound in space, and frames it as a part of what he calls the audio-visual contract, a specific kind of suspension of disbelief, where sounds are causally 'mapped' onto images even though their real relationship is a much more tangled web of causality. In the case of the dork-o-phone and my voice, it is more like an audio-visual contraction of sonic space, where the difference between the voice coming out of my mouth and the voice emanating from a speaker on my chest cease to matter. Once the social question that the dork-o-phone

presents is answered – 'what the fuck is that?' – it retreats into my voice. It simply becomes part of me in the course of social interactions. Social magnet-ism moves in the opposite direction of the magnetism exerted by the magnet in the dork-o-phone's speaker.

It can also disappear in social contexts where I am being ignored. My first public outing with it was a crowded exhibition at the Musée des Beaux Arts in Montreal on the 27 March 2010. According to my notes, and my blog entry after the visit, my companion Carrie and I registered no stares or reac-tions at all. People were minding their own business. While a body-mounted speaker stands out, a head-mounted microphone may not stand out. I was just another dorky guy with a Bluetooth headset, perhaps anticipating an urgent call that was definitely not destined to arrive. But this is the exception rather than the rule. The dork-o-phone feeds back mightily in restaurants, to the point once that it interacted with a PA system, overwhelmed the piped in music and silenced a 100-odd people for a moment; it performed an act somewhere between guerilla, sitespecific performance art and those cheesy undergraduate sociology experiments where the experimenter does some-thing awkward in an elevator and then notes other people's reactions like it is a controlled experiment or some other kind of social science. There was a moment of confusion, followed by the termination of the feedback, and back to meals and chatter. This is particularly unfortunate for me, since I live in a city where fashionable restaurants are very loud. But even in class, I have to be careful: the dork-o-phone feeds back when I hold an object in front of my chest because of the close proximity between the microphone and the speaker, and the signal gain structure within. The class of object as 'book' or 'menu' is less relevant than its length, width and position. I live with it in classrooms and at talks where I am in charge, but this means that I probably use it less at restaurants and parties than I would if it had better feedback rejection.

If I give an academic talk with the dork-o-phone, say to a small seminar, and do not explain it, it also has a profound effect. Since I am often invited to talk about sound (and often oblige my hosts), the audience reads my unex-plained use of the dork-o-phone as a profound comment on the mediality of the voice. If I choose not to explain the speaker-box hanging from my neck, it becomes part of an impressively recursive phenomenon: my presence at the front of the room or the end of the table signifies sound and media theory, and perhaps the eccentric white male professor stereotype, and as a result, the dork-o-phone actually does effect a metacommentary on the mediality of the voice, as if all by itself, without me saying a word about it, all because of how signifying chains and academic speech acts work. Performatively, this scenario is somewhere close to Stanyek and Piekut's (2006: 19) concept of rhizophonia: 'all sounds are severed from their sources - that's what makes sound sound. Rhizophonia is our term for taking account both of sound's exteriority and the impossibility of a perfect identity between sound and source'. In the context of sound scholar Jonathan Sterne giving an academic talk on sound while wear-ing the dork-o-phone, as a speech act, it announces the fundamental impossibility of perfect identity between body and voice. Conversely, if I come out as a speaker in need of supplementation at the beginning of a talk, that has a whole other apodictic effect, moving us from the abstract philosophy of the voice to the technological and environmental politics of disability, which can range from meditations on stigma (dork-o-phone versus evewear) to medita-tions on the value of interdependence and collaboration in the construction of

experience (when I have audience members read out long quotations at my talk). In the context of public performance with the dork-o-phone, my voice demands commentary. It is an 'intermaterial vibrational practice' (Eidsheim 2015: 11, 156) that enfolds my body, the room and its listening subjects, the dork-o-phone's transducers and the social and technical prescriptions of the speaking situation. But it does more than that, because voice out of place, whether on my chest, unexpectedly emerging from an oddly placed speaker or bouncing around under water instead of in the air, reveals the intermateriality of all voices and all subjects.

Aimie Hamraie has defined 'crip technoscience' as a process through which 'misfit disabled users, for whom estrangement is already a pervasive experi-ence, draw on the sensibilities of friction and disorientation to enact design politics' (2017: 103). A focus on impairment forces disability theory to consider what happens to its theoretical reach in its murky margins, and extends its critique of norms beyond the obviously crip world. At the same time, the lived experience of impairment is a shuttling between ability and disability. A vocal impairment both estranges me from my own voice and binds me with it in new ways. A prosthesis like the dork-o-phone is supposed to have a compen-satory dimension, allowing me to focus on a task, rather than my voice, when speaking through it. However, in actual use, the dork-o-phone both estranges me from my own voice again and unifies itself with me on a different plane. The ways in which this estrangement and unification play out can be different for me, and for every person with whom I share a speech situation. This is why I call my vocal condition experimental: every day, every encounter is an experiment where my voice, once a constant in my selfconception, is now a vari-able. And the dork-o-phone has been at the centre of an experimental vocal practice where I still live inside ideologies: the ideology of ability, which says that ability is preferable to disability, and the metaphysics of presence, where I operate a voice as if it were the carrier of my intent, as if it were my soul and will spilling forward out of my mouth with my breath. Like all ideologies, the ideology of ability and the metaphysics of presence at once create real mean-ing for the subjects who experience them, but they also mask other constitu-tive dimensions of relational experience. Like all voices, my voice is constantly redirected, shortcircuited, negotiated, challenged. The difference is that I now must attend to that fact, explicitly and tacitly, from moment to moment. And in interacting with me and my dork-o-phone, the transparency, givenness and agency of 'the' voice as a universal phenomenon are challenged for others. This is the beginning of a crip vocal technoscience: every speech act involving my voice raises anew the relationship between intent and expression, interiority and exteriority. As speech acts involve others, they refract these questions and add layers of agential complexity. And there at the centre is the dork-o-phone: a quirky box that sounds one way and signifies another, a prosthesis that gives the lie to the still-pervasive belief that voices can exist without supplement.

ACKNOWLEDGEMENTS

I would like to thank Carrie Rentschler, Jessica Holmes, Nina Eidsheim, Burç Kostem and the anonymous reviewers for their comments on this essay

REFERENCES

Ahmed, Sara (2006), Queer Phenomenology: Orientations, Objects, Others,

- Alper, Meryl (2017), Giving Voice: Mobile Communication, Disability, and Inequality, Cambridge: MIT Press.
- Berland, Jody (1984), 'Contradicting media: Towards a political phenomeno-logy of listening', *Border/Lines*, 1:1, pp. 32–35.
- Cavarero, Adriana (2005), For More Than One Voice: Toward a Philosophy of Vocal Expression, Stanford: Stanford University Press.
- Chion, Michel (1994), *Audio-Vision: Sound on Screen* (trans. Claudia Gorbman), New York: Columbia University Press.
- Derrida, Jacques (1973), Speech and Phenomena and Other Essays on Husserl's Theory of Signs (trans. David B. Allison), Chicago: Northwestern University Press.
- Dolar, Mlanden (2006), A Voice and Nothing More, Cambridge: MIT Press. Eidsheim, Nina Sun (2015), Sensing Sound: Singing and Listening as Vibrational

Practice, Durham: Duke University Press.

Hamraie, Aime (2017), Building Access, Minneapolis: University of Minnesota Press.

Hosokawa, Shuhei (1984), 'The Walkman effect', Popular Music, 4, pp. 165-80.

Kafer, Alison (2013), Feminist, Queer, Crip, Bloomington: Indiana University Press.

Kuppers, Petra (2017), 'Dancing disabled: Phenomenology and embodied politics', in R. J. Kowal, G. Siegmund and R. Martin (eds), *The Oxford Handbook of Dance and Politics Vol. 1*, Oxford: Oxford University Press.

Linton, Simi (1998), Claiming Disability: Knowledge and Identity, New York: NYU Press.

Michaud, Alyssa (2017), 'No one in the spotlight: Holographic performance, East and West', paper presented at the *International Musicological Society Quintennial Conference*, Tokyo, 19-23 March.

- Mills, Mara (2011), 'Hearing aids and the history of electronics miniaturization', *IEEE Annals of the History of Computing*, 33:2, pp. 24–44.
- Pullin, Graham (2009), *Design Meets Disability*, Cambridge: MIT Press. Siebers, Tobin (2008), *Disability Theory*, Ann Arbor: University of Michigan Press.
- Sobchack, Vivian (2004), Carnal Thoughts: Embodiment and Moving Image Culture, Berkeley: University of California Press.
- Stanyek, Jason and Piekut, Ben (2010), 'Deadness: Technologies of the inter-mundane', *The Drama Review*, 54:1, pp. 14–38.
- Sterne, Jonathan (2003), *The Audible Past: Cultural Origins of Sound Reproduction*, Durham: Duke University Press.
- Weheliye, Alexander (2002), "Feenin": Posthuman voices in contemporary black popular music', *Social Text*, 20:2, pp. 21–47.
- Williamson, Bess (2019), *Accessible America: A History of Disability and Design*, New York: New York University Press.
- Young, Iris Marion (2005), On Female Body Experience: 'Throwing Like a Girl' and Other Essays, New York: Oxford University Press.

SUGGESTED CITATION

Sterne, J. (2019), 'Ballad of the dork-o-phone: Towards a crip vocal technos-

cience', *Journal of Interdisciplinary Voice Studies*, 4:2, pp. 179–89, doi: 10.1386/jivs 00004 1

CONTRIBUTOR DETAILS

Jonathan Sterne is James McGill professor of culture and technology at McGill University. He is the author of MP3: The Meaning of a Format (Duke, 2012), The Audible Past: Cultural Origins of Sound Reproduction (Duke, 2003), and numer-ous articles on media, technologies and the politics of culture. He is also editor of The Sound Studies Reader (Routledge, 2012) and co-editor of The Participatory Condition in the Digital Age (Minnesota, 2016). He is currently working on two books: Diminished Faculties: A Political Phenomenology of Impairment and, coau-thored with Mara Mills, Tuning Time: Histories of Sound and Speed. Web address: http://sterneworks.org

Contact: Department of Art History and Communication Studies, McGill University, 853 Sherbrooke St. W., Montreal, QC H3A 0G5, Canada.

E-mail: jonathan.sterne@mcgill.ca

https://orcid.org/0000-0002-6618-0898

Jonathan Sterne has asserted his right under the Copyright, Designs and Patents Act, 1988, to be identified as the author of this work in the format that was submitted to Intellect Ltd.