

MACHINE LISTENING, UNSETTLED:
AUTHORITARIAN DIFFUSION, PRIVACY, AND INDIGENOUS TECHNIQS

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Abstract

Technologies are repeatedly pushed onto others, or diffused, without listening or consultation in ways that reinforce inequalities, entrench problems of surveillance and disrupt sociotechnical milieus. In this unilateral process, the diffusion of innovations (Rogers 2003) is rationalized because certain technical practices and orientations are commonly misrecognized as non-technical, and thus, positioned to receive a technofix. This dissertation theorizes this pattern in terms of *authoritarian diffusion* to analyze how technologies and infrastructures are imposed, adapted, and resisted by groups according to their position within distinct sociotechnical milieus. Building on frameworks of digital authoritarianism and Mumford's theorization of "authoritarian technics" (1964), this dissertation does not focus on the diffusion of norms and practices from authoritarian regimes, but instead, analyzes how authoritarian logics are extended through technological practices and structures. While authoritarian diffusion involves a generalizable incapacity to listen, I argue that milieus anchored by listening techniques are disproportionately exposed to this process because listening is commonly misinterpreted as a non-technical practice. In response, the dissertation centers three high-stake contexts that are exemplary of this problem: AI apps applied in medical and non-medical settings that analyze voices for medical and wellness inferences (Chapter Three); a crisis counselling platform that updates practices of active listening through datafication and automation (Chapter Four); and the colonial history of salvage ethnography that shows how early sound recording technology was used to preserve the oral culture of Indigenous peoples alongside fundamental misrecognition of the political authority and *cosmotechnical* (Hui 2014) orientation of Indigenous listening practice (Chapter Five). As a corrective to this gap between technology and listening articulated by authoritarian diffusion, the dissertation develops a series of theoretical, empirical, and creative interventions into the field of machine listening—expanding its utility as an epistemic hinge for the systematic study of listening techniques within wider technical systems and uneven processes of exchange. Through this inquiry, a range of cosmic and moral-technical orientations to listening are centered to foster a space of dialogue between Indigenous and Western listening milieus. In doing so, the dissertation reframes privacy as a precondition for listening practice by demonstrating how authoritarian diffusion erodes the spaces of withdrawal necessary for pluralistic forms of cosmotechnical activity, innovation, and exchange.

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I wrote this dissertation from my home in Guelph, Ontario on Treaty Three Territory, also known as the “Between the Lake Purchase”. Guelph is on the treaty territory of the Mississaugas of the Credit (Michi Saagiig Nishnaabeg) and falls within the Great Lakes region covered by the Dish with One Spoon Wampum Belt Covenant held between the Anishinaabeg and Haudenosaunee. I am Métis and belong to the Georgian Bay and Environs Métis community surrounding Penetanguishene through kinship ties from my mother. My Métis ancestry stems from Red River through the Dusome-Clermont family line. My community came to Penetang in 1828 from Bootaagan-minising (Drummond Island) in Lake Huron following the War of 1812 after the island was ceded to the United States. Penetanguishene or ‘the place of white rolling sands’ in Wendat is the traditional homeland of the Huron-Wendat and the contemporary treaty territory of the Anishinabek people known as the Chippewa Tri-Council.

Michif-Fransè:

Chu Métis dla kawmunoté dla bé Jawrjyènn pi lé zanzviroon dzu koté dma mér Giselle Forget. Ma rasinn Métis è dla Rivyèr Rouj èk la lign dfamiy Dusome-Clermont. Mé ansèt fu déplasé an 1828 pi yon imigré a Penetanguishene dlil Drummond dzu lak Uron. Su lkawté dma mér, jé bokou dla paranté a Penetanguishene èk lé Forget, Maurice, Marchand, pi Laurin. Mon gran mawnonk René Laurin yé tinpawrtan dan ma vi pi ansègn su lé Métis dan la kawmunoté. Y paws bokou dson tan a sovè lé lang Métis.

Heritage Michif :

Michif niiya Georgian Bay ita alaantoor kawweekihk ooshchi la maaamaa Giselle Forget avik la famii rasinn miina aen ishwahkohtoohk la Rivayr Roohz miina Dusome-Clermont. Nil Drummond ishi Penetanguishene 1828 papaambichewak. La paraanti mischayt oota Forget, Maurice, Marchand meena Laurin. Moon noonk Rene Laurin li praynsipaal didaan la vii niiya, wiiya la laang Michif kishinamakew meena pimachihew.

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Chapter One: Introduction: Machine listening, Unsettled

In September 2022, OpenAI released Whisper, an open-source model for automatic speech recognition in dozens of languages, including te reo Māori and Ōlelo Hawai‘i – two endangered Indigenous languages. Yet the provenance of the training datasets was quickly questioned by Papa Reo, an Indigenous team developing an AI platform to build speech recognition and natural language processing tools for Indigenous language revitalization. As the team pointed out, the audio data it used was likely scraped from web platforms like YouTube without community consent (Mahelona et al. 2023). While the scraping of copyrighted materials and unpaid online labour to train generative AI systems has drawn legal and ethical challenges, the extraction of Indigenous linguistic data from Elders and language keepers reveals ongoing colonial logics of appropriation and erasure that violate Indigenous self-determination rights. The Whisper model, in other words, is designed to accommodate Indigenous languages—gesturing towards technological inclusivity—while silencing Indigenous authority over their languages.

The diffusion of technical systems is bound up in political dynamics and complex relations of power. I follow Leroi-Gourhan in understanding diffusion as a seemingly straightforward process: the sharing or expansion of some technical innovation or “the ongoing development of a whole setup” (2023, 140) from one group to another. Based on this interpretation, a politics of diffusion can be expressed in many ways, as through military action, colonization, or the entrenchment of infrastructural dependencies.¹ Diffusion can involve one group taking hold of another, both from the outside and inside as instantaneous (and disruptive) assimilation is compelled. Simply put, one group can be pressured to appropriate the innovations of another group either through voluntary adoption or coercion. It is in this sense that I find theories of digital colonialism (Kwet 2018; Couldry and Mejias 2019) most convincing, insofar as the expansion of digital systems into the majority world involves both a data grab from low-resource communities and nations and an assertion of control over the conduct of those people’s lives and cultures, through surveillance, algorithmic nudging, and the entrenchment of manufactured dependencies. It is this expression of power that is at play with the Whisper model and other AI

¹ For instance, a politics of diffusion is laid bare as Canada and the European Union grapple with long-term over reliance on software infrastructure from US tech giants who ultimately answer only to an increasingly adversarial American government without paying heed to matters of digital sovereignty (Rudolph 2025).

infrastructures which claim authority over entire peoples' languages, voices, stories—and by extension—worlds.

The focus of this dissertation involves questioning a logic of *authoritarian diffusion* that is so “underdimensioned” (Mumford 1964, 7) and ideologically one-sided that it allows one group to construct dominance or control over another without listening or consultation. Authoritarian diffusion involves the unilateral rollout of technology into a domain that is misrecognized to be non-technical without dialogue with those most affected. Leroi-Gourhan, who systematically studied techniques as evolving systems and traced how tools and practices spread between and converge across ethnic groups through adaptation and exchange, saw diffusion as a principle in which “one group is in a position to offer an innovation, the other to receive it” (Leroi-Gourhan 2023, 140). In the case of Indigenous peoples, historical accounts affirm that they were regarded by Europeans as primitive in their tool use relative to the technological organization of colonizing nations. In a contemporary context, the diffusion of the Whisper model suggests that OpenAI—like other American Big Tech companies—presupposes that Indigenous language communities remain on the wrong side of a technological divide, as inferior people unquestionably positioned to receive innovations from Western tech companies. Community consultation would have quickly corrected this bias. In fact, the Whisper model performs significantly worse in te reo than the system developed by Papa Reo, with word error rates of 73% and 53%, respectively. However, what is important here is the technical (or better cosmotechnical) substrate of the Papa Reo system, as a multilingual AI infrastructure built upon Indigenous protocols of data sovereignty and reciprocity. It is this technical substrate that is commonly unseen or misrecognized as non-technological by authoritarian groups. On the contrary, Indigenous protocols involve *techniques*, creative practices that materialize and sustain worldviews through shared understandings, customs, and boundaries. Cosmotechnics, from philosopher Yuk Hui (2016), names the idea that every culture's technics emerge from and express its own cosmic and moral order. From this position, technics are never universal but are grounded in different worldviews. This formulation of technics orients the central problem of this dissertation, that the authoritarian diffusion of technology disrupts and suppresses the technical milieus inhabited by other people, thereby revealing an incapacity to recognize and learn from other cosmotechnical orders.

Diffusion is not only expressed between ethnic groups or nations but can be enacted between distinct “social microclimates”, groups of people who mobilize techniques and tools “scaled to their dimension” (Leroi-Gourhan 2023, 245) and their constitutive values and needs. A social microclimate might represent a community of practice, a subcultural milieu in which knowledge and techniques circulate, refine, and stabilize according to group norms that may be at odds with those of other groups or a dominant culture. For instance, we can look at open-source developers, self-trackers, healthcare professionals, or volunteer crisis counsellors as communities of practice that inhabit distinctive social microclimates. From this, I argue that authoritarian diffusion is commonly rationalized by a diffusing group when the technicity—the generic quality of being technical—of a social microclimate is invisible to outsiders; for example, when a group’s technicity involves practices that are not industrialized, mechanized, computational, or scientifically rationalized.

In this dissertation, I employ the concept of authoritarian diffusion to analyze how authoritarian logics are embedded within and extend through technology. In political science, authoritarian diffusion refers to the dissemination of norms, strategies, and practices from authoritarian regimes (Ambrosio 2010; Lankina et al. 2016; Bank 2017). More recently, media scholarship on digital authoritarianism has extended the analytic of authoritarianism beyond the state to include platform corporations and technological systems that enact authoritarian logics through practices such as surveillance, censorship, and infrastructural control (Jarrett et al. 2025; Akbari 2025). In line with this technological emphasis and in continuity with Lewis Mumford’s account of authoritarian technics (1964), my use of authoritarian diffusion reframes processes of technological exchange as sites where authoritarian politics are reproduced, expanded, and contested. In doing so, this dissertation responds to two persistent critiques in the literature: first, it corrects a pro-innovation bias in diffusion research, which treats adoption as inherently desirable and rejection of new technology as irrational (Rogers 2003, 106-118); and second, it challenges the tendency for technological diffusion to reproduce or intensify existing inequalities (130-134).

Based on this, authoritarian diffusion can be observed in all sorts of structures and scenarios when technology is pushed onto individuals and groups without their input and when that very technology further entrenches inequalities and silences the “feedback” of that group. Listening or

community consultation is ostensibly the obvious answer to such a problem, functioning as the primary mechanism through which diffusion is expected to be negotiated and legitimated for a userbase, group, or community. However, such a straightforward answer ignores the very impossibility of communication, or incommunication, even or especially within formal spaces of listening, such as the courtroom (Robinson 2020) or town hall. As Cecchetto highlights, incommunications do not require much attention to notice but are regularly encountered and perceptible (2022, 7-8):

To feel frustrated—as a very simple example—by the inefficacy of speaking to one’s local political representative is to feel a specific impossibility of communication: one has the feeling...that the communicative situation of political representation entirely precludes not only anything like a “matching of minds” but also even anything more pragmatic like the “cultivation of fruitful activity in an evolving community”.

The frustration of incommunication is compounded especially when postures and practices of listening are performed within such exchanges—as anyone can relate to after speaking with a customer service chatbot that claims to “hear you” and your issue. Similarly, the typical public relations playbook following a scandal is to express a listening attitude and responsiveness that rarely, if ever, feels sincerely understanding. While we might critique such expressions of incommunication as a simulation of listening, the position I take is that failures to listen in the communication process of diffusion (Rogers 2003, 5) are rooted in moral-technical disagreements embedded within the very concept and practice of listening itself. While formal definitions of listening understand it as a practice that pays attention to sound, quotidian understandings of listening expand it beyond literal sound in referring to techniques that fulfil commitments and responsibilities to others: a steadfast friend listens to you over text, or a crisis counsellor holds space for silence. This mismatch between conceptions and practices of listening—and the resulting experience of incommunication—manifests as a problem in the diffusion process when communication is meant to resolve asymmetries, disagreements, and anxieties about new technology. From this perspective, the failure of listening expressed by authoritarian diffusion speaks to a gap between groups or milieus in the very sociotechnical practice of listening.

This perspective helps explain a very recurrent pattern of authoritarian diffusion: social microclimates, or even worlds, that are anchored by a sociotechnical substrate of listening may be disproportionately predisposed to technological disruption and labour devaluation because listening is commonly regarded as a non-technical practice or skillset. Based on this, it is no

surprise that social work, customer service, and call centre industries are treated as testbeds for automation because the labour involves so-called soft skills of listening and responsiveness to language, tone of voice, as well as the stories and problems of people. As I argue throughout this dissertation, authoritarian diffusion is not only rationalized in contexts where knowledge, skills, and work are undervalued, but also when the technicity and value of listening go undetected.

In this way, authoritarian diffusion occurs in both mundane and high-stakes settings. For example, the release of AI chatbots at McDonald's drive-thrus was quickly rolled back after viral videos showed repeated failures to take customers' orders, making clear the indispensability of low-wage listening labour (Robins-Early 2024). While the stakes at a fast-food counter may be limited to poor customer experience or wasted burgers, authoritarian diffusion can carry far greater consequences in ethically and culturally sensitive contexts where listening is integral and even life-saving to people and communities. In this dissertation, I center three high-stake contexts that reveal how the same logic creates conditions for profound and enduring harms.

I begin by looking at the diffusion of health-related apps by tech startups that use AI to analyze voices for biomarkers of medical conditions, mental health disorders, or other wellness indicators in clinical and non-clinical settings. Here, the understaffed work of bedside listening conducted by healthcare professionals is delegated and reshaped by apps that strategically bracket the linguistic content of a patient to monitor for various health-related signals. Meanwhile, these same companies adapt clinical datasets and models to develop workplace monitoring apps and thus advance a larger process of diffusion by repurposing data from one setting to implicate a disparate milieu. In this secondary milieu, the interpersonal work involved in managing workers and providing human resources to employees is delegated to apps that claim to detect signs of fatigue, stress, or burnout. Writ large, the rollout of these products tends to exemplify authoritarian diffusion as surveillance technology is imposed without dialogue with patients, workers, and community members most impacted. At the same time, this process reveals how the tacit knowledge, skill, and careful labour invested in human acts of listening becomes further devalued and displaced.

Subsequently, I explore the diffusion of algorithmic and AI systems in the context of crisis counselling, where the life-saving technique of active listening is applied by volunteers to help callers who are contemplating suicide, self-harm, or are otherwise in desperate need of someone

to talk to. Technological innovations such as algorithmic conversation analysis and triage systems are applied on the tech stack by crisis helpline organizations or asynchronously for research purposes—often without meaningful consultation with workers and other crisis community members. On the frontline, some crisis counsellors adopt automated tools including GenAI, while others vehemently reject it for violating principles of informed consent in such a high-risk and sensitive setting. In dialogue with volunteers at Crisis Text Line who variously assimilate AI and oppose it, I trace the ethical and technical negotiation that occurs against the backdrop of a larger process of authoritarian diffusion—as the data of crisis conversations is repurposed for secondary and commercial AI applications that become foisted onto other workers and customers in commercial settings.

Taken together, these two cases show how authoritarian diffusion moves across different scales and structures, setting the stage for an analysis of a longer colonial history of this recurring logic. More specifically, I turn to the legacy of North American salvage ethnography, where Western anthropologists at the turn of the 20th century used phonographs to make wax cylinder recordings of Indigenous oral culture. At the time, sound recording was believed to resolve the issue of a field recordist’s “sound blindness”, a settler-colonial auditory subjectivity that led to an “inability to perceive the essential peculiarities of certain sounds” in Indigenous languages and songs (Boas 1889, 47). Here the development of a whole setup of anthropological techniques including phonography was used across Turtle Island and beyond to colonized territories around the world to preserve records of Indigenous culture before Indigenous languages and ways of life were lost. As my discussion emphasizes, anthropologists were self-reflexive about their linguistic and musical biases yet failed to deconstruct how cosmotechnical assumptions underwrote the implementation of new technology in this colonial encounter: because Indigenous peoples were framed as technologically primitive, Western anthropologists rationalized their authority over salvaged cultural belongings and recordings. As I explore in depth, the historical consequences of authoritarian diffusion can be encountered today as Indigenous people struggle to reclaim cultural and political authority over cultural belongings that are housed in archives and maintained outside of the stewardship of their home communities. Authoritarian diffusion is revealed as a mechanism that reproduces ongoing power structures that continue to silence people’s authority over their own culture or community of practice.

As a whole, this dissertation shows that the central consequence of “authoritarian technics” and its corollary logic of diffusion is the entrenchment of a technological order that has forgotten how to listen except insofar as listening can be operationalized for extraction and the system’s own expansion. Following Mumford, I understand authoritarian technics as the techno-logic of large-scale, centralized systems compelled toward continual expansion and “absolute command of physical energies of cosmic dimensions” (1964, 5). In the twenty-first century, authoritarian diffusion continues despite loud and diverse refusals and cries—from Indigenous leaders, climate and youth activists, human rights advocates, and from the more-than-human voices of animals, waters, and lands. This failure to listen, I argue, suggests that authoritarian machinery, built from the long histories of colonialism, industrialism, and capitalism, has overridden the very possibility of listening. From this, it is no surprise that the billionaire architects of the tech industry either seek to automate empathy through customer service and therapy chatbot apps or to purge it altogether from society—viewing it as an impediment to technological progress.² This not only points to a lack of care, I argue, but an incapacity to ethically attend to the other: to recognize a difference in perspective and to respond to that difference in an effort to do right by others or to learn from them.

If authoritarian technics threatens or challenges possibilities of listening, then what we require is a framework for analyzing how processes of technical diffusion encounter, interact, and reshape underlying listening techniques and milieus. The next section proposes machine listening as that framework.

Machine listening: a field of study

Machine listening organizes the chapters that follow; however, I leverage this term in a way that deviates from standard definitional understandings. As Jonathan Sterne explains, machine listening generally “refers to the process of converting sound into data and then subjecting those data to a machine learning process” (Sterne 2022, 1). Or as Napolitano and Grieco elaborate further (2021, 183):

[machine listening] is the effect of several technological layers (microphones, analog-digital converters, analyzers, dimensionality reduction algorithms, pattern matching algorithms etc.), each with its own

² This orientation is articulated explicitly by Elon Musk. For example, in public statements justifying his approach to cutting US government spending through the Department of Government Efficiency (DOGE), Musk has framed empathy as a liability: “The fundamental weakness of Western civilization is empathy, the empathy exploit” (Wolf 2025).

techno-culturally coded operations, interacting with socially heterogeneous networks and infrastructures, with regimes of expectations and knowledge about sound and auditory perception.

Here, machine listening is constructed as an object of study produced through the intertwining of computational technology, cultural techniques, and epistemologies of sound. Consistent with this, critical scholars increasingly use machine listening to amalgamate a broad set of digital systems, including voice assistants, interactive music systems, and acoustic sensors, that involve the datafication and algorithmic processing of sound (Parker and Dockray 2023). Importantly, machine listening is not used by engineers and developers, nor has the term entered the vernacular of citizens and consumers. In this sense, machine listening has become a field of scholarly inquiry organized around what I see as an overdetermined object of study; specifically, one that risks fetishizing high technology (Mackenzie 2002) while reifying the conflation of listening with hearing: a set of techniques of paying attention to sound through AI applications.

To be clear, I mobilize the conventional usage of machine listening ‘technology’ at times out of convenience to designate systems that computationally process sound: for instance, the Papa Reo system—which involves automatic speech recognition—is a clear instantiation in this sense. Similarly, in Chapter Three, I discuss health-related apps that process voice data and other audio to make inferences about people’s health. However, my aim is to deliberately open the analytical field of machine listening which, at present, is overdetermined by sound signal processing and machine learning technology.

In this dissertation, I approach machine listening as a field of critical study oriented toward the technicity and infrastructural conditions of listening—without being overdetermined by a fixed category of technology. One way to understand this is to think of machine listening as a subfield of *technologie*, in keeping with the French research tradition that understands *technologie* as the logos and study of technique (Leroi-Gourhan 2023, 13). As the English translator of Leroi-Gourhan’s work explains: “*technologie* is to *techniques* what musicology is to music, or criminology to crime” (14, emphasis in original), with *technologie* referring to the systematic study of techniques within the humanities and social sciences. Read through this lens, machine listening becomes an epistemic hinge for the systematic study of listening techniques and operational chains (*la chaîne opératoire*)—the sequence of actions, decisions, and technical processes that contribute to the (re)making of technical objects or techniques. For instance, Semel’s (2022) ethnography of a digital phenotyping project explored how the development of a

smartphone app to monitor speech to predict bipolar episodes was contingent on the hidden human labour of annotators and the crafting of a technique that she calls “listening like a computer”, in which the semantic meaning of speech content is deliberately—albeit impossibly—bracketed to attend to acoustic patterns. Her account is exemplary in underscoring how listening techniques take shape within human–machine operational chains. To resist framing machine listening solely as a cluster of technologies defined by the combined use of audio signal processing and machine learning, I occasionally use the italicized French spelling, *technologie*, to remind the reader that dominant conceptions of technology, as mechanized or digital, should not foreclose other modes of inquiry into the technicity of listening.

Whereas the technicity of listening is typically invisible to outsiders of a milieu, machine listening is an explicitly technological term that draws attention to the sociotechnical practices that can easily go unnoticed. The goal here is not to naively resolve the problem of communication, but rather to foster awareness of the cosmic and moral-technical gaps and differences between groups and milieus that come to shape listening practices and orientations. In striving to make the technicity of listening more sensible, machine listening enables the identification and interrogation of operational chains of listening that reproduce inequities and injustices through mismatched or incompatible listening practices and expectations. As a *technologie*, this involves the systematic observation and analysis of listening techniques that are meaningfully crafted, negotiated, and transformed across operational chains. Finally, as a creative trajectory, machine listening may lead to projects that repair or reconstruct the operational chains of authoritarian technics to reorient how we listen across milieus and worlds.

Sound studies readers will recognize that this is by no means a radical position. In fact, I am echoing Jonathan Sterne’s recent call to approach machine listening with the objective of understanding “listening as a set of techniques that can be developed, repeated, and transformed over time” (2022, 3). My orientation resonates with this critical work, but my objective is to consciously shift the technological scope, which now represents yet another “scene in which the form, function, and meaning of listening is debated” (4). What is integral, however, is questioning the very rationality of machine listening as part of this broader technological inquiry. Quite simply, it is no coincidence that machine listening is overdetermined by questions of sound as this reflects a logical extension of positivist conceptions of listening, organized through a

paradigm of single-sense engagement in which the ear, or some other delegated transducer, is constructed as the obligatory passage point for listening technics.

The starting point of my approach involves looking back along operational chains of listening beyond a dominant Western sensory paradigm. Definitional understandings of machine listening reveal how the field is structured by a positivist operational memory of listening, as a technique of paying attention to sound. If humans inherit a culturally situated technical consciousness, as Bernard Stiegler has so convincingly argued, then this operational memory can be carried forward through *technologie*. Put simply, the socialized and technical memory that we are born into can shape the very way we approach the study of technical objects and techniques. Thus, the very things that are gathered under the banner of machine listening are culturally revealing and can structure our decisions as researchers, all the way down to the very topic and design of research.

In response, this dissertation gradually moves away from a study of computational systems that process sound to an analysis of a digital platform that has remediated a listening technique by detaching it from its aural pinning. In Chapter Four, I turn to the Crisis Text Line (CTL) platform, a crisis counselling system that adapts the technique of active listening on a text-based and algorithmically mediated platform. CTL would typically escape the critical attention of machine listening researchers because there are no microphones, audio, or pricked ears to point to. However, drawing from interview research, every crisis counsellor I spoke with conveys the belief that it is not only possible to listen over text, but that the modality offers unique listening pathways. For instance, many youth prefer to reach out to a crisis line over text because it feels safer and more anonymous compared with speaking aloud over the phone. Counsellors' perspectives align with what Ernst describes as a "true media archaeology of listening [that] is not limited to acoustic phenomena but also takes listening in its hermeneutic and even epistemological sense as *understanding*" (2016, 24, emphasis in original). With CTL we are shown how texting can inspire personal disclosures and create new bonds of understanding between strangers through the practice of active listening: a technique that unfolds within an ever-changing operational chain that now includes tenuous links of digital infrastructure supported by volunteer labour and empathy.

In this dissertation, machine listening is not constructed as a problem, but on the contrary as a means of attending to the technicity of listening. In this way, I view machine listening as a response to the problem of authoritarian diffusion, which arises when one group fails to see the technicity of another group's milieu due to an incapacity to listen. Put otherwise, a technological inquiry into listening can identify what techniques and technical conditions are needed to oppose authoritarian technics.

From Leroi-Gourhan I carry two additional principles forward across the chapters to enliven my machine listening inquiry. First, on a conceptual level, I take seriously what he describes as a consistent fact in the history of technique, that “innovations appear by the addition of new operations without the abandonment of the ancient series that serves as their substrate” (2023, 26). For Leroi-Gourhan, a fact is something observable, but by no means universal or objective. Facts are inextricably linked to the milieu in which they occur. For instance, the default gendered voice of Alexa or other smart speaker assistants, is a technical fact of design: it is materially observable, but not inevitable. Alexa's voice reflects and sustains the milieu of domestic service, histories of feminized labour, and the cultural assumptions and desires of tech bro developers (Woods 2024). Likewise, the poor performance of speech recognition systems in processing voices with accents or those of people with disabilities is a technical fact produced by the interactions of techniques, tools, and the milieu of training datasets, design priorities, and cultural hierarchies of languages and voices. Innovations get added onto facts, yet we often lose sight of the older series that serves as the technical substrate. In this regard, proletarianization (Stiegler 2010) represents one way that facts become taken for granted. For Stiegler, the grammatization of gestures, such as the writing down of language, sound, or the automation of various techniques, establishes a foundation for proletarianization as a milieu loses the knowledge of how to make things (33). On the factory floor, machines reproduce the gestures that the factory worker no longer needs to know how to perform, just as transcription apps isolate the gestures of manual transcription and listening from the typist's hands and ears. However, proletarianization is by no means a universal law, but, again, is produced by the interaction of technique, tool, and milieu. As Stiegler maintains, technologies are pharmacological – offering both a poison and remedy. Consider the positive case of Indigenous AI for language revitalisation – which directly works against the loss of linguistic and cultural knowledge in the wake of colonialism. For instance, Michael Running Wolf—a North Cheyenne software

engineer—explains his vision for Indigenous AI as a stepping stone for Indigenous communities to reclaim their endangered languages, as opposed to a techno solutionist endpoint (2023). Similarly, what is expressed by calls to make “kin with the machines” (Lewis et al. 2018) is not a rigid assimilation of the technical facts of the Big Tech industry, but rather a call to add AI upon the cosmotechnical substrate maintained by Indigenous nations and communities, despite the very real losses of language, territory, and sovereignty.

Secondly, a methodological principle I carry forward is drawn from a passage from Leroi-Gourhan about the pre-historic fabrication of flint tools, where he advises that the process of crafting stone tools can be systematically interpreted by following the “chain of documents” (2023, 174): systematically studying the available technical evidence, which in his case, meant archaeological and anthropological artefacts housed in museums and archives. For Leroi-Gourhan, an objective of *technologie* is to reconstruct the “mental structure of the maker; to observe the technique become more rational from epoch to epoch...” (176). His approach to accomplish this involved following the gestures of manufacture, “flake by flake” (ibid.), to unearth the techniques and technical consciousness of the maker. As he explains: “The culture of a human group leaves its mark on all its productions, and it is therefore possible to perceive this culture in the outlines of a flint knife as much as between the lines of a text” (176). However, the problem raised by listening techniques is that there is a paucity of technical evidence—in the sense of manufactured objects—produced prior to the innovations of sound reproduction techniques. Resultantly, without phonography, listening technics can be difficult to apprehend. I respond to this methodological challenge across each of the chapters that follow.

In Chapter Two, I center three stories from First Nations and Métis Elders that transmit an Indigenous technicity of listening across generations. Although these stories have been written down and now qualify in a Western research paradigm as a form of documentation, their much longer cultural maintenance through oral storytelling underscores how Indigenous technicity persists beyond Western modes of intelligibility or validation. This offers a starting point to counter the problem of authoritarian diffusion—which again, is rationalized in part by an inability to see or recognize another people’s cosmotechnical milieu.

In Chapter Three, I move to following the gestures of health-related machine listening developers, flake by flake, not to understand how they manufacture these technical systems, but

rather to examine how this operational chain is diffused into different social settings from medical clinics, office workspaces, and various social microclimates. Like Leroi-Gourhan, my method relies on documentary evidence—in this case, archived webpages that reveal a 10-year history of two startups as they diffuse their products into different social domains and eventually converge with the acquisition of NeuroLex Labs by Sonde Health. Here I gradually unearth the culture of authoritarian surveillance that is rationalized by tech bros by interpreting the outlines and patterns revealed by a micro historical process of diffusion.

In Chapter Four, I move to the specific social microclimate of crisis counselling to explore the adaptation and rationalization of active listening by volunteers on a text-based and algorithmically mediated platform. What this offers is a rich account of how individuals reshape techniques, flake by flake, in dynamic interaction with the tools that are available within their inhabited milieu. Through discussion with volunteer counsellors about how they utilize generative AI (GenAI) and other digital tools in their work, it becomes clearer how an operational chain of listening is actively negotiated according to different moral-technical orientations: while some volunteer counsellors embrace new technology in their work, others cite ethical concerns related to privacy and consent as the rationale for their rejection of automated systems. It is only through interviewing and listening to volunteers that this technical negotiation can be surfaced for someone who approaches a social microclimate as an outsider. Thus, although the dominant technoculture of a group can be discerned from an analysis of the tools that are entrenched and diffused, the outlines of alternative technicities and rationalities may not surface through tangible objects or tools alone, but rather through listening.

After attending to the perspectives of crisis counsellors, Chapter Five centers my own Métis story and invites the reader to follow the gestures and sequence of actions that I took in developing a creative technique of documentation to enter into negotiation with the legacy of authoritarian technics in Canada. In an era of Truth and Reconciliation—which itself embodies an operational chain of listening, learning, and institutional justice seeking—this chapter contributes to ongoing conversations within Indigenous and Canadian society through research creation. As Leroi-Gourhan explains: “While individuals at all times and in all societies have no other starting point than collective knowledge, they also have, as individuals, the possibility of exercising their judgment on collective memory, of comparing or associating its elements, and of

personally giving rise to new technical forms” (2023, 205). In addition to inventors, artists are another important group of people who can surface new technical forms. This chapter revolves around a creative chain of documents that I call silent records, consisting of photography of sound media and musical performance. Through this simple media form, the project complicates expectations of listening and reorganizes an operational chain shaped by “hungry listening” (Robinson 2020) that is sustained through colonial archives.

As an epistemic hinge, machine listening is offered as my answer to the problem of authoritarian diffusion, which can be observed today most forcefully through the positioning of GenAI as an obligatory passage point in virtually every sector and social domain. Individuals may voluntarily adopt GenAI—in part because of its legitimate utility as a tool and at other times because of misleading marketing. However, GenAI is also being unilaterally rolled out in many settings without paying heed to the immediate social risks, inequitable dependencies, and the sensitivity of various technical milieus and social microclimates. To be clear, I am not of the opinion that GenAI cannot be responsibly integrated in various contexts; rather, digital authoritarianism is expressed through the force-feeding of technosolutionism in settings where an older series of techniques would remain effective if it were not for prior systematic divestments. For example, in 2025, Canadians trying to resolve urgent tax matters found their calls to the Canada Revenue Agency unanswered after thousands of call-centre jobs were cut, coinciding with the government’s promotion of a self-serve GenAI chatbot beta (“GenAI chatbot beta” 2025; Harris 2025). The episode illustrates how a prior infrastructure of listening is left understaffed, while an automated system is imposed on the public without consultation, with the effect that listening labour is further devalued and taxpayer expectations of being heard are increasingly frustrated while being funneled to private systems. This is precisely the problem of authoritarian diffusion which manifests through failures to value listening labour and technique. It is here that machine listening becomes useful as an analytic framework to trace how listening techniques are disrupted, devalued, and displaced through authoritarian diffusion.

Listening beyond ourselves

To meaningfully address the problem of authoritarian diffusion, a framework is needed that can recognize and learn from other cosmotechnical orders. Whereas machine listening can be rethought as an epistemic hinge, a framework of “two-eyed seeing” is proposed to help decode

how different knowledge systems materialize in techniques, and to suggest that by learning from multiple epistemologies we can better recognize and respect the technicity of other peoples, groups, or communities.

The teaching of “two-eyed seeing” from Mi’kmaq Elders Albert Marshall and Murdena Marshall is an ethical-epistemological paradigm that involves the core belief that there are many ways of seeing the world and that both Indigenous and Western knowledge systems can offer important contributions in knowledge creation. Because any worldview is inherently partial, a two-eyed approach strives to learn from and hold multiple perspectives at once. When incorporated into a research paradigm, this demands humility in remaining open to epistemic change, hybridization, and cultural transduction.

I can already hear critique about the suitability of a visual paradigm to a study about listening from readers who assume incongruence of visual metaphors and theories in sound studies. However, any such presuppositions are reflective of a positivist epistemic division of the senses—an assumption that listening is strictly auditory and that by extension, what we can know about it must therefore be exclusively sonic. Two-eyed seeing resists this tendency by recognizing that knowledge and worldviews are always crossing between modes of perception: “if we envisage these two versions of knowing (Western and Indigenous) as two people sitting around a campfire sharing knowledge, suspending judgements and opinions and simply listening to what the other has to say—then we have the essence of two-eyed seeing” (Martin 2012, 36). Here, listening is used as a metaphor to explain the principle of two-eyed seeing such that we might equally understand this paradigm in terms of *two-eyed listening* or *two-eared seeing*. The crucial point I take forward in this dissertation is that listening—which does not necessarily begin or end with our ears—is always shaped by a worldview and that it is possible to learn how to listen beyond ourselves: stretching and unsettling inherited technical milieu, cultural assumptions, and positionalities.

As a Métis scholar, I find myself particularly drawn to this epistemological principle—as Métis communities have always been dynamically positioned between Indigenous and European languages, religions, economies, knowledge systems, and technical milieus. Put simply, the Métis have always been positioned between worlds and have faced unique pressures of assimilation. Even so, the “survivance” (Vizenor 2008) of the Métis nation—that is, our

continuance and storied presence amid colonialism—is expressed through blended and adaptive practices and worldviews.

Despite its radical epistemic openness, two-eyed seeing is an anti-positivist framework, as positivism involves the belief that there is such a thing as an objective truth or authoritative account of the world (Martin 2012). Moreover, I regard two-eyed seeing as an anti-authoritarian epistemology because it respects a diversity of perspectives and resists the entrenchment of any authoritative account or system. Whereas authoritarianism involves the suppression of alternative perspectives, two-eyed seeing puts different worldviews in conversation with each other (Marshall, Marshall, and Bartlett 2011).

My contribution to this approach lies in engaging two-eyed seeing as part of a cosmotechnical inquiry. More broadly, one goal of two-eyed seeing involves identifying Western theories that bear similarities to Indigenous thought, in order to trace points of contact without collapsing difference. In the context of a technological inquiry, I think of this in terms of “convergence” (Leroi-Gourhan 2023, 143), where different cultures or groups of people come up with a similar innovation without direct contact. For example, the stretching of animal skin over a circular frame to create a drum is a clear instantiation of technical convergence between peoples across the globe, due to common material constraints and technical tendencies. In Chapter Two, I establish convergences between Indigenous and Western epistemologies and techniques of multi-modal listening that have developed in parallel from within very different milieus. Oriented toward a cosmotechnical inquiry, two-eyed seeing helps recognize similarities and divergences in technical practices across worlds as the basis for dialogue and for contesting authoritarian diffusion. The role convergences play in such dialogue is not to synthesize difference, but to mark partial alignments that sustain relation without erasing cosmotechnical divergence—a process I understand as cultural transduction (Viveiros de Castro 2004), that is, a mode of translation that retains difference.

Chapter Two engages two-eyed seeing in depth by centering Indigenous storytelling and philosophy. The chapter analyzes several convergences between Indigenous and Western listening techniques before moving to center the unique contributions that Indigenous cosmotechnics can make to discussions of privacy. A recurrent motif of going into the bush is figured to reveal how privacy, sovereignty, or some aspect of boundary maintenance represent

preconditions for listening techniques and technical practice, more broadly. In retreating into the forest and the quiet awareness this space affords, a solitary figure can uncover new relationships within the more-than-human world that are integral to aspects of indigetechnical practice and innovation. In the bush, animals begin freely communicating, trees express their agencies, and human beings learn how to craft techniques and tools that maintain balance with “natural reason” (Vizenor 2009). Drawing from these stories, a central contribution of the dissertation concerns the relationship between privacy and cosmotechnics, insofar as privacy holds space for alternative ways of making and crafting relationships, such as those that materialize an Indigenous worldview.

This framing of privacy becomes critical in assessing the fuller impact of authoritarian operational chains of listening, which impinge upon conditions of privacy in ways that exceed matters of informational privacy. The kinds of devices and apps that typically populate imaginaries of machine listening, such as voice assistants, smart speakers, and the health-related applications that I discuss in Chapter Three, raise tremendous data privacy concerns. Whether we are at home, in our cars, at school, work, or on public streets—devices with built-in microphones are scraping our conversations, voices, and identities. A data privacy regime remains an important framework in challenging the continual encroachment of mass surveillance on our private lives. However, the tech industry is adept at manipulating public discourse by characterizing privacy legislation as an impediment to technological innovation. While privacy rights certainly limit the kinds of technological applications that can be diffused in a society, I argue that privacy also represents a precondition for certain forms of technical practice, skill development, and learning. Put otherwise, as part of the toolkit of authoritarian technics, mass surveillance can foreclose upon a space of technics, understood as ways of making and crafting relationships. With this basic premise, I suggest that by centering privacy as a precondition for cosmotechnical alternatives we can better recognize the tyranny of authoritarian diffusion as an order of technological expansion that impinges upon technical practices and milieus that require protection and renewal to sustain a more caring and equitable world.

Critical technology and surveillance scholars have long argued that marginalized groups and communities are disproportionately targeted and impacted by mass surveillance and automated decision-making systems—leading to a whole manner of rights violations and personal

indignities (Browne 2015). However, the argument I add to this is that privacy violations constitute an attack against cosmotechnical orders and the technical milieus of social microclimates by intruding into the space of technical practice—subjecting people and communities to surveillance and other forms of inequitable disruption. Put otherwise, without being able to retreat into the bush, so to speak, how can alternative techniques or innovations be practiced or created to materialize alternative worldviews? The answer I give is that the rise of surveillance necessitates creative forms of retreat and tactics of silence that ensure the survivance of alternative technical forms.

After centering indigetechnical contributions, my two-eyed approach analyzes the widely diffused Western technique of active listening in Chapters Two and Four to establish a convergence between Indigenous and Western techniques of multi-modal listening. In doing so, the dissertation avoids painting the problem of authoritarian diffusion as a simple clash between Western and Indigenous cosmotechnical orders. Media studies has long remarked on differences between oral and print cultures (Ong 2002), with Marshall McLuhan arguing for a sonic turn in Western media theory to better understand the qualities of electronic communication. In response to what he interpreted as the numbing effects of print media on the ears of Western man, McLuhan looked to Indigenous and African peoples as groups who have maintained “deep roots in the resonating echo chamber of the...tribal world” (1995, 20). Put simply, Western print culture has extended the eyes while numbing the ears, in contrast with the rich acoustic perspective of “tribal” peoples. Thus, in approaching new media, McLuhan posited that Western man might finally have something to learn from less technical peoples. Bracketing the offensive and perplexing aspects of McLuhan’s writing on race and tribalism, this essentializing approach also obscures the presence of entire social microclimates in the Western world which privilege listening despite the ostensibly numbing effects of print culture – from musicians to therapists, clergy, and the entire academic field of sound studies. Just as there may be worlds within worlds (Escobar 2018), peoples’ senses and listening techniques are never uniformly extended or numbed but rather may be attuned in ways that fall outside a dominant grid of intelligibility.

What two-eyed seeing finally exposes is that alternative technical practices persist within and beyond dominant technocultures—even if these remain disregarded, devalued, or unseen under the machinery of authoritarian technics. As I repeatedly show, the technicity, value, and labour of

listening commonly go unrecognized—from Indigenous techniques and epistemologies to the volunteering activities and empathetic motivations of crisis counsellors. Thus, by centering the *technical survivance* of listening techniques—the active and creative persistence of practices that refuse to disappear amid widespread cultural numbing and systemic erasure—we can foster capacities to listen and learn from different cosmotechnical orders and social microclimates.

Power and technical survivance

To resist erasure, authoritarian diffusion may force alternative techniques and worldviews underground. When a diffusing group works to silence the authority of another group or people in pushing an innovation onto them without meaningful dialogue, an unmistakable expression of power is raised. However, silence must not be interpreted here as a total loss or absence of power but rather as a possibility and condition of survivance: what Vizenor describes as an “unnameable presence” (2009, 23) that resists domination and surveillance (1999, 178). For Vizenor, survivance does not wallow in stories of victimhood or in the grief of absence but involves the union of “active survival and resistance to cultural domination” (2009, 24). Put otherwise, survivance is a strategic force embodied in storytelling, songwriting, and other pathways that assert a creative presence in direct—yet sometimes subtle—challenge to domination (L’Hirondelle 2015).

In consideration of authoritarian diffusion, survivance may also be expressed through the maintenance of technical traditions and protocols that remain unintelligible to outsiders while continuing to hold together societies, communities, and moving units of people. Leroi-Gourhan refers to such continuities as “technical” [*survivance technique*], describing them as stable milieus made visible when a group refuses to assimilate some new technique or tool. Technical survivals or traditions, he argues, are “almost never an ideal” nor a “completely conscious practice” (2023, 137). He instead understands traditions in the technical domain as a “ready-made technical bloc” that is transmitted and gradually improved upon across generations (ibid.).

For example, the continued use of fax machines in the healthcare system to send prescriptions illustrates a technical survival through the persistent use of an otherwise outdated tool and communication infrastructure. The fax machine endures in this social microclimate not as an act of defiance but as part of an “economy of technical means” (138). It persists because it remains

functional, contextually familiar, and infrastructurally embedded as an articulation of inertia rather than political intention.

What the notion of *technical survivance* adds is an account of how refusal and negotiation around innovations can be strategic and politically motivated. When a group consciously maintains or revives a technical form despite the diffusion of new technology, it ceases to be mere survival but expresses a form of survivance. In this dissertation I attend to forms of *indigetechnical survivance* in Chapters Two and Five, alongside practices of technical survivance in the social microclimate of crisis counselling. In Chapter Four, I develop an analysis of the resistance of volunteer counsellors at CTL to assimilate algorithmic tools including GenAI that aim to make the work of active listening more quantifiable, standardized, and efficient. Here, technical survivance takes shape as a conscious decision to resist authoritarian technics and sustain a different moral-technical substrate of listening technics grounded in principles of privacy, consent, and transparent applications of technology.

Authoritarian technics, which involves relentless expansion, necessarily threatens to violate boundaries of privacy or sovereignty in claiming authority over languages, voices, stories, and worlds. Constant surveillance and observation infringe upon spaces of technical practice, yet in doing so, they underscore the indispensability of privacy as a strategy of survivance. Vizenor repeatedly points to silence as part of a toolkit of survivance that figures in Indigenous storytelling as an unnameable presence. In this sense, technical survivance entails practices of concealment and opacity that sustain a technical substrate that endures beneath the reach of authoritarian technics. What remains unseen and unnamed as technical continues to assert presence for groups who inhabit resonant cosmotechnical orders. For instance, the principle of data sovereignty which Indigenous developers integrate into digital infrastructures reflects the maintenance of a cosmotechnical order that may not be regarded as technical by those who have no place within its operational chain.

In this context, technical survivance refers to the continuance of practices that materialize anti-authoritarian worldviews, despite being surrounded and pressured underground by authoritarian technics. Thus, although authoritarian diffusion manifests as a failure to listen and learn from other perspectives, it is through this failure that survivance emerges, as seen in the endurance of older techniques that persist, adapt, and quietly resist domination.

What the analysis of technical survivance ultimately suggests is that power does not only flow through a logic of diffusion, but also through the inertia of technical milieus that escape the notice of authoritarian orders. However, technical survivance demands ongoing attentiveness to the ways innovations spread and the political adjustments they demand of us, especially as much of this continues to raise increasing privacy violations. With each new rollout of technology, communities must adapt and negotiate their own technical continuity, not always in isolation but with an eye to convergences and strategic solidarities with other groups. In this sense, survivance is a dynamic and forward-looking practice, a way of sustaining a plurality of cosmotechnical orders that persist beyond the reach of authoritarian control and surveillance.

Overview of the dissertation

This dissertation proceeds from the observation that authoritarian diffusion is enacted in contexts where the technicity of a second group remains invisible to outsiders. Such diffusion unfolds through a structural tendency to impose technologies without dialogue, thereby displacing or overriding other people's ways of making and crafting relationships that sustain and build upon their worlds.

This carries pronounced consequences for milieus whose techniques are not mechanized or computationally configured. Listening belongs to this category of unseen and undervalued technics: the work, skill, and relational craft of listening are difficult to perceive and thus become devalued or erased from the outside. Yet this very misrecognition exposes a deeper problem: an incapacity to listen or learn from others whose technicity appears irrational only because it materializes different values, knowledge systems, or cosmotechnical orders.

The label machine listening, conventionally used to describe systems that combine audio signal processing and machine learning, risks reinforcing this problem by valorizing listening techniques that are explicitly sonic, machinic, and computational. In this sense, machine listening appears to entrench the technological superiority that lies at the heart of authoritarian rationality. Yet attending to such systems remains vital, for they make explicit the silencing effects of authoritarian diffusion that simultaneously displace people's self-authority while extracting value from the voices of marginalized peoples. To resist this tendency, the term machine listening is unsettled through a technological inquiry whereby listening techniques are *procedurally transduced* (see Chapters 2 and 4) within dynamic operational chains. I argue that this

reorientation not only helps to recognize and revalue the underlying technicity of listening practiced by diverse groups across different milieus but also restores the possibility of listening and learning from other cosmotechnical orders.

What holds the chapters that follow is not a bounded object of study, but a cohesive epistemological and methodological program that confronts the silencing effects of authoritarian diffusion by tracing the technical milieus and operational chains of listening that persist under conditions of surveillance and technological disruption. In writing this dissertation, I found myself constantly moving between different methods and, more significantly, between worlds—from tracking the diffusion of health-related machine listening apps, engaging crisis counsellors in intimate interviews, to reconnecting with my own Métis positionality through archival research and land-based research creation. Although this diversity of topics and approaches has sometimes made my contributions appear fragmented or difficult to neatly summarize in conferences, applications, or casual conversation, this movement between disciplines and paradigms is precisely what the project demands. Authoritarian diffusion exposes an incapacity to recognize and learn from other cosmotechnical orders; thus, shifting between approaches becomes an ethical and epistemological necessity. Put differently, this is where the principle of two-eyed seeing becomes essential to uncover anti-authoritarian convergences and solidarities across diverse worlds and technical milieus. At times, these connections have appeared unclear—both to others and to myself—yet I have continued to let the unnameable presence of an intuitive hunch guide my thinking. Perhaps this is one way the trace of survivance finds form in this dissertation: as a mode of dialogic thinking and reflection that quietly persists beneath the surface of empirical rationality.

In Chapter Two, I mobilize the ethical-epistemological framework of two-eyed seeing to hold an anti-authoritarian dialogue between Western and Indigenous listening milieus. The chapter locates convergences across these distinct worlds through listening techniques that complicate positivist conceptions of listening. Through First Nation and Métis storytelling from Eli Baxter, Rene Meshake, and Delorès Gosselin, I show that listening extends beyond the act of attending to sound to encompass multi-modal techniques that materialize worldviews. Adding to this cosmotechnical dialogue, Indigenous technological thought about the relationship between privacy and technical practice is centered through the motif of going into the bush. Privacy here

involves a practice of withdrawal from observation that creates space for indigetechnical practice and innovation. As a whole, the chapter opens a two-eyed paradigm of listening that reframes privacy, or non-interference, as a precondition for cosmotechnical dialogue without authoritarian overreach.

In Chapter Three, I analyze the diffusion of AI systems that make health-related inferences through audio analysis as a paradigmatic case of authoritarian diffusion. Tracing the product development of NeuroLex and Sonde Health—and the subsequent merger of the companies—the chapter shows how systems initially positioned as tools for clinical care expand far beyond medical settings into homes, workplaces, and various sectors. As these systems are diffused, voice data that were voluntarily collected in clinical or research contexts are repurposed to monitor people in settings marked by unequal power relations and limited opportunities for meaningful consent. In this process and in keeping with an actuarial logic of surveillance medicine, listening shifts from an orientation toward semantic communication to a signaleptic mode that problematizes voices as sources of medical risk. Based on the dual case study, the chapter argues that the scope, speed, and harms of this case of authoritarian diffusion are obscured through patterns of function creep combined with the rhetorical strategy of privacy washing (Cirucci 2024). As a contribution to the dissertation, the chapter reconceptualizes privacy as a collective form of surveillance resistance—or a pact of silence that deliberately withholds data and transductive labour (Semel 2025) to protect conditions for dialogue.

In Chapter Four, I interpret the Loris.ai data scandal involving Crisis Text Line as a predictable and disturbing outcome of authoritarian diffusion that implicated the data and labour of help seekers and volunteer counsellors. Through interviews with volunteer counsellors, the chapter analyzes frontline perspectives on the data scandal and the broader technological conditions within which volunteer counsellors operate. Despite the top-down diffusion of technology in this milieu, volunteer counsellors variously assimilate, adapt to, and ethically oppose different aspects of an operational chain of listening that includes algorithmic nudges, supervisory oversight, and automated systems. Based on these accounts, the technical survivance of older active listening practices is interpreted as an effort to safeguard the wellbeing of help-seekers and the ethical principles of the crisis counselling milieu. In doing so, the chapter addresses the limits of an anonymization-based approach to privacy, as volunteer counsellors stress that constant

observation and consent-less datafication can constrain possibilities of listening, regardless of any mitigation to personal identification. As a contribution to the dissertation, the chapter shows how frontline listeners evaluate and negotiate processes of diffusion based on their work experience and various moral-technical perspectives on technology in relation to questions of privacy, trust, and consent.

In Chapter Five, I develop a creative media practice using silent records to defer and complicate listening in order to craft a pathway of indigetechnical resurgence and anti-authoritarian resistance. The chapter discusses the history of salvage ethnography and the unique story of the Métis to address the silencing effects of authoritarian technics. As a theoretical contribution to the dissertation, the project reopens the question of diffusion through the framework of authoritarian technics, emphasizing how technical systems spread not only through discrete innovations but through larger and protracted processes of expansion. Turning to a colonial sound archive, the project argues that even though innovations in sound recording were not immediately diffused by anthropologists to Indigenous communities, they nonetheless produced long-term infrastructural dependencies that sustain authoritarian conditions through the archival gatekeeping of Indigenous cultural belongings. In response, silent records—that is, photographs of sound media and musical practice—are taken from within colonial archives to renew Indigenous cycles of listening within conditions dominated by authoritarian technics. At the same time, the project restores indigetechnical pathways of singing and listening by recirculating Métis songs through land-based research creation. In doing so, silent records articulate a mode of technical survivance that innovates upon old operational chains of listening while remaining resistant to authoritarian control through practices of withdrawal and sonic withholding.

Chapter Six concludes the dissertation by drawing together the conceptual and methodological threads developed across the preceding chapters, clarifying how machine listening offers a framework for recognizing the technicity of listening across worlds as a corrective to problems of authoritarian diffusion. It closes with a brief return to Indigenous AI projects that walk a path of anti-authoritarian diffusion by engaging in nation-to-nation dialogue with other Indigenous communities. Highlighting indigetechnical contributions of data sovereignty (Kukutai and Taylor 2016), the conclusion reaffirms that resisting authoritarian diffusion ultimately depends on cultivating the capacity to listen across milieus and cosmotechnical orders.

The composition of the dissertation is itself deeply personal and reveals how my own positionality and life events have thoroughly shaped the studies that follows. In titling this dissertation, *Machine Listening, Unsettled*, I gesture to my unconventional usage of the term and to a decolonial epistemology of two-eyed seeing, but also to the instability of my own worldview as it was reshaped through research. In keeping with a principle of two-eyed seeing, the perspective from which I write is far from static, but rather, is gradually unsettled. When I began this research, I had just survived a near-death experience that transformed my outlook on the medical system and on life itself. Around the same time, I had recently become a father, an event that drew me closer with my Métis heritage and inspired me to raise my son connected with community and culture. This spiralling between life and death, heritage and future, unmistakably drew me to the topic of crisis counselling which resonates with my recent existential struggles and hope for renewal. Speaking with crisis counsellors about their volunteer experiences challenged some of my critical assumptions about technology and taught me, above all, about my responsibilities as a researcher to those who let me into their world. In writing from a standpoint that is continually unsettled, I aim to hold open the tensions and convergences between lived experience and theory across Indigenous and Western perspectives. It is on this shifting ground that I hope to continue this conversation, striving to listen beyond myself and beyond regimes that fail to see the richness of worlds that lie forever beyond their authority.

Chapter Two: Listening across Worlds

In *The Sounds of Life*, Bakker (2024) recounts how digitally networked microphones and ultrasonic sensors have transformed how humans listen to nature: hydrophones that record whale songs, miniature contact microphones that capture vibrations in honeybee hives, and algorithms that translate these sounds into legible signals of intelligence. By allowing humans to hear and interpret the voices of nonhuman life—from animals and plants to entire ecosystems—Bakker argues that machine listening might help repair our relationship with the natural world.

Yet, as Bakker emphasizes, many of these so-called discoveries have confirmed what Indigenous peoples have been hearing all along. For example, the Palauan people in Micronesia have long understood that fish larvae sense distant coral reefs and navigate toward them (90). While Western scientists would later identify these as inaudible acoustic signals, Palauan fishers have long used this knowledge in their harvesting practices. On the other side of the globe, the Iñupiat in the Arctic had already mastered a technique of underwater listening long before hydrophones were invented, placing the end of a wooden oar against the jaw and dipping the paddle into the water to hear the voices and songs below.

In the 1970s, Iñupiat elders and hunters pushed Western science to catch up. After decades of commercial whaling, the bowhead population was decimated, leading the International Whaling Commission to ban commercial whaling and impose strict limits on subsistence hunting rights. After commercial whaling had been curtailed, visual survey methods continued to show an endangered bowhead population, but the Iñupiat's listening practice suggested otherwise. To confirm this, the Iñupiat commissioned their own study in collaboration with Western scientists, who used hydrophones to eventually confirm that the bowhead population had indeed rebounded. A Western researcher recalls lowering a hydrophone into the water and hearing a “cacophony of voices and singers” (33). He handed his earphones to his Iñupiat guide, who already knew which animals were communicating. Although microphones and more recent machine listening innovations are capable of processing sounds that vibrate beyond the limits of human hearing, these moments expose a deeper failure to recognize the authority of Indigenous technics until it echoes back through positivist science.

Despite the well-meaning intention of environmental advocates and scientists to use bioacoustical data to give voice to the nonhuman world and as evidence for climate collapse, the diffusion of machine listening risks repeating the problem of authoritarian technics by extending a “myth of unqualified power...increasing omnipotence, if not omniscience” (Mumford 1964, 5). As bioacoustician Michael André believes, machine listening is an innovation or “a new sense” that allows humans to “listen to the ocean just like a dolphin or a whale. But even better than a dolphin or a whale, as we have the capacity to listen everywhere, at the same time, all the time” (Bakker 2024, 200). While André relies on the authority of Indigenous community members to make sense of the sounds he records, this unqualified sensory power reproduces the very ideology that Mumford warns against—a system that exhibits a stubborn compulsion to expand the scope of its authority and control (1964, 6). Put otherwise, machine listening paradoxically reveals an incapacity to listen outside or beyond a positivist order where the knowledge of Indigenous collaborators is regarded as a hypothesis to be confirmed until translated into legible data. Yet the fulfilment of machine listening’s promise is dependent on the diffusion of innovations that desire omniscient observation. Only then, we are instructed to believe, may a stop to planetary destruction finally ring out with authority.

The lesson from this is not to reject digital innovations outright, but to see how the diffusion of technocratic solutions continues to fall short in listening to the authority of Indigenous worldviews and expertise. This is not only a problem of silencing and marginalization, but a deeper incapacity to recognize and learn from other cosmotechnical orders until they can be translated into a dominant episteme. The concept of cosmotechnics put forward by philosopher Yuk Hui helps to rectify this by reopening the question of technology. Yet as he explains, reinterpreting technology from multiple perspectives requires “another form of translation: no longer a translation based on equivalence...but a translation based on difference, a translation that allows a transduction to take place” (2016, 310). In this chapter, I respond to this call through an approach of two-eyed seeing, which moves between Indigenous and Western cosmotechnical orders to guide a progressive transformation in how listening itself is understood and may be practiced. By recentring the technicity of listening, I argue, the problem of authoritarian diffusion can be challenged by allowing for a dialogue that loosens the dominance of a positivist epistemic order and leaves room for difference to remain untranslated, unobserved, and unknowable, without being dismissed as unfounded.

This chapter argues that positivist conceptions of listening, though culturally constructed, have been diffused as authoritative and universal. Meanwhile, this diffusion has foreclosed cosmotechnical dialogue by misrecognizing the technicity and value of other listening practices. As discussed in the introduction to the dissertation, the failure to perceive the technicity of other modes of listening helps to rationalize processes of authoritarian diffusion in which innovations are pushed onto others without regarding them as equals. Rogers identifies “authority innovation-decisions” (Rogers 2003, 23) as a top-down diffusion process, yet this framing remains largely apolitical and treats authority as an organizational structure. In contrast, authoritarian diffusion draws attention to the systematic misrecognition and suppression of other cosmotechnical orientations through the diffusion process itself, thereby altering the dynamics of communication. Diffusion necessarily involves communication (Rogers 2003), yet this is inherently asymmetrical because no genuine dialogue can occur with an interlocutor who is already deemed to be technologically disadvantaged. As a result, the diffusion of machine listening innovations that confirm and systematize what Indigenous people have been hearing all along reveals how Western cosmotechnics have obscured the very technicity of listening—a technicity that, as this chapter shows, is capable of exceeding the limits of human hearing and its technocultural extensions.

Situated within the dissertation’s broader investigation of authoritarian diffusion—the process by which technologies are unilaterally imposed on milieus whose technicity remains unseen—this chapter centers listening as the site where this logic most acutely manifests. While the introduction established that authoritarian diffusion is amplified when the technicity of listening is undervalued or unseen, this chapter traces that misrecognition to the dominant Western cultural construction of listening as an act of paying attention to sound. By engaging two-eyed seeing as both an ethical and epistemological framework, I demonstrate how practices of listening that complicate a positivist division of the senses and the originary status of hearing can unsettle authoritarian diffusion and restore the conditions for dialogue across worlds.

What I aim to enact in this chapter is a cross-cultural and epistemic rethinking of listening technics through a dialogue between Indigenous and Western perspectives. Listening, here, is not simply an act of attention to sound, but a transductive process—a movement through which milieus exchange properties, energies, messages, and knowledge while maintaining epistemic

distance. As I argue, the space that allows such difference to persist—what I discuss in terms of privacy—is integral to the crafting and maintenance of alternative technicities. In the framework developed throughout this dissertation, privacy functions as a precondition of retreat for technical practices, relations, and orientations that are otherwise constrained or interrupted by strategies of authoritarian technics, such as surveillance. In this context, constant observation and demands of translation and assimilation can obstruct the transduction that is required for a cosmotechnical dialogue.

Triangulating its central arguments, this chapter proceeds in four major sections to show how authoritarian diffusion persists both through the dominance of Western epistemologies over others and through a failure to respect boundaries of privacy that allows different technicities and worlds to coexist. In response, the chapter recenters the technicity of listening to articulate how transductive exchange across worlds may resist the logic of authoritarian technics.

The first section examines how a positivist construction of listening is carried forward through authoritarian technics. It begins by tracing how the scientific partition between hearing and listening serves as a dominant epistemic foundation for Western listening that deprivileges or obscures figurative modalities of listening and multimodal listening techniques practiced both within and beyond the West. For example, conceptions of listening to the body and active listening both exceed and complicate matters of paying attention to sound through hearing alone, yet the technical aspects of these *extra-aural* listening practices are interpreted as metaphorical and non-technical according to dominant understandings of technology. This misrecognition primes authoritarian diffusion by positioning milieus and worlds that privilege or depend on such forms of listening as technologically deficient. Further, certainty about what listening technics is and is not migrates into theories of media and technology that frame machines as extensions of human faculties, helping to naturalize the idea that machine listening represents a superior form of human listening by hearing more. By following this conceptual chain from hearing → listening → machine listening, the section shows how positivist assumptions about sound are materialized in technical systems that advance a process of sonic proletarianization whereby listening knowledge is passed into machines, while other techniques become forgotten and displaced. It concludes by preparing the ground for the next section's reconsideration of transduction beyond a scientific account of signal transduction.

Next, I explore how listening metaphors disclose points of technical convergence between Western and Indigenous cosmotechnical orders. This section begins by drawing on deconstructive notions of originary technicity to unsettle the assumption that listening merely supplements hearing, contending instead that listening technics precedes hearing itself. From this ground, the section turns to metaphors and multimodal practices of listening in Western thought—such as active listening—to reveal an imaginative rationality that complicates positivist divisions of the senses. These metaphors demonstrate how Western techniques complicate a positivist division of the senses in ways that converge with Indigenous listening technics. The final part extends this dialogue to Indigenous conceptions and techniques of listening which exemplify a technics of transindividuation—the ongoing co-formation of individuals and worlds through shared technical supports.

The third section turns to Indigenous storytelling as a medium of survivance that teaches and materializes techniques of listening that unsettle a Western cosmotechnical order. I begin by situating storytelling as an aspect of indigetechnics—a set of Indigenous technical milieus that have been sustained across generations and in relation to more-than-human worlds. Through close engagement with stories shared by Anishinaabeg and Métis Elders, the section helps solidify the movement from listening as an activity of paying attention to sound to a multimodal and cosmotechnical practice. Moreover, these stories reveal listening's integral role within a long circuit of transindividuation whereby humans, animals, and other actors co-create technical knowledge through protocols of respect and reciprocity. The section concludes by foregrounding privacy and solitude as necessary conditions for such relational technics of listening.

The fourth section completes the dialogue of this chapter by reframing diffusion through the lens of transduction to challenge the linear, asymmetrical logic of technological transfer. It begins by showing how authoritarian diffusion constricts space for technical practices, as revealed by the diffusion of machine listening systems that reproduce positivist and extractive modes of attention. From this ground, the section reinterprets diffusion as a transductive process—one in which the movement of techniques, concepts, and practices transforms both the milieus that spread techniques outward and those that adopt or reject them. Drawing from Simondon, Mackenzie, and Viveiros de Castro, I distinguish three interrelated forms of transduction—cultural, conceptual, and procedural—to track how innovations circulate, mutate, and resist

assimilation. These modes clarify how the diffusion of innovations involves the dissemination of tools and cosmotechnical hegemonies, while offering terminology to track the dynamics of transductive exchanges. The section concludes by turning to technical survivance, reaffirming the role of privacy as a condition for technical practice, reinvention, and refusal of authoritarian diffusion.

Before moving into the main structure of the chapter, the following subsection offers a lived demonstration of two-eyed seeing through my own listening practice, showing how such practices and possibilities depend on privacy: a quiet awareness that allows distinct epistemic orientations to enter into transductive exchange without collapsing into synthesis.

Privacy and Two-eyed Seeing

Two years ago, I was introduced to the Mi'kmaw principle of two-eyed seeing by Auntie Diane Kilby at a Grand River Métis community event on water testing. As Métis people, she taught, we should strive to see the world through both our Indigenous and Western eyes to strengthen our land stewardship practices. She gifted the river tobacco before the larger group arrived and shared with us a song and a lesson that before we test the water, we must ask for the river's permission. How will you know permission has been given, she asked? You simply will—you will feel it.

Since then, I've been testing water near my home in Guelph with my son on a monthly basis as part of a community-based monitoring group. Yet it's not the testing of the water—measuring temperature, chlorine, pH, alkalinity, hardness, chloride, and conductivity levels—that has developed my relationship and sense of responsibility for the water, but the act of visiting and returning to testing sites along Speed River. From these places, I notice seasonal patterns, changes in the flow and depth of running water, new foam collecting at the surface, odours, as well as garbage that gets thrown in or collects around the shoreline. As part of this, I upload testing data to a Water Rangers app as part of monitoring group measuring road salt runoff. But I've also begun to advocate for the river by reporting dumping to the city—sending photos as proof of my observations.

In my own experience with water testing, I have experienced a quiet awareness of the importance of privacy as a condition for two-eyed technics—practices of crafting relationship and meaning

through Western and Indigenous approaches. Privacy here names the spacing that allows techniques of relation to unfold—not a withdrawal from the world, but a spacing that mitigates unwanted observation. For instance, there are times when I feel rushed while testing water during weekends, feeling self-conscious about strangers walking nearby. I have lowered my voice in song, and at times, even forgotten to ask for the river’s permission. Put simply, the intrusion of observation has interrupted my listening practice. The water testing itself often prompts people to ask what I’m doing; one of my favourite places to test is from the top of a pedestrian bridge, and many assume that I’m fishing upon seeing me throw a small bucket, attached to a string into the river. While it is easy to answer the occasional question, I have found that to really immerse myself in a two-eyed approach to water stewardship—of singing, listening, and testing—I need to be alone. Not to fully withdraw, but to immerse myself in a quiet awareness of what surrounds me.

Listening, and also distancing, are integral to growing and maintaining my relationship and responsibility to the river. The figurative sense of listening that I am reaching towards constantly rubs against my ears: the babble of the river, the chatter of birds, the wind brushing against my skin, or the dampening effect of snowfall. Hearing persists as a medium through which relation takes form alongside a technique that listens for the voice of the river—a voice that responds in excess of what I can literally hear. Moreover, a quiet awareness is integral to the listening practice I am after. In an urban area like Guelph, this form of privacy is elusive, especially when pedestrian bridges offer the safest place to test from and because accessible wooded areas in the area are located on public lands that are heavily frequented by hikers. When I go into the bush to test, I can quickly immerse myself in quiet, yet my ears often alert me to the approach of curious observers—who, regardless of intent, stunt my relationship to the forest, river, wildlife, and listening technique that I am trying to practice.

The intrusion of observation can lead to the contraction of technique—not the erasure or irreversible silencing of technique but a contraction of a space of open practice. Amidst observation, a quiet persistence of technique endures—as I come to sing under my breath in asking for permission. It is the technical survivance of listening practice that this chapter seeks to trace and theorize as it persists under conditions of surveillance and diffusion.

Yet this scene does not stage a dialogue between Indigenous and Western epistemologies but rather demonstrates how individuating practices of two-eyed seeing can contract or become displaced under conditions of observation. Similarly, a dialogue between epistemic orders must strive to protect the quiet intervals that allow for distinct ways of knowing to move beside one another while remaining held apart in relation. This transductive exchange forms the basis for contesting authoritarian diffusion by learning to give space for difference to remain uncommunicated, untranslated, and undominated. By treating privacy as a foundation for cosmotechnical dialogue, the invisibility of other technical milieus may be understood not as an absence or deficiency, but as the incommensurability of difference itself.

However, one might rightfully wonder about the suitability of a Western liberal concept of privacy to talk about the importance of a kind of spatial bubble within an Indigenous process of learning. While privacy indeed is often conceptualized quite narrowly and individualistically—as in a data privacy regime, I share the perspective that the meaningfulness and utility of privacy are not restricted to a Western liberal framework but rather offer a “convenient conceptual shorthand way to describe a cluster of problems” (Bennett 2011, 486, commenting on Solove 2008). Put otherwise, despite the philosophical roots of privacy as a liberal framework to ensure individual autonomy, and in particular the rights of white, male property owners (Igo 2018) from the state and other infringements of civil rights such as freedom of expression, it is also used to denote various forms of spatial boundary control (Altman 1981). This is accounted for by histories of privacy that interpret various practices of spatial retreat and defense from observation through the lens of privacy before any right to privacy had been codified as such (Vincent 2016; Locke 2010). This is not to deny the continued conflation of privacy with matters of individual informational control in prevailing legal theories, which commonly reject spatial metaphors and analyses of privacy (Cohen 2008, 191), but rather to utilize privacy as a familiar analytic for naming practices that mobilize a right “to be let alone” (Warren and Brandeis 1890, 195)—both individually and communally.

In this spirit, First Nation governments have enacted their own privacy protections laws (Gee 2019) and international frameworks such as the United Nations Declaration on the Rights of Indigenous Peoples UNDRIP have leveraged a communal conception of privacy to codify

Indigenous peoples' rights to control access to cultural and sacred sites.³ Moreover, in informational contexts, the Indigenous data governance and sovereignty framework of OCAP (Ownership-Control-Access-Possession), represents a familiar framework to uphold First Nations privacy (Williams et al. 2011).

For the purposes of this dissertation, privacy offers a pragmatic interface for a two-eyed dialogue and process of reciprocal learning. First, although this should not be misconstrued as representing a pan-Indigenous conception on matters of informational and spatial control, the analytic of privacy, paradoxically opens a window into seeing the world from another perspective. Using privacy as an interface within a two-eyed dialogue does not naively pretend that one can fully take on another's viewpoint but rather involves recognizing common—and perhaps universal—practices that maintain pluralistic differences by refusing unwanted forms of exposure, extraction, or forced translation. In other words, privacy maintains possibilities of cultural transduction where understanding of irreconcilable differences is used as the basis for dialogue and cosmotechanical exchange. Second, by transducing, and unavoidably simplifying complex and varied practices and cultural meanings of boundary control or spatial retreat through the shorthand of privacy, a Western term can be used to facilitate knowledge exchange through Indigenous practice and vice versa.

However, my preceding account of two-eyed water-testing and the role that listening plays within it indicates is that the very intelligibility of Indigenous technical practice—of singing and asking for the river's permission—remains unintelligible within a Western cosmotechanical order. To understand how this misrecognition is rationalized and extended by media technologies, the next section turns to the epistemic foundations of Western listening and the technics that sustain its authority over other worlds.

Western facts of listening

This section extends the previous discussion by challenging the presumed factual certainty about listening that stems from a positivist scientific ordering of the senses and the division between hearing and listening. This critique is necessary, since such certainty provides the empirical foundation for claiming that machine listening represents an extension or augmentation of human

³ Article 12 in UNDRIP codifies the privacy right of Indigenous people over religious and cultural sites (United Nations General Assembly 2007).

listening. Simply put, these certainties construct a chain of gradual technical and attentional progress: hearing → listening → machine listening.

Standard definitions of machine listening—the computational processing of datafied sound—are thus built upon a substrate of “facts” about listening. To challenge this, I leverage the terminology of Leroi-Gourhan (2023), where technical facts are understood to be culturally contingent and serve as a technical basis upon which innovations can be added. For instance, machine listening develops upon the technical assumption that listening entails paying attention to sound, yet this assumption is neither universal nor objective.

This section therefore traces the epistemic and technical foundations of dominant Western notions of listening, so that the cosmotechnical basis of machine listening can be revealed and unsettled as a starting point for a two-eyed analysis of listening techniques and operational chains.

Epistemic foundations of Western listening

By most accounts, listening is straightforwardly defined in opposition to hearing. Whereas hearing refers to the faculty of perceiving sounds, listening denotes an activity of sonic attentiveness. This definition is reflected in many theories of listening which position hearing as a passive process in comparison with listening as an active one (Lacey 2013; Oliveros, Anderson, and Ione 2024). As an act of paying attention, listening is treated as a cultural and technical practice that supplements hearing as the biological perception of sound. Despite recurrent critiques (Sterne 2022, 69; Cecchetto 2022, 106-7), listening continues to be figured as a technical layer added to the natural faculty of hearing—effectively channeling conceptualizations and theories of listening through the human ear.

Thus, hearing—specifically human hearing—is positioned as an originary condition for listening: “we hear in order to listen” (Oliveros, Anderson, and Ione 2024, 38). David Cecchetto’s intervention unsettles positivist assumptions by illustrating how factual distinctions between hearing and listening collapse once their apparent self-evidence is interrogated.

The quotidian distinction between hearing and listening doesn’t hold. One might hear tell that hearing refers to the perception of sound, whereas listening refers to the attention given such sounds. But any concerted attention to the distinction itself announces an indistinction between the two that cannot be held in abeyance. Put simply, any account of listening as attention to hearing must attend to the fact that attention itself is caught up in affective processes, relations, forms, and architectures that have nothing to

do with its concentrations. Likewise hearing is never a question of simply receiving a signal. Just as we know that mind and body are constitutively and primarily inseparable from one another, so too is the raw data of hearing always already cooked in the cauldron of listening—a cauldron that is itself seasoned from the other uses to which that pot is put. (106-7)

This indistinction opens a space to contest the authoritative rationality underlying positivist epistemologies of listening.

Epistemic certainties about hearing and listening do not remain at the level of definition; they solidify into theories of technology that reproduce a common Western division of the senses (McLuhan 1964). These “facts” of listening migrate into conceptual frameworks that cast the human ear—and its mechanical analogues—as both the technical model and limit for listening. In this cultural configuration, hearing becomes an obligatory passage point (Latour 1993), a conduit through which listening technics must pass.

The conception of listening as an extension of human hearing exemplifies the ways Western cosmotechnics simultaneously propel and delimit technical thought about listening. This dynamic is laid bare in critiques of the McLuhanesque tradition, which as Langlois highlights, is limited to “a unidirectional extension from the human outward, and not for instance, from nonhuman entities, dynamics, and processes inward... Within such a framework, what counts as media is what fits into this specific concern with Western, Eurocentric, and colonial power” (2022, 68-9). As a result, extension theory struggles to account for technical mediations that do not flow from the human body and from sensory divisions imposed by Western science. In the case of listening, this leads to a failure to perceive the technicity of non-aural forms of listening—practices that craft meaningful relations with the world in ways that exceed hearing alone. Paradoxically, then, extension theory names not an opening but a deterministic narrowing—an ironic misnomer that contracts the space of technical practice and technological inquiry.

Nowhere is this problem clearer than in the case of Indigenous peoples who are commonly mistaken as being nontechnical or pre-technological. In regard to listening practices, Indigenous cosmotechnics cannot be reconciled with positivist divisions of the senses and so non-aural and multi-modal listening practices become interpreted as metaphors rather than techniques. Put otherwise, Western cosmotechnics not only determines what can be rationalized as a technique but also delineates what counts as a technical extension. This becomes evident in the very

sensibility of machine listening, an innovation grounded in a specific construction of listening that obscures how listening techniques might unfold through modalities other than sound.

The authoritarian diffusion of Western cosmotekhnics as universal and objective consequently obscures the technicity of other groups. For Yuk Hui, the way out of this impasse begins with an a priori recognition that technics are not anthropologically universal. In the context of this dissertation's machine listening inquiry, this entails questioning the assumption that listening technics must be routed through human ears.

In calling this process authoritarian, I am building off Lewis Mumford's argument that authoritarian technics involves an "underdimensioned ideology" that measures all human activity by standards of technical efficiency or productivity. This lens flattens social life while obscuring the plural values, practices, knowledge, and relations that materialize worldviews. The diffusion of this system is built into the very logic of authoritarian technics as a system that "must be expanded, at whatever eventual cost to life" (1964, 5). Western cosmotekhnics tilts toward the authoritarian in its refusal to respect natural or social constraints and in its diffusion of an ideology that devalues alternatives such as democratic technics and indigetekhnics. Authoritarian diffusion, in this sense, describes the underdimensioned expansion of a system that extends control by constricting spaces of technical practice, and in doing so, making other worlds appear smaller.

Western cosmotekhnics not only diminishes or disregards non-aural and multi-modal listening practices as though they were non-technical and metaphorical, but also directly assaults Indigenous worlds. For instance, Dylan Robinson has shown how Western listening practices were diffused to Indigenous nations as part of colonial rule in Canada. He explains that listening is both fixed to single-sense engagement (2020, 40) and mobilized within a "civilizing" sensory order (3). Through the construct of "hungry listening", Robinson illustrates how Western certainties about listening were forcibly diffused to compel Indigenous people to unlearn Indigenous cultural practices and knowledges.

"It is a "civilizing" sensory paradigm that has been imposed on Indigenous people who grew up within residential school, boarding school, and day school systems; who were part of the sixties and seventies scoop; who have been disenfranchised by the Indian Act and forced migrations; who grew up on-rez and in urban centres. Practices of hungry listening have been passed on intergenerationally through families, and continue to be defied through culturally immersive learning environments within Indigenous communities across the globe". (3)

The diffusion of hungry listening thus marks the authoritarian spread of a sensory order that operates as a technical substrate of Western colonial worldmaking. By enforcing assimilation to this regime of listening, Western cosmotechnics disrupts the technical substrate through which other technics can be practiced, learned, and valued. Yet Indigenous peoples have continually defied Western cosmotechnics through acts of unlearning, refusal, and reconnection that may not always be practiced openly or legibly.

The next subsection deepens this political exigency by showing how positivist certainties about listening are uncritically diffused through digital technologies that carry forward the hungry logic of assimilation and sonic control.

Machine listening extensions

The hearing/listening distinction is an active site of debate in the field of machine listening (Napolitano and Grieco 2021; Sterne 2022) yet these discussions have not fully reckoned with the cosmotechnical substrate that gives the term *listening* its sensibility.⁴ Foreshadowing the next subsection's turn to listening metaphors, much of this debate centers on how listening functions metaphorically when sound is computationally processed. As I show, just as theories of listening are often funnelled through the human ear, so too are theories of machine listening.

Napolitano and Grieco problematize the term machine listening on the basis that it is overtly “anthropomorphic—the very term ‘listening’, when referring to numerical operations, can be seen as a metaphor in itself...” (2021, 186). Although the authors seek to contest anthropomorphic conceptions of machine listening, their interpretation of listening as an exclusively human practice reflects an understanding of the human body as integral to listening itself. As Sterne observes: “they [Napolitano & Grieco] argue that machine listening systems operate according to their own logics, which are not the same as the logics of human hearing” (2022, 2). This is not a minor esoteric debate but one that subtly reinforces the cosmotechnical hegemony of Western media theory in regard to thinking about the senses, nature, and technology. The media archaeological tradition advanced by Napolitano and Grieco is heavily influenced by Marshall McLuhan's (1964) extension theory, however the authors hold that machines do not merely “extend humans' listening ability” (Napolitano and Grieco 2021, 185).

⁴ Relatedly, Parker and Dockray argue against terms such as “machine hearing” and “computer audition” because they rhetorically position these technological assemblages as biological and apolitical (2023, 257).

Nonetheless, their premise that listening constitutes an anthropomorphic metaphor demonstrates an understanding of listening that is pinned to human ears. Put otherwise, the sensibility of the term machine listening according to the authors hinges on its status as a metaphorical extension of human hearing.

Machine listening critics have interrogated the rationality of listening in relation to human technics, yet this line of critique leaves intact deeper assumptions about listening as an attentional supplement to hearing. By leveraging machine listening as an epistemic scope (Leroi-Gourhan 2023, 14) for the systematic study of listening techniques, I aim to challenge the ear as an obligatory passage point for listening technics, while resisting the reification of sound reproduction technologies, databases, and machine learning systems as such. Put otherwise, the reconceptualization of machine listening I am reaching toward continually rubs against hearing and computational technology without being determined by either.

This reframing directly challenges the problems raised by authoritarian diffusion. If machine listening is regarded as an extension of human listening—metaphorical or otherwise—milieus that have yet to adopt such digital systems are positioned at a disadvantage: as milieus primed for diffusion. Machine listening, as it is generally understood, implicitly surpasses the physiological limitations of human hearing. Unlike machines, human hearing is limited in bandwidth both in terms of audibility and attentional capacity. In this sense, machine listening reproduces what Mejias and Couldry (2024) call data colonialism’s civilizing narrative of scientific advancement. Machine listening can be constructed as a modern upgrade because these systems can ‘hear’ more than humans are capable of hearing. Left unexamined, machine listening helps to rationalize diffusion into milieus deemed technically deficient.

As I show in the next chapter, this opens the door for strategies of authoritarian diffusion such as function creep whereby innovations are pushed into new settings without dialogue or consent. At this stage, this chapter reopens the question of diffusion, by recentring the technicity of extra-aural listening practices that may allow us to practice a quiet awareness and responsiveness with other milieus and technical possibilities.

Insofar as machine listening reflects an extension of positivist conceptions of listening, it produces a deeper social and cognitive consequence—what Stiegler calls proletarianization.

Sonic proletarianization

Rather than accepting a narrative of augmented listening, I propose that the authoritarian diffusion of machine listening enacts a loss of knowledge and technique. For Stiegler (2010, 38) proletarianization involves the transfer of technical know-how from practitioners into machines. In regard to listening, this process is expressed through the civilizing drive of hungry listening, the spread of surveillance logics, and a systemic cultural disregard for non-aural listening practices. Sonic proletarianization, understood here as the loss of listening knowledge and technique in how to craft relation through and in excess of hearing, marks a social and cognitive loss but also a deeper epistemic crisis—a technological order that has forgotten how to listen beyond the rationality of a positivist epistemology.

Stiegler's terminology borrows from Simondon for whom the proletarian is a “disindividuated worker” (37): one whose capacity for learning and technical practice is outsourced to the machine. The proletarian's relationship to technology and technical practice thus stultifies learning and inhibits individuation within the milieu of their work (38).⁵ This insight is prescient in light of contemporary concerns about generative AI, where increased use has been correlated with declines in critical thinking (Lee et al. 2025). If AI is making people stupid, then machine listening may be making us impoverished listeners.

Sonic proletarianization involves the technological exteriorization of memory in how to communicate and listen. Yet this is not only a problem of interpersonal listening, but of intercultural divides. As touched upon in the introduction to the dissertation, Open AI's whisper model, like many machine listening systems, was likely trained on YouTube data to develop its Indigenous speech recognition capacities. The treatment of Indigenous linguistic knowledge as part of a vast repository of immaterial labour, illustrates the consequences of sonic proletarianization: cultural knowledgebases are absorbed into systems that neither recognize nor respect their cosmotechnical provenance. Open AI's appropriation of Indigenous voices, languages, and stories, puts Indigenous labourers to work for a machine that has no respect for Indigenous culture and principles of data sovereignty. Authoritarian technics thus lead toward sonic proletarianization as incapacities for listening otherwise become hard coded into

⁵ According to Stiegler, proletarianization involves a loss of knowledge in how to act (*savoir-faire*), how to live (*savoir-vivre*), and how to theorize.

infrastructure. Put simply, machine listening systems do not merely reflect proletarianization—they extend and naturalize it, further entrenching Western cosmotechnics and authoritarian logics of extraction, surveillance, and relentless diffusion.

Importantly, sonic proletarianization must not be interpreted as inevitable or technologically determined—in keeping with Stiegler’s thesis of technological exteriorization being “*irreducibly pharmacological*” (42, emphasis in original). Recognizing this duality reframes machine listening not as a fixed condition but as a site of negotiation, where cultures and communities are given space to reshape how technics are lived and imagined. In Chapter Four, I examine crisis counsellors who navigate the diffusion of automation while cultivating new listening techniques to hold space in caring for others. Similarly, collaborative projects in Indigenous language revitalization (Pilkington, 2025), show how digital innovations can be reinvented through dialogue. When space is given for people to practice agency over the technical substrate of their milieu, machine listening can be reclaimed as a site of renewal, reconnection, and reciprocity.

The pharmacological negotiation of techniques and innovations by a milieu relates to what I think in terms of transduction: the mechanism through which change propagates across milieus. In sound studies, transduction is often confined to an engineering sense—the conversion of energy from one form to another—but, as I elaborate later in this chapter, I use it here to describe the transformation that occurs when a technique passes between milieus or evolves within an unstable technical and epistemic environment. The next section turns to this engineering conception itself—showing how signal transduction must be rethought to contest authoritarian diffusion.

Passing through signal transduction

Transduction is a central concept and keyword (Helmreich 2015) in sound studies used to describe processes by which sounds are transmitted through media. Transduction is typically defined as the conversion of one form of energy into another, a definition which stems from the word, transducer: “any device by which variations in one physical quantity (e.g. pressure, brightness) are quantitatively converted into variations in another (e.g. voltage, position)” (“Transduction,” n.d.). Yet the problem with the engineering hegemony over transduction is that it further pins listening to hearing, as sound scholars have come to understand the physiology of the ear through the mechanical operation of transduction (Sterne 2003).

Helmreich notes that the abstraction of the ear as a transducer effectively “folds an engineering formulation into scientific understandings of the sense of hearing as such” (2007, 625). Yet engineering formulations of transduction have not only shaped understandings of hearing but have also overdetermined conceptions of listening. For instance, Nina Eidsheim argues that “listening...should be defined as the transmission and transduction of sound” (2015, 180), maintaining that “transduction describes energy that is transformed from one state to another” (170). Although Eidsheim is mindful that this notion of transduction is culturally constituted, her definition of listening in this passage reinscribes an engineering formulation to continue treating hearing as originary. By pinning down transduction, listening is further pinned to the ear, helping to rationalize the assumption that listening is something added onto hearing. Thus, a mechanical principle of energy conversion is treated as a universal foundation for listening technics.

Moving beyond signal transduction does not mean rejecting it as a scientific principle but refusing to let it define what counts as listening so that we may better appreciate the technicity of listening practices grounded in other rationalities. Shifting from signal to metaphor reframes transduction as a form of cultural translation, opening the possibility for cosmotechnical dialogue. This reframing is vital as two-eyed seeing invites attention to convergence and reciprocal learning between different orders of knowledge—without collapsing into epistemic synthesis.

The next section advances this dialogue in another register by examining the technicity of listening metaphors, taking seriously the idea that metaphors are not just descriptive, but actively do things—shaping techniques, relations, and worldviews. For instance, anyone who has taken a yoga class can recognize that a pose like downward dog expresses a moment of matter-taking-form (Mackenzie 2002, 50), a transductive movement, in which the body learns and stretches through analogy as canine movement takes shape in human gesture. The technicity of metaphor, as I see it, helps unsettle positivist certainties and offers a starting point for cosmotechnical dialogue. The next section teases out how listening metaphors can be interpreted as technical convergences between Western and Indigenous orders. Listening metaphors reflect a logos that stretches beyond a positivist worldview, articulating what Vizenor calls an “imaginative rationality” (2009, 91). As I argue in the next section, listening metaphors act as tools to grasp

what cannot be fully comprehended while functioning as a means to craft relations, meaning, and perspectives that stretch beyond one's inherited worldview.

Listening metaphors as a place of technical convergence

This section seeks to establish technical convergences between Indigenous and Western modes of listening to help realize a framework of two-eyed seeing. As I see it, convergences represent points of contact that support dialogue between distinct cosmotechnical orders. Informed by Leroi-Gourhan, convergence refers to instances in which different cultures arrive at similar innovations seemingly independently, without diffusion taking place. Convergences, he explains, frequently arise from technical tendencies—the material constraints and affordances that shape invention. As he writes, “to suspend an ornament [on the body] can only be done by piercing the nose or the ears, to spin fibers is possible only by twisting them, to attach an axe to its handle only can be done following a dozen or so combinations of handle and blade” (2023, 144, addition in original).

In this section, I begin by turning to Western metaphors of listening that reveal a technical substrate of multimodal listening that survives the positivist division of the senses. Listening metaphors, I suggest, point toward convergences with Indigenous listening techniques—not as cosmotechnical equivalents, but as functional analogues that can help illuminate technical resonances across worlds.

Convergences indicate a technicity of listening that precedes (and survives) the sensory and cultural divisions through which hearing and listening become later distinguished—an intuition that Western philosophy would later articulate as originary technicity. Originary is a shorthand for the deconstructive logic of the supplement (Derrida 1979) which describes “all those situations in which what was thought to be merely added on to something more primary turns out to be irreversible and inextricably presupposed in the constitution of what it is said to be added on to” (Mackenzie 2002, 7). As I have laid out, hearing is typically thought of as preceding listening. However, this is absolutely thrown into question by Sterne's history of sound reproduction technology: “The only way a hearing researcher has access to hearing as a pure faculty is through the subject's highly cultured act of listening” (Sterne 2015, 72). Originary technicity brings the logic of the supplement to recognize that a nontechnical domain does not precede the technical. In regard to listening, Sterne argues that not only is listening prior to

hearing, but so is technology (72) insofar as all knowledge about “hearing in its natural state is a result of the interactions between ears and sound technologies” (69). In this sense, listening is always already technical before it is routed through human hearing.

A deconstructive logic departs from positivist rationality by unsettling hierarchies that separate nature from technoculture, as reflected in the division between hearing and listening. Similarly, metaphors of listening engage an imaginative rationality that complicates the quotidian distinction between hearing and listening. For Vizenor’s metaphors act as tools to help reach for what cannot be fully grasped (2009, 91)—feelings, aesthetic experiences, and I would add, cosmotechnicality: the principle in which moral and spiritual orientations shape the limits and possibilities of technical practice and technological thought. In what follows, I examine the imaginative rationality of Western listening metaphors to show how they disclose an originary technicity of listening that unsettles positivist worldviews while pointing toward convergences with indigetechnical substrates that might otherwise fail to speak to one another. Like deconstruction, imaginative rationality works by loosening categorical boundaries, opening a space to listen across epistemes.

Metaphors that reach beyond our ears

As a figure of speech, metaphor refers to something expressed in a non-literal or unusual sense. When applied to technics, metaphors stretch sense-making to engage an imaginative rationality of technique. For instance, listening metaphors complicate assumptions about a technics pinned to the human ear.

Consider the concept of “listening to the body”, which is often understood metaphorically as an injunction to pay attention to internal signals, to check in and respond to one’s feelings and physical needs. Here, listening becomes an intentional practice of attending to inaudible signals—stretching beyond what hearing can literally apprehend.

Yet this metaphor can be folded back onto a material and acoustic plane. Many internal signals that typically go unheard can, in fact, be sonically attended to: affect resounds through the voice and breath; hunger grumbles in the stomach; blood pulses audibly through the head; bones and joints crack as the body moves and adjusts. These vibrations remind us that listening to the body exceeds hearing itself, while still engaging a technics that continually reencounters sound.

Additionally, there are many other internal signs that could be described in terms of what Goodman calls unsound frequencies—those not yet heard vibrations that occur at the “fuzzy periphery of auditory perception” (2009, 198). These unsound signals, including the apocryphal low- and high-pitched tones Cage heard in the anechoic chamber—corresponding to his blood circulation and nervous system—can, in principle, be amplified or sonified. After all, once different forms of technical mediation are involved, virtually any embodied signal engaged in practices of listening to the body can be understood as “implicitly sonic” (Ernst 2016). Thus, as a technique, listening to the body appears constitutively inseparable from sound, even when metaphorically invoked as a way of paying attention with more than hearing alone.

Similarly, Tina Campt’s practice of listening to images deploys an imaginative rationality that is not purely figurative in its engagement of vibration. Drawing from scientific definitions of frequency, she reminds us that “all sound consists of more than what we hear. It is an inherently embodied modality constituted by vibration and contact” (2017, 7). This closely aligns with Goodman’s notion of the unsound, which is “masked due to limitations on not just the deficient physiology of the auditory system, but also the policing of the sensible enacted by groups defined by their affective affinities determined by taste, expertise, or other audiosocial predeterminations such as class, race, gender, and age” (2009, 191). While such a technique, might be policed as merely metaphorical, Campt’s figuration is materially consequential by reorienting listening practice toward unheard and overlooked forms of contact, vibration, and affective resonance.

In problematizing the “boundaries of the auditory” (xvi), sound studies represents an important field to challenge authoritarian technics’ incapacity to recognize and learn from other cosmotechnical orders. By pushing readers to reconceptualize sound and listening, sound studies consistently attends to technicities that by their very nature remain invisible yet are integral to the making of relations, meanings, and worldviews. In this light, and in response to what has been identified as “the whiteness of sound studies” (Stadler 2015), I approach the problem and task ahead somewhat differently from Stadler. I share the concern that the field has been shaped by universalizing assumptions about categories such as “the ear”, “the body”, or “the listener.” Yet I also see sound studies as a field that, despite demographic imbalances, demonstrates a sustained capacity and willingness to learn from other perspective. For instance, foundational

work on acoustemology (2015) demonstrates how seriously the field has engaged with non-Western lifeworlds, and how listening itself has been redefined through such encounters. In this sense, sound studies is both marked by whiteness and has actively worked to hear beyond it—using intercultural learning as the basis to transduce dominant understandings of listening.

Building on this openness for expansion and critique within sound studies, the next subsection turns to the Western technique of active listening to deepen an account of multimodal listening practice that converges with Indigenous listening technics.

Metaphors that reach beyond vibration

The technique of active listening might be conceptualized within a positivist frame as both a material and metaphorical deployment of listening, one that embodies the imaginative rationality traced in the preceding discussion: it involves listening “not only with our ears, but with our eyes, mind, heart and imagination” (Rogers qtd. in Robertson 2005, 1053). However, this multimodal conception of listening not only involves the reception of sound and the unsound (e.g. body language), but also a form of dialogical communication as a technique that sends a message back to the speaker (Rogers and Farson 1957, 11).

To elaborate, active listening communicates through mirroring practices including restatement of words as well as matching of a speaker’s tone of voice, pace, and body language—a multi-modal technique that conveys to the speaker “I think you’re worth listening to, and I want you to know that I’m the kind of person you can talk to” (Rogers and Farson 1957, 11). Moreover, for Carl Rogers, active listening involves speaking to ‘test understandings’ or ‘check perceptions’, techniques that conversationally question and confirm if listening is accurately on target (Guenther 2022, 205-6).

However, the most radical relational aspect of this non-directive counselling technique lies in the capacity of active listening to foster relationships and nurture change among multiple parties across different positional axes. Put otherwise, active listening is imagined and practiced as a means of bringing about positive, co-productive change on personal and social levels:

sensitive listening is a most effective agent for individual personality change and group development. Listening brings about changes in people’s attitudes toward themselves and others, and also brings about changes in their basic values and personal philosophy...When people are listened to sensitively, they tend to listen to themselves with more care and make clear exactly what they are feeling and thinking. Group members tend to listen more to each other, become less argumentative, more ready to incorporate other

points of view... Not the least important result of listening is the change that takes place within the listener himself. Besides the fact that listening provides more information than any other activity, it builds deep, positive relationships and tends to alter constructively the attitudes of the listener. Listening is a growth experience. (Rogers and Farson 1957, 3-4, emphasis added)

In theory, active listening can articulate a process of co-individuation whereby all parties take up the role of becoming a good listener to nurture individuated growth and interindividuated growth for the collective (Stiegler and Rogoff 2010). Co-individuation, as Stiegler describes it, refers to the simultaneous formation of individuals within a shared milieu through technical and affective exchanges—a process in which one's becoming is inseparable from the becoming of others. As Rogers and Farson explain:

Active listening carries a strong element of personal risk. If we manage to accomplish what we are describing here—to sense deeply the feelings of another person, to understand the meaning his experiences have for him, to see the world as he sees it—we risk being changed ourselves. For example, if we permit ourselves to listen our way into the psychological life of a labor leader or agitator—to get the meaning which life has for him—we risk coming to see the world as he sees it. It is threatening to give up, even momentarily, what we believe and start thinking in someone else's terms. It takes a great deal of inner security and courage to be able to risk one's self in understanding another. (15-16)

This relational risk signals a technical convergence with the Mi'kmaw principle of two-eyed seeing, described by Martin (2012) through the analogy of listening around a campfire without judgment and with a willingness to see the world through another's perspective.

Moreover, what is important here is that sensitive or active listening does not seek to hear more. Rather, active listening strives to listen beyond vibrations and the natural limitations of human hearing. In this way, active listening may articulate the survivance of multimodal listening principles—not a mere survival of an outdated technics, but a conscious manifestation of a technique that refuses to conform to a positivist division of the senses. By tracing the imaginative rationality of listening metaphors, it becomes clear that techniques persist within the Western toolkit that strive to listen responsibly in relation with other people and worlds—perhaps in direct resistance to the dominance of hungry listening and authoritarian technics.

Convergences work as conversational icebreakers across worldviews. The next subsection discusses Indigenous listening practices that might typically be interpreted metaphorically, but which I interpret as evidence of cosmotechnical difference. The point of this discussion is not to appropriate or imitate, but to bring Indigenous techniques into dialogue.

Metaphors from beyond the Western world

Indigenous listening practices offer essential contributions in a two-eyed dialogue by centering the transindividuating capacity of listening technics. Following Stiegler, transindividuation refers to the process through which psychic and collective individuations co-constitute one another across technical milieus. In the examples that follow, listening functions as a multimodal technics and a shared substrate through which individuation unfolds, with listening techniques transmitted across generations through language and storytelling. What emerges is a conception of listening technics that does not derive its intelligibility from the perception of sound, but from transduction—the cosmotechnical relay through which relations are made and remade.

This transductive operation finds expression across diverse Indigenous contexts. Dustin Tahmahkera explains the technique of *Tubitsinakururu*, which he translates from the Comanche language, *Numutekwapuha*, as meaning to “listen carefully” (2016, 309).

Nakikaru means listen, but to practice *tubitsinakururu* is to listen closely and engage with the speakers and sounds, be they familiar or foreign, friendly or fierce, fictive or factual, or sometimes, in the eccentricities of humanity, all of the above. It is to perform possibilities of conversing not at, around, or away from each other but, as Lisa Jackson says during the conversation with Elle-Máijá Tailfeathers and Helen Haig-Brown, “through each other.” (ibid.)

This practice exemplifies a transindividuating mode of listening that transduces across milieus—between speakers and sounds, the familiar and foreign, the fictive and factual. Drawing connections from Turtle Island to Australia, Tahmahkera associates this with Blaze Kwaymullina’s concept of “listening through the heart”, a practice of respect and reciprocity towards a speaker that can transform the listener through the reception of “knowledge, experience, and emotion” (2012, 6). Together, these practices articulate a technical substrate of listening that exceeds human hearing while still enfolding sound within its cosmotechnical relay.

As another illustration of indigetechnical listening, from an Australian context, Miriam-Rose Ungunmerr explains the practice of *dadirri*, which she characterizes as the *Ngangikurungkurr* people’s greatest gift—something that a two-eyed framework can learn from (1988). “It is inner, deep listening and quiet, still awareness” something akin to “contemplation” (n.p). This practice’s spiritual and attentional quality resonates with Mackenzie’s account of “transductive individuation” (2002, 191), understood as a process that meta-stabilizes connections beyond the self. Ungunmerr explains: “When I experience *dadirri*, I am made whole again. I can sit on the riverbank or walk through the trees; even if someone close to me has passed away, I can find my

peace in this silent awareness. There is no need of words. A big part of dadirri is listening” (1988, n.p.). As a reiterative process of becoming whole again, dadirri can thus be read as a practice that restores and replenishes relationship within an extended circuit of transindividuation—a relay of connection linking the human, the cosmos, and more-than-human relations.

There are many cosmotechnical commonalities between Indigenous peoples of Turtle Island and Australia (Wilson 2008) and what each of these examples illustrates is a sophisticated reflexivity of listening’s unsounded technics. As Ungunmerr says: “In our Aboriginal way, we learnt to listen from our earliest days. We could not live good and useful lives unless we listened. This was the normal way for us to learn—not by asking questions. We learnt by watching and listening, waiting and then acting. Our people have passed on this way of listening for over 40,000 years...” (1988, n.p., ellipses in original). What these examples—and the next section—illustrate is how Indigenous cosmotechnics articulate a reflexive relationship with the originary technicity of listening, one that has been skilfully practiced since time immemorial yet must continually be learned anew and passed down across generations.

The next section traces how storytelling sustains this inheritance, examining how stories act as media of survivance that not only convey ideals of listening but actively teach and transmit a multimodal technicity. Vizenor centers storytelling as a medium of survivance, yet it is the recurring motif of individual retreat—of going into the bush—that I highlight in these stories as revealing a crucial link between privacy and technical survivance. In this examples, storytelling passes down an indigetechnical insight: that certain forms of technical practice and innovation depend on spaces of withdrawal from observation.

Storytelling and indigetechnics

Having unsettled dominant frameworks for understanding listening by tracing convergences in Western and Indigenous listening practices, I now turn to storytelling to deepen an account of indigetechnical listening. In the spirit of a respectful learning relationship, I have sought to incorporate diverse Indigenous teachings throughout this chapter to highlight the status of Indigenous peoples as cosmotechnical Knowledge Holders from whom others can learn. The aim is to recognize different milieus of listening and to protect the space required for their cultivation and practice. Meanwhile, it is imperative to avoid constructing a pan-Indigenous theory of technicity in acknowledgement of differences and disagreements among Indigenous nations and

communities. I proceed by engaging two stories told by Anishinaabeg Elders and a third from a Métis Elder to advance an argument about the importance of privacy as an ethical relation and an epistemic condition for communication across milieus. This in turn provides a foundation for the broader claim that constant observation obstructs the possibilities of transduction required for dialogue across worlds and for resisting the logics of authoritarian technics.

The story of the “Song by the Edge of the Woods” as told by Elder Eli Baxter

In *Aki-wayn-zih*, Elder Eli Baxter (2021) teaches about the Anishinaabayg’s “Song by the Edge of the Woods”, a song that is integral to Anishinaabeg diplomacy and transindividuation. As Baxter explains, storytellers from every Clan also acted as messengers from one village to another.

The only things he [the messenger] carried were his medicine pouch and the oral messages he was required to deliver...

The “Song by the Edge of the Woods” was delivered by all the messengers. If the messenger did not recite the “Song by the Edge of the Woods” and simply walked into the village, anyone had the right to attack him. The dogs would be the first to let the people know there was a visitor outside. When he arrived at the village...the messenger built a fire near the village to let the people there know that he was a visitor and wanted to come into the village. He would sing. The Chief is then notified, and he sends out a delegation to meet the stranger. By the time the delegation from the village reaches the messenger, the fire is burning, and the song is still being sung. There is no talking yet.

The delegates sit down around the fire and the messenger takes up his pipe with tobacco in it. The pipe is smoked by everyone at the fire. The messenger introduces himself to the delegation and says that he has a message for the Chief and Council. They all get up, put the fire out, and walk into the village...[to eventually share the message]. (12-13)

This cosmotechnical custom of Anishaabay law opens a space of multi-modal and relational listening that precedes the delivery of a verbal message: a fire is lit, the song is sung, medicine is smoked, and introductions are given. This protocol evidences the cultivation of a long circuit of transindividuation—an organological network that is inscribed through a relationship of sensory practices, technical mediations, and social laws.⁶ Moreover, the space that is created by this protocol of transindividuation illustrates a technicity of listening that does start or stop with hearing, but nonetheless is marked by sonic activity as with the barking of dogs, crackling of fire, and the song itself.

⁶ For Steigler transindividuation is an organological process that involves the co-articulation of bodily organs (e.g. eyes, ears, etc.), artificial organs (e.g. tools, instruments) and social organs (i.e. human groupings organized into social systems) (2010, 34)

The “Song by the Edge of the Woods” is a cosmotechnical actor that belongs within a long circuit of Anishinaabeg transindividuation. It reflects an attentive cultivation of respectful listening relationships as grounded in a principle of non-interference. The song is an important part of a multi-modal and highly intentional and relational circuit that is recreated time and time again between geographically isolated villages to create space for communication and renewed relationships grounded in principles of reciprocal respect, trust, and sovereignty. Put otherwise, the song enacts a listening protocol that engages the originary technicity of listening.

In the next two stories music and listening protocols mark a process of technical mediation that neither begins nor ends with human hearing, underlining further differences between Indigenous and Western listening technics.

A foundational belief for most Indigenous peoples is the interconnectedness of humans with nature or mother earth, encapsulated in the phrase all our relations which is shared across much of Turtle Island. The phrase expresses an ethic of inherent relationality and a practice of maintaining balance with more-than-human relations, including animals, plants, and even inanimate entities. Indigenous cosmotechnics embodies this principle not by asserting mastery over nature but by nurturing balance with relations as the ground for technical learning, inquiry, and practice.

The story of the pipigwan as told by Elder Rene Meshake

The late Elder Rene Meshake recounts how his relationship with the pipigwan (Anishinaabe wood flute) started in his book *Injichaag* (the spirit within) (2019).⁷ Growing up on the rez, Meshake heard stories about the flute but never heard it played. He shares how the flute was given to the Anishinaabeg: a broken-hearted young man wandered off into the forest after being rejected by the young woman he loved.

He sat down beside this big tree and started crying, and above him one of the branches started blowing. The winds heard him and felt sorry for him, asking, “What are we going to do?” As they said this they blew harder against the branch, so hard that the bark came off.

Nearby, there was a bird we call pipigwis—the woodpecker, the one that flickers, and when he flies you see this flash of yellow and green. So pipigwis was flying through the pine trees making a sound, like the one

⁷ I was honoured to hear Elder Rene Meshake speak just two months before he passed away when he led a public event held at the Civic Museum in Guelph to mark the National Day for Truth and Reconciliation in Canada in 2024. Reflecting his many storytelling and creative gifts, the event spanned discussion about his life, philosophy, poetry, visual art, and musical performance. I was very touched by his immense wisdom, candid spirit, and overflowing charm and sense of humour. He shared a similar telling of the story at this event.

he does really loud in the morning. He landed on the branch beside the young guy who was crying and started pecking holes in the branch. As he did this, the winds blew harder, and the branch fell off, landing right beside the young guy, on top of a bush.

The guy thought, What is this? He was really curious about the sounds he had heard coming from it. He picked it up, thinking, I'm going to go back to the village one more time just to get one more glimpse of the girl.

As he started walking, he heard this big noise coming from an elk. He looked and saw that there was a herd of females all gathered around this elk and became transfixed by this vision before him. When the elk walked away, all the female elk followed him. So, okay, the young man thought to himself, *that has something to do with courting female elks*. He then thought, *maybe I can try making music by the river, where the girl usually comes to get her water in the morning*.

He went back to the village and began playing the branch instrument that pipigwis had made. (188-189, emphasis in original)

The story continues with the young woman agreeing to marrying him after hearing him practice the flute. As Meshake explains that “when you are brought up in the forest, it’s not only the people, like the aunts and uncles, that raise you up. It’s the birds, the elks, the trees, and the wood, the wind; this is the music, the medicine” (189).

The story reflects how Anishinaabeg technicity grows in connection with more-than-human relations through a listening relationship that creates a space for transindividuation. Because there is this space for co-becoming with life in the forest, technics fulfils an integral role—more specifically, an originary technicity of listening is engaged to create space for co-individuating flute making, flute practice, and musicking. Meshake’s story reflects this knowledge of technical mediation with the music of the flute being articulated as *medicine* that is gifted and grows from the earth.

There are important lessons about technical reflexivity from this story. The passage shows how a relationship with originary technicity is maintained through storytelling especially since Meshake grew up listening to stories about the instrument without hearing its music.

Cosmotechanical reflexivity is signalled linguistically through the relationship between the pipigwan (flute), pipigwis (woodpecker), and pipigwe (the language of the instrument) (189).

Thus, the relational worldview of the Anishinaabeg is articulated and reflexively maintained through Anishinaabemowin etymology and the story of the pipigwan’s technical becoming.

Meshake explains that when missionaries arrived, pipigwan’s music died, but the language of pipigwe—the cosmotechanical literacy and reflexivity—was not lost: “pipigwan still speaks” (189). Meshake shares his own story about how pipigwan came back.

Joan and I had just gotten married and we were living by the river. One day, as I was looking through our big bay window, I saw the fog gradually opening, like curtains drawing. Then I saw a bird soar across the opening and evaporate into the mist. I didn't know what it was. It looked like a hawk, but I didn't pay much attention to it.

I had forgotten that vision until years later, when I was at an Indigenous heritage festival at a local high school. The word "heritage" had gotten my attention and drawn me there. Heritage would be *anikeshkagewin* in my language. *Anikeshkage* (to follow after another), *win* (state). What was I following? *Anikeshkage* to what?

...I took some time to browse the other vendors. I saw this guy with a flute on his table on a little stand, and I walked over because it was calling me. With a nod of my head, my eyes fixated on it. It pulsed with a shine and spoke to me. I had never wanted any instrument in my life so bad. (189-192)

After purchasing, the instrument he asked the vendor, what's the name of the flute?

He said, "Red-tailed hawk."

Then I had this epiphany and that vision came back. I realized the bird that had soared across the opening in the mist was the red-tailed hawk. I stood frozen on the floor. I held a red-tailed hawk pipigwan flute in my hands.

Now, I didn't know how to play the flute. Growing up on the rez, no one played pipigwan...

I took my pipigwan out and went into the cornfields and began practising scales. The birds came chirping and fluttering around me and I began to mimic their songs. The crickets and insects kept time. Before long, I found myself jamming with the birds and crickets. I thought, *I may not have known traditional Anishinaabe flute songs, but it's no big deal. The birds and the crickets are teaching me! Nita pipigwew. I speak pipigwan language now. The magic begins when the pipigwan melodies induce in my head visualizations moving in colour and shapes and vice versa!*

Then some women walked by and called out, "That's pretty good!" "No, no, I'm just practising!" I decided I needed to get away from women and everybody else, so I drove to another parking lot out by what used to be a railroad track. I thought I was deep in the bush, riding the free roads and I could just play the flute. But then I saw a big German shepherd looking at me. And guess what? A woman crawls out of the bush, and says, "That was pretty great!"

So I figured I can't play in private anymore. And now that I have this flute, what am I going to do with it?

Make the turtle dance. (192-193) [emphasis in original]

In writing this chapter, what I take from this passage is a teaching about the originary technicity of listening, again, which is constitutively and primarily inseparable from hearing, but is not reducible to hearing itself. This is signalled through metaphorical language: the instrument *calling* to Meshake in resonance with his vision of the hawk and *speaking* through multi-modal transductions ("it pulsed with a shine and spoke to me"). Evidently, Meshake's listening practice does not originate from his ears but rather passes through his eyes, heart, mind, and spirit. This multi-modal quality is further activated through his flute playing which he experiences through a synaesthetic cross-wiring of the senses—listening in colour and shape and seeing in pipigwan language ("pipigwan melodies induce in my head visualizations moving in colour and shapes and vice versa").

Yet Meshake also speaks to the role of social proxemics and non-interference within a space of technics. Meshake senses the importance of a form of privacy (“I needed to get away from women and everybody else”) in learning how to play the flute and in becoming transindividuated with it and through it. According to this, going out into the bush—away from intruding human ears and unwanted commentary of social bystanders—is necessary to open space for sociotechnical relations with more-than-human relations (“the birds and the crickets are teaching me!”). The bush figures here as the space needed for a long circuit of transindividuation.

We can observe this lesson repeated in the origin story of the pipigwan with the gift of the flute coming to the young man only upon his retreat away from community into the forest. In other words, Meshake’s story teaches about the importance of retreating to a space of technics to enter in relation with more-than-human relations. Privacy, in the sense of a solitary connectedness and quiet awareness, becomes a pre-condition for technical practice and transindividuation.

From this, violations of privacy come to take on a new light because individual freedoms are not the only things being infringed upon; rather, violations of privacy short-circuit or rupture a space of transindividuation, specifically by interrupting technical practice. Put otherwise, invasions of privacy or mass surveillance contract the space of technical becoming, disrupting how and where listening techniques can be practiced. These stories therefore teach that privacy is not a passive withdrawal from relation but an active condition for the renewal of technical life.

The story of the birch bark canoe as told by Elder Dolorès Gosselin

The importance of solitude, privacy, sovereignty, or self-ownership (Otipemisiwak) as a pre-condition for transindividuation figures prominently in Indigenous stories of cosmotechnical becoming. In many stories, these conditions are articulated through a technicity of listening. In *L’Esprit du Canot* (2021), Grand-Mère métisse de la Rivière-Rouge (Red River Métis Elder), Dolorès Gosselin tells the story of Jos Perreault’s canoes. Jos Perreault was a master canoe builder who spent all his time building canoes in the community—receiving gifts from everyone in exchange for his work.

The story from Elder Gosselin suggests that Jos was attuned with an originary technicity of listening: a technical milieu of multi-modal and relational listening that precedes human hearing itself. Quoting Elder Gosselin at length:

I have to tell you that Jos had another talent. A gift from God, as they say, a gift from Heaven. Every night after dinner, he would go for a walk in the forest and would talk to the trees. And the trees would answer him. They would tell each stories like good old friends.

One evening, a big, big old oak tree says to him, “I want you to cut me down to make your canoes,” Joe replies: “I can’t do that. You’re too beautiful! It will break my heart!” The old oak tree says to him: “It’s true that I’m old—over 300 years. To be honest, after 300, I stopped counting. But you see, I’m slowing dying. You would help me die with dignity. And with my wood, you could make the most beautiful canoes—maybe 7 or 8, even more, who knows! And, if you use me, I’ll transfer my Spirit to your canoes. It’s going to be a way to transform myself into something beautiful”. Jos goes back home to get his axe and returns to start chopping down the tree. With every hit on the old oak, he cries. The old tree encourages him by saying, “Stop crying, think of all the beautiful canoes you’re going to build with my beautiful wood.”

Jos likes to make canoes but he also loves his forest. So one day, he decides to take a day off and go for a walk in the forest all day long. He leaves in the morning, at the crack of dawn...He walks, walks and walks in silence, at peace with the trees. It was for him, Heaven on Earth. Around noon, he sits on the ground next to a large tree to eat his lunch. He smokes his pipe and takes a little nap.

About ten minutes later, he starts walking again. Suddenly, he sees some trees he had never seen before. He looks at them, surprised! An old tree tells him, “We are birches. And you know what, Jos, you can make canoes out of our bark.” Jos says: “I can’t do that. It would take five or six trees to make just one canoe. That’s too much! It would break my heart!” The tree says: “No, you see, you make a slit at the top, a slit at the bottom and a slit from top to bottom between the two cuts. Then you carefully remove the bark and we will re-grow the bark.” Ti-Jos thinks it’s great but he says: “It’s all very good but I’m quite fat, when I put my foot in the canoe, I’m going to go through.” “No, no!” says the birch tree. “You’ll see we’re quite solid.”

Jos keeps thinking about this and says: “My canoes will be made with pieces. There will be cracks, it will take in water,” “No, no!” says the birch tree: “You take spruce gum, you put that on the cracks and holes and you’re good to go. Plus, you’ll see, your canoe will be as light as a feather and it will slide over the water like a Loon. “Jos wasn’t too sure but the trees had never lied to him, so he decided he would try. (54-56)

A few days later, Jos later takes his birch bark canoe far up the river and disappears—never to been seen again. Searching for Jos, his brother, Henri, finds his canoe upon the riverbank.

Suddenly, he sees Jos’s canoe. He jumps on shore and screams: “Jos, Ti-Jos, where are you?” He hears a voice that says, “Stop looking. I’m fine. I’m giving you my canoe.”

Henri can’t believe his ears. He shouts once more: “Jos, Tis-Jos, is that you? Where are you?” The voice says, “Stop looking. I’m fine. I’m giving you my canoe.”...

They say that this was the beginning of the birch bark canoe.

They also say that if you have a birch bark canoe, and if you go on a lake one night and decide to talk to Jos, he will tell you what happened to him. (58-59)

Jos Perreault’s story continues sometime later with a voyageur named Levasseur.

One fine summer evening, Levasseur picks up his birch bark canoe to go for a tour on the lake. His friends say to him: “Hey Levasseur, can I go with you?” Levasseur replies: “No, tonight, I want to be alone. I want to try something”

The lake is as calm as a mirror and his canoe slides like a Loon. And Levasseur hears the Loon calling him. In the middle of the lake he shouts: “Hey Jos Perraeault, do you hear me? Can you tell me what happened to you?”

Silence...

All we hear is the song of the Loon in the distance. Levasseur continues: "Hey, Jos Perreault, are you here? I would like to know what happened to you". Then Levasseur hears a voice that says: "Yes, I'm here and I'll tell you what happened to me...(61)

The story continues with Levasseur learning that Jos Perreault was visited in a dream during his short nap by the Loon who told him to walk in the forest to receive its teachings. As he walked deeper and deeper, Jos was guided further by Wolf, Loon, Bear, and Turtle until he reached a clearing, where he met his future wife, a First Nations woman.

She beckoned me to sit down as if she had been waiting for me. She signalled me to eat with her and stay. We spoke to each other but we didn't understand one another because our languages were very different.

It was OK because love doesn't need words. And I stayed!

And it was the end of Jos Perreault's story...

They say that this was the beginning of the Métis Nation.

They also say that the Métis People are hardworking, generous and honest. They enjoy playing the violin, jigging, having fun and telling stories.

And they also say that their stories are beautiful and deserve to be told. (66-67)

Although there are many First Nation stories about how the canoe was created, this story teaches that the technology of the canoe was central to the co-individuation of the Métis Nation as a people born from the early fur trade on Turtle Island through the initial intermarriage of voyageurs with First Nations women.

More than this, the story illustrates the relationship of listening and technical practice as Jos Perreault learned how to make beautiful canoes because he had cultivated a reciprocal listening relationship with the trees. In other words, an originary technicity of listening lies at the centre of a long-circuit of co-individuation with more-than-human relations. After all, Jos needs the guidance of trees to create his beautiful canoes and likewise, the oak tree needs Jos and his axe to become co-individuated into a canoe that is imbued with spirit.

The story also suggests that solitude or silence is essential at times to enter into relation and receive the guidance of the forest and animals. This is demonstrated in the case of Jos Perreault, the master canoe builder, and later for Henri to receive the gift of Jos's birch bark canoe, and again for Levasseur to learn what happened to Jos Perreault ("I want to be alone"). In this way, solitude, or perhaps privacy, creates the breathing space for an Indigenous cosmotechnics of listening. Importantly, this is a mode of listening that is not necessarily or exclusively aural

(“Henri can’t believe his ears”) but rather is a practice of radical openness and cosmotechnical responsiveness that can be learned under conditions of relational solitude: a technics of reciprocal communication with/in the forest that allows for more-than-human technical co-individuation.

The story of the birch bark canoe in particular illustrates the agency of trees within a process of “matter-taking-form” (Mackenzie 2002, 50). The trees teach Jos how birch bark, spruce gum, and the body of a loon can exchange properties through a transductive event: in becoming concretized as the technology of the canoe. This resonates powerfully with Mackenzie’s discussion of Simondon’s concept of information (i.e. in-formation) as living entities (e.g. trees) that individuate continuously (ibid.). In other words, trees are in-formation, living entities that are part of continuous and variable processes of matter-taking-form. In the story, trees are not regarded as matter that can be moulded into the form of a canoe—as they would be within a hylomorphic paradigm—but rather are individuating entities that engage in intense interaction with other lifeforms, including through conversation with people who have learned to practice a technics of listening. Although Jos is a crucial part of the transductive event that is concretized with the making of a canoe, he is merely one actor that allows for the milieu of technical instrument (i.e. axe), birch, spruce, and the loon to converge. Put simply, the technology of the canoe is not an extension of man nor the body of a loon but rather reflects a concretized relationship between dynamic relations.

By articulating a long circuit of transindividuation, the story of the canoe—and the birth of the Métis nation—points to the role listening plays within Indigenous cosmotechnics. If such a technicity of listening were confined to a human milieu, then we might perceive continuities with the Western technique of active listening which similarly listens with ears, eyes, mind, heart and imagination and interprets listening as a form of communication. Yet the story of the canoe gestures to an originary technicity of listening that extend beyond human bodies and human social groupings, encompassing more-than-human collectives: animals and trees that listen, speak, and participate as equal members in a cosmotechnical relay of transindividuation.

Together these three stories illustrate a rich technical milieu of listening characterized by layered mediations and a sophisticated reflexivity toward cosmotechnics. In keeping with a positivist division of the senses and certainties about hearing/listening, the listening technics of these

stories would be interpreted metaphorically since they do not construct the human ear as an obligatory passage point for listening technics. Yet the cosmotechnical significance of listening becomes evident through the capacity to consciously mediate relations among human social groupings and more-than-human agencies within a shared technocultural field.

The contemporary creativity and retelling of stories reveals the technical survivance of listening practices that persist under colonizing pressures, including the diffusion of hungry listening and the surveillance of Indigenous peoples. In each of these stories, privacy emerges as the fragile condition for transductive listening and dialogue across milieus, enabling communication across groups, technical innovation, and balance with more-than-human relations. The recurring retreat into the bush represents the thematic ground for a two-eyed dialogue attentive to boundaries as much as to convergences. Put otherwise, privacy becomes an ethical and epistemic condition to allow for a translation with difference—a transduction of worldviews and technical practices.

The stories of the messenger, the pipigwan, and the birch bark canoe show how listening unfolds through quiet awareness. Yet the quiet that enables individuation can remain illegible to those outside its milieu. It is therefore crucial not to mistake the invisibility of a technical milieu for its deficiency. Two-eyed seeing, in this light, counters authoritarian diffusion by attuning perception to transductive possibilities and the technicity of listening. Through such attunement, two-eyed seeing reclaims listening as a technics capable of resisting authoritarian diffusion and sustaining dialogue across worlds.

Transduction amidst diffusion

Authoritarian technics disrupt the quiet awareness required for some forms of technical practice. Mistaking silence for absence, it interprets listening milieus as openings for diffusion. As Rogers explains, diffusion is a special form of communication about new ideas (2003, 5). Yet diffusion is premised on asymmetric communication: it assumes an advantaged, authoritative source and a disadvantaged recipient. Authoritarian technics extends this logic to its extreme, disseminating its own innovations as progress while revealing an incapacity to see from other perspectives. From this, it is unsurprising that the disadvantaged recipient is expected to be persuaded and to catch up, while the authoritative group bears no responsibility to listen and to question its own faith in what counts as superior technology.

Diffusion thus becomes ideological when privileged groups unreflectively disseminate what they believe others lack. Yet authoritarian technics diffuses not only innovations, but entire worldviews, materialized in techniques, tools, and communicative practices. Through this logic, biases are unconsciously disseminated. For instance, those who resist new technologies are labeled *laggards* rather than interlocutors from whom the dominant group might learn. At its worst, diffusion obstructs re-invention and treats refusal as irrationality due to a failure to recognize the technicity and alternative rationality of the so-called disadvantaged milieu.

Machine listening risks diffusing a widespread sonic proletarianization, as knowledge of how to listen is increasingly delegated to machine learning systems. As automated systems are marketed as superior to non-computational forms of listening, the positivist and extractivist logic of these listening models becomes taken for granted as universal, objective, and as a firm instance of technical progress: digital sensors promise to hear what human ears cannot and chatbots increasingly simulate “active listening skills” to make users feel heard (Xiao et al. 2020, 2). Yet what is crucial to remember—amidst widespread technical forgetting—is how authoritarian technics extends itself through such systems, further entrenching an incapacity to see and listen beyond the worldview of their makers. The failure of listening is thus twofold: it is articulated through diffusion, which privileges one-way communication, and embedded within the infrastructures of machine listening, which endlessly reproduce and disseminate narrow models of sensory attention as the basis of listening technics.

Two-eyed seeing offers a different route by reframing diffusion as a genuine dialogue—a moment where two worlds meet in an exchange of techniques, tools, and perspectives. It insists that the diffusion of innovations requires openness to transformation on both sides. Rather than a hierarchy between advantaged and disadvantaged groups, diffusion becomes a reciprocal process of transduction.

In Mackenzie’s reading of Simondon, transduction helps to elucidate and track processes that come into being through the convergence or intersection of “diverse realities” including “corporeal, geographical, economic, conceptual, biopolitical, and affective dimensions” (ibid.). For Mackenzie, the hallmark of transduction is precisely this knotting together of heterogeneous realities. Two-eyed seeing is thus inherently transductive, as an epistemic practice that brings worldviews into relation without losing sight of their heterogeneity. As established earlier, sound

studies has often reduced transduction to the transformation of energy or signal.⁸ Yet following Simondon, I understand transduction more openly as any “process be it physical, biological, mental or social, in which an activity gradually sets itself in motion, propagating within a given domain, by basing this propagation on a structuration carried out in different zones of the domain” (Simondon qtd. in Mackenzie 2002, 16). In this expanded sense, diffusion itself can be read as a transductive process: the exchange of a technique involves movement between heterogeneous groups that restructures the technical milieu of both.⁹

Modalities of transduction

Transduction offers a tool to think about the process of transformation as diffusion and dialogue between groups—not only ethnic or cultural groups, but also social microclimates. Here I align myself with Mackenzie’s argument that a transductive process calls for transductive thought (2002, 18). To this end I introduce three conceptions of transduction that can help us listen beyond signal transduction: cultural, conceptual, and procedural transduction. Bringing these into contact helps to rethink the transductive dynamics that occur as techniques circulate and transform across milieus.

First, this can be approached through the lens of cultural transduction. Stemming from Eduardo Viveiros de Castro’s perspectival anthropology, transduction posits difference rather than identity as the principle of relationality in Amerindian cosmology. “The Amerindian relation is a difference of perspective. While we [non-Indigenous anthropologists] tend to conceive the action of relating as a discarding of differences in favor of similarities, indigenous thought sees the process from another angle” (2004, 19). In Amerindian thought, human relationships and affinities with more-than-human relations are founded on a presumption that different entities have different perspectives of the world. “Blood is to humans as manioc beer is to jaguars, in

⁸ Despite expanding the concept of transduction within sound studies, both Helmreich (2007) and Gautier (2014) ultimately center sound—and by extension hearing—as the primary site of transductive operation, maintaining an engineering formulation as the definitional foundation of listening. Helmreich cites the Oxford English Dictionary definition of transduce: “to alter the physical nature or medium (of a signal); to convert variations in one medium into corresponding variations in another” (2007, 622)—a meaning first recorded in 1949 and since extended across fields such as microbiology, sensory psychology, and physics (Myers 2006). Gautier similarly defines transduction in terms of energy transformation, writing that “no matter how we conceive of it at particular historical moments and locations, the important element to emphasize is the very transformation of energy that the relation between sound object and listening subject implies as an idea with which to think analytically” (2014, 216). In both cases, listening remains tethered to the physiology of the “transductive ear” (Helmreich 2007, 632).

⁹ Importantly, this understanding of transduction is rooted in its etymological substrate, as an action of “leading over, a removing from one place to another” (1656-) (“Transduction,” n.d.).

exactly the same way as a sister to me is a wife to my brother-in-law” (ibid.). Drawing from this foundational observation, perspectival anthropology hinges on “a method of controlled equivocation”—or cultural transduction—that assumes “differential fields of conceptualization” as the basis of relation (3).

Two-eyed seeing enacts cultural transduction. As an orientation, it frames my discussion of listening technics, which has traced productive convergences while preserving space for cosmotechnical divergence. In this way, two-eyed seeing contests authoritarian diffusion by calling for respectful, quiet awareness of difference as the ground of relation.

If cultural transduction concerns how difference sustains relation between worlds, conceptual transduction attends to how difference transforms meaning across domains of thought. Where cultural transduction foregrounds the ethics of relation, conceptual transduction reveals the epistemic consequences of translation and adaptation.

Malaspina (2018) draws from Simondon to advance a theory of conceptual transduction to describe how the movement of a concept into a new domain of knowledge transforms the domain and changes the concept itself as it is transferred and adapted. Moreover, Malaspina proposes that the transduction of concepts is irreversible—not in the sense that it cannot be renegotiated—but because the movement of a concept into a new domain changes the concept in both domains, since there is not a “one-to-one correspondence of concepts between one field and another” (95).

Through a detailed analysis of the concept of noise that traverses fields of information theory, cybernetics, thermodynamics, biology, psychiatry, and sociology (x), Malaspina details how the movement of a concept across disciplines inevitably produces a degree of “metaphorical warping” or “metaphorical distortion” (96) as they are repurposed and readapted.¹⁰ From this Malaspina calls for critical scrutiny of transductive processes:

To accept metaphorical warping and to understand that concepts are often transduced not only in the form of abstract formalization but also in the form of mental images, must not mean to accept the intrusion of concepts coming from other fields of knowledge uncritically or without precision. (96)

¹⁰ Similarly, the hegemony of an engineering formulation of transduction expresses an instance of conceptual warping that is taken-for-granted within sound studies literature.

The concept of privacy provides a useful illustration of this problem of warping. Despite the rich history and complex meanings of the concept—as a human right, a condition of dignity, and a sphere of personal autonomy—it has been hollowed out by contemporary data privacy regimes, which reduce it to mere control over information. Sensing this distortion, critics seek to jettison the concept of privacy (Ruckenstein 2025), yet dynamics of transduction remind us that privacy can be reclaimed. By introducing Indigenous perspectives on privacy, I aim to transduce the concept myself—stretching it beyond individual rights of information control toward a practice of spatial distancing and quiet awareness that safeguards cosmotechnical difference.

Procedural transduction

While conceptual transduction emphasizes the movement and transformation of ideas, procedural transduction focuses on the migration and adaptation of techniques through the circulation and transformation of procedural knowledge across milieus. Procedural knowledge (i.e. ‘knowing how’) is commonly distinguished from conceptual knowledge (i.e. ‘knowing that’) (Ryle 2000; Scheffler 1978), though in practice the two are interdependent (Hiebert and Lefevre 1986; Star 2013). On one hand, conceptual knowledge or declarative knowledge is commonly defined as knowledge of facts or propositions (Anderson 1982; Scheffler 1978), yet such a definition understates its complexity as a form of understanding “rich in relationships” (Hiebert and Lefevre 1986, 3). On the other, procedural knowledge involves the “possession of a skill, a trained capacity, a competence, or a technique” (Scheffler 1978, 92). To clarify with an example, an individual can understand the proposition that active listening is an effective technique of empathetic communication without possessing the skilled knowledge required for its practice—a form of knowledge that develops only through situated application and repetition. As with conceptual knowledge, the diffusion of procedures entails transduction: a reciprocal transformation between technique and milieu through which change unfolds across contexts.

Procedural transduction can be thought of in contrast to simplified accounts of transferable skills. McCormick gives the example of problem solving as a higher-order form of procedural knowledge that is commonly misunderstood to be a “general-purpose skill” (1997, 146)—a framing that ignores the reality that problem-solving procedures are dependent on extensive and domain-specific knowledge. “Thus, rather than it being a general skill that can be employed with equal success in a variety of areas, it requires expertise in the context of its application” (ibid.).

In other words, the myth of a transferable skill such as problem-solving obscures processes of transduction, deflecting attention from the disruptions, distortions, and reinventions that take shape with the movement of procedures across domains of application. Just as skillful knowledge or techniques must be adapted to secondary milieus, the diffusion of innovation is irreducibly transductive.

In contrast to dominant understandings of diffusion, procedural transduction draws attention to the dynamics of negotiation, adaptation, and power relations that accompany the spread of an innovation into new contexts. Diffusion is often imagined as a linear process, from group A (the diffusing group) to group B (the adopting group). Yet diffusion researchers have found that innovations are more successfully diffused when they make room for re-invention—the freedom given to group B to change or modify an innovation during its adoption and implementation. Re-invention, though, also takes place beyond the intentions of innovators; for instance, the transformation of the turntable by early hip-hop DJs into a performative instrument through scratching and mixing exemplifies unauthorized re-invention. In digital settings, re-invention is central to the doxa of open-source communities yet remains circumscribed by dominant digital infrastructures that restrict modification, tinkering, and reverse engineering. These examples show how re-invention can push against authoritarian technics, as transductive exchanges of techniques and tools open a dialogical space between technical milieus amidst diffusion.

Yet procedural transduction also occurs when an innovation from group A is rejected or discontinued by group B. In this case, it is not the proposed innovation that is transduced necessarily, but rather the technical substrate of group B, which must reorient itself and adapt in response to the intrusion of foreign techniques or tools. The concept of technical survivance captures this dynamic, describing how a pre-existing practice endures and reforms amidst diffusion through adaptation or strategic withdrawal from visibility to preserve its meaning and utility within altered conditions. The recent resurgence of “dumb phones”, for instance, is not a neutral technical survival of obsolete devices but a strategic discontinuance of smartphone use motivated by resistance to dataveillance and the libidinal economy of mobile networking. The survivance of the dumb phone, however, remains transductively entangled with a dominant technical milieu, as users consciously disconnect from always-on culture to the frustration—and occasional exclusion—of their peers.

The language of survivance is especially apt for describing adaptive action under conditions of observation and social pressure to assimilate. Diffusion, after all, inevitably involves observation: group A monitors and measures the rate and scope of uptake and exerts influence or coercion, often through “change agents”—who may be perceived as snoopers (Rogers 2003, 4)—to encourage adoption. With the diffusion of digital technology, this observational logic becomes infrastructural; surveillance is built into the diffusion process itself, as apps, devices, and platforms continually feed developers data on patterns of use, adoption, and engagement. Put differently, technical survivance involves creative adaptation under conditions of surveillance, as communities or cultures renegotiate the presence and persistence of earlier techniques, and even complex cosmotechnical substrates. All the while, survivance occurs as group B is watched and judged as irrational laggards for resisting the gifts of “progress”.

Procedural transduction invites critical scrutiny of the diffusion process by helping to challenge the idea that there is such a thing as a seamless or neutral transfer of a new idea or technique from one group to another. It reminds us that innovations emerge through the transductive addition of new operations to an existing technical substrate, as explored in depth in Chapter Four through the remediation of active listening over text on an algorithmic platform. Procedural transduction calls for political scrutiny of diffusion’s power dynamics through reciprocal attention to technical milieus and the inequitable relations that shape adoption and adaptation.

Authoritarian diffusion fails to perceive the transductive field of struggle, extending a positivist vision of technology that sees only one proper understanding of technics and technology (Hui 2016, 11). Within a regime of authoritarian technics, group A perceives itself as technologically superior and appears reluctant to engage with group B as a genuine interlocutor. Put simply, authority is presumed in advance and diffusion is posited apolitically. Moreover, those cast at a disadvantage—those people whose technicity remains unseen and unvalued—are not regarded as sources of insight but as populations to be persuaded and cosmotechnically absorbed.

I have argued that authoritarian diffusion is rationalized when the technicity of another group remains invisible to outsiders, and that this problem recurs in milieus where listening is integral to the cultivation of ethical relations and embodying a worldview. If authoritarian technics envisions diffusion as politically neutral, procedural transduction recenters its relational and negotiated dynamics. By foregrounding Indigenous practices of listening and storytelling, I have

worked to counter this tendency while drawing on multimodal Western approaches to listening as points of convergence that support dialogue. Yet rather than treating Indigenous techniques as resources to be adopted or appropriated, I have emphasized how cosmotechnical differences and practices of survivance affirm the need for privacy as a condition of transductive exchange. An expanded sense of privacy offers a way to engage in two-eyed dialogue that contests authoritarian diffusion by preserving a quiet, unobserved space for relation. Again, diffusion is interlaced with observation, yet privacy can be integral to technical practice and survivance. Thus, the invisibility of technical milieus might arise not only from failing to look at the milieu properly, but from looking too intently in the first place.

Conclusion

This chapter has developed a framework of two-eyed seeing to resist the main problem addressed by the dissertation: authoritarian diffusion operates through a technological order that has grown incapable of recognizing and learning from other cosmotechnical orders. Yet authoritarian diffusion is not only a matter of how technologies spread, but of how a failure to listen becomes hardcoded into the process of communication, foreclosing genuine possibilities of dialogue. The very label of “machine listening” encodes a narrow model of listening that is presumed to be universal and diffused as such. Yet as the introduction suggested, the failure to listen is repeated by machine listening systems that allow the authority of Indigenous epistemologies and expertise to echo back through positivist infrastructure while reproducing the problems of authoritarian diffusion—the relentless expansion of the system that desires to hear everything and everywhere once translated through a dominant episteme.

The chapter contributes to the larger dissertation by showing how the ethical-epistemological framework of two-eyed seeing can guide a study of listening that resists authoritarian diffusion. By recentring the technicity of extra-aural listening practices that complicate a positivist division of the senses, I have sought to show that certainty about what qualifies as listening obstructs dialogue. Put simply, attention to sound should not be regarded as a communication model for diffusion, as this deprivileges listening practices that center quiet awareness and responsiveness across modalities, milieus, and technical possibilities.

The chapter’s approach has modelled how the dominance of Western positivism can be loosened through a two-eyed dialogue that seeks to unlearn proletarianized habits of listening. Put

otherwise, two-eyed seeing helps to contest sonic proletarianization, by reclaiming capacities to live, act, and theorize listening beyond human hearing and its machinic extensions.

The chapter began by illustrating how the positivist certainty of Western listening is culturally contingent yet diffused in ways that devalue and displace alternatives. This problem of authoritarian diffusion is concretely expressed by the rise of machine listening, as cloud-connected microphones spread everywhere—from our homes and workplaces to hospitals, schools, public spaces, and web platforms—that encode a very narrow model of listening. As I continue to argue in Chapter Three, machine listening displaces alternative technics of listening, not only by further entrenching surveillance but by colonizing the very concept of listening through a distinctly Western lens—a problem examined next in discussion of health-related machine listening.

The chapter then centered multimodal listening practices within Western culture that reveal technical convergences with Indigenous listening practices. In contrast, when viewed alongside Indigenous conceptions of multimodal listening, dominant conceptions of listening seem to reveal a cosmotechnical rift that cannot be bridged or repaired. In response, I have sought to restore conditions for dialogue between these distinct technical substrates by theorizing an originary technicity of listening that precedes hearing and cultural divisions of the senses.

With convergences established, indigetechnical contributions to listening were highlighted that do not extend from human hearing yet include hearing as part of a broader activity of transduction. Discussions of *numutekwapuḡha* (i.e. listening carefully), listening through the heart, *dadirri* (deep listening) reveal how listening surpasses human hearing by involving techniques of quiet awareness that restore and replenish relationships. As a component of transindividuation, Indigenous storytelling highlights how the technical support of listening is passed down over generations amidst pressures of diffusion, assimilation, and colonization.

In crafting space for indigetechnical dialogue, Indigenous storytelling reveals important lessons about privacy that can be learned from and extrapolated into two-eyed discussions. The recurrent motif of going into the bush showcases how indigetechnical practice and innovation depend upon spaces of withdrawal from observation. In conditions of relational solitude, quiet awareness of transductive possibilities becomes evident in enabling communication with more-than-human relations and in-formation exchanges across milieus, as exemplified by the stories of the

pipigwan, birch bark canoe, and my personal anecdote of water testing. Using these stories to stretch a conception of privacy, as a precondition for transduction, makes clear that quiet awareness is not only vital for indigetechnics, but also for two-eyed seeing—as an ethical-epistemological paradigm that gives space for the authority of Indigenous perspectives in dialogue.

Together this lays a foundation for a two-eyed technological inquiry of listening that can resist authoritarian technics by reimagining diffusion not as a one-way transfer of innovation but as a transductive encounter between cosmotechnical orders. When we look for convergences in technical substrates without compelling observation and translation upon that which is withheld or incommensurable, a strong conversational footing is established. Moreover, by recentering the quiet awareness afforded by privacy in cosmotechnical dialogue, the invisibility of other technical milieus can be interpreted in a new light—whereby incommunication of technicity is not regarded as an absence to be corrected through diffusion, but as a generative opacity that preserves difference and sustains the conditions for reciprocal transformation and learning.

The chapter gradually developed awareness of how the quiet awareness afforded by privacy draws critical attention to transductive processes. Building off theories of cultural and conceptual transduction, I have advanced a framework of procedural transduction to call for reciprocal attention to the dynamics of exchange between technical substrates as techniques propagate across and within changing milieus. Diffusion is irreducibly transductive in this sense, yet the political significance and power dynamics that shape adoption and adaptation are not necessarily voiced or perceived. For instance, the technical survivance of alternative practices may not be immediately observable, especially when authoritarian diffusion and surveillance push these underground as a strategy of adaptation. Procedural transduction reminds us that innovations are never neutrally transferred and that the survival of techniques can be motivated by the continuance of desirable differences—whether political, cultural, or cosmotechnical.

The chapters ahead follow this thread of privacy, further stretching it beyond individualistic conceptions to reimagine privacy as a worldbuilding praxis of two-eyed seeing—in recognition that space can be created, respected, and protected to enable others to more freely retreat into the bush—so to speak. As a condition that affords quiet awareness of transductive possibilities, privacy might help restore conditions of dialogue across worlds so that ancient techniques,

imaginative innovations, and two-eyed technics can collectively challenge the power of authoritarian technics.

Chapter Three: Creeping Diffusion: Machine Listening in the Age of Surveillance Medicine

After his brother, Tim, was hospitalized for a psychotic episode, biomedical engineer, Jim Schwoebel revisited old voice mail recordings and noticed some obvious signs of illness: his brother's speech was different and peppered with neologisms. Something sounded off.

And yet before the incident, Tim had seen several general practitioners and psychiatrists, all of whom had failed to notice the warning signs that he was on the verge of a mental health crisis caused by an undiagnosed case of schizophrenia. Reeling from the initial shock of his brother's struggles and obvious shortfalls of the medical system, Jim read an article in *Nature* describing a proof-of-principle study showing that automated speech analysis could predict psychosis onset (Bedi et al. 2015). Inspired by this technoscientific breakthrough and Tim's experience, Jim founded NeuroLex Laboratories and began working tirelessly to commercialize automated voice analysis as a tool to fill monitoring gaps in clinical care.

In its early years, NeuroLex pitched a growing range of diagnostic applications for its product, echoing emerging claims in scientific literature, including potential uses for Alzheimer's disease, post-traumatic stress disorder, schizophrenia, bipolar disorder, and depression (Huckvale and Beke 2017; Cummins, Baird, and Schuller 2018; Chen et al. 2022). With each year that passed, the list of NeuroLex use cases grew and by 2020 this had increased dramatically to include diagnostic applications related to autism, sleeping disorders, brain cancer, stroke, diabetes, skin flares, suicidality, and COVID-19.

This chapter develops an empirical study of the diffusion of health-related machine listening (HML): applications that process sounds, and especially voices, using machine learning methods to produce health-related inferences. Focusing on NeuroLex and its acquiring company, Sonde Health, as a convergent case study I interpret the patterns, paces, and strategies of diffusion as HML extends far beyond clinical settings and research labs into homes and workplaces across multiple industries. The chapter also establishes conceptual groundwork to rethink privacy in relation to the mode of listening deployed by HML, foregrounding transductive labour as a way to understand how individual data move across milieus and how these movements support the diffusion of HML.

Interpreting diffusion as a process of communication, the chapter analyses the website history and rhetorical marketing of HML developers from 2015 to 2025, focusing on two communication strategies that help propel the diffusion process. First, shifting arrays of promoted functions and sectoral integrations make the diffusion process difficult to track. I evaluate how this process aligns and departs from patterns of function creep – the slow and gradual expansion of a technological system. Helping to interpret this process, I introduce the concept of *function sweep*, which names a short-term, two-stage pattern of diffusion involving an initial rapid expansion of functions followed by steps to refine earlier experimental stages; this dynamic departs from the slower, incremental pattern typically associated with function creep. Second, privacy washing (Cirucci 2024) is used to rhetorically sanitize HML and hide its broader surveillance logics. As a whole, the chapter argues that the diffusion of HML is exemplary of authoritarian diffusion because of product development patterns that limit transparency and communication practices that frame the privacy implications of the technology in misleading ways.

The chapter builds on privacy and surveillance debates about “creepy technology” by locating the creep factor of HML within the process of authoritarian diffusion, in which technologies are spread onto others in ways that avoid public dialogue and through obfuscating communication practices. I argue that, affixed to this particular mode of diffusion, HML exacerbates problems of authoritarian technics by extending a mode of listening that brackets speech to listen for vocal biomarkers. While HML leverages the free speech of human conversation, it is agnostic to linguistic content and extracts signal from speech in ways that foreclose conditions of dialogue. Rather than interpreting this mode of listening as inherently creepy, it is the imperceptible diffusion of this mode of listening without meaningful consent and privacy protections that exemplifies the problem of authoritarian technics that this dissertation seeks to contest.

The chapter begins with conceptual groundwork to reframe privacy at a scale beyond the individual. HML relies on a *signaletic mode of listening* that treats the semantic content of speech as irrelevant and instead derives inferences from individual patterns that are rendered meaningful in relation to population level norms. Yet this signaletic mode of listening is rhetorically positioned as a privacy affordance of the technology by HML developers because semantic speech is ignored. In reality, the technology relies on individual contributions of data

and labour to develop HML models of risk that later diffuse into other settings and communities. In other words, the dividual logic of risk monitoring is mismatched with individualistic models of privacy, which are leveraged to help diffuse HML by masking its discriminatory objective. Reading against the grain of company messaging, I show how the diffusion of HML is primed to disproportionately target people from precarious and marginalized groups, including low-SES workers and racialized communities—sometimes in contexts where keeping people healthy is secondary to reducing financial risks.

Drawing from the theoretical framework and empirical findings, the chapter concludes by suggesting that the authoritarian diffusion of HML depends upon participation that can be disrupted through collective modes of resistance – a pact of silence, so to speak, that withholds transductive labour and data to resist surveillance, protects conditions for dialogue, and cares for the wellbeing of individuals, communities, and worlds beyond ourselves.

Health-related machine listening

In this section, I theorize HML as a recent innovation that contributes to a much larger regime of surveillance medicine (Armstrong 1995) by enabling the production of health-related inferences and risk scores from voices and other bodily sounds of daily life. HML can be embedded with other digital health products (Ruckenstein and Schüll 2017) and its diffusion is thus supported by prior stages of surveillance medicine diffusion and earlier cycles of technological innovation. At the same time, HML depends on continuous vocal production across many environments, which links the spread of surveillance medicine to the growth of transductive labour (Semel 2025) that moves across clinical, domestic, and commercial settings.

I theorize the signalletic mode of listening advanced by HML in reflection on Chion's three listening modes (1994) to show how the production of vocal biomarkers involves the suppression of the voice's semiotic intelligibility and agency. This signalletic orientation transforms vocalization into a resource that can be sorted, compared, and circulated—preparing the ground for the kinds of extractive and distributed labour practices examined later in the section. Linking this to the problem of participation that surveillance medicine seeks to overcome, I discuss how HML raises serious questions of consent. Unlike other modes of monitoring, HML occurs invisibly and passively while being conducted in diffuse settings far beyond medical clinics and research labs. Additionally, the dependence of HML on large datasets of voices, positions non-

health platforms as part of an infrastructure of surveillance medicine, as developers scrape voice data from web platforms like YouTube (Parker and Dockray 2023) for experimentation or to add to their datasets and models. These practices show how HML already operates within a diffuse factory (Lazzarato 1996) where speech is continually repurposed as raw material for modelling and prediction, long before individuals recognize themselves as participating in medicalized processes.

Taken together, these dynamics reveal how HML advances the aims of surveillance medicine by recruiting speaking subjects into forms of immaterial labour and data production that span heterogeneous milieus. This provides the conceptual groundwork to interpret how the diffusion of HML exemplifies authoritarian diffusion by involving the spread of signaleptic listening into settings where people cannot reasonably avoid participation in a regime of surveillance medicine.

Surveillance medicine

Armstrong theorizes surveillance medicine as a biopolitical paradigm that emerged in the early twentieth century through the problematization of the normal (1995, 395). Unlike earlier models that defined illness through symptoms, surveillance medicine arranges health and illness on a continuum of risk: the healthy can become healthier, and health can co-exist with illness (400). Everyone thus becomes a potential patient.

The clinical-iceberg thesis (Last 2013) underscores that most illness unfolds outside formal care and helps justify the expansion of clinical monitoring into non-clinical environments. Medical attention therefore moves beyond hospitals into homes and communities through public health campaigns and neoliberal practices of self-responsibilization and participatory surveillance. Digital technology strengthens this shift as individuals are increasingly urged to monitor themselves with personal sensors (e.g. FitBits) and “data-for-life” tools (Schüll 2016) that promise empowerment through self-tracking. Thus, the diffusion of surveillance medicine is entangled with the diffusion of new self care practices and monitoring devices which demand the extensive sharing of personal data (Hobart and Kneese 2020, 4).

Surveillance medicine is a data-hungry regime that assumes the ubiquity of illness (Armstrong 1995, 397), locating every person on statistical scales of normality. The risk factor represents a

key mechanism in this paradigm, referring to any state or behaviour from which a probability of illness can be calculated (402). By decoding health into endless chains of risks, surveillance medicine aims to predict and pre-empt illness, disease, and disability. With HML, the voice itself is analyzed for risk factors, by measuring vocal features against composite models derived from population datasets. Much like children's growth trajectories (Armstrong 1995, 396), the singular voice is made legible only through reference to collective norms.¹¹ The next subsection clarifies how the decoding of risk factors from the human voice hinges on a listening technique that brackets signifying aspects of speech.

Say “ahh”: signalitic listening

HML involves a mode of listening suited for surveillance medicine by seeking to identify and interpret risk factors: for instance, respiratory monitoring apps might listen to the sound of breath to detect asthmatic risk, or the sounds of coughing to screen for infectious diseases, or the sounds of snoring to monitor for risk of sleep apnea; in every case, sounds are medically problematized. Most commonly, HML apps analyze vocal biomarkers or biological signals of health risk that are sonically communicated by the voice. For instance, NeuroLex uses the terminology of “voiceomes” in reference to vocal biomarkers, aligning HML with an imaginary of genome sequencing in which risk factors can be decoded from individual voices.¹²

Listening takes on a distinctive meaning in these systems and discourses, as a mode of listening that shifts attention from semantic communication to the medicalization of vocalic signals (Williams and Calnan 1996). Humans can pick up on health-related signals from voices, however the “sensory superiority of AI” is a major selling point for HML (Semel 2025, 206). AI hears more than humans can hear and helps solidify positivist assumptions about listening by framing HML as the next step in a natural progression from hearing to listening. These assumptions echo

¹¹ There is an expansive literature in voice studies that debunks the myth of voice as a marker of some deeper essence, identity, or hidden truth of a person (Silverman 2010; Feldman and Zeitlin 2019). The discourse of a voiceome ostensibly posits the voice as an immediate or natural echo of a speaker's physiology and mind—in complete opposition and presumable unfamiliarity with these positions. However, upon closer examination of health-related machine listening discourse post-positivists researcher emphasize “the inferred, probabilistic pattern rather than the fixed individual trait” that is computable “across aggregate collections” of voices as opposed to the “unique features within individual records” (Li and Mills 2019, S155).

¹² As claimed in a NeuroLex document: “With the Voiceome you can then use machine learning models on speech features to infer health conditions – like whether someone is depressed or not through the fundamental frequency and speaking rate. This is analogous to how you can use genes to infer various health conditions” (Schwoebel and Ghomi 2019, 3).

the conceptual chain of sensory augmentation developed in Chapter Two (i.e. hearing → listening → machine listening) to materialize a worldview that treats machine listening as an endpoint of listening technics. In doing so, they contribute to a process of sonic proletarianization that encourages listening to be delegated to machines while displacing and deprivileging the technicity of other listening modes.

To challenge this presumed superiority, we need to attend to HML as a specific mode of listening. Michel Chion's well known "three listening modes" offer a helpful starting place. Talking on the phone we engage in what Chion calls "semantic listening" (1994, 28) by listening to "a code or a language to interpret a message". HML similarly strives to interpret the codes or "vital parts of speech" to generate medicalized measures and models (Stasak 2018, 3).¹³ However, HML operates differently than semantic listening, in which a "phoneme is listened to not strictly for its acoustic properties but as part of an entire system of oppositions and differences" (Chion 1994, 28). Semantic listening ignores many acoustic variations that are impertinent to the language in question (*ibid.*), while HML treats these variations as features from which to build statistical norms and models, creating a new codebook of meaning.

Semantic listening can overlap with what Chion calls "causal listening", whereby we listen to gather information about the cause or source of sound (25). Everyday listening often blends these modes. For instance, speaking on the phone we engage in semantic listening to understand speech, while at the same time noticing the properties of the voice – which might include judgements about a person's age, sex, or even health status. Yet Chion notes, causal listening is a very "deceptive mode of listening" (26).¹⁴ As Semel notes, supporters of vocal biomarker research imagine the technology as "a stethoscope for conversation itself" that will enable

¹³ Semantic listening is not limited to linguistics, for instance Chion includes morse code as an example other than speech. Similarly, we can think of the analysis of voice patterns as a semantic process of decoding. As founder and CEO of NeuroLex explains: "Like DNA, we can sequence the voice. DNA is composed of genes, which are fundamentally composed from adenine, thymine, guanine, and cytosine base pairs arranged in a double helix structure. Speech, on the other hand, is composed of words, which are fundamentally composed from phonemes (e.g. 'a', 'b', etc.) exerted at varying powers and speaking rates" (Schwoebel 2018, 108).

¹⁴ People make interpretive and discriminatory judgements about what they hear based on other factors. For instance, if I suspect a person with a raspy voice is a heavy drinker – I might assume that a late-night binge is the more likely cause of vocal change rather than a head cold. The fallibility of both semantic and casual listening is supposedly rectified by HML. For instance, a nurse completing a patient intake might fail to notice subtle warning signs of congestive heart failure risk as they rely on a technique of semantic listening. A similar problem is raised for mental healthcare professionals who employ causal listening to evaluate a person's psychological state. In this context, HML is posited as a technofix to overcome the unreliability of human listening.

clinicians to “listen directly into the beating, biological pulse of psychosocial disabilities” (2025, 206).

Drawing from Pierre Schaeffer, Chion identifies a final mode of “reduced listening” (29): an aesthetic or meditative mode of listening that relies on sound recording and focuses on acoustic properties without seeking to interpret or pay attention to cause or meaning.¹⁵ Reduced listening strives to quiet cultural interpretation to attend to the sonic object itself to refine listening skillsets. Although HML similarly involves techniques of “dimensionality reduction” (Schwoebel 2018, 139), it diverges from aesthetic aims by developing inventories of voice patterns to support the interpretation of risk that allow people to be classified, screened, and monitored.

HML reflects a hybridized mode of listening that fuses coded interpretation, causal inference, and reduction techniques into a signaletic register. By targeting a field of proto-enunciation (Genosko 2016, 3) or coded signals that lie prior to semiotic significations, it can be characterized as a mode of *signaletic listening*. Importantly, while speech is attended to by HML systems, the signifying component of speech is bracketed to uncover operational signals of medical risks that lie beneath the noise of human meaning-making. For this reason, I interpret signaletic listening less like a stethoscope, than as a tongue depressor by suppressing the voice’s semiotic intelligibility and agency.

Overcoming the problem of participation

According to Armstrong: “The ultimate triumph of Surveillance Medicine would be its internalization by all the population” (1995, 400). However, participation remains uneven: people may resist monitoring, distrust providers, or deny the reality of their illness, interrupting the steady data flow that risk monitoring depends on. Addressing surveillance medicine’s problem of participation, HML offers unique advantages by processing vocal biomarkers communicated automatically and unconsciously.

HML discourse repeatedly frames silence and gaps in participation as a problem. For instance, studies on depression and suicide risk note that clinical assessments often miss warning signs

¹⁵ Reduced listening involves a “descriptive inventorying of sound that cannot be compiled in a single hearing” (Chion 1994, 31). It is an exercise that aims to sharpen one’s sense of listening by fixing sound using recording technology so that a singular event can be replayed exactly again and again.

because “some suicidal patients may present an outwardly calm façade” (Cummins et al. 2015, 15). Likewise, U.S. military investment in systems to detect PTSD among soldiers responds to chronic under-reporting of mental-health issues (Semel 2019). Because “higher symptoms [are] associated with reduced [therapy] engagement” (Larsen et al. 2024, 18), those who do not speak or cooperate are recast as most in need of surveillance—folding silence itself into the logic of risk.

Firms such as Sonde describe HML as a solution to surveillance medicine’s problem of participation in its intellectual property patents: “individuals who consider themselves healthy may be less likely or inclined to initiate use of health monitoring and screening applications...” (Harper and Chen 2019, 8). Since self-judgement cannot be trusted and their participation remains inconsistent, HML is positioned as a gap filler—one that promises to make it impossible for people to suffer in silence or live in unspeakable pain.

Importantly, the participation of willing test subjects and voice donors help create models that can later be applied on others. Under surveillance medicine, participation is not restricted to self care interests but also interpolates populations to invest in a project of “anonymous care”, whereby “the texture and specificity of a particular life [is] irrelevant, or relevant only insofar as the survival of the other is ensured” (Stevenson 2014, 86). Sonde draws on a morality of anonymous care similar to other forms of biopolitical participation such as donating blood, stem cells, or organs, in asking people to think about how their participation might help potential strangers in future need. As Sonde’s privacy policy states directly: “The voice samples and the answers you provide in the app are used to develop and improve automated computer analysis methods that could one day help transform the every-day sounds of your voice into simple ways of detecting and managing diseases” (2017-3-1). In other words, users are asked to invest in a project of anonymous care that leverages voice data into resources for future risk monitoring systems.

Transductive labour in the diffuse factory

Through this dynamic of looping self and anonymous care, transductive change spreads across milieus: one person’s data and participation contribute to AI models that will impact anonymous others in settings marked by different stakes and power relations. HML follows the logic of surveillance medicine in being diffused everywhere and to everyone, including those who may

be less cooperative or participative. For instance, data produced from vocal biomarker research are transduced into a range of applications, including clinical models, consumer self-tracking apps and workplace monitoring tools. In keeping with the broader approach of the dissertation, this subsection foregrounds the transductive labour of surveillance medicine as a key concept for grasping how data and participation move across milieus, and for making legible the authoritarian logic of HML.

Through her ethnography of voice biomarker research labs, Beth Semel defines transductive labour as a “maintenance work that involves moving and transforming sound across multiple media” (208). Transductive labourers include research personnel and annotators, but also research subjects whose work involves “producing speech in exchange for a cash stipend” (ibid.). Although AI agents like Alexa, Siri, and Google might appear automated or autonomous, the concept of transduction labour helps peel back the acousmatic curtain on the “manual and menial work” that creates the “illusion of immediacy” (211).

Semel explains that a key component of this work in vocal biomarker research involves the production of speech. This can be achieved by speech elicitation tasks borrowed from neuroscience and psy-disciplines such as the PaTaKa speech test or sustained phonation tasks (e.g. say ‘ahh’) (Uberti et al. 2020; Lancheros, Friedrichs, and Laganaro 2023; Manes et al. 2023; Dedry et al. 2024). Alternatively, participants may be asked to describe images or generate words that are relevant to pre-assigned categories as in the semantic fluency task (Borkowski, Benton, and Spreen 1967) or Boston Naming Test (Goodglass, Kaplan, and Weintraub 1983). Once initial AI models have been developed through the input of clinicians and prior vocal biomarker research, free speech can be feasibly analyzed in real-time and with smaller samples of speech. In this context, Semel notes that a big part of transductive labour in vocal biomarker research involves “the staging of communicative interactions that encourage subjects to produce speech” (208). This plays out in commercial apps like Sonde’s mental fitness app which asks users to summarize their day, share their feelings, or speak about any topic whatsoever, despite the irrelevance of signifying semiotics in producing a risk score. Quite simply, there is no need to enter a research lab or to consciously say “ahh” to have one’s tongue depressed by signalitic listening.

Semel advances transductive labour as a way of challenging the technoscientific claims of vocal biomarker technologies and the validity of a stable and objective indexical relation between voices and risk. What matters here is that ubiquitous surveillance creates conditions for a diffuse factory in which the work of speaking subjects spills far beyond research labs. Thus, I seek to expand Semel's theorization of transductive labour by considering the different dynamics of labour and surveillance that contribute to the diffusion of HML beyond research settings.

Semel pinpoints the role of research subjects as a starting point of calculation in a dataset from which the "voices of future, anticipated speakers" will be compared (2025, 208). A diffuse factory of transductive labour reminds us that other subjects contribute to vocal biomarker production and that models developed inside research labs are not confined there. This distinction matters due to questions of consent. While research subjects contribute knowingly, other HML systems exploit the immaterial and free labour (Terranova 2000) housed on YouTube as a transductive resource. For instance, NeuroLex's Tribe initiative demonstrates this diffuse sourcing, including efforts to build vocal biomarker models for conditions like Depression, Schizophrenia, Anxiety Disorder, Seasonal Affective Disorder, PTSD, Grave's Disease, and the common cold from YouTube audio. This includes the scraping of voice data from ordinary users who self-identify with different conditions and from celebrities who later died by suicide after struggling with mental health disorders. It remains important to challenge the accuracy and technoscientific claims of such models, since the quality of this transductive labour is far lower than what is produced in controlled research environments. Yet my focus here is on how labour that is freely given or otherwise unrecognized as work (Lazzarato 1996) is nonetheless quietly enlisted in the production of HML systems.

Importantly, the economic valorization of vocal biomarker technology regularly foregrounds "the quality of the labour that literally animates the commodity" (Terranova 2000, 48). For instance, after the purchase of NeuroLex, Sonde Health made clear that they do not use YouTube as training data for its HML systems. However, once valorized vocal biomarkers are in hand, these models can be transduced elsewhere, creeping outward from more controlled environments (i.e. research labs and clinical settings) into more diffuse settings. Thus, the transductive labour that contributes to the development of HML systems emerges in a diffuse factory that is already

located within and circulating across homes, workplaces, mobile apps, social media, and standardized datasets.

As I use it, transductive labour helps to conceptualize how individuals, communities, and milieus are collectively entangled. Research subjects or self-trackers give their labour freely and might find therapeutic benefits from the tech. However, not all transductive labour is given so freely or equally. This unevenness matters because people can contribute to the training of AI without intending to, a process that de-individuates them by separating speakers from the products of their transductive labour, whether they recognize this or not. HML amplifies this dynamic and contributes to the broader transformation of labour that Stiegler describes as proletarianization. Sonic proletarianization names the process in which voices, cultural expression, and communication are siphoned into computational systems to extract value while excluding their producers (i.e. transductive labourers) from any meaningful participation in the milieu of work (Stiegler 2010, 38). The diffusion of HML is inherently proletarianizing in this sense, as it involves the surveillance of language and the staging of conversations to create a signaletic system that mediates research participation, self care, and anonymous care in ways that many people may not anticipate, desire, or freely consent.

The authoritarian logic of HML is expressed by the “extremely rapid and violent penetration of technology in the different social systems” whereby not everyone is given equal choices of adoption but is rather compelled to adapt to a process of “generalized proletarianization” (103). Importantly, there is nothing inherently de-individuating about signaletic listening insofar as self-care uses or early warning systems for health risk could be beneficial. However, the signaletic aspect of HML intensifies the problems of authoritarian technics by shifting attention away from speech as communication toward medical risk. This shift takes on authoritarian force when the diffusion of HML depends on forms of monitoring that bypass meaningful consent and unilaterally expose people’s voices to signaletic conditions. Put differently, as a system that depends on the production of speech to build models that treat meaning as noise, HML risks diminishing the space for dialogue when people are unequally pressed into roles as both data-producing labourers and monitored subjects.

Although surveillance strives to expand continuous monitoring to everyone as a potential patient, this interpolation is not always appropriate, including when people perform their roles as

employees or customers. Once HML moves into non-clinical settings, health risk is less likely to be oriented toward care and more likely to be mobilized for evaluative or punitive institutional aims. This dynamic is evident with the promotion of depression detection systems to identify purportedly falsified insurance claims (Monaro et al. 2018; Stasak 2018, 24), signalling a shift in which HML is recast as a fraud detection tool or punitive technology. Signaletic listening frames speech as untrustworthy and the diffusion of this logic into non-clinical settings creates environments where ordinary communication can be reinterpreted as evidence of liability or misconduct.

This analysis sets the stage to examine how HML spreads through creeping diffusion that obscures the widening reach of its signaletic mode of listening.

Creeping diffusion

The term “creepy” is used casually in public debates about technology, but also gestures toward broader concerns about the diffusion of innovations. Privacy-invasive technologies are regularly referred to as “creepy” – yet this is a heavily debated concept for its ambiguity and moralizing judgement. In Keenan’s data privacy framework of technocreep, HML might be perceived as creepy for producing biometric and health-related data that belongs to an elevated class of personal sensitivity (Vitak 2020). In a recent edited collection, Atanasoski and Parvin (2025, 5) argue against labelling particular technologies as “bad” or “creepy” as this shifts focus away from the conditions that make so-called creepy technologies desirable in the first place. For instance, long histories of mental health stigma that contribute to self-silencing tendencies help create a demand for HML among people or communities who are otherwise reluctant to talk about their problems and seek out professional help.

In this section, I engage with literature on creep to conceptualize creeping diffusion as the imperceptible expansion of technologies in function, infrastructure, and social application. This framing interprets creep as a pattern and strategy of authoritarian diffusion in which stealth and obfuscation shape the social negotiation and dialogue of technological adoption. By interpreting creep as a pattern of diffusion, I frame creep as an authoritarian mode of communication or incommunication. Specifically, I interpret creep as a subtle and often imperceptible form of communication in which the perceived newness of technology keeps expanding or shifting so that uncertainty remains unresolved. This imperceptibility of social change can foster

imaginaries of technologies acting and moving on their own, in resonance with popular narratives about creepy technology (Chatterjee 2025). By interpreting creep as a problem of communication in which the dynamics of change are inadequately or misleadingly communicated, I situate creep and related processes in the framework of authoritarian diffusion whereby technologies are spread disruptively and without trustworthy dialogue.

Clarifying the lexicon of creep

For Keenan (2014), technocreep refers to an expansion of digital surveillance and to ever-expanding privacy intrusions and violations of rights. Critiquing this as an undertheorized phenomenon, Atanasoski and Parvin (2025) challenge the reduction of creep to surveillance to foreground other ethics, politics, and technological relations that are obfuscated by a data privacy regime. Drawing on feminist technoscience, the contributors in the edited collection rework the concept of technocreep as a method for slow and careful inquiry into technological relations and resistances. I draw inspiration from this methodological shift while engaging in more depth with privacy and surveillance debates. Putting a lexicon of creep into conversation, I advance Atanasoski and Parvin's (2025) deployment of technocreep as method, retain the concept of function creep, and add the concept of function sweep to describe a distinct pattern of technological diffusion that differs from function creep in aspects of purpose, speed, and perceptibility. I describe my technocreep procedures and research paradigm in the methodology section that follows.

Function creep remains a useful concept, I maintain, for describing a pattern of social diffusion. Bert-Jaap Koops (2021) theorizes function creep with precision, explaining that it boils down to “an expansion or shift in the proper activity of a data-processing system in relation to its purpose or use, which is considered contestable because people insufficiently recognise that it involves a qualitative change that raises public-policy concerns” (53). Koops notes that the element ‘creep’ in the concept is a complex and stretchy term with associations of slowness, imperceptibility of movement, and negative connotations of “stealth or furtivity, and possibly also feelings of fear or repugnance” (34). Crucially, Koops does not attribute creepiness to technologies themselves but instead situates it in how diffusion patterns are perceived.¹⁶

¹⁶ This aligns with Mumford argument that the danger of authoritarian technics is not directly attributable to “specific scientific discoveries or electronic inventions” (1964, 6).

Importantly, Koops focus on data-processing systems is explained by the recent history in the diffusion of innovation and by the particular affordances of digital software and platforms that allow remote downloading of changes into apps and devices, subtle updates, or the clandestine embedding of background features that can be unlocked at a later date. For instance, the unexpected discovery that Google's Nest Guard included a hidden microphone generated widespread concerns related to function creep (Lee 2019). Evidently, function creep poses a problem of communication in which "there is or has been insufficient room for debate about the acceptability of the change. What is contested is not (only) that a change is transformative, but (also) that it is imperceptibly transformative" (53). The affordances of data-processing systems for such imperceptible patterns of diffusion help explain why dataveillance and creep often overlap.

Moreover, when surveillance technologies are introduced, they commonly raise expectations of function creep because earlier cases have primed the public to anticipate such shifts, such as the repurposing of genetic databases built for ancestry research into tools for policing.¹⁷ Resultantly, data-processing and surveillance technologies might be reasonably perceived as creepy by design for indicating a foreseeable expansion in function that will unfold through small and gradual steps which obscure the "tipping point" into a controversial or contested social change (Koops 2021, 52). Such ex-ante concerns about function creep then are justified when viewed against longer histories of surveillance diffusion.

However, conceptions of function creep begin to lose precision when the pattern of diffusion deviates in aspects of purpose, speed, and perceptibility. Creep denotes movement and departure from an original and acceptable purpose, yet many applications of surveillance medicine have always been anchored by a sweepingly envisioned purpose. Moreover, function creep denotes a slow and furtive movement that contributes to problems of imperceptibility, yet many systems expand or shift in scope very rapidly. In consideration of the lightning speed that many startups and Big Tech corporations move, function creep begins to conceal more than it reveals about

¹⁷ Scholars have proposed related terms, including "mission creep" (Mariner 2007), "surveillance creep" (Nelkin and Andrews 2001), as well as both "purpose and function creep" (Wisman 2013) in differentiating aspects and processes of creep.

some patterns of diffusion.¹⁸ For this reason, I propose the concept of *function sweep* to help attend to different problems of rapid diffusion, especially where expansive and amorphous ambitions are articulated in research and development phase in innovation cycles. The groundwork for this rests in my earlier exposition of the diffuse factory of transductive labour that lubricates the circulation of HML across milieus.

“Authority innovation-decisions” in the diffusion process have always been linked to faster rates of “adoption” or “rejection” since people can be ordered to adapt to innovations by decision makers “who possess power, status, or technical expertise” in a milieu (Rogers 2003, 28-29). There are good reasons why tech companies move quickly: money is on the line, investors are awaiting results, and there is often intensive market competition. However, in moving quickly, non-transparent and misleading communication can be used as a strategy of diffusion that obscures early stages of experimentation and decision-making. In the findings section of this chapter, I elaborate on this process in discussion of a pattern of function sweep that is reinforced by privacy washing rhetoric that helps to pre-empt critique of surveillance innovations.

By interpreting patterns of function creep and function sweep as problems of communication, I aim to highlight that these strategies are reflective of authoritarian diffusion because they involve the deliberate dissemination of technology without adequate or genuine dialogue with the groups who are expected or compelled to adopt or adapt to it. Thus, what we have is a nexus of three terms in which *technocreep* offers a method to attend to two distinct processes, one exhibiting a relatively slow creeping dynamic and the other involving a relatively rapid sweeping dynamic of technological change.

Privacy critiques

This section engages in technocreep debates and develops analysis of privacy as both a site of manipulation and possibility of resistance to authoritarian technics. It shows how the diffusion of HML exploits narrow and individualized notions of privacy and illustrates why signalitic listening requires a reconceptualization of sonic privacy.

¹⁸ In the case of NeuroLex, the small startup managed to amass an enormous voice database, published several experimental studies (Ozkanca et al. 2019; Phi et al. 2019; Tracy et al. 2020; Zhang et al. 2020), secured funding and financial investments, and developed partnerships with hospitals and clinicians—all in less than five years.

Signalitic listening brackets semantic speech to produce micro-features from voices that can be absorbed into population-scale datasets from which dividual profiles are produced, circulated, and reformed. Cheney-Lippold (2017) extends the notion of privacy using the Deleuzian concept of the *dividual*—a proto-subject constituted through data traces rather than a stable identity. While individual privacy remains an important regime for safeguarding liberal rights, dividual privacy recognizes that control now operates through aggregation and inference, as data is abstracted, anonymized, and recombined to act on populations. HML facilitates this shift because it converts micro-acoustic features into inference-ready variables that lie before and beyond the scale of individuals. In this sense, privacy violations no longer occur solely at the level of personal information, but through algorithmic sorting and prediction that act on signals circulating at the dividual scale.

HML contributes to dividual privacy risks by deploying machine learning normative modelling techniques that use large population datasets to quantify the variance of an individual voice from constructed norms (Chen et al. 2022). In this way, individual data comes to dividentally interact with populations as voice profiles and health risks are statistically aggregated and modelled. Even longitudinal assessments of a user draw on the accumulated traces of others, illustrating how “the intersubjectivity of others’ dividualities” shapes future encounters with HML systems (Cheney-Lippold 2017, 236). Thus, an individual’s personal data can contribute to anonymous monitoring systems that may reproduce discriminatory outcomes as dividual patterns become stabilized into population norms.

Transductive labour takes on increased significance through the lens of dividual privacy as the work of self care becomes dividentally informative of anonymous care systems and potentially feeds into less caring applications such as workplace monitoring, insurance adjustment, or security interventions. Put otherwise, one’s transductive labour may actively help build systems that will impact others who have varying degrees of privilege, social status, and marginalization. In this way, proletarianization carries added social justice implications when people are put to work without realizing it and when this transductive labour contributes to disagreeable objectives or politics. In response, this section develops an account of dividual privacy as a collective value that helps rethink how transductive labour might be reclaimed for individuating and anti-oppressive outcomes.

Technocreep critiques

Atanasoski and Parvin (2025) rightly note that problems of creep can be narrowly framed through privacy loss, reducing ambivalent forms of digital relation to individualized consumer-rights issues. To clarify what this critique overlooks, Semel offers an incisive formulation concerning HML that warrants quoting at length (2025, 207):

They primarily characterize the harms that vocal biomarker technologies portend through binaries of privacy and surveillance while depicting users and makers of vocal biomarker technologies as uncritical and agentless... This critique imagines a normative user/patient who has never before experienced being interpolated by a White, colonial “hegemonic perceiving subject” that rigidly maps them onto social categories based on the sound of their voice, someone who has never been told that they “sound,” for instance, disabled, trans, or not American. Other critiques portray vocal biomarker technologies as creepy because they can plumb the depths of a speaker’s psyche without the speaker ever knowing, making it “nearly impossible for people to hide their feelings” and turning even the unintentional expression of affect into a potential mechanism of control and commodification.

Yet throughout the edited collection, a false binary between surveillance and privacy is reaffirmed and strawman arguments about privacy are repeated. Semel’s transductive labour offers a brilliant redirection to “reclaim the messy contradictions of technologically mediated relations” (Atanasoski and Parvin 2025, 5), helping also, in my view, unsettle the false binary between surveillance and privacy. Consumer privacy rights are indeed not the only way to challenge problems of creep. However, privacy itself exceeds the narrow legal frame of data protection being dismissed by the contributors. For instance, privacy can represent a pre-condition for technical practice and transindividuation, as argued in Chapter Two, to similarly point to a condition of solitary connectedness that represents anything but straightforward technologically mediation relations.

Privacy techniques commonly reveal contradictions of any supposed binary between surveillance and privacy, such as tactics of coded communication, obfuscation, hiding in plain sight, and media scarce resistance which do not fully escape surveillance, but instead, subvert it through negotiation and creative adaptation (Elmer and Neville 2024). Finally, the messiness of technologically mediated relations can be revealed with and through privacy, as one person’s data and participatory surveillance come to affect other people as this data circulates across multiple settings, making the distribution of agency and power harder to discern.

Viewed from this angle, privacy contradictions open directly onto the circulatory logic of HML itself, where ordinary and voluntary contributions travel far beyond their points of origin and

primary dynamics of consent, complicating any supposed boundary between public health and algorithmic surveillance, as well as self-tracking and collective care (Kneese 2025).

As I explain in the next subsection, HML developers strategically leverage outdated and reductive conceptions of privacy as a means of lubricating the process of diffusion. It becomes a problematic concession then to jettison privacy when developers strategically weaponize reductive privacy framings. Put otherwise, if HML developers deliberately exploit privacy framings to encourage adoption, then the critical task becomes challenging such reductive conceptions of privacy and reopening privacy as a tool of critique and dissent.

Privacy washing as diffusion strategy

Privacy washing represents a strategy in the toolkit of authoritarian diffusion, as a means of deceiving early adopters about the broader stakes of a technology and facilitating processes of creep. As coined by Cirucci, privacy washing reflects a strategy where “companies attempt to promote privacy friendly activities to deflect attention from their less privacy friendly activities as well as to influence customer choice...” (2024, 2). Sonde actively incorporate privacy marketing in its product branding. In the findings section of this chapter, I cite numerous documents spanning from 2020 to 2025 where Sonde leverages the medical term *non-invasive* as a privacy washing trope. Attached to the framework of authoritarian technics, privacy washing is used to understand how diffusion can be accelerated by encouraging people to misunderstand the privacy risks of signalitic listening.

The second trope of privacy washing used by HML developers extends from the distinction between semantic listening (i.e. attention to what is said) and signalitic listening (i.e. attention to micro-features of voice). Protection of semantic privacy would cover what is communicated through language and other codes, and this form of privacy protection features prominently in HML marketing discourse despite being mismatched to the signalitic mode of listening that HML operationalizes. Put otherwise, semantic privacy represents the wrong level of analysis concerning technologies that extract value from pre-semantic signals. Moreover, semantic privacy grafts neatly onto individualistic conceptions of privacy whereas signalitic privacy would involve protections for individual harms. As I illustrate in the findings section of the chapter, HML’s mode of signalitic listening is marketed as a privacy affordance that fulfills

individual expectations for protection against eavesdropping, while distracting attention from individual concerns of surveillance and discrimination.

Mental models of “sonic privacy” (McNealy 2022) largely stem from concerns of eavesdropping and wiretapping whereby clandestine actors seek to overhear sensitive information or secrets that can be damaging to the reputation, freedom, or degree of privacy experienced by individuals (Hochman 2022). These pre-digital mental models of semantic privacy are commonly ported into digital ecosystems in evaluation of emergent technologies while ignoring signalethic privacy risks. For instance, a common refrain in users’ evaluations of privacy concerns related to smart speakers and voice assistants is that individuals have nothing to hide because their semantic interactions with these platforms are blatantly innocuous (e.g. “Alexa, play my favourite music playlist”). In these cases, there might not be a major eavesdropping risk because there is nothing sensitive being linguistically communicated in such an mundane interaction.¹⁹ However, the rise of vocal biomarker technology means that even seemingly innocuous semantic interactions with technology can automatically implicate signalethic concerns in which health-related data is produced, aggregated and compared with norms, and eventually circulated across organizations and contexts beyond the boundaries of individual privacy.

In response to privacy washing strategies, the following section leverages the conceptual stretchiness of privacy (Bennett 2011, 493) as a means of contesting the process of HML diffusion.

Stretching privacy: from individual right to collective breathing space

There is an expansive literature that demonstrates how privacy is both theorized and culturally understood as a common value (Steeves 2009; Regan 2010) in which individual privacy rights and practices are regarded as instrumental for civil society and for intersubjective relationships. Despite historical and contemporary inequalities in the privacy protections afforded to privileged individuals compared with marginalized communities, privacy scholars have leveraged the stretchiness of privacy as a mode of social justice and collective resistance to surveillance.

¹⁹ Likewise public concern towards smart speakers has largely turned to issues of wake word misfires when speech data are collected without users’ intention – in some cases capturing sensitive semantic information (Dubois et al. 2020). Smart device manufacturers have sought to pre-empt and respond to such eavesdropping concerns by outfitting their products with microphone on/off switches, fulfilling users’ expectations to restrict unwanted forms of semantic listening.

Skinner-Thompson (2020) is exemplary of this approach in arguing for a privacy praxis that hinges upon anti-oppression values, whereby individual privacy practices are leveraged as a medium of allyship with oppressed groups and collective resistance against surveillance inequalities. Similarly, Cheney-Lippold's (2017, 215) conceptualization of a "breathing space" to protect the dividualities of other peoples advances recognition that participation in a surveillance regime is not only individually impactful but is dividually implicating and potentially harming. Put simply, individual choices to provide data and transductive labour to HML systems need to be situated within collective political discussions and struggles. From this view, self-tracking debates about self care and datafied empowerment must question how one person's dividualities will eventually lead to discriminatory outcomes for others who are disproportionately categorized as risky, unhealthy, and abnormal. Seen from the lens of transductive labour, the collective value of privacy helps reveal how people become complicit (Semel 2025) in the diffusion of surveillance technologies, simply because one person's signalitic disclosures impact others who may be less privileged to negotiate surveillance intrusions. In the case of HML we can anticipate this playing out with disproportionate targeting of low-SES communities and within sectors of precarious employment (Villongco and Khan 2020).

Together, the collective value of privacy helps remind us that we can choose, negotiate, and resist what products our transductive labour contributes to. Surveillance medicine always implicates transductive harms as individuals become analyzed and stigmatized according to population norms, yet on the other hand, privacy can be reclaimed as a practice of care and community that protects both individuals and the dividual traces that tie people together as data points, regardless of whether they are reflexively aware of that entanglement.

In regard to HML, to stretch privacy as a collective good involves clear recognition of how signalitic listening leads to widespread proletarianization as the work of listening is absorbed into computational systems and diffused across disparate milieus. Collective resistance then might engage in a different modality of work that aims to protect shared spaces of listening, care, and communication from surveillance intrusions. More concretely, the diffusion of HML into many aspects of social life demands a tactical response of withdrawal, a collective pact of silence that pulls away from the dividual harms that one's speaking voice can reproduce. If the argument from Chapter Two holds that privacy represents a precondition for technical practice and

learning, then such silence may help support the survivance and innovation of other listening practices. As Jonathan Crary argues about machine listening (2022, 118):

We are losing the possibility of listening; of facing, with forbearance, a stranger, someone destitute, someone who offers nothing to our self-interest. We are even less able to understand the difficulties of being present to someone, or to accept that dialogue may open up not on connectedness or fellowship but onto the unknowability of others.

A pact of silence in regard to HML thus reflects an effort to listen to others while leaving space for interpersonal and cultural transduction: a form of translation that respects the boundaries needed for difference to remain uncommunicated and unknowable when called for.

Again, I am not calling for an outright rejection of HML on the principle of the technology being intrinsically creepy, but rather am positioning silence as a mode to challenge its process of authoritarian diffusion. HML systems use the dividualities of voices for unexpected ends, diffusing the mode of signalitic listening into new settings and onto new communities. A pact of silence then would involve collective resistance to this authoritarian logic until the concerns raised by HML are meaningfully addressed.

Semel's ethnography of HML research labs similarly points to participants' resistance against monitoring through practices of silence, in which individuals remain taciturn or withdrawn upon being invited to talk within the staged conversation that facilitates data collection for vocal biomarker research. Just as individuals can rely on tactics of silence to resist unwanted privacy intrusions or clinical monitoring, a collective praxis of quiet awareness calls for shared attention to the broader harms that transductive labour divdually reproduces. Contributing to the arc of the dissertation, a pact of silence serves as a creative and political mode of care for other peoples' well-being, lives, and worlds by withholding transductive labour from systems that are rapidly and often imperceptibly diffused without adequate opportunities for dialogue with those most affected.

The next section details a methodology of technocreep designed to render the dynamics of authoritarian diffusion more perceptible and contestable through a case study analysis of NeuroLex Laboratories and Sonde Health.

Technocreep as method

This study examines the diffusion process of HML from NeuroLex and Sonde Health as a convergent case study, tracing the dual company history from 2015 through the acquisition of NeuroLex by Sonde in 2020 and continuing to 2025. The objective is to observe the patterns, paces, and strategies in the diffusion process as the technology develops in function, application setting, and infrastructure. In keeping with diffusion research, time is an important variable to the analysis (Rogers 2003, 126), yet my approach aligns heavily with the method of technocreep laid out by Atanasoski and Parvin (2025, 6), in slowing down to interpret what otherwise moves too subtly or quickly to observe and interpret.

Public websites offer an important window of analysis of technology companies but raise challenges because of the impermanence and changeability of webpages. One oft repeated factoid from Brewster Kahle, founder and director of the Internet Archive, is that the average webpage is deleted or changed every 100 days (Zomorodi et al. 2023). Using the Internet Archive's Wayback Machine, which provides a free public repository of the World Wide Web, I manually scraped archived data for both Sonde and NeuroLex along with their intellectual property, SurveyLex and the Voiceome protocol from 2015 until 2025 to conduct an analysis of website history. The research design follows the gestures of the diffusion process, "flake by flake" (Leroi-Gourhan 2023, 176), as companies update their messaging in reflection of new partnerships, hardware and software integrations, product offerings, and diffusion changes.

In examining these archived materials, my focus is not only on how the technology itself develops but on how HML expands into different social environments including research labs, clinics, workplaces, and other social microclimates. This approach is aligned with the spatial logic of surveillance medicine (Armstrong 1995) which seeks to expand the clinical gaze across myriad environments. Attending to website documents as evidence of subtle developments in the diffusion process, the study tracks the spatial dissemination of HML across shifting contexts over a ten-year period.

Atanasoski and Parvin (2025, 6) call on researchers to stop studying "creepy technologies" (7) to instead use creep as a feminist method for technoscience (7). Through wide-ranging contributions, the edited collection "dwells on histories that undergird our present moment" (6), in rejection of critical scholarship that is constantly on the back foot in trying to keep up with the

latest gadget, platform, or startup. Similarly, this study involves slowing down to analyze an immediate history of the present to follow a process of diffusion that is repeated time and time again. In the preceding chapters, I characterized authoritarian diffusion as an abstract process, whereas in this chapter I aim to foreground a case analysis that is reflective of this broader problem without striving for generalizability. Put otherwise, I use technocreep as a method for attending to mechanisms of function creep and its speedy cousin, function sweep, which can be further refined and tested in future research. Using creep for the purpose of an anti-oppressive technological inquiry, I aim to make apparent the imperceptible patterns and authoritarian logics of diffusion revealed by the case study. Despite the non-generalizability of the findings, the study uses a methodological approach that can be applied or retooled beyond the specific case examined here, while also adding to understanding of the general problem in which diffusion exacerbates inequality (Rogers 2003, 130) by manufacturing new dependencies, entrenching surveillance, or disrupting integral aspects of cosmotechnical milieus (Sharp 1974). Thus, my approach is strongly aligned with the contributors of *Technocreep* (2025) in advancing an anti-oppressive research agenda of “attunement to technologies as motile, creeping processes that continually reconfigure relations” (Chatterjee 2025, 245) between diffusing, adopting, and adapting groups.

While tracking the changing dynamics of diffusion, the study also examines the consistent privacy problems that are obscured because of manipulative privacy rhetoric that incites adoption and propels diffusion of HML. Thus, rather than chasing after the newest technology itself, my diachronic analysis strives to contest the diffusion process and contest creeping problems of privacy.

Case study

This study is guided by the following research question:

1. What functions of HML are publicly promoted, and how do these change over time?
2. How does this pattern of change align or deviate with understandings of function creep?
3. In what sectors and domains of application are the products positioned for adoption?
4. How are privacy issues rhetorically framed and how does this obscure surveillance concerns, relational harms, and power dynamics of HML?

The study draws attention to two main overarching findings that together support the arguments of the chapter insofar as they lubricate the diffusion process by making the broader surveillance

impacts of HML less perceptible. Paying close attention to the moment of Sonde's acquisition of NeuroLex on August 25, 2020, I provide empirical evidence concerning a subset of function creep that I term, function sweep: a two-stage process involving an initial rapid expansion of functions followed by an effort to refine prior experimental stages. In addition to this pattern of diffusion, privacy washing (Cirucci 2024) is identified as a rhetorical strategy that masks issues of signalitic privacy and the dividual harms posed by HML.

Founded in 2015, Sonde Health is a mid-sized firm and subsidiary of PureTech Health that focuses on the development of HML. In addition to conducting vocal biomarker research they have three commercial products: namely, a "mental fitness" app that tracks mental health changes including depression and anxiety for self-tracking, corporate wellness programs, clinical monitoring, and insurance plans; second, a "cognitive fitness" app that detects cognitive strain and fatigue for self-tracking and corporate wellness programs; and lastly, a clinically validated "respiratory health" app that detects and monitors for symptoms of COVID-19, asthma, COPD, and other pulmonary conditions from the analysis of coughing, shortness of breath, and other variables.

Prior case study research on Sonde Health has focused on the company's application programming interface (API) documentation as a "rich text" (Ma, Patitsas, and Sterne 2023, 642), and others have analyzed the company as part of a media genealogy of the interaction between the psy-disciplines and sound reproduction technologies (Levy-Landesberg and Pinchevski 2022). In contrast, the design of this study treats NeuroLex and Sonde Health as a convergent case study for diachronic analysis from 2015-2025.

Founded in 2016, NeuroLex Laboratories was a start-up that was acquired by Sonde on August 25, 2020. The company's efforts were focused on data collection and pilot studies for vocal biomarker research. Its largest effort, the "Voiceome Study" (Schwoebel et al. 2021) gathered about 500,000 voice samples labelled with health-traits from over 30,000 individuals. The Voiceome project came up in a public conversation between James Parker and artist-investigator, Lawrence Abu Hamdan as part of a machine listening curriculum (Abu Hamdan and Parker 2020). NeuroLex never brought a vocal biomarker app to market but released a web-based voice survey app called SurveyLex in 2018. SurveyLex was used to collect data for the voiceome study and marketed as an efficient data collection tool for clinical research, as well as for non-medical

use cases such as job interviews and consumer market research. Unlike written responses to survey questions, SurveyLex was pitched as a tool that allows voice responses to be auto-labelled for variables including age, gender, race, emotion, and accent – meaning that demographic questions can be skipped to speed up the data collection process and improve completion rates from participants. Following the acquisition of NeuroLex, founder and CEO Jim Schwoebel, was briefly employed by Sonde Health as VP of Engineering. The pre-print publication of the Voiceome Study results was published in 2021 with Schwoebel’s Sonde Health affiliation, making it probable that Sonde’s purchase was motivated by the massive datasets collected by NeuroLex, as well as its data collection tool. SurveyLex remains an active product and has been used in at least three additional Sonde research studies (Muomah et al. 2023; Nyawornota et al. 2023; Larsen et al. 2024).

Data collection

The data used in this study represents a mix of publicly available documentation produced by Sonde and NeuroLex throughout the research timeframe from 2015-7-14 (the date on which the first public document from NeuroLex was published) up to 2025-5-8 when the data collection concluded. This includes current and archived website data from Sondehealth.com, NeuroLex.ai, Voiceome.org, and SurveyLex.com, which were accessed using the Wayback Machine. Additionally, the dataset includes patents filed by Sonde Health, as well as press releases, interviews, and news articles from both corporations. Marketing materials were also examined, including promotional content and videos hosted on platforms such as YouTube and Vimeo. Social media data from NeuroLex’s Twitter account and its crowdfunding campaign on Indiegogo were reviewed to contextualize the company’s public outreach efforts. Sonde’s API documentation and guidebook also form part of the corpus to help understand the technical parameters and framing of its products. Finally, I reviewed academic publications authored by researchers affiliated with NeuroLex and Sonde to interpret their scientific framing and research ethics.

A supplementary appendix is included that provides a detailed overview of sectoral domains by year for NeuroLex and Sonde Health (Appendix A). Additionally, the raw data corpus underlying the study is available upon request from the author.

All data was labelled and organized by date of publication (e.g. year-month-day) to facilitate diachronic analysis and is cited accordingly in the findings paper with a short-hand title (e.g. 2016-6-29) to provide contextual information on the document's date of publication.

Function sweep

Both Sonde and NeuroLex were founded with experimental aims and without clarity on what the killer app for vocal biomarker technology will be: what functions the technology will be useful for, who it's for, or where diffusion should be concentrated. A promotional video from Sonde reflects this exploratory logic through broad and speculative product applications that stretch from the crib to the grave.

Your health and wellness are always changing. Imagine if your phone could hear asthma, stress or sleepiness in your voice and connect you to resources that help you stay well or feel better. Or if your child's smartwatch could detect breathing problems before it becomes a problem and prompt a caregiver to seek timely help. And a parent's voice-powered speaker that detects flu symptoms or depression could alert a child to check in or help out. Maybe you're out late and your phone hears signals in your voice that indicate it's time to call it a night. Sonde-powered apps and devices can alert the right people or provide access to useful services to help manage health and wellness. (2020-5-15, Sonde)

Animated frames depict a Black child's smartwatch alerting their parent about breathing problems, a Black elderly man stuck in bed with a bedside smart speaker, and a couple sharing late-night drinks when the man's phone issues a "sleepy alert". The diffusion of HML is not anchored by a single use case, but involves intersecting and expanding functions, shifting domains of application, and various hardware integrations. In this findings discussion, I highlight how this process of diffusion aligns and deviates from patterns of function creep in relation to aspects of purpose, pace, and perceptibility while introducing the concept of function sweep to more accurately qualify the diffusion patterns evidenced by the case study.

Whereas function creep refers to the imperceptible and gradual shift in a system's intended use and purpose, function sweep refers to a more short-term pattern and two-step action involving an initial rapid expansion of functions followed by an effort to refine prior experimental stages (i.e. sweep = swift search + clean up). Drawing from the conceptual discussion of technocreep, this section will illustrate how the pattern of function sweep may be folded into a more overarching process of function creep over a longer timeframe as early experimental functions begin to gradually reappear in mature products.

Purpose

From 2015-2020 there is a gradual expansion of functions from both NeuroLex and Sonde Health. In 2015, NeuroLex hinted at two use cases: psychosis diagnosis and medication monitoring through vocal biomarker analysis. In 2016 their product was being promoted for additional diagnostic applications, including for Alzheimer's disease, bipolar disorder, depression, PTSD, and schizophrenia. In 2020 the list of vocal biomarkers for NeuroLex increases significantly, including use cases for suicidality detection as well as alcohol and drug use monitoring. Similarly, Sonde began by promoting only three functions: monitoring of cardiovascular conditions, depression, and respiratory conditions. In 2020 the list of promoted vocal biomarkers for Sonde had increased to 20, illustrating a clear expansion of functional activities detailed in the following pages.

However, this process is not aptly described as a pattern of function creep since there is no shift away from any original purpose. Rather both companies begin and remain open to the discovery of as many vocal biomarkers and associated functions as possible, as reflected in the two quotations that follow.

We may find things like brain cancer in primary care that appear in the text or structure of the sentences before any symptoms appear. We might be able to find autism in adulthood due to hyperlexia and odd use of language. We can predict psychotic breaks before they occur through the structure of the sentences. We could potentially find sleeping disorders like insomnia or sleep apnea from the tone and speaking rate. The list is endless. (2017-4-26, NeuroLex)

Two years later and immediately prior to the official acquisition of NeuroLex, Sonde expressed a similar logic of sweeping product development.

It started out with Parkinson's disease...but it's grown to depression and suicide and determining suicidality in the voice versus just depression groups...and more broadly, Alzheimer's disease and dementia. It's a huge space...So we're doing a lot of things. It gives you an idea of the array and it's quite extensive and promising. (2020-6-16, Sonde)

The concept of function sweep captures this willingness to pursue multiple function at once as the basis for widespread diffusion of vocal biomarker technology. For instance, one year before NeuroLex was officially founded, Schwoebel explained that his product could be used to monitor a patient's tolerance, responsiveness, protocol adherence for specific medications, but also to recommend drug treatments.

If a person's speech shows fewer signs of depression or bipolar disorder after being given one medication, this tool could help show that it's working. If there are no changes, the AI might suggest trying another

medication sooner, sparing the patient undue suffering. And, once it's gathered enough data, it could recommend a medication based on what worked for other people with similar speech profiles. (2016-8-23)

Six years later, CEO of Sonde, David Liu shared his surprise in an interview that the pharmaceutical industry would be an early adopter for drug marketing purposes (2022-7-23). This expansion into pharmaceutical marketing is not illustrative of function creep per se, but rather, is symptomatic of the open-ended purpose of HML. Moreover, the breadth of HML's functionality carries implications for authoritarian diffusion, since data and transductive labour cultivated in one domain can be seamlessly repurposed to extend the technology elsewhere and onto others. The next section explains that the speed of diffusion further signals a top-down pattern of adoption that unfolds across varied social settings.

Pace

At first glance, the expansion of HML into different sectors and subcategories of application domains appears to resemble a pattern of function creep. From 2015 to 2017, the technology is situated for adoption in the Health and Life Sciences sector alone, but this gradually expands into several other sectors up until 2020; namely, Organizational and Corporate Settings; Consumer and Smart Home Technology, Education and Events, and Finance.

Table 1 provides an overview of the sectoral coverage by year for NeuroLex and Sonde Health. Values in the table indicate the number of distinct sectoral domains inductively identified through document analysis. As shown in Table 1, sectoral breadth expands steadily over time, alongside increasing density of distinct domains within the Health and Life Sciences and Consumer and Smart Home Technology sectors. Appendix A provides domain-level details corresponding to the sectoral values reported in Table 1. In terms of sectoral coverage, a general pattern of function creep can be observed insofar as from 2015 to 2017, HML is situated exclusively within the Health and Life Sciences sector, before gradually expanding into multiple sectors leading up to 2025. However, a pattern of function sweep—that is, the selective refinement or withdrawal of earlier experimental applications—is evidenced, for example, by Sonde's decision to temporarily roll back previous applications within the Education, Events, and Sports sector after its acquisition of NeuroLex in 2021. Additionally, within the Organizational and Corporate Settings sector, there is a temporary contraction in the number of distinct sectoral domains from 2020 to 2021 as Sonde removes references to human relations, marketing research, industry research, and political research domain applications for SurveyLex. In 2021,

Sonde narrows its product offerings in this sector to call centre integrations and later reintroduces human relations applications in 2024 for corporate workforce monitoring through its Mental Fitness and Respiratory Health apps.

Year	Health and Life Sciences	Organizational and Corporate Settings	Consumer and Smart Home Technology	Mobility and Transport	Defense and Security	Education, Events and Sports	Industrial	Finance
2015	1	0	0	0	0	0	0	0
2016	4	0	0	0	0	0	0	0
2017	6	0	0	0	0	0	0	0
2018	6	2	0	0	0	0	0	0
2019	6	2	0	0	0	0	0	0
2020	7	3	2	0	0	2	0	1
2021	7	1	2	1	1	0	0	0
2022	7	1	3	1	1	0	0	0
2023	8	1	4	2	1	0	0	0
2024	8	2	4	2	1	0	0	0
2025	8	2	4	2	1	1	3	0

Table 1: Sectoral coverage and domain density by year for NeurolEx and Sonde Health

Tied to the sweeping purpose of the vocal biomarker technology, HML is consistently positioned for adoption across multiple industries and application domains, as captured in a blog post from Sonde-CEO David Liu: “Voice biomarkers...can pay dividends across multiple industries and transform companies across sectors into healthcare companies...The benefits of using vocal biomarkers across a wide variety of industries are endless” (2022-4-15). While the pace of development is more aptly characterized in terms of function sweep, the diffusion of HML into myriad sectors and industries creates conditions for other actors to gradually expand their own monitoring activities, as the open-ended purpose of HML is adopted by third parties who then creep into health-related surveillance. Thus, we see a short-term pattern of function sweep contributing to wider social issues of function creep as different sectors and organizations incorporate HML into their surveillance toolkits—especially as non-medical companies add health-related data monitoring into their operational purview.

Infrastructure integrations and partnerships are key to the fast pace of diffusion. Sonde’s API and SDK (software development kit) support widespread device and platform integrations including mobile phones, wearables, voice assistants, and enterprise software applications. Following an announcement of a partnership with Qualcomm in 2021, Sonde’s software is embedded on Snapdragon chipsets built into countless smart devices; as of 2025, Sonde promotes additional device and platform integrations ranging from hearing aids, headphones and earbuds, automobile software, to a range of other smart products including children’s smartwatches and smart glasses (2025-1-9). The milestone partnership with Qualcomm propels the rapid process of function sweep as new HML applications become applied far beyond clinical and research settings in call centers (e.g. burnout detection), video gaming (e.g. tilting detection), aging in place settings (e.g. dementia detection), and transportation and logistics industries (e.g. fatigue detection).

As I will expand in the following subsection, the variable of speed provides clarity to the distinction between function sweep and function creep in relation to the problem of imperceptibility. Whereas, the slow and steady pacing of function creep is typically considered integral to the imperceptibility of the pattern, this does not hold true in evaluation of HML – and presumably other technological systems.

Imperceptibility

Function creep is arguably contestable because of the imperceptibly slow and gradual shift away from an original intended purpose that raises problems of transparency and forecloses public oversight (Koops 2021). In contrast, function sweep is imperceptible in part because of the speed of diffusion, but even more so because prior stages of experimental deployment are obscured over time. This is evidenced between 2020 and 2021, following the acquisition of NeuroLex, when the rapid expansion of HML functions become intentionally scrubbed or swept up from Sonde's webpages. Figure 1 and Figure 2 both visualize the changing array of vocal biomarker use cases promoted by NeuroLex and Sonde, illustrating a dramatic drop in the functional array at this time.

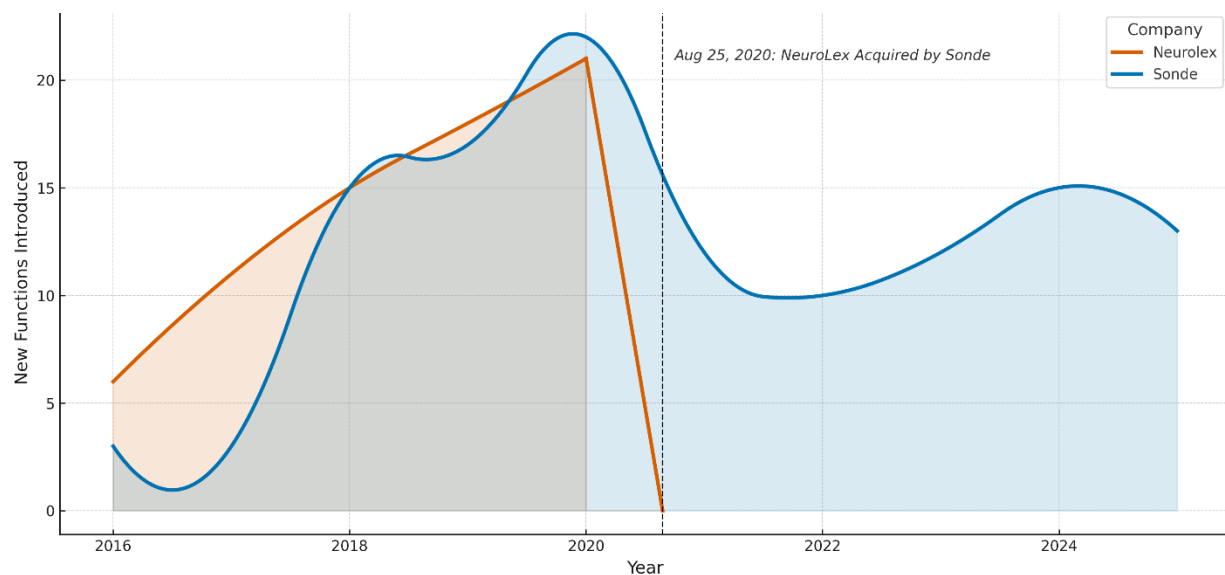


Figure 1: Overview of changing number of vocal biomarker functions per year by company

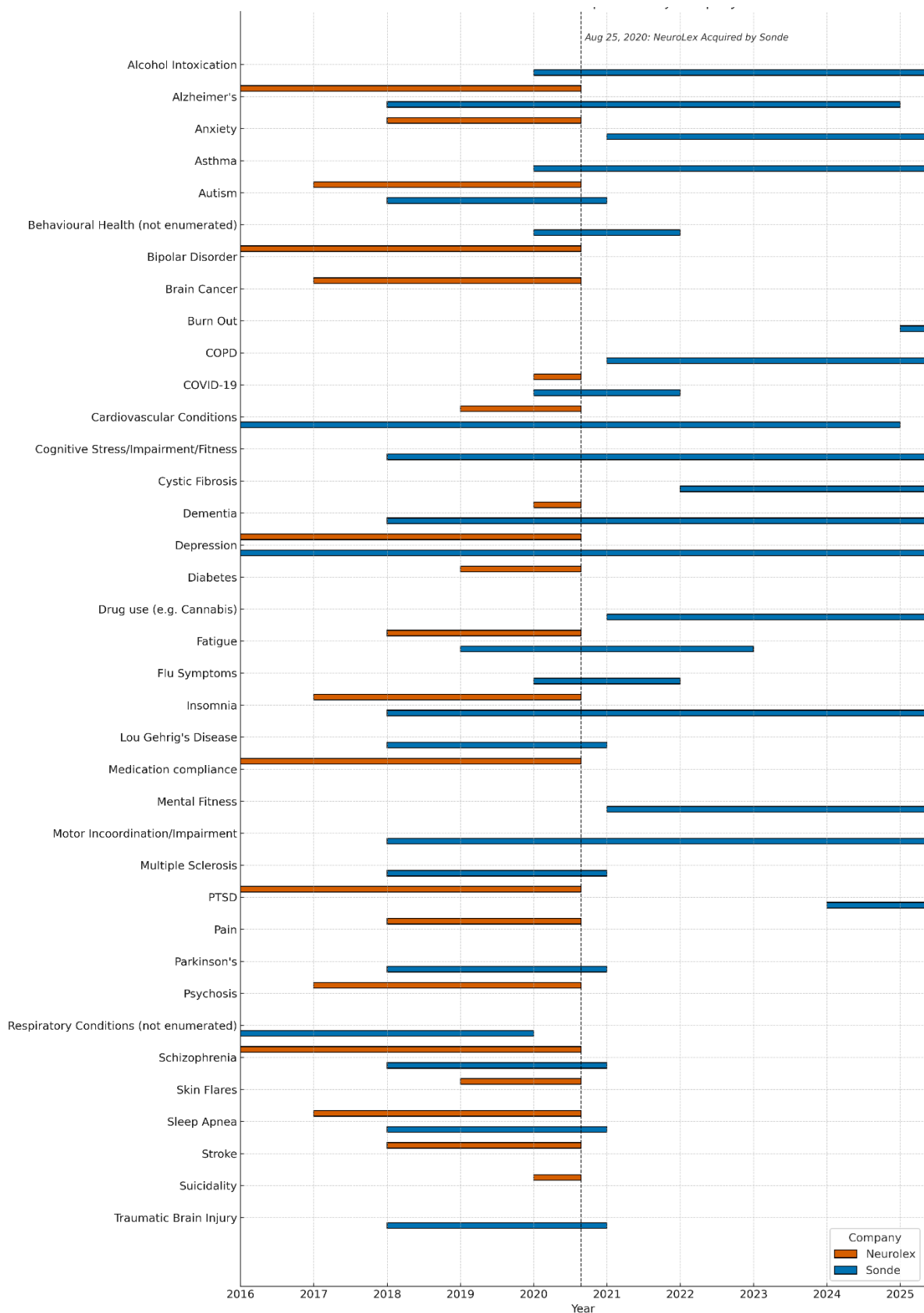


Figure 2: Detailed overview of changing vocal biomarkers functions per year by company

After NeuroLex is acquired by Sonde in 2020, nine NeuroLex vocal biomarker functions are not initially adopted by Sonde Health; namely, applications related to Bipolar Disorder, Brain Cancer, Diabetes, Medication Compliance, PTSD, Pain Detection, Psychosis, Skin Flares, and Suicidality. Thus, beginning in 2021 there is a rapid refinement and reduction of promoted applications. After acquiring NeuroLex, Sonde even drops some of its own previously marketed uses cases – and removes mention of at least seven vocal biomarkers from their websites – such as monitoring and screening of Autism, Lou Gehrig’s Disease, Multiple Sclerosis, Parkinson’s Disease, Schizophrenia, Sleep Apnea, and Traumatic Brain Injury.

By erasing stale or unsuccessful use cases, this pattern limits transparency on the development and diffusion process and may make it easier for problematic applications to remain concealed. For instance, in 2020 Sonde promoted a COVID-19 pandemic screening app, yet by 2022 Sonde backtracked this application (2022-7-23). In any expansive search for a profitable killer app, it is inevitable that some use cases will not stick. However, in the absence of clarity and transparency, some use cases may be removed in ways that reduce visibility into whether controversial or privacy-invasive applications were previously explored or remain on the horizon of redeployment. In this sense, function sweep can function to obscure or displace privacy concerns, even without clear evidence of deliberate intent.

This is best illustrated by the voice survey tool, SurveyLex which evidences a dramatic expansion of promoted use cases from 2018-2020 on its website, including a growing list of non-medical functions such as voice survey templates for job interviews, employee screening, and political research. Paired with SurveyLex’s capabilities to auto-label voice responses for variables like age, gender, race, emotion, and accent, it isn’t hard to anticipate harmful use cases arising from this. For example, job applicants could be automatically screened in relation to speaker profiles or political research could be triangulated with vocal emotion profiles. Figure 3 presents two screenshots from the SurveyLex website, side-by-side for comparison: one from July 2, 2020 which shows sixteen promoted data collection templates, before the site was updated following Sonde’s acquisition of NeuroLex, and the other from Dec. 26, 2021 which includes only two templates in total – one for clinical research and the other for speech research. As of 2025, the advertised templates still have not been expanded upon, illustrating Sonde’s ongoing efforts to promote a limited range of SurveyLex use cases.

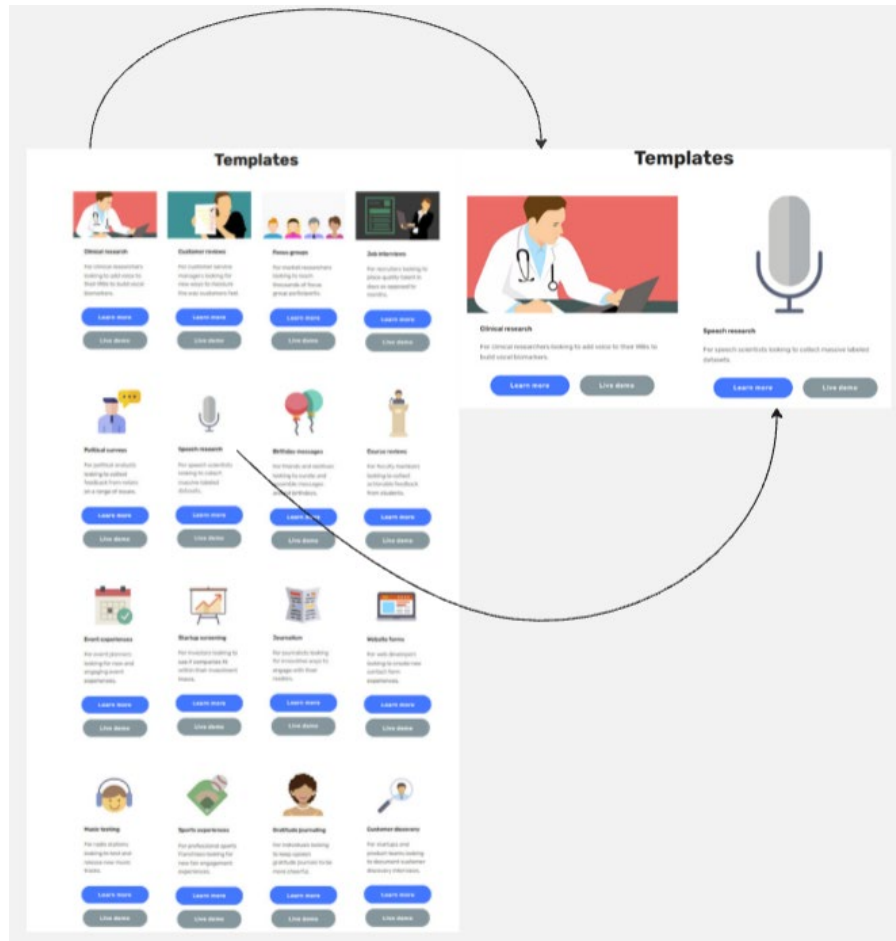


Figure 3: SurveyLex product functions on website: 2020-7-2 to 2021-12-21

Function sweep reflects a strategy of diffusion that makes the rapid expansion and experimentation of new technology imperceptible as surveillance functions become delisted, deleted, and permanently swept up – if not for the Internet Archive. The process of clean-up after the acquisition of NeuroLex includes a swift update of Sonde webpages and the deletion of potentially controversial SurveyLex use cases, including job application monitoring. As a result, Sonde effectively pre-empts a major social concern about the use of HML to profile job candidates by signaling to a “prospective employer that you’re a risk for a job” (Turow 2021, 288). Yet the deletion of any mention of problematic use cases from public websites should not be cause for complacency, but rather serve as a warning sign of potential creep. As the next subsection explains, function sweep likely works in tandem with more overarching patterns of function creep.

The sweep before the creep?

By taking a longer view of the process of diffusion, a pattern of function sweep is arguably nested within a more overarching process of function creep. After NeuroLex is acquired in 2020, SurveyLex stops being positioned for adoption in several sectors and application domains (Figure 3). However, the entire ten-year time frame shows a gradual growth including in Organizational and Corporate Settings, in the Mobility and Transport Sector, in Defense and Security, and in the Industrial Sector. Thus, a pattern of function sweep in the years of 2015-2020 appears to be nested within a more overarching pattern of function creep from 2015-2025. Looking back at Figure 2, Sonde also reintroduces past vocal biomarkers onto its website between 2021-2025, including applications previously promoted by NeuroLex, such as monitoring and screening for anxiety and PTSD.

By interpreting function sweep as a subset of function creep situated within a broader process of diffusion, it becomes possible to reveal and pre-empt the return of concerning use cases. For instance, Sonde rolled back its autism screening and monitoring use case in 2021. However, a recent press release from the National Institutes of Health (NIH) in the United States describes plans to pull from insurance claims, electronic medical records, and consumer wearables like Fitbits and smartwatches to “create a national autism registry” (Wise 2025).²⁰ The growing financial and political incentive to identify autistic Americans could presumably prompt Sonde to revisit the diffusion of an autism application in a time of dire political unrest and renewed fear of eugenicist agendas (Ma et al. 2023; Schreiber 2025). In this way, function sweep might help forecast problems of authoritarian diffusion in which autism monitoring would become pervasive despite ongoing objections from autism community members to top-down surveillance.

This finding discussion has foregrounded function sweep to outline how the diffusion process of the HML case study aligns or deviates from patterns of function creep in relation to aspects of purpose, speed, and perceptibility. The following section expands on this analysis by exploring how privacy rhetoric from the companies seeks to sanitize and manage public perception of the true surveillance impact of HML.

²⁰ Autism advocates have expressed serious alarm including privacy and function creep concerns about the plans of the National Institutes of Health (Wise 2025). Despite denials that such a database constitutes as a autism registry, Department of Health and Human Services (HHS) Secretary, Robert Kennedy Jr. has made his views on autism clear to the public in describing it as an “epidemic” and “preventable disease” (Harris 2025).

Privacy manipulations and their dividual consequences

This section examines how privacy and consent are rhetorically constructed as a means of propelling the diffusion of HML. It illustrates the main strategies of privacy washing and marketing used by Sonde which hinge upon the rhetorical trope of non-invasiveness and individualistic framing of semantic speech protections. Drawing from the chapter's prior theoretical discussion, I interpret privacy marketing according to a logic of signaletic listening that complicates individualistic framings of consent because of how data is divdually aggregated and circulated across communities and milieus. The discussion develops to illustrate how individual participation and biometric enrollment need to be rethought as a mode of transductive labour that contributes to dividual surveillance, whereby one person's data contributes to the broader profiling affordances of HML. The findings conclude in providing evidence that the diffusion of HML will disproportionately affect marginalized groups and exacerbate pre-existing inequalities tied to socioeconomic class, race, disability, health, and employment.

Marketing privacy

Sonde brands its products as “privacy-centric” (2024-7-11) by constructing a narrowed vision of privacy that pairs medical metaphors, convenience framing, and security rhetoric to obscure the signaletic and dividual privacy risks of HML. By marketing privacy protections, HML developers help ease the diffusion process across myriad social environments.

In its API documentation, Sonde acknowledges privacy concerns as a “pain point” (2024-7-11) for customer adoption and user compliance. Confronting this problem head-on, Sonde relies on the trope of medical invasiveness to help market its products as “non-intrusive” or “non-invasive”.²¹

In medical discourse, non-invasive denotes a procedure that does not require the introduction of instruments into the body (“Non-Invasive” 2025). In keeping with this usage, academic literature on HML refers to natural speech analysis as non-invasive because it provides health insights without drawing blood or extracting some other physical sample from a patient or research

²¹ This rhetoric appears in the following documents within the data corpus: 2020-8-25; 2020-7-8; 2023-12-15; 2023-5-23; 2024-7-11; 2024-8-12; 2025-1-10; 2025-1-14; 2025-1-9; 2025-5-6

participant (Cummins et al. 2015). HML is aptly non-invasive, not due to privacy considerations, but rather because it facilitates health analysis without penetrating the body.

The rhetoric of non-invasiveness is leveraged by HML developers like Sonde to encourage potential adopters to take the term out of context. More specifically, its use outside clinical or biomedical research settings reflects a strategy of “deceptive privacy” (Veliz 2023) that exploits the associative pairing of privacy *harms* and *invasions*. “Sonde Health provides a non-invasive, privacy-focused mobile solution that utilizes vocal biomarkers to monitor and improve worker wellness” (2025-5-6). As this rhetorical gesture makes clear, people are encouraged to overestimate the degree of privacy afforded by the technology (Véliz 2023, 214).

Similarly, as per health science literature, HML is aptly non-intrusive in the sense that it does not cause discomfort, inconvenience, or annoyance. For instance, intrusive examinations require patients to awkwardly comport their bodies to diagnostic imaging machinery such as X-Rays or MRIs. This is a selling point for HML as other digital health applications have been experienced by patients as highly intrusive (Oikonomidi et al. 2020). Non-intrusive health monitoring in daily life is used as a promotional talking point for Sonde, yet this is also rhetorically positioned to encourage associations with privacy protections: “Sonde’s mental fitness app provides a new way to objectively measure mental fitness in a way that seamlessly fits into busy daily routines and habits with complete privacy” (2024-1-8). Thus, a subtle slippage is constructed between privacy and non-intrusiveness, as the convenience of passive monitoring becomes associated with privacy through nothing more than their repeated pairing.

Adding to this, a strategic conflation of privacy and security is evidenced in Sonde’s discussion of its on-device processing or “edge computing” (Cao et al. 2020)—articulating a common privacy washing technique identified by Cirucci (2024).

Security and Privacy- Health scores and the audio samples captured to assess them require strong security. In an edge implementation, the recorded audio does not leave the device for feature extraction and scoring...A user’s scores remain private on the phone and can be securely shared with other secure health and wellness application. (2024-5-6)

On-device processing occurs locally rather than on the cloud and can be exemplary of privacy-enhancing technology, yet the secure circulation of health scores beyond an individual’s device leaves core privacy questions unresolved: health scores can still be used to profile individuals and communities when this data travels within expansive data markets, despite audio never

leaving one's device. Moreover, secure edge computing allows non-intrusive passive health checks to be performed continuously (2021-12-12), yet this does not address the core privacy risks at stake with vocal biomarker technology when the resulting scores are aggregated and shared with partners such as wellness apps, insurers, or employers.

Finally, the low latency of edge processing is rhetorically paired with privacy in a STAT News article, which Sonde presents as pivotal for market diffusion:

On-device processing could speed up the analysis of voice recordings and helps ensure the privacy of the captured data, which has long been a concern around voice-controlled features. Removing friction from the experience, Liu argued, could open the door for wider adoption of the vocal technologies like the biomarker system. Sonde has been developing and illustrates the potential value of building its tech natively into smartphones. (2021-8-11)

As a whole, privacy becomes framed as a feature of individual convenience and audio security rather than a safeguard against health profiling. Through these rhetorical techniques, HML is privacy washed as a safe technology that is primed for diffusion. This manipulation of privacy carries into the next subsection, which discusses the semantic and signaletic dimensions of sonic privacy.

Sonic privacy

Sonde promotes its products as privacy protective by stressing that it never analyzes semantic content, a claim anchored in its signaletic mode of listening which strategically brackets signifying semiotics of speech. This registers as a privacy washing technique because it reassures adopting organizations or users about their semantic privacy protections without addressing the forms of signaletic exposure created through vocal biomarker analysis.

Signaletic listening can rely on short samples of speech to make powerful inferences about people's health and identity, yet this dimension of sonic privacy is entirely absent from company messaging in favour of repeated emphasis on semantic privacy protection (2024-7-11; 2025-5-6):

With Sonde's proprietary machine learning technology derived from millions of data points coming from tens of thousands of Sonde users, we have built intelligent tools that track health changes by analyzing just a few seconds of voice. Your privacy is important, so we only analyze how you sound, not what you're saying. (2020-5-15)

This privacy marketing strategy plays to widespread mental models relating to sonic privacy, insofar as people are rightly concerned about the threat of everyday conversations and personally sensitive discussions being overheard, eavesdropped on, or subjected to sonic data mining

techniques of “eavesmining” (Neville 2020). However, it is overtly disingenuous to characterize signalitic listening as a privacy affordance when HML models are commonly agonistic to signifying semiotics of speech (i.e. what you say) by default, in targeting the asignifying features, variations, and population-level norms of vocal biomarkers. Semantic privacy protections do nothing to prevent these forms of inference and profiling, despite being extolled as a virtue by Sonde.

Cirucci observes that people are primed to mostly think about issues of “social privacy” (i.e. interpersonal privacy) as opposed to “institutional privacy” in evaluation of digital systems (2024, 4). Likewise, people are primed to reflect on *semantic sonic privacy* while *signalitic sonic privacy* remains outside common awareness. By further priming people to fixate on semantic dimensions of privacy, Sonde effectively “deflect[s] attention” to displace critique of their “less privacy friendly activities” (2).

Sonde’s privacy washing of sonic privacy propels the diffusion of its HML products: “Sonde’s privacy-centric design has gained trust from institutions, enabling quick approval for use in research and clinical settings” (2024-7-11). Without challenging these rhetorical strategies, privacy will continue to be leveraged as a selling point for surveillance technology.

A further layer of privacy washing appears in both NeuroLex and Sonde’s invocation of data minimization and short-retention principles, which both hinge on HML’s capacity to produce major health inferences from “the smallest speech sample” possible (Schwoebel 2018, 371; Schwoebel and Ghomi 2019, 3). Sonde’s edge computing SDK and API delete audio files immediately after producing health scores, but again, this offers no protection against the circulation of those scores across contexts and the dividual aggregation they enable. Similarly, Sonde’s current privacy policy includes data minimization rhetoric (2021-7-16) despite detailing a range of personal data points including background health information, device information including GPS location, usage information, and information from any connected third-party services (e.g. Facebook, Google, and SurveyLex). The shift toward signalitic listening allows audio collection to be minimized and shorter samples to be analyzed while also enabling fair information principles to be rhetorically co-opted rather than substantively applied.

Taken together, these manipulations of privacy rhetoric and marketing help lower the guards of potential adopters of HML, easing the diffusion process. As HML spreads into other settings, the

principle of consent becomes increasingly vulnerable to unprincipled circumvention, a concern that frames the range of issue discussed in the next subsection.

Issues of Consent

In the early years of promoting NeuroLex, CEO Jim Schwoebel openly discussed using vocal biomarker technology to analyze his schizophrenic brother's voicemail recordings and similarly, in a talk radio appearance, he promoted the technology in a shocking way: "So you might be interested to quantify your mother's voicemails. We'll be able to do that at some point to insert them in the app and output some interesting things from the voicemails or manipulate them. There's a lot of cool, interesting things you can do" (2016-11-22). These comments reveal how easily HML can be applied without peoples' meaningful and informed consent, a concern that remains central as the industry expands toward passive and background processing of vocal biomarkers.

In contrast with this chilling application characterized by Schwoebel, Sonde is much savvier in avoiding such PR blunders and recognizes that social acceptability and adoption of HML is strongly tied to user consent or patient consent. Sonde's passive monitoring allows HML to be integrated when speaking on the phone or in any Voice of Internet Protocol (VoIP) app such as Zoom, once users have opted-in (2022-7-23). Another available modality is true passive processing, which is akin to the always-listening design of smart speakers, but instead of being activated by a wake word (Parker, forthcoming) such as "Alexa" or "Siri", it is triggered by detection of a biometrically enrolled voice profile to avoid processing peoples' voices who have not opted-in. "Your application will continuously analyze the audio in background and only filters the authorized user voice and rejects the other user voices" (2024-5-6). Demonstrating the true passive mode, Liu converses with his wife and shows only his voice being analyzed, effectively demonstrating how family members or other co-dwellers will not be unintentionally subjected to monitoring if they have not consented. This controlled demo, however, contrasts with the broader populations that Sonde positions as likely adopters.

CEO David Liu hints that texting-inclined "young people" will be a primary target of passive processing because they often do not talk over the phone (2022-7-23). Sonde's products could certainly be utilized as a controversial tool of parental mediation for which substitute consent from a parent or guardian may be all that is deemed necessary (Livingstone and Helsper 2008;

Leaver 2017). In an era of stacking moral panics concerning youth self-harm, suicide, cyberbullying, cybercrime, and digital isolation, the appeal of passive health checks to predict depression, or some other behavioural risk might prove to be too tempting for some parents, guardians, and institutions to resist.

Patterns of function creep and function sweep throw additional ambiguity on the issue of consent, since HML is not restricted to self-tracking use cases. For instance, workplace applications complicate principled consent if employees experience undue influence in providing consent to invasive forms of monitoring as a condition of secure employment. Similarly, if used for insurance risk stratification, financial incentives might be offered to customers in exchange for monitoring permission. Thus, the diffusion of HML into various sectors and application domains reveals the cracks in the very thin veneer of consent promised by Sonde.

In addition to problems of individual consent, the final subsection pushes for recognition of the dividual harms of HML. As Cheney-Lippold writes: “In a dividual world, we no longer can center privacy on traditional liberal individuality, just as dividual privacy does not protect the same vulnerabilities as its individual counterpart does” (2017, 237). Similarly, this prompts a shift in thinking about consent by underscoring how it is unevenly distributed, since consenting participation and transductive labour can enable future acts of discrimination carried out without meaningful consent.

The inequalities of transduction

The final subsection more directly addresses the broader surveillance risks as individuals shed off dividual layers of data that contribute to HML models and its diffusion. The ability to take charge of one’s health can be unmistakably empowering as confirmed by literature on datafied self-tracking (Feng et al. 2021). However, individualistic evaluations of surveillance medicine fail to address how dividual data are aggregated and interpreted to mediate the at-risk identities and diagnoses of anonymous others. Put simply, when someone consents to being treated as a sample from a population for self-betterment, their data can live on to shape the identity and life stories of people that they will never personally encounter. Cheney-Lippold argues: “When identity is formed without our conscious interaction with others, we are never free to develop—nor do we know how to develop” (2017, 8). In other words, the privacy threats of HML short-circuit freedoms of individuation for others, and particularly for people whose voices are

disproportionately categorized as risky, unhealthy, and abnormal. As I explain, HML is positioned for diffusion onto communities who already face systemic inequality and social marginalization, such as those who belong to low-socioeconomic status (low-SES) groups including workers with precarious employment conditions, racialized people, as well as people with disabilities and serious medical conditions.

In soliciting individual donations of voice data, HML registers as a mode of anonymous care, yet the broad diffusion of HML reveals a key difference: donating your voice to a biometric databank is not the same thing as donating blood, stem cells, or organs to help someone else in need when the downstream uses of vocal biomarkers extend far beyond therapeutic contexts and align with profit-driven logics of risk scoring and cost containment. As far back as 2016, Schwoebel stated how NeuroLex applications could be used by insurance providers to automatically screen sick people from healthy people in a cost-effective way.

A lot of large insurance companies, they usually have cost bottlenecks in their plan. And so, they have patients that are high-cost relative to others, and its often patients with comorbid conditions. And so being able to screen for things with voice is a low-cost alternative to say imaging or some other diagnostic that's high cost. (2016-11-22)

Similarly, in 2024, Sonde explained that “in the life insurance sector, our technology can be used to monitor the health of policyholders, leading to better risk management and potentially lower premiums” (2024-7-11). Thus, while individual self-care practices might be rewarded, HML will also be used to justify higher premiums, denials of coverage, and other issues for less healthy individuals.

Transductive labour helps recognize how one’s person’s self care and anonymous contributions to a regime of surveillance medicine can be dividualy disempowering for others. While the newest generation of smart devices may come equipped with Qualcomm’s Snapdragon chips that include Sonde edge-processing, it is not the affluent individuals who can afford the newest generation of digital devices that will be the primary targets of HML in the near future.

The harms that arise from the downstream effects of transductive labour will not fall evenly. Early Sonde research and deployments already target low-SES, racialized, and medically underserved communities (Zhang et al. 2020; Muomah et al. 2023; Nyawornota et al. 2023), where HML is framed as an efficient solution to fill unmet clinical need. Yet the diffusion of HML onto marginalized community groups risks reproducing what Eubanks (2018) describes as

“technological innovations in poverty management” which “hide poverty from the professional middle-class public and give the nation the ethical distance it needs to make inhuman choices” (16). This distance will predictably compound problems of authoritarian diffusion by shielding privileged groups from the lived consequences of HML.

There are clear plans to diffuse HML into precarious work industries staffed by employees and contractors who may have little choice but to accept it. A Sonde promotional video explicitly depicts workplace scenarios where meaningful consent may not be obtained in practice: call center agents speaking to customers over headsets, warehouse fulfillment center workers interacting with a tablet next to a skid steer, and a truck driver speaking over CB radio (2025-5-7). Sonde envisions applications spanning across transportation and logistics industries to monitor the voices of “every Uber driver” (2022-7-23) and presumably, every Amazon fulfillment center employee and contracted courier. Based on the patterns of function creep and function sweep, we can anticipate ambiguous objectives behind such widespread monitoring, where keeping workers health is secondary to increasing productivity and profit while reducing risk in industries marked by high turnover, low pay, and limited worker autonomy.

Function sweep draws attention to interacting changes and shifts in functional capabilities and social applications as surveillance medicine increasingly becomes promoted to boost workforce performance. As a result, we can anticipate and pre-emptively challenge invasive emotion detection applications such as anxiety detection of call center agents to prevent absenteeism or to boost productivity (Roemmich, Schaub, and Andalibi 2023). Additionally, we can anticipate gig economy drivers being monitored and screened for infectious diseases or mental health conditions like depression.

Sonde’s patents also list disabled and cognitively impaired individuals as a target population (2018-8-23). While this is framed as an accessibility benefit, it risks functioning as an “assistive pretext” (Mills 2010, 39) to justify the diffusion of innovations and to expand surveillance of people who already face structural marginalization. Folded into a system that scores mental and cognitive fitness (Ma, Patitsas, and Sterne 2023), disabled community members may be among those most exposed to the discriminatory harms reproduced HML.

The diffusion of HML into sectors and communities that face structural disadvantages and marginalization reaffirms the need to broaden individualistic accounts of privacy when

evaluating and negotiating the harms posed by HML. A pact of silence that honours the real privacy invasions that HML systems produce involves withholding consent, voice donations, and transductive labour to protect the privacy and wellbeing of others who may be disproportionately exposed to discriminatory surveillance.

This discussion of findings has described how privacy marketing of the HML case study displaces privacy concerns through rhetorical manipulation and has foregrounded the dividual consequences of surveillance medicine. Privacy and surveillance critique remain essential to the critique of HML diffusion, since its continued spread appears contingent on privacy washing and on the displacement of surveillance concerns.

Conclusion

The chapter has argued that the diffusion of HML operates as a form of authoritarian diffusion because it relies on opaque development practices and on privacy rhetoric that obscures the technology's surveillance implications. I have also argued that HML's signaletic mode of listening is not inherently creepy, but becomes sociopolitically controversial when it is imperceptibly diffused into new settings and communities that heighten concerns about privacy, consent, and power. Signaletic listening can undoubtedly compound problems of authoritarian technics by bracketing signifying semiotics of speech in analysis of asignifying vocal biomarkers, yet this is not technologically determined by its mode of listening. Rather, the authoritarian quality of HML diffusion hinges on problems of communication, as seen through developers' strategic manipulation of privacy rhetoric and limited transparency around ongoing product transformations.

To substantiate these arguments about authoritarian diffusion as a communicative process, the study employed technocreep as a method to slow down and observe the subtle messaging patterns and shifts that mark the ten-year period of HML diffusion. This orientation supported four research questions that I revisit in turn to summarize the chapter's main theoretical and empirical contributions.

The first research question asks what functions of HML are publicly promoted and how these change over time. My account of surveillance medicine helps explain why the promoted functions of HML remain unstable and continue to expand through ongoing experimentation

with a range of vocal biomarkers linked to various risks. From the diachronic analysis, a counterintuitive finding emerged, that the most expansive and nonmedical functions of HML, including for job applications and political research, appear in the early period of product development (i.e. 2015-2020) while later website materials refine the public facing functions. Moreover, the total number of promoted vocal biomarker applications is reduced sharply following Sonde's acquisition of NeuroLex, including controversial uses such as autism risk identification. My theorization of function creep and function sweep helps explain this pattern by showing how developers introduce, withdraw, and later repackage functions as part of a broader communication strategy.

The second question asks how this pattern of change aligns or deviates with understandings of function creep. Focusing on aspects of purpose, pacing, and imperceptibility I have interpreted function creep and function sweep as distinct yet mutually supporting patterns. In contrast with the slow accretion of functions associated with patterns of creep, function sweep describes a rapid search for viable applications followed by the strategic refinement of earlier experimental traces. A pattern of function sweep is evident between 2015 and 2021 due to the rapid proliferation of functions and subsequent deletion of numerous problematic use cases from public websites as well as the general product refinement undertaken by Sonde Health. Over short periods, function sweep appears distinct from function creep because it does not gradually drift away from an original core purpose, but rather rapidly grows from a foundationally ambiguous purpose. However, the longer period from 2015 to 2025 suggests that the traces of early product development that get cleaned can later tie back into more conventional patterns of function creep, as early biomarker functions reappear later in more stable applications.

This study infers that function sweep might foreshadow longer trajectories of function creep. However, the limitations of this study include its ten-year period of analysis and case study design. As a result, future research might test the hypothesis that function sweep regularly precedes and obscures longer processes function creep in the diffusion of digital innovations. Future research might similarly study convergent case studies by following the website history of startups before and after being acquired by a competitor or by interviewing employees at both companies; this offers a useful method to analyze what the aftermath of acquisition reveals about market plans and diffusion objectives. For instance, the deletion or expiry of on an outdated

startup website or webpage can be innocuous, however future research could examine whether and how early product development history is strategically rewritten or built upon by the acquiring company to help interpret future diffusion objectives. A second line of future research might also explore the development of a typology of function sweep patterns and structures. For instance, startups that emerge from ghost mode emerge on the market with a great deal of secrecy about past experiments and product development. Ghost mode can be understood as a configuration of sweep where exploratory work and concealment efforts occur simultaneously, since teams keep prototype development hidden from both competitors and the public. Insight into early stages of company history might give insight into long term plans and critical concerns of a particular corporation or innovation. A typology could help differentiate between varied strategies and rationales for sweep to clarify which patterns most reliably foreshadow later stages of function creep. For instance, function sweep might be motivated by reputational management or strategic secrecy to thwart copycat competitors. A broader research agenda including comparative analysis would help establish whether function sweep is a productive analytic to forecast problems of function creep and surveillance overreach.

The third question asks what sectors and domains of application the products are positioned for adoption. My account of surveillance medicine explains why HML is primed for diffusion well beyond clinical settings and research labs. Since surveillance medicine strives to interpret health risks as they unfold anywhere, the clinical gaze seamlessly migrates into homes, workplaces, schools, and consumer devices; this logic helps explain why HML's signalethic mode of listening is positioned not only for the health and life sciences sectors but also for corporate wellness, insurance, education, logistics, leisure entertainment, and customer service settings. The findings reveal a consistent throughline in which HML target milieus marked by precarity such as low-wage workplaces, gig workers, racialized communities, and disability communities. Thus, although HML is positioned for adoption across a wide range of sectors and domains, it appears most concentrated in milieus that are already exposed to surveillance inequalities.

Finally, the fourth research question asks how privacy issues are rhetorically framed and how this obscures surveillance concerns, relational harms, and power dynamics of HML. I have interpreted privacy washing as a communicative strategy that is exemplary of authoritarian diffusion by narrowing dialogue about privacy concerns and deceptively framing the technology

as non-invasive or harmless. Privacy washing foregrounds individualistic concerns of semantic sonic privacy while diverting attention from broader concerns about surveillance and consent. In this sense, privacy is both materially threatened by surveillance systems and rhetorically manipulated to propel the diffusion process. Although HML developers like Sonde invoke user choice, consent becomes structurally fraught when HML is applied passively or diffused into settings with power imbalances such as between parents/guardians and children or between employers and employees. Given this dynamic, I have adapted the concept of transductive labour to clarify how individual data contribute to models that travel across milieus with varied configurations of privacy. This process is not a neutral transfer of data, but a transductive dynamic or a translation with difference that raises concerns about inequities when voice biomarkers are derived and deployed in dissimilar settings for different people.

Privacy washing hides the individual harms posed by HML and seeks to depoliticize immaterial labour as a free and uncontroversial resource. Adding to the dissertation, transductive labour helps to problematize the logic of authoritarian technics by underscoring how it extracts value from other peoples' labour and voices to continually expand technological systems for secondary ends. This process overtly manifests proletarianization when transductive labour is pulled from people without consent to create products that are explicitly at odds with their intentions to individuate themselves with and through digital systems. Future work might explore follow up research with transductive labourers to ask them about their perspectives on the legacy of their work. The next chapter extends this analysis of transductive labour through interviews with Crisis Text Line volunteers.

At its core authoritarian diffusion reflects a disruptive strategy that involves spreading technology onto others without meaningful dialogue. In recognition of the surveillance concerns, relational harms, and power dynamics of HML, the stakes of resistance become clear and require collective action and allyship. If some applications of HML are contested or controversial, then it becomes vital to reframe participation as a form of complicity in potentially oppressive and discriminatory structures that are being rapidly diffused onto others. In response, a pact of silence is called for to help hold space for others and for worlds that are inherently deserving of privacy.

Chapter Four: A Crisis of Listening: Volunteer Counsellor Perspectives on Crisis Text Line and the Loris.ai scandal

Investigative reporting in 2022 exposed a disturbing data-sharing agreement between Crisis Text Line (CTL), a nonprofit mental health service in the United States, and its for-profit spin-off Loris.ai (Levine 2022). CTL provides free text-based crisis support to millions and has long branded itself like a Silicon Valley mental health start-up.²² The service is used heavily by young people in moments of acute vulnerability. As investigative reporting revealed (Levine 2022), anonymized crisis conversations—messages written in desperation and at times at the brink of suicide—had been quietly funneled into the training pipeline of a commercial AI system.

Loris.ai launched in 2017 and is a developer of AI-in-the-loop systems that aim to improve customer service interactions by implementing the “optimal blend of AI agents and human agents” (Doyle 2025). As of 2018, CTL was the majority shareholder of Loris and a delisted CTL web page plainly explains the relationship: “We literally own it. (And we share a Founder/CEO – Nancy Lublin – so it’s all in the family)” (“What is Loris.ai?” 2018). This relationship gave Loris access to de-identified conversation data from CTL’s massive archive to build proprietary AI tools (Chancellor 2025). In return, CTL hoped to generate revenue from a system powered by the unwaged emotional labour of its volunteer counsellors and vulnerable texters’ data.

Internally, CTL framed the arrangement as a necessary and even ethical response to chronic funding challenges (Ruiz 2022). As CTL put it, Loris would help bring “more empathy into the world” while securing the nonprofit’s operational sustainability (“What is Loris.ai?” 2018). One year before the scandal broke, Loris openly boasted about the data pipeline: “We draw our empathy insights from the largest mental health dataset in history—150 million messages and growing. Now, we’ve baked all of that learning into enterprise software that helps companies boost their empathy and bottom line” (“Better Conversations” 2021). These statements presented

²² This stance was made explicit by founder Nancy Lublin in 2016: “We’re a tech start-up that happens to be a mental-health not-for-profit... We’re growing like a tech start-up, we solve problems like a tech start-up, and we need to raise money like a tech start-up” (Wallace 2016). Despite its start-up style, CTL is financially organized as a typical non-profit that operates through philanthropic donations, corporate funding, and collaborations with government and other institutions (“Financials” n.d.).

the partnership as an unproblematic flow of knowledge into the private sector even as it relied on crisis disclosures that texters and volunteers believed were shared in confidence.

However, internal rationalizations clashed sharply with external expectations of how a crisis helpline service ought to operate. News media (Porcaro 2022), mental health activists (Reiersen 2025), and the civil society group, The Electronic Privacy Information Center (EPIC) condemned CTL's actions ("EPIC's Response" 2022). EPIC wrote: "the use of private message data from sensitive crisis communications for commercial research crosses an ethical line and violates the intimate and private nature of those conversations regardless of how the data is processed and scrubbed" (ibid.). Anonymization was also critiqued as insufficient protection given the context, sensitivity, and potential identifiability of the conversations (Levine 2022). Notice and consent, moreover, were buried in terms of service that no help seeker could reasonably be expected to read in distress—as board member dana boyd acknowledged (2022). Under mounting scrutiny, the organization ended the agreement with Loris, requested deletion of CTL data, and revised its data policy ("An Update on Data Privacy" 2022; Trujillo 2022). Nonetheless, the speed of innovation represented CTL's primary justification for the misstep, as current CEO Dena Trujillo wrote: "The world of technology and data ethics evolved rapidly, and Crisis Text Line quickly changed course" (2025, 3).

Although public backlash focused on the concerns related to help seekers' wellbeing, privacy, and exploitation, the data scandal also raises serious labour concerns due to the unique work conditions and backgrounds of volunteers. Volunteer counsellors at CTL receive about 30 hours of structured training in crisis de-escalation, risk assessment, and platform-mediated counselling before taking conversations with help seekers. Volunteers come to the organization with a range of professional backgrounds and life experiences; some bring prior professional experience in peer support, social work, or adjacent mental health fields, while others arrive without formal training and develop these competencies through supervised practice on the platform. In general, crisis helpline volunteers are motivated by the meaningfulness of care work and often by personal proximity to mental health crisis, including experiences of supporting family members or friends or directly benefiting from a crisis helpline themselves (Aguirre and Bolton 2013; Sundram et al. 2018). Moreover, crisis line volunteering poses serious work demands especially from high-risk and distressing conversations that can lead to forms of vicarious trauma and

burnout (Willems et al. 2020; 2021a; 2021b). In this context, the data scandal raises additional ethical concerns due to the commercialization of unwaged labour given under emotionally intensive conditions in an express commitment to empathetic care.

In this chapter I argue that what appears as an isolated violation of data ethics at CTL is better understood as a predictable and disturbing outcome of authoritarian diffusion, where technological innovations are introduced without meaningful dialogue with those who practice a technics of listening. Importantly, diffusion here involves both the transfer of crisis data to create AI products in the external domain of customer service and the inward diffusion of startup values and operational principles into the domain of crisis counselling. This chapter contributes to literature on digital authoritarianism, where authoritarianism is systematically fostered by a platform corporation without malevolent intentions, but rather through organizational practices and logics of surveillance, centralized control, and rapid scaling of technological systems (Pearson 2024; Akbari and Wood 2005).

In Chapter One, I argued that authoritarian diffusion is rooted in a technological order that devalues the technicity of listening and that overrides people's authority over their voices and stories. Meanwhile, value is often extracted from these milieus in a disruptive manner, further complicating the conditions of privacy that are required for certain techniques and technical relations to be practiced, learned, and sustained. The problem of authoritarian diffusion is made vivid in this chapter because crisis counselling depends upon conditions of trust, safety, privacy, and human connection that are orchestrated by the technique of active listening practiced by volunteers on the platform. In this context, the repurposing of crisis data undermines the very conditions upon which listening can be meaningfully practiced as a technique that holds space for help seekers and their sensitive disclosures.

In keeping with the dissertation's broader framework, this chapter conducts a machine listening inquiry that attends to volunteers' listening practice as a technical element within CTL's *operational chain of listening*. To develop this inquiry, I foreground active listening as a technical practice that is reshaped by media technology as it shifts across audio, text-based, and algorithmic modalities.

An operational chain (Leroi-Gourhan 2023) of listening refers to a set of interlinked technical actions that together contribute to the repetition and modification of listening in a specific milieu

of practice. As I discuss throughout the chapter, the introduction of algorithmic techniques including machine learning at CTL reshapes how active listening is operationalized on the platform through technical elements like suggested replies and supervisor monitoring systems that alter the flow and governance of conversations. In this context, the technique of active listening is subject to multiple processes of procedural transduction as the conduct and context of technique is altered. At the same time, this operational chain facilitates outward diffusion as crisis data forms the basis for procedural transduction into the milieu of customer service through the CTL-Loris partnership.

At stake in this chapter then is a dual problem. First, the introduction of new technology reorganizes how listening is practiced, evaluated, and governed in this context, yet this process can leave frontline listeners conflicted. Second, data is extracted from this operational chain of listening to diffuse similar innovations beyond the counselling milieu itself without meaningful dialogue with volunteer counsellors or help seekers. Together, these dynamics position volunteer counsellors' listening practice and experiences at the center of both the internal governance of the CTL operational chain of listening and the external process of authoritarian diffusion.

Drawing on interviews with volunteer counsellors (N=32), the study explores how the technique of active listening is reshaped, technologically structured, and governed within CTL's operational chain. The analysis of interview data unfolds across three themes that address the chapter's research questions. First, the findings show how listening is practiced, reshaped, and negotiated by volunteers on the CTL platform amid changing technological conditions and shifting moral-technical rationales. Second, the findings show how volunteers' listening practice is governed through supervision, surveillance, and automation that lead to self-monitoring and ethical tension. Finally, the findings show how volunteers interpret and contest the repurposing of crisis data and their listening labour in relation to the Loris scandal.

The chapter proceeds by developing a theoretical framework that mobilizes machine listening as a mode of inquiry and situates the technique of active listening as a focal point within CTL's operational chain. This framing establishes the analytic basis for examining how listening is reshaped, governed, and transduced across institutional and technological contexts. The second section extends this framework through the concept of transduction to problematize the assumption that technique and technical labour can be seamlessly transferred across media and

milieu without transformation, distortion, and harm. Together, this conceptual framework prepares the empirical study that follows which explores how volunteer counsellors experience and negotiate technological conditions they know are limited, ethically contested, and not fully within their control.

Machine listening as mode of inquiry

In Chapters One and Two, I developed my reorientation of machine listening as a mode of inquiry dedicated to the study of listening techniques in relation to what Leroi-Gourhan calls “operational chains”: a succession of linked actions or technical operations. Based on this approach, a machine listening inquiry treats listening techniques as an object of study that is typically nested within broader operational chains of technical actions and infrastructure. Insofar as technology in its typical usage is assumed to represent something technically superior and advanced to technique (Leroi-Gourhan 2023, 13), this assumption necessarily deprivileges materially grounded practices and moral-technical orientations, such as those learned and practiced by crisis counsellors, and can foreclose careful inquiry into frontline listening practices. In my framework, machine listening serves as a reminder to continue foregrounding the technicity of listening practices that might appear to be “non-technological” or relatively “primitive” in order to make legible what authoritarian diffusion overlooks, devalues, or fails to regard as technical, despite these practices functioning as central technical components within CTL’s operational chain.

This reorientation of machine listening shifts the object of study to focus on listening practices that lie beyond the conventional remit of machine listening—which is typically defined as a category of technologies that involve the application of machine learning processes to datafied sound. In Chapter Two, I explained how this conceptualization extends from a positivist division of the senses that posits hearing as originary to listening before problematizing this conception through a discussion of Western and Indigenous techniques of multi-modal listening. This chapter extends that analysis by examining the technicity of text-based active listening, which adapts a multi-modal or extra-aural listening technique—that is, a mode of listening that uses more than hearing alone—as a non-aural technique that does not engage hearing at all. Importantly, every CTL volunteer I spoke with affirmed from their perspective that it is possible to listen over an SMS (Short Message Service) platform in this sense. While a positivist view

might dismiss this as merely metaphorical, the sensibility of active listening as a text-based technique underscores a conception of listening that does not start or stop with hearing. In keeping with an epistemic reorientation of machine listening, the chapter redirects attention to the operational chain of the CTL platform as a milieu where specific listening techniques take shape as practices that are repeated, reshaped, and negotiated in relation to other technical elements, such as algorithmic natural language processing, that are more readily apparent as technology.

In this framework, it is important to recognize that different technical elements contribute to CTL's operational chain of listening that includes volunteer counsellors, supervisor oversight, platform infrastructure, algorithmic tools, and emerging forms of generative AI. However, active listening remains at the center of the CTL service model, even as it is shaped by a predictive mode of listening (Wang 2025, 184) that is operationalized through standardization, surveillance, and the pre-emption of risk (206).

At its core, active listening is a technique that allows a person to “get inside the speaker” (Rogers and Farson 1957, 3): to step into their shoes and see the world from their point of view. In general parlance, active listening is a watered-down concept that vaguely signifies a mode of focused and intentional listening. In contrast, in therapeutic fields active listening denotes a trained capacity that supports empathetic communication (Weger Jr. et al. 2014).

Yet as Rogers and his colleagues learned, good listening was a hard skill to develop, one that required considerable practice and technological support. In the early 1940s, they used phonographic recordings so counsellors could re-listen to their own sessions, reflect on mistakes, and refine their own therapeutic practice (Guenther 2022). Transcripts of recorded sessions were produced to help study client-counsellor interactions in detail (Rogers 1942, 429).

However, the early use of sound recording equipment was the subject of both practical and ethical debate amongst practitioners. First, the utility of transcripts was questioned since they stripped away emotional tone, pace, and other para-linguistic cues from the record (Gill et al. 1954, 112). Second, the ethics of recording counselling and psychoanalysis sessions were questioned, especially as this was often done “without the patient's, and sometimes even the therapist's, knowledge” (Levy-Landesberg and Pinchevski 2022, 3). For example, Rogers and his

students used concealed microphones to amass a large archive of recorded sessions, which they justified as a means of minimizing disruption to the therapeutic encounter (ibid.).

Over time, the practical dimension of this debate led Rogers and his colleagues to stop producing sound recordings and transcripts (Guenther 2022), especially as the non-verbal aspects of speech were increasingly recognized as integral to empathetic communication (203). Concerns about privacy and consent were not the primary driver of this shift, but rather a reconfiguration of technique: during the late 1950s, Rogerian active listening increasingly involved practices of “checking perceptions” (Guenther 2022, 205), where counsellors confirmed understanding by posing questions, such as “it sounds as though you are angry”. In this way, media experimentation with sound recording and transcription was gradually abandoned as practitioners debated how best to construct an operational chain of listening. However, the ethical questions raised by these early uses of recording and transcription technology in this context remained largely unresolved and would be reasserted in the CTL case under different technical conditions.

In the end, Rogers framed active listening as a multi-modal practice rather than an exclusively auditory one. As he put it (Rogers qtd. in Robertson 2005, 1053):

We listen not only with our ears, but with our eyes, mind, heart and imagination, as well. We listen to what is going on within ourselves, as well as to that is taking place in the person we are hearing. We listen to the words of the other, but we also listen to the messages buried in the words. We listen to the voice, the appearance, and the body language of the other...We simply try to absorb everything the speaker is saying verbally and nonverbally without adding, subtracting, or amending.

In this sense, the technicity of active listening exceeds hearing itself. Thus, the sensibility of text-based listening on the CTL platform is not simply metaphorical, but irreducibly technical.

CTL volunteers apply non-judgemental active listening in their work with help seekers. The technique carries particular weight in crisis contexts (Danby et al. 2009) because skilful and caring communication can help a person in acute distress feel “heard”. On CTL, this practice is situated within an operational chain that includes transcript logs, supervisory oversight, algorithmic nudges, and emerging AI applications. These technical elements shape how the technique is learned, practiced, and evaluated, while introducing tensions that volunteers must navigate in relation to the wellbeing of callers and their own moral-technical compass.

As the findings show, this operational chain is continually negotiated in the social microclimate of crisis counselling. New AI tools in particular raise concerns about privacy, consent, and

proletarianization: the possible de-skilling effects of technological delegation. In response, many volunteers avoid using or outright reject algorithmic tools such as suggested replies or GenAI and rely instead on more established interpersonal techniques. Their choices express a form of technical survivance because the persistence of old practices is explained not solely because they remain functional, but because of ethico-political convictions related to the wellbeing of help seekers and the protected milieu of crisis counselling. For instance, many people remain strongly averse to the use of automated technology by a crisis helpline, raising additional transparency and consent concerns (Ma et al. 2022; Neville 2025). In this way, technical survivance clarifies how techniques become sites of negotiation within diffusion processes, while foregrounding the situated motivations and resistances that techno solutionism tends to eclipse.

Anonymity and privacy represent integral preconditions for the practice of active listening on CTL and more broadly in crisis counselling. An internal study from CTL notes that the text-based modality makes the CTL platform *feel private* for texters, helping them to open up about sensitive topics (“A Decade of Impact” 2024, 5): texters cannot be seen, their voices cannot be heard by the counsellor, and their conversations cannot be overheard by someone in their physical vicinity such as at co-dwellers at home or classmates at school. Put simply, texting can restrict unwanted access to one’s personal sensorial space (Véliz 2023), even as every message is logged, algorithmically monitored, and potentially repurposed in ways texters cannot fully anticipate. As many of my interview participants shared, the anonymity and sensorial privacy afforded over text also provides volunteers with a safe space for skill development and practice, since they too cannot be seen or heard, and thus cannot be judged or discriminated against by texters based on their identity, voice, or appearance. Thus, both parties experience privacy affordances of the CTL platform as a relational spacing that feels protected from unwanted observation, judgement, or interference. This sense of relational privacy—that I have developed throughout the chapters of the dissertation—is what allows volunteers to *hold space*, a term used by crisis counsellors to describe the active creation of a protected zone of communication where a texter can disclose vulnerable information without fear of exposure. It is within this protected space that the technique of active listening can be practiced, allowing volunteers to connect with those in desperate need and, in some cases, save lives.

Yet this experience of privacy is fragile for both texters and volunteers. Monitoring of conversations is conducted for purposes of training, quality assurance, legal reporting, and research initiatives. Moreover, in many jurisdictions, predictive assessments of immediate suicide risk can trigger geolocation protocols that route calls to local emergency services without the help seeker's collaboration (Gould et al. 2016). Such mechanisms enable police welfare checks that may result in involuntary psychiatric detention and further breaches of help seeker privacy (Wipond 2023). Some volunteers also experience certain aspects of this observation and intervention as intrusive. These tensions culminate in the Loris.ai partnership, where the repurposing of crisis conversations undermined the very conditions of privacy and institutional trust that make active listening possible in the first place—regardless of CTL's data anonymization procedures.

Help seekers are not made fully aware of the automated aspects of the platform and some may be reluctant to engage with mental health systems that apply emerging technologies (Ma et al. 2022). The CTL triage system begins with automated messages and then informs the texter that they are being connected with a crisis counsellor. However, algorithmic processing of conversations both synchronous and asynchronous continues in the background without meaningful notice, raising concerns about transparency and consent.

Texters remain anonymous to volunteers, however the predictive mode of listening that operates concurrently within CTL's operational chain threatens the privileged status of the milieu by subjecting conversation data to intensive analysis and forms of surveillance. Through statistical modelling, crisis helplines like CTL triage help seekers according to their assessed risk of suicidality ("Detecting Crisis" 2018). Interpreting suicide as a population-level risk (Wang 2025, 184), predictive listening serves a biopolitical function that supports the surveillance-based management of life. Drawing on an analysis of the 988 Suicide and Crisis Lifeline national service in the United States, Wang explains how crisis response systems are folded into a "public mental health surveillance infrastructure" in which all calls are "retrievable, datafiable, and interoperable" (2025, 212). The technique of active listening is similarly folded into this operational chain; for example, counsellors are trained to conduct a ladder-up risk assessment after building rapport with callers in the exploratory stage of a conversation ("Understanding Suicide Prevention" 2020). This assessment proceeds alongside active listening and poses four

questions that determine imminent risk: Is the help seeker feeling suicidal? Do they have a plan? Do they have the means to carry it out? And do they intend to act soon? Active listening is thus nested within a structure of anticipatory governance (Wang 2025, 206) that shapes how listening is practiced across the operational chain by predictively determining when it should shift into a biopolitical register.

CTL's operational chain of listening includes active and predictive components while their interoperation draws attention to how listening techniques undergo transformation when situated within CTL's platform.

Transduction

This subsection introduces transduction to conceptualize how listening techniques are reshaped as they are adapted within CTL's operational chain and work environment. This conceptual framework clarifies the kinds of transformations and tensions that volunteers later describe in their accounts of listening on the CTL platform, supervisor and algorithmic governance, and data repurposing. The discussion unfolds through two modes of transduction that clarify different aspects of this adaptive process.

Procedural transduction

Procedural transduction refers to the transformation of a technique as it moves across operational chains and into new milieus. It explicitly acknowledges that technical elements and actions are never neutrally transferred but are reshaped as they are adapted into new contexts. In Chapter Two, I emphasized procedural transduction as a corrective to the notion of a transferable skill to highlight the mutations, distortions, and negotiations that occur across technical substrates when techniques are diffused and adopted by a different milieu. More broadly, procedural transduction is offered as a challenge to authoritarian diffusion which fails to critically reflect upon the transductive field of struggle that exists as techniques and innovations are transported across new media and social settings while being remolded to suit different objectives, values, and priorities.

CTL offers a paradigmatic case of procedural transduction because it reorganizes active listening for a text-based, algorithmically mediated platform that simultaneously increases perceptions of sensory privacy while exposing crisis conversations to intensive logics of datafication. This shift alters the operational chain of listening by removing auditory cues while introducing new pacing

affordances through a semi-asynchronous rhythm where long pauses do not carry the interpersonal awkwardness they would over the phone. Yet this transduction can also flatten affective cues; for instance, researchers have found that empathetic communication over text can be difficult to convey (Moylan et al. 2022). This perceived empathy deficit has been used to justify the diffusion of algorithmic tools designed to compensate for what many counsellors and peer supporters struggle to convey over text (Sharma et al. 2021). At CTL, active listening also became ported through the operational values of a tech startup (McNeil 2022), including an emphasis on innovation, datafication, and rapid scaling. Yet as I show next, this opened the door for datafied forms of transduction: the leveraging of data as a transferable resource for the diffusion of platform-ready protocols bound for secondary ends.

Through its Data Enclave program (Pisani et al. 2019), CTL opened de-identified datasets to vetted researchers who parsed transcripts, categorized behaviours, and scored both conversations and counsellors in efforts to optimize the service and model generalizable procedural knowledge abstracted from the domain of crisis of counselling. Tim Reiersen (2025), a former CTL volunteer draws attention to a continuity between CTL's Data Enclave and Loris.ai by noting that an enclave research paper explicitly frames commercial use as a possible extension of its experimental work with crisis data (Zhang et al. 2019). In this context, conversation techniques modelled from crisis counselling data are presented as transferable to domains such as customer service, academic advising, and business negotiations. A subsequent paper by the same lead author categorizes CTL as one of many “goal-oriented asymmetric conversation platforms” (Zhang et al. 2020, 131:3) from which models of effective crisis counselling techniques can be transferred to other “technologically-mediated domains like customer service” (ibid.). Thus, besides the Loris scandal, the Data Enclave program shows that empathetic exchanges were already abstracted as portable communication protocols that could be transduced into commercial aims.

Adding to the brief historical discussion of Rogerian technics, procedural transduction is evident throughout the history of active listening and the lived experiences of volunteer counsellors. An internal study from CTL reported that nearly all volunteers report using active listening outside of their counselling work (Meagher and Loots 2024). What occurs here is a diffusion of active listening as the technique is transduced offline into face-to-face community settings to support

similar care-based objectives. Reflecting on CTL's early operations, dana boyd explains how leadership began to consider "the potential benefit of training far more people to manage crises, even if they did not want to volunteer for our service" (5). At one point, CTL explored developing training modules and workshops for external organizations, yet mounting financial pressure redirected the organization toward a data-transfer model that promised greater scalability and revenue potential.

What the Loris scandal reveals is that procedural transduction under platform logics of datafication can rupture the sensitive and protected milieu of crisis counselling, especially when the people directly engaged in conversation are themselves *retooled* as involuntary technical components in a larger infrastructural chain. This is precisely what occurred in the Loris partnership, where volunteer-driven active listening facilitated data collection from a vulnerable user base. Authoritarian diffusion becomes evident here as the operational chain of listening was transduced into an external commercial domain without the awareness or consent of texters and their empathetic confidants.

While the concept of procedural transduction lays bare how techniques can become politically retooled, the next section explores how the Loris scandal revealed the unintended transductive labour performed by volunteers, whose work as an empathetic sounding board created the conditions for datafied forms of procedural transduction.

Transductive Labour

Semel's (2025) concept of transductive labour was discussed in Chapter Three as a mode of maintenance work articulated by the production of speech and the transformative movement of sound across media. In line with my reorientation of listening technics, this section conceptualizes text-based active listening as a mode of transductive labour. Quite simply, active listening sets the stage for help seekers to voice their problems on the platform and produces the conditions for this sensitive data to move across media and milieus. Transductive labour in this context is what makes the crisis counselling platform feel human and caring, when it might otherwise feel distant, impersonal or overtly scripted. This is perhaps best articulated by a frequent question volunteers receive on CTL: "Are you human?". By facilitating sensitive conversations, volunteers create the very conditions for datafication and for the movement and transformation of listening technics across media and milieus.

Crisis counselling is distinct yet structurally similar to other milieus in the Internet gift economy (Barbrook 1998) in terms of its labour conditions and vulnerability to capitalist appropriation. CTL volunteers work remotely from home and are motivated by proximity to mental health crisis or a desire for personal growth and meaningful skill development (Lublin 2010).²³ Additionally, the social context of crisis counselling differs dramatically from other forms of “free labour” (Terranova 2000) that are typically associated with pleasurable and expressive forms of unpaid digital cultural production, such as blogging and social media content creation. Despite the unique motivations and conditions, volunteer labour at CTL was appropriated in ways similar to other digital contexts. The CTL-Loris partnership reflects what Crawford describes as the AI industry’s “ruthless pragmatism” whereby data are appropriated en masse to create profitable AI systems with minimal consent, caution, or consideration of social context (2021, 95).

The digital milieu creates conditions for volunteer labour to double as a transductive form of “maintenance work” (Semel 2025, 208) that sustains the conditions for crisis disclosures to become datafied and analyzable within the platform’s predictive mode of listening. Without volunteers listening on the other end of the platform, texters would stop reaching out, the service would stop functioning, and the data pipeline would stop flowing. However, volunteers and help seekers alike were not meaningfully informed about how they were being put to work, not only to sustain and improve the CTL platform, but also to produce a customer service AI model under conditions of empathy and duress.

Although CTL repeatedly emphasized that it never sold or shared personally identifiable information, this framing sidestepped how conversation data was systematically repurposed to train commercial models for Loris.ai (Trujillo 2022). Semel explains that a key part of transductive labour involves the elicitation and production of speech (2025). In this case, active listening acted as the technique to draw out sensitive disclosures that were then funneled into Loris’s training pipeline. Despite the unique aspects of the crisis counselling milieu, the case echoes Terranova’s argument that what is freely given on the Internet is not autonomous from

²³ In her trade book, Nancy Lublin writes: “What could be more valuable than helping employees develop new skills or acquire new knowledge? Skills translate to greater career success, either in your organization or somewhere else...Not-for-profits possess numerous options to help their people acquire skills and knowledge, from providing in house classes to paying for seminar and workshop tuition...People are keenly aware that knowledge and skills are the foundation of great careers, and having the chance to acquire some of both can make even a mundane job meaningful” (2010, 26-27).

capitalism, insofar as “the market economy is always threatening to reprivatize the common enclaves of the gift economy” (Terranova 2000, 36).²⁴ As I discuss in the findings section, this commercial appropriation of transductive labour was experienced as a violation of volunteers’ ethical motivations.

The labour conditions at CTL help explain how these transductive outputs could be concealed in the first place, since the platform is structured by what Rogers calls “authority innovation decisions” (Rogers 2003, 28). At CTL, the integration of new tools and data practices is determined not by volunteers and the frontline staff of supervisors and coaches, but by a “relatively few individuals in a system who possess power, status, or technical expertise” (28-29) who steer the innovation diffusion process and the repurposing of volunteer labour. This decision structure allowed CTL to appropriate crisis conversations for Loris without the awareness or consent of those whose labour generated the data, reinforcing the authoritarian diffusion at the heart of the controversy.

The labour of volunteers is integral to CTL while being systematically devalued. Volunteers perform emotionally intensive work without pay within platform environments that resemble both call centres and gig work economies (Ball 2022).²⁵ At the same time, volunteers are monitored according to performance standards adapted from commercial call centres, including measures of script adherence and time-to-resolution metrics that recast the interpersonal labour of active listening as a standardized service model (Wang 2025, 210). Despite the lifesaving function of this work it is devalued like other forms of transductive labour in being regarded “as mechanical, unskilled...and altogether marginal to the technology development process” (Semel 2025, 211). These labour arrangements make it easier for innovation decisions to proceed without the direct input of active listeners thereby appropriating their work as a transductive input.

Despite the new platform conditions of CTL’s operational chain of listening, the case study reactivates unsettled debates about the limitations of transcript-based listening and the ethical

²⁴ The blurred boundary between non-profit and for-profit activities is clearly expressed by Lublin, who argues that non-for-profit organizations should behave more like businesses (2010, 12).

²⁵ Volunteer work can also articulate a form of “aspirational labour” (Duffy 2016) in terms of career advancement into paid positions either within the organization itself or elsewhere. For example, it is common for students or early career individuals to seek out opportunities at specific volunteer placement organizations because of a strong alignment with personal career goals or to learn some marketable and transferable skill.

implications of non-transparent and non-consensual technological applications in a context involving vulnerable groups. The recurrence of familiar tensions concerning privacy, consent, and the diffusion of innovations echoes the central argument of the chapter, namely, that the Loris.ai scandal is not an anomalous misstep of data ethics, but a predictable expression of authoritarian technics. To analyze how these tensions are reactivated through the CTL infrastructure, this chapter draws on procedural transduction to attend to the sociotechnical transformation of techniques as they are readapted across media and milieu. The CTL–Loris case is relevant to this framework in two analytically distinct respects: first, through an inward process of procedural transduction, as CTL reshapes active listening for SMS-based crisis counselling and introduces new technical elements including automation that together restructure how listening is practiced and governed; and second, through an outward process of procedural transduction, as this operational chain of listening is readapted for a customer service context. Building on this account, the concept of transductive labour foregrounds the contributions of volunteer counsellors and help seekers whose listening acts (Wang 2025) and disclosures sustain these conditions.

The affordances and limitations of transcripts in counselling milieus are well established in academic literature (Nesmith 2018; Alimohammadi et al. 2025); however, what remains underexamined from a critical perspective is how newer forms of algorithmic mediation and automation raise familiar tensions around utility, privacy, and consent in this milieu. More specifically, the study explores how frontline listeners work within or reject technological conditions they know are limited, ethically contested, and not fully under their control. While this gap is tangible even without the analytic of transduction, the framework developed here explains how volunteer counsellors are positioned within an operational chain that is continuously being technically transformed and redeployed in ways that generate moral-technical conflict.

The study that follows engages volunteer counsellors who are at the center of CTL’s operational chain of listening to explore how they interpret and negotiate the moral-technical tensions they encounter in a context subject to ongoing appropriation of data and technical transformations.

Method

This study is guided by the following research questions:

1. How is listening practiced, reshaped, and negotiated by volunteers within CTL's text-based algorithmic platform?
2. How do supervision, surveillance, and automation govern volunteers' listening practices?
3. How do volunteers interpret and contest the repurposing of crisis data and their listening labour in relation to the Loris.ai scandal?

To answer these questions, the study conducted interviews with 32 CTL volunteer counsellors via Zoom in Spring and Summer 2024. A semi-structured interview protocol was designed (Appendix B) that asks general questions about participants' counselling experience and includes discussion of platform-mediated interactions with texters on the CTL platform. Follow up questions were tailored to participants' accounts, and the protocol concludes with questions about the Loris.ai scandal to explore volunteers' perspectives, concerns, and interpretations.

Participants were selected based on their direct experience as volunteer counsellors at CTL, since recruiting help seekers would have introduced significant risk. Notably, four participants moved onto hold employment positions at CTL, offering additional insight into some of CTL's internal policies and supervisory concerns. Participants have experience ranging from less than one year to more than five years, and volunteer tenure spans 2016-2024, with twenty volunteer counsellors serving as active volunteers at the time of data collection.

Recruitment occurred in two stages: an initial online contact helped recruit eight additional participants, forming a first sample of nine participants. After a four-week interval, an online recruitment advertisement was posted on LinkedIn, which generated a large response from former and current volunteers. This dual approach increased the sample size and helped reduce sampling bias. The initial group (n1=9), which emerged from an activist informant, held uniformly critical views of CTL. The second group expressed consistently positive views (n2=23). As a result, the study combined convenience sampling with theoretical sampling (Corbin and Strauss 2008) to build a more varied and conceptually useful set of perspectives.

Interviews were conducted online via Zoom during Spring and Summer 2024 (N=32), with each session lasting about one hour. Many participants chose to keep their camera off, which accommodated individual comfort preferences. Participants received a \$50 CAD honorarium, and data collection concluded at 32 interviews, which provided a sufficiently rich and varied dataset for analysis.

Participants completed an online screening and consent process, and the study received low-risk research ethics approval from York University (STU 2023-103). The interview protocol was designed to limit discussion of sensitive personal material and participants were informed that the topic might cause them minimal psychological or emotional risk in revisiting the CTL data scandal. Written consent was obtained before scheduling each interview, and verbal confirmation was collected at the start of the session. Participants are identified by randomized numeric codes to protect their anonymity throughout the findings discussion (e.g. P1). Additionally, gender-neutral pronouns (they/them) are used to further anonymize individuals.

The study is guided by a critical and constructionist approach to thematic analysis (Braun and Clarke 2021). The analysis was informed by the dissertation's broader theoretical engagement with transduction, which was refined by engaging the interview material. Coding proceeded iteratively, and the analysis identified patterns of meaning that recur across volunteer accounts. Patterns of meaning were constructed into themes by identifying a central organising concept: a core idea or meaning voiced by volunteer counsellors (122). The flexibility of thematic analysis allowed the study to engage both deductive concepts from the dissertation's theoretical framework and inductive insights that emerged from the interview material. Consistent with a non-positivist paradigm, intercoder reliability was not pursued, and theme frequency was not used as a measure of analytic value.

The findings are organized around three interconnected themes that emerged from the analysis: the practice and transformation of listening on an algorithmically mediated platform, the governance relations that shape and constrain volunteer practice, and the contested transduction of listening in relation to the Loris scandal.

Listening across the operational chain

This theme explores how listening is reorganized across CTL's operational chain through a series of technical mediations that volunteers engage, negotiate, and sometimes reject. These mediations include peer-to-peer exchanges, asynchronous transcript review, suggested replies, and the integration and disuse of AI tools such as ChatGPT. On the CTL platform, active listening becomes intermixed with an algorithmic mode of predictive listening. For instance, CTL deploys a "conversation phase classifier," an LLM model that infers the stage of a conversation in relation to a standardized crisis arc and can inform algorithmic nudges to

counsellors or supervisors (Databricks 2024). Taken together, these mediations reveal how the technicity of listening is practiced, reshaped, and negotiated across the platform's operational chain.

Peer and platform knowledge exchange

The collaborative message board represents the first layer of mediation through which volunteers refine and recalibrate their listening practice by exchanging information and offering support to their peers. P25 explains that a running chat stream is integrated into the counsellor interface, enabling real-time collaboration and learning:

People would ask about all sorts of different things. A lot of times it was really specific verbiage. "Someone said this thing to me, what do I say now?" And other people would chime in: "You could say this", and someone else would be like, "you could say this". And that was super helpful. (P25)

Peers quickly offer their suggestions, drawing on past conversations or their own experience as active listeners. For new or uncertain volunteers, community feedback can be a valuable resource for navigating complex conversations.

The message board also supports broader learning through informal dialogue and commiseration. As P22 describes, it offers a shared space where volunteers compare strategies, reflect on their work experience, and further develop their counselling skills:

We chat with people about how the job is going, about situations they normally face, how they tackle situations and how things have been going through their own perspective. We kind of share ideas together on how work should be carried out more effectively...it was very helpful, having people to talk with – likeminded people, who are doing the same job as yours. You can actually learn a lot from them and improve upon your skills.

In addition to the message board, volunteers can also asynchronously review the transcript history of the help seeker they are currently speaking with. These records allow volunteers to review prior conversations with repeat help-seekers, enabling some degree of continuity of care and informal skill development. In this sense, transcripts operate as a technical component in the operational chain of listening by mediating how counsellors attune to texters.

For P25, reviewing transcripts was a routine activity to avoid offering irrelevant or previously rejected resources:

I really didn't want to send the same resources too. That always felt shitty when I accidentally did that. Here's a resource. They're like, oh yeah, they already sent me that. It didn't help. I'm like, that's awful. So, I always would review, and I found that super helpful and you can't always get through the whole thing. Sometimes they're really long. (P25)

Beyond concerns about redundancy, transcripts are also used as a learning resource that allows counsellors to benefit from the good example of others. As P25 continues:

I've learned a lot about how other counsellors speak, reading other counsellors' conversations. And I don't know if other counsellors do that as much, but I would always try to read them all. And I just learned a lot of what other counsellors did.

Similarly, P23 was moved by what they discovered in the archive in witnessing a masterful exchange.

I remember one time looking back and I read a conversation, the transcript, and I just thought, "wow, this volunteer who helped this person was fantastic". I even tried to reach out through my coach and said, "can you send something to this person? Because I want them to know how really amazing they were." Because some people may be able to do it naturally, but I think it's an art to be able to have these conversations. It's really a highly developed skill and art. It's a combination of so many things that the person answering does that makes the conversation [feel] safe, helpful, effective, human...so you can learn from those transcripts.

Much like the transcripts consulted in the development of Rogerian listening, CTL transcripts are used by counsellors as a pedagogical resource.

Unlike the collaborative message board, there is no clear agreement amongst volunteers about how transcripts should be consulted, as volunteers voice ethical concern and negotiation about whether the feature aligns with their role in providing an "anonymous ear" (Zeavin 2021, 117). Some volunteer counsellors are uncomfortable reviewing transcripts due to concerns about consent and transparency, since texters may not be aware that their prior conversations can be re-accessed.

P25 navigates this issue by tacitly using their knowledge of transcript history:

I would never signal to them, like, "I see what you said two weeks ago". I wouldn't do that the way a therapist would. Right? I wouldn't let them know that I knew, because to me, I don't know if that will be disconcerting for them because I don't think they necessarily know. So, I would use that information implicitly.

In contrast, P23 avoids reviewing transcript histories altogether:

So, the approach I took was I wouldn't look at that generally. I wouldn't look at it because this call coming in is the present moment. This is the present moment for them. The past history doesn't matter. We're going to work through these steps as if it's a clean slate, a blank slate. I felt that was respectful because this person calling in doesn't know that there's this, potentially, history and it's not fair to go back and say, oh, I know what this person's all about, to try and start making some presumptions about that person for this call. I didn't want to have that.

Similarly, P27 suggests that even limited forms of transcript use can raise ethical concerns and offers an alternative:

I feel like stuff like that should always be confidential except for the conversation that you currently are having. I feel like a better middle ground would be just how it was resolved, how every conversation was resolved. Like, okay, we gave this person resources and they were satisfied, but not looking through every single message that has been exchanged since this person has been seeking help on the platform.

Transcripts represent a site of moral-technical negotiation, as volunteers balance practical utility against their commitment to practice a “transpersonal” mode of active listening in which neither the volunteer nor the help seeker is a “specific, stable, [or] named person” (Zeavin 2021, 117). This negotiation is not limited to transcripts; it also surfaces in other technical elements across the operational chain, such as suggested replies and algorithmic cues that shape how listening is practiced and recalibrated on the platform.

Stock messages and suggested replies

Counsellors can access a menu of stock messages authored by experienced coaches, which are available to copy-and-paste into chats with minor adjustment to help maintain the conversational flow. These stock messages are discretized expressions of active listening that signal receptiveness and attention to the texter. The phrase bank includes messages of affirmation (e.g. “That was really brave of you to share”), tentative observations (“e.g. It sounds like you’re feeling...”), validations (e.g. “It’s understandable to feel that way”), as well as a list of open-ended questions. These prewritten suggestions are especially useful when counsellors feel cognitively overwhelmed or unsure how to respond. As P10 explains, “It’s really helpful for me because when there’s a conversation you might be speechless or don’t know how to respond or reply to the person, but the suggestion box can always help you out in terms of those kinds of problems and issues”.

Some of these suggestions are static, while others are flagged in real time by Natural Language Processing tools. P24 notes, “when the word, anxiety, comes out, it actually pinpoints it out and prompts about anxiety and about how to tackle the problem”. These keyword-based cues signal a form of sentiment analysis that generate templated replies. Suggested replies can redirect listening attention according to platform-defined parameters, yet counsellors often treat them as flexible cues rather than fixed scripts in choosing to adapt or override them as needed. As P24 elaborates:

You really shouldn’t rely wholly on the technology aspect of it. You also need to be able to understand how to give your own personal responses... That is why there is this freedom for you to edit it to whatever you like it to be. And most of the time, you don’t want to just give a texter any random prompt, you need to check it to ensure that whatever reply you give should really be supportive enough for the texter. So yeah, sometimes I disagree with the prompts. And I give my own response.

Similarly, P26 describes their hybrid approach: “Sometimes the messages or responses are bulky, so I try to combine a quick response with my own words.” In these moments, counsellors

exercise careful discernment in shaping responses that feel genuinely responsive to the needs of the texter. Rather than fully automating care, the suggested replies offer a scaffold for listening practice that requires active modulation from the volunteer.

Stock messages and suggested replies do not uniformly structure volunteers' counselling practice. On the contrary, some rarely engage with these automated features. As P12 explains, suggested responses fail to incorporate a counsellor's "personal point of view." Others explain their disuse of these tools in terms of a motivation to pay attention to help seekers. In this sense, avoiding suggested replies can reflect a form of technical survivance, where volunteers deliberately maintain a core manual practice of active listening despite the availability of automated supports.

I focus more on the active listening and try my best to create that synergy and that space with my texters.
P17

I think the listening process is really demanding... I tend to focus more on the listening. I try my best to focus on the matter at hand. And sometimes you get lost trying to help the person that you don't really pay attention to because of the aids that are available. P13

These accounts reveal an ongoing moral-technical negotiation with CTL tools that becomes more pronounced as volunteers consider adopting more advanced AI supports on the platform.

Listening with AI

Volunteer counsellors share that a sophisticated AI tool was integrated on the CTL platform from about 2017 or 2018 up to early 2022.²⁶ As P21 recalled, the long-term direction towards automation was clear:

By the time I left [in 2021], there was some energy being put in that direction, of having the end goal being that some sort of AI would be able to comb through a conversation and flag stuff for someone to give feedback or be able to give reasonably accurate feedback...It's certainly the end goal, at least when I was there, where ideally most everything would be automated.

Volunteer accounts differ in how they narrate the timeline of automation. Some describe it abstractly as an institutional aim while others recount directly using Loris as a fully integrated toolkit on the CTL platform. Despite these narrative tensions concerning Loris, volunteer

²⁶ Importantly, the timeline of these accounts coincides with the official timeline given from CTL about the data sharing partnership with Loris: Loris was founded in 2017 to act on the commercial viability of a data sharing agreement with CTL. According to CTL board member, dana boyd (2022), the data sharing partnership with Loris was temporarily paused in 2020 after CEO and founder of CTL, Nancy Lublin, was terminated. boyd explains that the board voted "to freeze the agreement with Loris, with an explicit commitment to reconsider the relationship in 2022 once a new CEO was in place" (n.p.).

counsellors position AI development as a part of a broader technical trajectory through which listening practice was being reorganized on the platform.

In this subsection, I make no allegations about CTL's integration of Loris but instead relay volunteer counsellors' reported interaction with a third-party AI toolkit that is consistently referred to as Loris (P4, P12, P8, P30, P29, P28, P15, P24, P26). Moreover, three other volunteer counsellors (P3, P32, P16) similarly report that senior colleagues had direct experience using the Loris toolkit as CTL employees and openly discussed this with them. According to P8, CTL took proactive measures to cut ties with the Loris toolkit after catching wind that whistleblower actions would be made public. These accounts stand in tension with investigative reporting and CTL's official statements (Levine 2022; Trujillo 2022), which frame the Loris partnership as a data-sharing arrangement rather than an integrated AI toolkit on the CTL platform.

Volunteer counsellors consistently share that the Loris toolkit "improved things" (P4), made the work "easier" (P12, P28, P32), "faster" (P3, P28, P32), "smarter" (P4, P32) and more "efficient" (P3). Tech developers for CTL have previously discussed using machine learning, such as real-time topic modelling and visualization as a means of mitigating the cognitive load of counsellors (Dinakar et al. 2014; Dinakar et al. 2015). Counsellors describe the affordances of the Loris toolkit in a similar way to what is promised in prior research on AI-in-the-loop, namely, that it helped to "navigate" the job and "manage work stress" (P16).

P29 explained how the toolkit alleviated burnout:

It reduces human stress. I think it is an important point because a job you should have for, let's say, for example, two hours, [otherwise] you're doing it for less than that and it gives you time for you to go ahead and do other things. Without the tool, you might struggle during the two hours and you might get burnout.

In this light, Loris functioned as a copilot in making emotionally and cognitively taxing interactions more manageable. AI tools thus might be leveraged as a gap filler to mitigate the listening fatigue that mental health professionals experience in contexts of inadequate staffing and excessive workload (Ricks and Brannon 2023).

Volunteer counsellors also described patterns of adoption that move beyond background support as AI tools became entangled with the moment-to-moment work of listening. In P15's words:

It's a perfect solution for me and for clients because sometimes they [Loris] are just there monitoring, they're monitoring the conversation that I'm having with my client and any sensitive words my client says to me, Loris.ai will perceive it and try to interpret the words for me. And after the interpretation, it will give

me a solution of what to say to the client. And if I don't really love the solution, I may pick two points, add [that] with my own and give that to the client.

Volunteer counsellors' accounts suggest that Loris was used as an empathetic copilot similar to what has been tested on peer support platforms (Sharma et al. 2021). The broader development of AI-in-the-loop experimentation in the mental health sector helps clarify the moral-technical negotiation that volunteers are drawn into. A deep reinforcement learning agent built on GPT-2 was deployed on the platform TalkLife to make sentence-level edits to supporter posts with the goal of improving empathetic communication (Sharma et al. 2021). A follow-up experiment by the same research team—including Tim Althoff, a former contributor to CTL's data enclave—developed an AI-in-the-loop agent that provides real-time edit feedback to peer supporters (Sharma et al. 2023). This diffusion of AI into the mental health sector is not without controversy: public backlash was swift concerning a similar experiment using GPT-3 to rewrite messages on the peer support platform Koko that were sent to help seekers without their informed consent (Cohen et al. 2023). Although AI adoption is widely debated in mental health and psychological contexts (Guest and van Rooij 2025), early adopters do not raise concerns about its controversial status (“Practical Uses of AI” 2024) while its use is often undisclosed to help seekers.

For many, the removal of the Loris toolkit marked a significant setback in working conditions. “I loved it back then when they both [CTL and Loris] were working together” (P4). For P29, the loss of Loris was emotionally draining and prompted their leave of absence:

I felt empty at first, totally empty because I was used to them [Loris] and it makes it easier. So that was the main reason I had to go on the break [from work]. I felt empty because the tools were not there to help people anymore because I was so stuck onto the tools because it makes it easier.

The removal of the toolkit demanded a sudden recalibration of work habits and emotional labour for this volunteer counsellor. However, as P29 continues, this later led to a positive outcome: “It was like a reset for me, you know, like you're trying to find yourself—starting over again or starting like a new phase of learning, of interaction”. Thus, the diffusion of AI might be taken for granted as a positive innovation at first, yet its disuse might come with unexpected benefits as volunteers come to appreciate the skill development and personal growth they experience by fulfilling the core demands of crisis counselling without automated support.

Despite the removal of Loris from the CTL platform and the period of relearning this prompted, P29 later acknowledged, “Sometimes I use ChatGPT because, to be frank, I love Loris.ai too. I

was kind of used to it. So sometimes I use ChatGPT to help me out”. This contradictory account of valuing automated technology while recognizing the benefits of a more manual active listening skillset reveals how the diffusion of AI involves an unsettled negotiation for some volunteers.

Thirteen volunteer counsellors report integrating ChatGPT into their workflow to varying degrees.²⁷ At one end of this spectrum, some volunteers use the LLM chatbot as a background resource, drawing on it for writing edits, phrasing help, or mental health research. “Maybe I want to learn about drug addicts, mental illness issues like that...it helps me get more details and information. It makes the learning easy” (P16).

These uses raise concerns of accuracy and accountability because the CTL interface provides a menu of mental health resources as well as answers to frequently asked questions that have been vetted by qualified experts. In contrast, ChatGPT generates responses by drawing on patterns developed from broad online training data that may not align with evidence-based research or accepted peer support guidelines.

Others engage with ChatGPT more extensively, using it to brainstorm, co-construct responses, and summarize mental health resources. P8 explains, “I use ChatGPT in solving some cases, I just fetch a little data from ChatGPT, because it will give me a lot of things, but I just summarize it, and remove one point, and add my own experience.” Similarly, P19 described using it to generate ideas for difficult cases:

I use it to gain information that I can text, for example, mental crisis: “how to solve mental crisis on that issue”, “how to solve mental health on depression”...or I would go to ChatGPT and be like, “how to solve mental issues concerning loved ones”, “concerning work”, “concerning society”, because then ChatGPT will give me a rundown of everything for what I want to solve. [Then] I'll pick one or two points from ChatGPT, summarize it, add my own idea, and give it. That would be the perfect solution for the person.

P15 and P19 both explain how they integrate ChatGPT to simplify their work in an effort to replicate the automated support that Loris once provided. As P15 describes, “I integrated it personally for myself...so that it can be like Loris.ai and give me what I want. Opening another app to get information and trying to go to another app can be stressful.” P19 offered a step-by-step reflection of how AI mediates their counselling practice:

When I open the text that someone drops me, then I will take the message to ChatGPT. And it will give me the more concise version on how to help the person. So, from there, I'm going to share an edit...When I'm

²⁷ These participants are P8, P12, P13, P14, P15, P16, P19, P20, P21, P22, P24, P25, P27

sharing it, it will take me down to an edit page. So, I will edit it, then copy it, add my own experience based on my family history...The person [help seeker] will be so satisfied.”

Here, ChatGPT plays a leading function in the operational chain of listening, while raising serious problems of consent: some help-seekers might be averse to engaging in dialogue and receiving recommendations shaped by GenAI. Additionally, help-seekers may assume they’re receiving support directly from a trained person using approved materials. In practice, the advice may have passed through a GenAI system with unknown sources and unknown biases. Moreover, when a conversation transcript is shared with ChatGPT or similar tools, sensitive data is processed on external servers and prompts can be used to train models—all without the help seeker’s knowledge or consent. Also, GenAI prompts can be used to train new models. OpenAI’s privacy policy (2025) also states – in typical boilerplate language—that personal information may be transferred to another entity during a future business transaction, creating further uncertainty about who may eventually gain access to crisis-related content.²⁸ Compounding these problems, sensitive data could be exposed in a future data breach or misused in various ways by actors who gain access to it. Thus, the adoption of GenAI exposes texters to new vulnerabilities and ethical tensions, especially as data policies from companies like OpenAI are directed at an end-user, even when the data being processed often complicates such a simplistic individual framing of privacy and consent.

Listening without AI supports

The vulnerabilities outlined above help clarify why some volunteers choose to work without GenAI or significantly limit their reliance on it. P14 expresses strong opposition to automation, citing both ethical tensions and data privacy concerns:

I would not do that personally, because – I think having to put in information about them [the texter] to create the prompt in the first place – it feels like that’s a violation of their PII [Personally Identifiable Information]. I just don’t know how you would train people to do it in a way that is ethical and prevents them from putting in private information.

Many volunteer counsellors with experience using GenAI in their counselling work report its disuse for multiple reasons, including ethical caution and privacy concerns.²⁹ For others, a

²⁸ A section of OpenAI’s privacy policy (2025) reads as follows: “Business Transfers: If we are involved in strategic transactions, reorganization, bankruptcy, receivership, or transition of service to another provider (collectively, a “Transaction”), your Personal Information and other information may be disclosed in the diligence process with counterparties and others assisting with the Transaction and transferred to a successor or affiliate as part of that Transaction along with other assets.”

²⁹ These participants are P11, P14, P15, P20, P23, P24, P26, P28, P30.

rejection of technology is prompted by a conscious decision to return to the core demands of active listening and a renewed attentional focus, as P7 describes:

I don't really use them that much. I just focus on the work I'm doing. At first, I'm just trying to make sure I save a life. I'm trying to calm that texter. I'm trying to create that rapport. I don't really focus on those features [AI tools]...I try my best to give them my attention, my optimal attention initially. And I try my best to also keep it throughout.

Some counsellors explicitly reject AI tools because they believe these aids may compromise their long-term learning and skill development by shifting their attention away from their core responsibilities. As P26 explains:

I love to be focused. I love to build my confidence and my intelligent response by myself. So, I prefer being me when sending a response so that I can build myself up. Because if I'm depending on any of the AI tools, I wouldn't be building myself, I wouldn't be growing higher with knowledge and all of that. So that is why I try to do everything with my knowledge and understanding and try to help without the use of any tools at all.

For others, the removal of the Loris toolkit was unexpectedly transformative. P29, who initially felt emotionally depleted by the loss of Loris, later observed that the change fostered personal and professional development: “After the relationship [with Loris] was over...I didn't see those features again. So I think that made me pay more attention to people. So it really helped me build myself, my esteem, my conversations with people, and the way I communicate on my own without the help of an AI.” In this way, some volunteers might only recognize the deskilling effects of AI after the operational chain has been significantly reorganized.

This section has discussed how listening is practiced and retooled within an operational chain that draws volunteers into heterogeneous relations with platform features and automated supports. In the crisis counsellor sector, CTL is an early adopter of automated technology and data analysis, but volunteers have varying perspectives on how this can and should be responsibly adopted in their line of work. P31 who helped develop training resources for counsellors reflects that the diffusion of innovations in this milieu can easily lead the organization astray in prioritizing efficiency and the rapid scaling of its listening infrastructure over more fundamental concerns:

Is that more about quality or is that more about making it easier for people to take more than one conversation [at a time]?...There's also a question of should it be so easy and straightforward to talk to someone who's going through a suicidal mental health episode? There are ways that maybe you can make things less confusing or reduce the friction but to what extent do you actually want to simplify how a volunteer engages with someone in a very complex mental health crisis.

Such tensions point beyond individual practices and negotiation of listening and toward the broader governance discussions that structure the operational chain and simplify counselling

work. The next section traces how volunteers can experience constraints and ethical tensions in their listening practice as a standardized communication protocol is enforced through supervisors and algorithmic monitoring of conversations.

Governing the operational chain

Despite the wide range of practices and uses of automated supports, volunteers are expected to conform to a protocol structured around five stages: 1) build rapport; 2) use active listening to explore background context and assess risk; 3) identify the texter's goal for reaching out; 4) identify coping skills, social supports, and share resources; and 5) conclude with a summary of the conversation. Although active listening is ideally practiced throughout the call, the short-term service model of crisis counselling is not intended as professional therapy and does not allow for open-ended listening. Thus, active listening is practiced within a constrained structure that is monitored for adherence to the conversational template. For instance, conversations are expected to last between 45 and 60 minutes, yet those involving help seekers who are not at imminent risk are expected to remain under 45 minutes. Further, predictive listening recursively shapes the practice of active listening because statistical patterns derived from conversation data have already informed the template and best practices of crisis counselling at CTL. As a result, the surveillance logic of biopolitics is directed not only toward texters, but also toward volunteer counsellors who are expected to follow parameters that are associated with predictably positive outcomes. This section discusses how such a blueprint is enforced and how volunteers experience and negotiate supervision and algorithmic monitoring of their listening practices.

Blueprint governance

Supervisors play an important role in ensuring that volunteers follow an approved template, or what one supervisor refers to as a blueprint. P28 explains:

So it's either you're dedicated to do it or maybe you don't want to volunteer. You know, you can maybe resign or leave for other people to come in. So, there's a blueprint for them to understand that you're coming here to save life... we have to give them the scope for them to understand what they really want to do. But if they really want to do it, they have to be OK with it.

This blueprint is designed to ensure consistency and safety, yet it can also be experienced as constraining by narrowing the space for interpersonal nuance. P14 describes the tension between following the blueprint and establishing genuine rapport: "I would always lean more towards having a natural conversation to build their trust. But that just was not really accepted." Other

volunteer counsellors echoed this difficulty. For example, P1 believed they were punished for their personal approach to listening:

I got kind of reprimanded from them, and that's when I said, 'I'm out'. I'm a volunteer and I'm not a robot. I am human. I think they need a human touch. Yes, there are definite questions you need to ask. Do they have a plan to kill themselves? Do they have the means, is it immediate? Do they have the intention? So that's necessary to ask, but then you need to go beyond. I would ask them about what they're interested in, and they would talk about things they might be grateful for. And in every case, I stopped them from suicide... I did tend to go off the grid and be less robotic. And I got many responses from them [supervisors] saying, 'I can tell you're listening. I appreciate this'... There's always the supervisor looking at your conversations and they'll go in and say, 'watch your time' and 'you're going off the protocol' or various comments... I began to feel that they [supervisors] were more interested in having someone follow their protocol word by word. And I felt more and more like I was denigrating my own integrity by doing that because I wanted to be human for them.

For P1, the blueprint of crisis counselling represented a barrier to forming a human relationship. Yet from the standpoint of one CTL coach, such departures from the protocol signal insufficient training or individual reluctance to follow institutional best practices, rather than a justified concern of interpersonal ethics. As P21 put it:

If this is a conflict for the volunteer, then that means that Crisis Text Line did not train on this subject well enough: inserting yourself and self-disclosing in a certain way is, I feel like, 99 out of a hundred times, is not appropriate for the situation. And so, I know that ruffles some feathers sometimes.

After a new volunteer is onboarded, coaches provide detailed feedback on a volunteer's conversations. After these early stages, monitoring of volunteers is delegated primarily to on-shift supervisors. According to P21, ongoing feedback from coaches becomes too irregular and too loosely integrated to sustain long-term adherence to the conversation blueprint:

Even if we saw a really horrendous conversation that someone would have, there's nothing you [as a coach] can do about it. It's not like you can really ban them from the platform or make them go through training or any of those things. It was just sort of, hopefully they'll see this feedback and you can follow up with an email and stuff. And if you yourself as a coach proactively do that, you can do that and put more work on yourself as a result, or also keep tabs on someone and review a conversation later or whatever. But that was not at all part of the workflow or expected at all or encouraged. So that was a big gripe at the time, at least on the coaching side.

The gaps in blueprint governance enforced by coaches and supervisors may in part be filled by what Andrejevic distinguishes as “symbolic surveillance” (Andrejevic 2019) which can be internalized by volunteers as a form of procedural discipline. Several counsellors described the psychological toll in believing they were constantly being watched and scrutinized. Even in the absence of real-time correction, the anticipation of evaluation can exert a powerful influence. P14 shares that the possibility of retroactive evaluation of past transcripts restricted their ability to meet the needs of texters and left them feeling pulled in two directions at once:

There were times where I was pretty confident that if I went completely off script, I could have brought it back around. But knowing that you've got your supervisor potentially reviewing the transcript and it's being

saved on that person's file forever, it made me kind of hesitant. And I just really wanted to believe that if I stuck to it [the script], it would work. So that combination of things sort of prevented me from trying anything too off script. And I wasn't necessarily afraid of getting in trouble, but I didn't want to get to a place where they're like, 'well, your conversations never follow the format. That's why they always go this way'...It just added to my own stress. I knew what I was supposed to be doing and that I was not always doing it. But again, I'm in the mindset of like, do I just follow the training? Or do I treat this person like a human and have a real conversation with them?

The disciplinary effects of surveillance are described by P25 as a persistent background presence that blurs the lines between symbolic and algorithmically operational surveillance:

It was always in the back of my head, that everything I was doing, they could see. I get it. I guess it makes sense. It makes a ton of sense. But I don't like the feeling of being surveilled. I do not. It's deeply embedded in everything I do. I don't like it. That was always in my head. And I think for better or for worse, you've got someone there to support you and monitor you. I don't know, not my favorite, but probably fine and best. And yeah, I guess it probably impacted what I would say or not say. It would make me think twice about some of the things I was saying... If someone's really going at it and having a tough time, I still want to be professional, but I want to dial that down a little bit to be slightly more colloquial to match where they're at. And people would respond to that because people respond well to being matched. So, I would do that a little, and anytime I would do that, I thought, I'm going to get a ping, because that would be something really easy to have automated.

P25 elaborates that this pressure constrained their expressive range, making them wary of letting too much personality or improvisation enter their responses:

I think that was my main thing about supervision: I was concerned that the more voice of myself I put in, the more that would get flagged, the more they dislike that. I never got far from the script – the general arc of conversation, I always followed that. But I think there's a lot of imaginative ways to deploy that arc.

The operational chain of listening is thus governed through internalized self-monitoring as volunteers anticipate being watched, flagged, or evaluated in relation to the conversation blueprint, yet also, through direct intervention from supervisors as the next subsection explores. As volunteer counsellors accounts make clear, surveillance can be experienced as intrusive and as a regrettable constraint on their ability to hold space.

Supervisory Interventions

The previous subsection examined how the symbolic aspects of blueprint governance, this subsection explores when supervisors intervene directly in live conversations. These interventions do not merely enforce protocol but reveal how supervisors themselves contribute to the operational chain of listening at CTL by steering the course of conversations and, in some cases, directly taking over in high-risk scenarios. Importantly, these interventions are highly selective in contrast with the constant and internalized discipline that some volunteer counsellors describe.

Supervisors monitor conversations at scale and often oversee ten to fifteen volunteers per shift (P28), many of whom may be managing several conversations simultaneously. This creates a considerable workload, as P6 notes, “Supervisors see all these conversations at once and they're monitoring them...my general impression was that supervisors are pretty taxed in terms of what they're doing.” Given these constraints, supervisors rarely step in directly (P21, P6), which heightens the significance of the moments when they do intervene. P23 describes an apparent glitch in the system that produces a strong emotional reaction that causes them to second-guess themselves:

I'm going through a conversation with a texter and all of a sudden, the whole conversation kind of scrolls rapidly down and up, that would happen. I figured out what that meant was a supervisor was reviewing it [the transcript]...I would have a traumatic response to that. It was probably a glitch in the software, but it would happen. And then shortly after, I would get a message from my supervisor that might say, “oh, well, looks like you could wrap this up”. That type of thing. Or it might have an affirmation. It might say, “wow, you made a really great connection with this texter”. But that's how I knew, whenever that happened, a supervisor was reviewing my conversation...I had a strong emotional trauma response to it just because my volunteer job, that work, was tough for me and it wasn't just that, oh, a supervisor's checking in on me...especially if that message came in from the supervisor, [that] “you're taking too long”. I really was strongly averse to that because I was being so careful in everything I did.

This moment illustrates how even minimal supervisory contact can produce acute effects while working in tandem with the symbolic power of surveillance.

Supervisors occupy a distinct position in the operational chain of listening as paid employees and experienced active listeners with backgrounds in social work, therapy, or crisis counselling.

Volunteer counsellors explain that supervisory interventions are episodic and typically reserved for high-risk texters or when a conversation requires individualized support. As P24 notes: “If the situation feels out of hand, maybe you can't give out proper services, you could refer the person directly to your supervisor, or you could seek supervisor help”. Thus, a baton can be carefully passed when necessary, so that a supervisor can then safely and successfully close out a conversation with a help seeker.

Volunteers occasionally receive nudges from supervisors in mid-conversation. P23 recounts one case where they were asked by a supervisor to deviate from the typical conversation blueprint:

So, I got a text message coming in, usual, and I got a nudge from a supervisor that said, “Hey, this texter is a frequent user of our service. What I would recommend you do is delay the ladder up, delay the risk assessment”. And I thought, okay, I don't really understand that, but that's what I'll do. I took the conversation, it was just like any other conversation as far as I could determine, and I delayed the risk assessment that seemed to work really well and finished the conversation. But I did look and there were over 200 transcripts. So that's frequent use.

Automated toolkits accessed by supervisors likely support governance processes within the operational chain. Due to an important limitation of the study – interviewing only three people with supervisory or coaching experience (P21, P20, P28) – the findings offer limited insight into how supervisors use algorithmic monitoring tools. However, given the scale of supervisory workload and CTL’s own research publications and collaborations (“Research and Impact” n.d.), it is probable that algorithmic systems flag live conversations for supervisory attention.

Back in 2018, CTL noted that its machine learning tools for identifying suicidality were only operational during the opening triage messages but emphasized their plans to integrate an improved model capable of “detecting and adjusting risk during the course of a conversation” (“Detecting Crisis” 2018). Moreover, additional machine learning experiments (Grimland et al. 2024) have evaluated the efficacy of suicide risk prediction, including studies using CTL data (Dinakar et al. 2014), with implications for the timing of supervisory intervention in high-risk conversations.

P23 expresses a belief that CTL deploys a “counsellor effectiveness algorithm” that evaluates the aggregate quality of one’s conversations with texters. This suspicion is corroborated by earlier research from CTL’s data enclave program, where success rates and crisis outcomes were shown to correlate with linguistic patterns in volunteer language (Althoff et al. 2016).

According to P28 who has multiple years of supervising experience at CTL, algorithmic tools were used to identify volunteers who might be approaching emotional strain to pre-empt negative interaction. P28 describes using digital tools to monitor counsellors for signs of “empathy fatigue and secondary PTSD”. Reflecting on the earlier era when Loris was allegedly integrated into CTL’s workflow, P28 explains that the system provided an overview of “the whole picture...Loris.ai can help me notice if people [volunteers] are actually feeling emotionally down or they need emotional support. Your workers need to be mentally sound, mentally balanced.” Public CTL documentation does not confirm this integration of the Loris toolkit; however, P28’s account resonates with Loris.ai’s description of its sentiment analysis application that monitors both customers and the emotional state of the agent supporting them (Zang 2024). Thus, P28 describes a parallel predictive monitoring application at CTL designed to flag conversations for supervisory attention so that de-escalation measures can occur precisely when interactions begin to trend negatively (ibid.).

This section has discussed how the operational chain of listening is governed through adherence to a conversational blueprint, algorithmic oversight, and supervisors themselves. The final theme follows the outward extension of that chain, where listening techniques and crisis data were transduced through the Loris partnership to build an AI model for customer service. The next section centers the ethical concerns raised by volunteer counsellors and the personal injury many described in response to CTL's unilateral decision to repurpose crisis data and volunteer labour.

Contesting the transduction of listening

Volunteers negatively reflect on the Loris scandal in relation to two focal points: the extractive appropriation of their listening labour and the commodification of empathy. This theme explores how volunteer counsellors made sense of the repurposing of crisis conversations and how they contested the extension of CTL's operational chain into commercial domains.

This section is drawn heavily from the first sample of participants ($n1=9$). Between the two samples, there are substantial differences in levels of awareness and understanding about the Loris controversy. In the first sample, eight of nine participants were highly aware of the scandal, whereas the second sample ($n2=23$) showed far lower and uneven levels of familiarity. In line with these differences, those in the first sample accurately described it as the commercial repurposing of crisis data within a formal agreement between CTL and Loris. In contrast, most participants in the second sample framed it vaguely as either a data security breach or a violation of a data sharing agreement on the part of Loris, with only four participants accurately describing the controversy. Given this difference, the first sample features more prominently in the critical discussion that follows.

Contesting the appropriation of listening labour

For many volunteer counsellors, the discovery of the Loris.ai partnership marked a breach of trust not only toward texters but also a violation of volunteers' free will. Counsellors give their free time and empathy to a tremendously impactful social mission: to save lives and connect with those who often feel unheard, unseen, and pushed to the margins. While their labour undoubtedly supported this mission, it was also appropriated for secondary commercial ends. For some, this was interpreted as an exploitation of the empathetic motivations that had guided their work, as P23 explains:

It's an act of abuse because it makes me complicit in that my care and words that I choose, every word I choose is with care, and it's for that person. It's not for anybody else. I didn't say those words for anybody else, just us two... before I knew about Loris.ai, I was a volunteer first of all, but secondly, I was carrying out these conversations without that knowledge.

The betrayal deepens when we consider what the act of listening entails. Counsellors work to establish rapport and to hold space for texters so that highly sensitive and often traumatic disclosures can be freely shared in confidence. Despite the best intentions, several volunteer counsellors described a disturbing realization: that the very trust they had cultivated to promote vulnerable disclosures had been used to extract data for a commercial system. For some, this retroactively tarnished the meaning they had attached to their volunteering experience at CTL.

To be complicit in that was like, what are we doing? I don't want to do that. (P21)

I'm very much complicit, creating conversations that they feel are so valuable that they can sell them for investors to make profit. (P23)

P14 chose to resign from the organization in 2020 because they suspected CTL was engaging in unethical data practices, two years prior to public reporting on the Loris partnership:

I thought I was maybe contributing to this theft of personal data instead of being a helper, which is the whole reason I was there...I think sometimes my own morals and ethics get in the way of being able to do stuff, but I don't want any blood on my hands...Sure, now and then you'll participate in something without realizing the impact, but as soon as it kind of started bubbling up in my mind, like, hey, this doesn't feel right. I just really didn't want to continue until I had some peace of mind that I wasn't doing anything harmful.

In contrast, most volunteer counsellors were blindsided about how their labour was repurposed because the idea that conversations grounded in crisis care could be used for secondary commercial gain seemed unimaginable. As P25 put it, "I think it's pretty concerning to commercialize that data. I think it's kind of morally bankrupt. I think it's pretty ridiculous to do it...It violates the spirit of the service itself and what you think you're getting."

In processing this breach of trust, P31 widened critique to the governance model at CTL where those with decision-making power were structurally detached from the work of listening:

One of my issues with Crisis Text Line was that there were a lot of people especially on the tech team in leadership positions or even just engineers and product managers that were being paid significantly higher than supervisors and frontline staff and making decisions that really affected them but were not volunteers or had never taken conversations on the platform before. So I think for me that was a fundamental tension where it's like how can we say we're really building transformative software that's meant to help other people if we're actually not actively placing ourselves in the shoes of the people that were using it. The lack of direct experience being a volunteer on the platform or working on these things, but yet like being concerned about these high-minded concepts about like, what can we do to innovate with data or how do we speed x or y up or optimize this? I think that's a very toxic ethos to apply to something that requires extreme care and caution when you're working with people that are texting in with suicidal ideation and things like that.

As this account argues, digital innovation may have been misguided at CTL due to a lack of empathetic understanding of the milieu of crisis counselling.

If authoritarian diffusion is rationalized due to a failure in recognizing the technicity of a milieu, then a different set of transductive possibilities comes into view when crisis data is not interpreted as a standing reserve that can be tapped for research experiments and commercial ventures in digital innovation. From their positionality as crisis counsellors, some volunteer counsellors imagined that tools like Loris.ai could be developed in ways that respect principles of transparency and consent in service to the wellbeing of texters.

I think it could be helpful to have this tool [Loris.ai], but that is totally undercut by the fact that you are a nonprofit who puts yourself out there to a vulnerable population as being there to help them while secretly you were mining them for value. (P9)

I think it's a nice idea personally [Loris.ai], but the fact that people don't feel comfortable sharing data and information I think that is something that that goes against what Crisis Text Line stands for. (P17)

From these accounts, a tool like Loris.ai is not inherently objectionable, rather volunteer counsellors object to the authoritarian conditions under which crisis data was extracted and used to transduce the communication blueprint from CTL into the domain of customer service.

For P21, the Loris scandal revolves not only around the sensitivity of the data source, but also the exploitation of the emotional labour and active listening of volunteers:

It [Loris] can formulate its own little canned responses from our training, no one has a patent on active listening and validating people. There's nothing particularly special going on [at CTL]. Every hotline, every hotline training is some version of the Crisis Text Line training for crisis. It's so possible to create the service of Loris without [using] people's actual suicidal crises or people's well-intentioned volunteered time—the sentence that they are crafting from their own hearts and minds. Certainly, someone can be paid to craft a sentence from their own heart and mind for Loris.

Nobody has a patent on active listening, leaving the door open for its procedural transduction into new settings. In contrast CTL's appropriation of transductive labour from volunteers and texters is firmly contested, precisely because the arrangement with Loris compromised the ethical grounding and empathetic craft of volunteers' listening practice.

Contesting the commodification of empathy

This final subsection centers volunteers' opposition to the process of transforming an empathetic technique into a commodified tool that can be abstracted from the domain of crisis counselling and seamlessly transferred into other contexts as a kind of universal instrument. For these volunteer counsellors, the “commodification of empathy” (P31) is resolutely contested for its

deviation from care-based principles. In contrast, the *commercialization* of empathy is held open as a possibility for “sociotherapy” (Stiegler 2010, 70) in which technics of care can be shared as gifts.

P31 pointedly describes how CTL’s vision for a universal instrument of empathetic communication was strikingly divorced from its situated practice in the milieu of crisis counselling:

It was just strange because the vision was, we're gonna make everyone an empathetic communicator...how can we make this our doctrine? We're gonna have empathetic communication everywhere and we're also gonna be able to make money from this. It's kind of like this commodification of empathy in a very unique way or this weaponization of empathy where it's like yes, Crisis Text Line is good and this is just one example of where empathetic communication can arise, but like what if we did this in customer service, what if we did this in x or y.

As P31 later put it even more starkly, “To me there's not really any gray areas other than you're exploiting the data from people in mental health crises to fuel a for-profit kind of dystopian chatbot venture”.

For some volunteer counsellors, the commodification of empathy lands on a deeply personal and visceral level. P23 reflects on the fragile milieu of crisis counselling while describing the core ethical stakes of procedural transduction.

The [Loris] controversy really goes to a gut reaction of just revulsion at the concept and the act of carrying out the concept. The concept was to take learnings from crisis conversations and apply them to a customer service use case and context with the idea of spreading those techniques to a wider audience essentially and helping to resolve a distress in that context of customer service. So, it was the bridge, putting a bridge over to a commercial application. And the reason [for revulsion] of course is that is not respecting the space for those very tender, intimate – to say the least – things people shared with me at the edges of what we can even comprehend or horribleness within humanity. So that deserves some protection and respect...the transformation of the source of the data, transforming that for some other, plugging it in some other place, any other place...in particular, the commercial side of it was just sickening. That's what I felt immediately. Immediately. The first article I saw about Loris, immediately, I thought, what in the world? That's the first thing, it was just gut level. That's wrong. In fact, that makes me feel sick.

P21 rendered the issue in equally powerful terms:

Using mental health as a business with the Loris.ai stuff, it's literally profiting off of people's pain, it is so insane, and it is just wildly irresponsible... It's literally profiting off of people's mental health crises.

The harms deepen in considering CTL’s position within a larger economy of care: the Loris scandal caused ripple effects across the crisis counselling sector in 2022. Public concern quickly extended to Shout, CTL’s UK counterpart, which issued assurances that UK users had not been exposed (Das 2022). Other international partners like Kids Help Phone use CTL AI models yet have not publicly commented on the data scandal. This silence leaves open whether help-seeking

behaviours have been affected in Canada or in other regions that similarly promoted their crisis platforms as being powered by CTL's technology. Uncertainty is intrinsic to the diffusion of innovations (Rogers 2003), yet in this context, uncertainty about how technology is used and how data is appropriated becomes materially consequential for texters' safety and wellbeing (Sengupta 2022). In these terms, P9 explains the structural harm of CTL's action:

The average user is not going to discriminate between Crisis Text Line and other services. It would have to take a competitor. The way Apple has branded itself as privacy protective, we [Apple] have encryption that even we don't have access to break. You have to put a lot of effort into your brand to undo the damage of the broad brush that everyone in your industry is going to be painted with when any bad actor, or even a negligent actor has a scandal like this...And I don't know that systems of care have the resources to, say 'but wait, we're not like that'.

This illustrates how the commodification of empathy can lead to widespread damage to help seekers' trust once crisis communication is framed as a transferable commercial asset by a single prominent organization.

In opposition to the CTL-Loris arrangement, P23 imagines an alternative model of transduction of CTL's active listening toolkit, similar to what was originally considered by CTL leadership (boyd):

Why don't you start an international school of Crisis Text Line and send people who've used these techniques out to do training sessions for anybody? It could be for anybody, because – I use it in my daily life, these techniques – every human being can use these techniques and benefit those around them and themselves. So it could be in schools, it could be in governments, it could be at corporate offices, and again, internationally. And so, you're taking, not the conversations themselves, but things we learn from having those conversations. And I think it is possible to protect people, and if you're clear about that's what you're using conversations for, then people can easily consent to that because it's simple and pretty clearly beneficial. That was just my thought off the top of my head, thinking it through...The data is not necessary at all for that, because what you do is you talk to volunteers who have taken 500, a thousand, 5,000 conversations and they can just share it.

This model holds the commercialization of active listening as an equitable possibility so long as active listening is not transduced beyond the boundaries of the platform using crisis data itself. P23's vision resonates with what Stiegler describes as a "new commerce" (2010, 50) in which listening technics are shared beyond the milieu of crisis counselling by the very people who give their time learning these techniques to help people in crisis. Such an "economy of contribution" for Stiegler constitutes a system of care or "sociotherapy" well suited for the digital age and its systemic appropriation of various forms of labour, whether immaterial, free, transductive, and so on (70). P23's proposal gestures toward a form of "democratic technics" (Mumford 1964), insofar as it prioritizes small-scale sharing of human skill beyond the milieu of crisis counselling

by frontline listeners.³⁰ At the risk of sounding too idealistic, listening may not solve all the world's problems, but its freely given practice might help create what Stiegler calls long circuits: "dialogical relational space" (2010, 50) in which technics can be gifted within an economy of contribution that fundamentally involves taking care of one another without personal and non-consensual financial gain.

Conclusion

This chapter has argued that the Loris partnership was not an isolated failure of data ethics but a foreseeable expression of authoritarian technics driven by platform actors (Akbari 2025), where innovations are integrated and diffused elsewhere without dialogue with those who practice and sustain a care-based technics of listening. Although the data scandal seemed unthinkable and unconscionable to many volunteer counsellors, the startup-esque *modus operandi* at CTL helps explain the rationale since the organization was built to move fast, and quite predictably, break things by damaging public trust, intruding upon the protected milieu of listening that volunteers work to ethically craft, and harming the wellbeing of help seekers. To support this argument about Loris.ai as a predictable outcome, the interview study sought to reveal the volunteers' perspectives about the platform conditions and data practices at CTL. The findings correspond to three research questions that I return to in order to draw together the contributions of the chapter.

The first question asks how listening is practiced, reshaped, and negotiated by volunteers within CTL's text-based algorithmic platform. Through a machine listening inquiry, I situated the technique of active listening within an unstable operational chain that involves a collaborative message board for counsellors, transcript logs, suggested replies, and newer AI integrations. The instability of this milieu is reflected in part by the procedural changes and tensions that are raised by the introduction of predictive listening techniques, such as risk assessments and automated analysis. However, volunteers' listening practice is itself unsettled as they form and reform moral-technical opinions about the relationship between listening and technology in the specific milieu of crisis counselling. Volunteers' accounts showed a range of perspectives about the right way to hold space and develop their skills as listeners. The study also includes the perspectives

³⁰ Mumford's formulation of democratic technics challenges authoritarian technics and is motivated by the belief that "life cannot be delegated" (1964, 7). Volunteer counsellors who feel conflicted by the technological conditions at CTL implicitly echo this conviction through their efforts to maintain active direction over the technical milieu of crisis counselling.

of enthusiastic early adopters of GenAI such as ChatGPT who use LLMs to simplify the work of listening by copy-pasting messages and adjusting the outputs of AI. Some early adopters of GenAI later return to a more manual technique of active listening by rejecting automated supports. Importantly, rejection of new technology in this milieu is often motivated by ethical principles including concerns of privacy, trust, and consent. Additionally, volunteers' rejection or disuse of new tools can reflect a conscious effort to develop active listening skills as a core practice of empathetic communication. Thus, volunteers negotiate the reshaping of listening practice on CTL's text-based algorithmic platform through a mode of moral-technical survivance in which the meaningfulness of an older series of active listening is consciously protected and preserved as a practice of caring for others. The next chapter deepens this intervention by creatively exploring how privacy can open pathways for technical survivance.

The interview study poses a limitation in relying on volunteer counsellors' accounts of their technology use which might not provide a full or accurate report of their practices. Future research could conduct walkthrough methods (Light et al. 2018) by following crisis counsellors as they handle conversations and use technological supports during their work activities. Ethical research principles must remain central to protect the wellbeing, privacy, and consent of help seekers. This could be managed through collaboration with a crisis helpline organization following internal ethics clearance and could offer social justice value in seeking to evaluate potentially harmful, irresponsible, or controversial uses of new technology. Organizational gatekeeping likely would introduce new limitations and recruitment biases, and so, alternatively, crisis counsellors could be recruited directly based on self-reported use of LLMs in their regular work activities. Phone-based walkthroughs could be conducted with crisis counsellors on text-based platforms to mitigate the ethical problems raised by in-person walkthroughs and shoulder surfing in this context. Research participants could be asked to describe how they use GenAI on a moment-to-moment basis—without disclosing personal information or conversation details—to explore how new technology reshapes and structures crisis counselling work activities, exposes help seekers to new risks, or threatens conditions of privacy and consent.

The second question asks how supervision, surveillance, and automation govern volunteers' listening practices. The study found that active listening is highly structured by a conversation blueprint that is predictably associated with positive outcomes. Volunteers are trained and

monitored to follow this blueprint, yet the oversight of paid coaches and supervisors is not operationally all-seeing. Nonetheless, the symbolic power of surveillance does lead to pronounced self-disciplinary behaviours for some volunteer counsellors. This can cause ethical conflict when a volunteer senses that a help seeker requires a different mode of attention or communication style while feeling compelled to abide by the CTL blueprint due to the possibility that their conversation might be reviewed. Thus, the presence of surveillance can be experienced as invasive or stressful by volunteer counsellors who feel constrained in their ability to communicate their listening intent by attuning to the individual needs of the help seeker. The accumulation of transcripts linked to individual counsellors takes on a quasi-disciplinary function, as a running record akin to a “correction-book” (Bentham 2011, 64) that systematically reinforces the self-monitoring behaviours described by volunteer counsellors. Volunteers suspect that workplace surveillance is also automated at CTL including the use of a counsellor effectiveness algorithm. Additionally, the study provided some initial findings about how AI systems are used by supervisors to keep oversight of the emotional stability of volunteers. In keeping with the instability of the operational chain of listening, governance at CTL involves a shifting interplay of human supervision and hybrid symbolic and operational surveillance that continues to be reorganized amid the ongoing diffusion of automated technology.

The study focused on the recruitment of volunteer counsellors and the inclusion of participants with employment experience as supervisors was unintentional, yet enriching to the study’s contributions. However, the small sample of supervisors poses a limitation that could be corrected in future research through focused engagement with supervisors. Similarly, following the earlier proposal to conduct walkthrough research, future research could explore how the monitoring activities of supervisors are supported by automated systems to better understand how surveillance is algorithmically operationalized on crisis counselling services.

Finally, the study asks how volunteers interpret and contest the repurposing of crisis data and their listening labour in relation to the Loris.ai scandal. Volunteer accounts reflected two complementary findings: First, volunteer counsellors describe the Loris scandal as a contestable transformation, whereby the procedural knowledge of empathetic active listening becomes distorted by a capitalist agenda in which profit is derived from human crisis. For instance, one volunteer counsellor used process nominalisation descriptors, namely *commodification*,

commercialization, and *weaponization* to contest this instance of procedural transduction. Second, volunteer counsellors contested how their labour was used for secondary ends that tarnished the meaningfulness of their work and left some feeling complicit in an extractive venture that violated texters' expectations of trustworthy and confidential care. This expanded upon Chapter Three's discussion of transductive labour by highlighting how active listening can double as both a mode of empathetic communication and as a form of maintenance work that contributes to the training and reproduction of AI systems. Importantly, volunteers point to equitable pathways of procedural transduction that share active listening techniques beyond the milieu of crisis counselling. Additionally, some volunteer counsellors maintain that the repurposing of volunteer labour as transductive labour is not inherently objectionable, so long as this is done transparently, in dialogue with frontline workers, and without the secretive appropriation of crisis disclosures as training data. Finally, the study examined the ethico-political interplay between transduction and innovation: all innovations are built upon a prior substrate of techniques and take shape without the "abandonment" of this "ancient series" (Leroi-Gourhan 2023, 26). The study substantiates Chapter Two's theorization of a transductive field of struggle that is commonly overlooked by an authoritarian technical regime by foregrounding the volunteers' heterogenous listening practices and perspectives on new technology. Although CTL sought to effectively "patent" a version of active listening, their posited authority over labour, data, and technique remains adamantly contested by many volunteers.

Together, these findings address a gap in the literature by showing how well-established ethical principles and known limitations of technology are lived, negotiated, and contested by frontline listeners working within a continuously transforming operational chain. The inward-facing process of procedural transduction within CTL's operational chain of listening itself left many volunteer counsellors conflicted. Concerns were raised about the constriction of human judgement and reflection through algorithmic communication protocols, automated supports, and surveillance in a milieu where human judgement and intervention in the machine are critical. Here, volunteer accounts gesture toward a form of democratic technics in striving to maintain autonomy and active direction over the technological conditions of their work (Mumford 1964).

In addition to ethical and privacy concerns raised about AI, volunteer counsellors who choose not to rely on automated supports believe that this is pivotal for their skill development, knowledge, and their ability to pay attention to help seekers. Beyond questions of de-skilling, the Loris scandal more acutely expressed proletarianization as volunteer counsellors were alienated or excluded from the product of their unwaged work (Stiegler 2010, 38). The appropriation of crisis data to create a commercial system was intensely critiqued by some volunteers as a personal and moral injury that violated the meaning and merit of their unwaged labour. Although the most obvious and significant harm of the data scandal is the potential loss of trust posed to help seekers, the erosion of trust among frontline listeners also destabilizes the ethical motivations of volunteer counsellors who remain integral to this fragile listening milieu.

As a case of authoritarian diffusion, CTL's rationalization of the Loris partnership is explained by C-suite executives' distance from the practice of listening rather than authoritarian intent or a lack of compassion for its userbase. As I have shown, the transductive field of struggle becomes clearly perceptible from within the situated technical space of a milieu. Put otherwise, those who sit firmly outside the technical circuit of holding space become capable of interpreting such technics as seamlessly transferable and generalizable beyond the procedural context of this sensitive milieu. In closing then, a machine listening inquiry offers a corrective to authoritarian diffusion by recentring the value and underlying technicity of active listening that continues to be practiced and safeguarded by volunteer crisis counsellors.

Chapter Five: Cycles of Listening: Silent Records in and out of the Colonial Archive

I am sitting in the Canadian Museum of History and have just learned that I won't be allowed to listen to a sound recording today—a digital copy of a wax cylinder from 1916 which contains the oldest known sound recording of “La chanson des Bois-Brûlés” by Pierriche Falcon. I already know this Michif song quite well and share some of its story with an archivist before whistling the opening melody. Although I left without hearing the recording—for reasons I will return to later in this chapter—Falcon's song nonetheless resonated through me that day within the colonial archive and much farther beyond it, as it has for over two centuries throughout the Métis homeland.

My visit to the institution, formerly known as Canada's Museum of Civilization, marks a singular moment that reflects a structural problematic engaged in this chapter: Indigenous technical practices and milieus navigate and persist within conditions dominated by authoritarian technics that suppress and supplant cosmotechnical difference—understood here as the articulation of cosmic and moral order through technical activity. In keeping with this tension between Indigenous cosmotechnics (or indigetechnics) and authoritarian technics, this chapter begins by reopening the problem of authoritarian technics to reveal the conditions and pathways through which plural technical practices and worlds persist despite pressures of dominance and assimilation.

The first section interprets literature on digital authoritarianism through Mumford's earlier intervention on authoritarian technics (Mumford 1964). I argue that the continuities between the history of salvage ethnography and contemporary practices of digital authoritarianism reveal the need to reopen the question of diffusion. This argument is developed in three subsections: that a long temporal view of diffusion is needed to show that what is commonly described as a recent turn to digital authoritarianism is better understood as part of a much longer consolidation of power. Second, a wide view of operational chains is mobilized to show how diffusion advances not only through the voluntary adoption of discrete innovations but through the wider expansion of technical systems organized by authoritarian logics that people are compelled to live within and become reliant upon. And third, a pluralistic view of technics is advanced to show how authoritarian technics suppress alternative technical practices and milieus. This suppression

operates in part through the extractive mode of listening that Robinson terms “hungry listening” (Robinson 2020), which I interpret as a widely diffused technique of authoritarian power.

The second section engages the history of Métis silencing in Canada to tease out lessons about technical survivance: the creative persistence of cosmotechnical difference under conditions of oppression and assimilation. I discuss the history of Métis self-silencing as a strategy of survival while interpreting Métis people’s narrativization of this period of silencing as a manifestation of survivance: the continuance of Indigenous stories that renounce tropes of dominance, loss, and victimhood. Lastly, I argue that storytelling and other modes of creative practice such as music can remediate conditions of oppressive silencing and thereby constitute pathways of technical survivance that enable the renewal of anti-authoritarian, pluralistic technics.

The third section builds on this theoretical framework to further differentiate the concept of indigetechnics (i.e. Indigenous technics) introduced in Chapter Two from authoritarian technics to foreground technical practices oriented by land-based relations and cyclical balance rather than imperatives of extraction and expansion. Contesting the assumption that indigetechnics is primitive or restricted to a pre-contact or precolonial milieu, I situate it within an ever-changing field of technological struggle to emphasize the possibility of indigenizing or reorganizing the operational chains of authoritarian technics according to Indigenous cosmotechnical principles and practices. Building on Urion’s (2022) account of singing and listening as practices that establish relation and unity with cyclical processes from a Cree worldview, this section prepares ground for my own intervention to resist authoritarian conditions of hungry listening.

The fourth section introduces the indigetechnical innovation of silent records which mobilize an operational chain of listening that asserts the continuance of cosmotechnical difference under conditions shaped by authoritarianism. Specifically, silent records name a creative operational chain composed of interlinked actions including music, photography, land-based travel, archival research, and autobiographical storytelling. This section explains my approach to handicraft that disrupts the operational chain of hungry listening through the deliberate withholding of sonic access by photographing sound reproduction media and musical performances. In doing so, silent records reconfigure what kind of listening is possible by fostering a medium of technical survivance that expresses a continuity of Indigenous technique sustained within conditions of privacy.

Together this framework provides the foundation for the research creation methodology that retraces the footsteps of my Métis ancestors by weaving between archival research and personal storytelling using silent record documentation. The objective of this project is to reassemble an operational chain of listening capable of resisting conditions of authoritarian technics while sustaining future cycles of indigetechnical innovation. The chapter closes by sharing some of the silent outputs of this project and reflecting on future directions for research, creative practice, and community engagement.

Authoritarian technics and the question of diffusion

This section reopens the question of diffusion from the framework of authoritarian technics, whereby technical systems are spread not only through discrete innovations but through a larger process of expansion. I place contemporary debates on digital authoritarianism in dialogue with earlier technical formations, including the history of salvage ethnography, to develop a broader conceptual frame for understanding how authoritarian technics diffuse over long temporal periods and across wide operational chains, leading to the suppression of pluralistic technical milieus.

A long view of authoritarian diffusion

Authoritarianism is typically characterized as a political regime that involves limited political pluralism and the suppression of democratic values and liberal rights, such as free speech (Pearson 2024). Recent scholarship emphasizes that authoritarian ideas and practices are on the rise globally (Roberts and Oosterom 2024) and are being further propelled by the Trump administration's policies (Jarrett et al. 2025). Stemming from this, there is a growing literature on what is termed "digital authoritarianism" which draws attention to the role of digital technologies in enabling surveillance, censorship, and social control (Pearson 2024; Akbari and Wood 2025; Calhoun 2025). For Indigenous peoples, however, these developments do not represent a novel turn so much as the intensification of techniques of governance, extraction, and surveillance that were operationalized long ago through colonial rule.

Digital authoritarianism can be expressed through authoritarian political regimes (Vadiati and Mehran 2025) as well as through extrapolitical actors and infrastructural logics (Glasius 2018; Costello and Gow 2025). As Pearson argues, data surveillance systems set conditions for authoritarianism regardless of the intentions under which they are implemented (2024). While

these accounts make important contributions to understanding contemporary political and technical configurations of power, their focus on digital media can obscure the longer historical trajectory and older media technologies through which authoritarian power is scaffolded upon. To address this gap, I place this literature in dialogue with Lewis Mumford's theorization of authoritarian technics to reorient the question of authoritarian diffusion according to a long temporal view. From this perspective, the history of salvage ethnography can be understood as an earlier expression of authoritarian technics that establishes parallels with the tendencies of digital authoritarianism today.

Mumford traces continuities of authoritarian technics into the early-Cold War period in a manner that anticipates the contemporary digital economy including the online attention economy and the rapidly growing hegemony of artificial intelligence across industry, education, government, and ordinary social life. He asks how "could democracy in any form survive" amid "new forms of mass control" and the "panoply of sedatives and aphrodisiacs" (1964, 7). This concern is prescient in light of contemporary developments of surveillance capitalism and the dopamine drip of social media. He further outlines a trajectory that resonates strongly with contemporary anxieties about artificial general intelligence (AGI): "Under the pretext of saving labor, the ultimate end of this technics is to displace life, or rather, to transfer the attributes of life to the machine and the mechanical collective, allowing only so much of the organism to remain as may be controlled and manipulated" (6). From this perspective, recent scholarship on digital authoritarianism can be understood as an echo of the critical concerns raised previously regarding a much longer trajectory of authoritarian technics.

This perspective prompts inquiry into the Majority World and Indigenous groups insofar as authoritarian technics extended through European colonialism have structured their cosmotechnical milieus over long temporal scales (Ahmad and Mehmood 2017; Akbari and Wood 2025). For Mumford, colonialism reflects a distinct configuration of authoritarian technics that also helps dispel the myth that democratic political regimes are incapable of authoritarian practices (Glasius 2018; Akbari and Wood 2025). For instance, the oppression of First Nations, Inuit, and Métis peoples in Canada, which has involved mass surveillance, incarceration, and genocide (Proulx 2014; Griffith 2017; Tetrault 2023), demonstrates how authoritarian rule can be exercised over marginalized populations within a nation that is domestically and internationally

recognized as democratic. Centering the voices and histories of communities who have long endured and resisted authoritarianism across myriad forms can expose the contradictions of democratic governance and establish these groups as interlocutors of technical survivance: people whose intergenerational experiences of authoritarian diffusion offer lessons in technical adaptation, resistance, and continuance.

As I explain, the history of salvage ethnography as encountered by Indigenous peoples offers important insight into the problem of authoritarian technics. The continuities and parallels of this history with digital authoritarianism become tangible upon consideration of key features, including extractivism, consentlessness, authoritarian collaboration, silencing, and the production of infrastructural dependencies.

At the turn of the 20th century, Western settlers assumed that Indigenous people around the globe were quickly becoming extinct due to the brutal effects of colonialism. As a result, “a last chance rescue operation” (Clifford 2020, 112) was mounted to collect specimens of ‘authentic’ Indigenous culture for anthropological preservation before being irreversibly lost or compromised due to patterns of miscegenation and assimilation. In Canada, the technicity of anthropological preservation was rationalized as the colonial government had willfully disrupted Indigenous ways of life, displaced communities from their territories, and forcibly removed children from their families through residential school policies that severed kinship relations, cultural knowledge, and fluency in mother tongues. This also expresses a cruel irony raised by Wakeham, that “agents of colonialism long for the very forms of life they have intentionally altered or destroyed” (Wakeham 2008, 140). In this way, dispossession prefigured anthropological preservation as an authoritarian response to colonial violence.

The mass extraction of Indigenous peoples’ cultural belongings involved early uses of new media such as the phonograph, which was used first in the field by the American anthropologist Walter Fewkes to collect songs and oral traditions of the Passamaquoddy on the east coast of Turtle Island in 1890 (Tomah 2022). Within salvage ethnography, the problem of cross-cultural listening was framed as a deficit of sensory perception on the part of the ethnographer. Anthropologists viewed themselves as guilty of “sound blindness”, described as “an inability to perceive the essential peculiarities of certain sounds” in Indigenous languages (Boas 1889, 47). The phonograph and its “apparent mechanical neutrality” (Hochman, 2014 99) offered a

technosolutionist fix that paved the way for new forms of big data extractivism (Landry 2022, 29-30).

In a pre-digital context, salvage ethnography similarly took shape across the globe under conditions of “consentlessness” (Costello and Gow 2025), whereby cultural belongings were purchased, stolen, or extracted through coercion or subterfuge (Riley 2005). For instance, Wilhelm Doegen’s Prussian Royal Phonographic Commission was conducted in prisoner-of-war camps during the First World War and recorded the languages and traditional music of captive allied soldiers from colonial territories (Hoffman 2024). Similarly, the sound recordings of anthropologist Rudolf Pöch from Southern Africa were produced in conditions under which recorded subjects often felt fearful for their safety (ibid.). In North America, we can look to Marius Barbeau, the so-called father of Canadian Anthropology and the field recordist for the version of “La chanson des Bois-Brûlés” this chapter opened with. Barbeau’s ethnographic objectives often took precedence over the wishes of Indigenous peoples. For instance, along the Western coast, Barbeau found himself unwelcome by the Gitksan people of Kitwankool. In response and without permission, Barbeau entered the village covertly at night and photographed 30 totem poles while the people were asleep (Roe 2016, 60). The consentless appropriation of “data” through technological means thus offers a striking parallel with the surveillance logics of today’s digital economy and AI industrial complex.

Although some anthropologists became famous for their ‘benevolent’ work in saving Indigenous culture, this framing obscures their roles as authoritarian collaborators under colonial rule (Boulton 1969; Nurse 2006; Hoffman 2022). For instance, Barbeau acted as a policy advisor for Duncan Campbell Scott—a controversial civil servant largely responsible for the expansion of the residential school system—and had significant influence in developing policy designed to displace First Nations such as the Huron-Wendat and Nisga’a (Roe 2016, 55; 60). Just as literature on digital authoritarian draws attention to agents of surveillance and other authoritarian practices beyond the nation-state, such as platform corporations (Akbari and Wood 2025), the history of salvage ethnography reveals the role of anthropologists as authoritarian collaborators and colonial archives as infrastructures indelibly shaped by this complicity.

Salvage ethnography did not merely extract information but produced records that actively displaced Indigenous authority over their cultural belongings. For instance, Barbeau often

claimed that he was a better judge of ‘authentic’ Indigenous culture compared with Indigenous people themselves (Roe 2016, 59) and “sought to actively exclude the cultural and political views of its subjects, particularly those which related to the contemporary moment”. In these ways, salvage ethnography functioned to silence Indigenous people by speaking on their behalf (Landry 2022).

Finally, the history of salvage ethnography reveals a similar production of infrastructural dependencies and monopolies to those evidenced today with the private sector’s brand of digital authoritarianism (Akbari 2025). As the next subsection explains, although the technological innovations of salvage ethnographers were not disseminated for Indigenous peoples to adopt themselves in the immediate present, Indigenous peoples’ contemporary engagement with ethnographic and colonial archives reveals long-term conditions of dependency that reproduce authoritarian logics regardless of intent, particularly through barriers to access and gatekeeping policies. For instance, archives can in some cases be the only place where certain stories or songs have survived. When these records are kept outside of home communities and governed by an external authority, efforts at cultural continuance and reconnection become structured by institutional and infrastructural dependency.

The contemporary repatriation of Ugandan sound recordings collected by Klaus P. Wachsmann is particularly demonstrative of how an authoritarian logic can manifest even despite good intentions (Nannyonga-Tamusuza and Weintraub 2012). Wachsmann donated his field recordings to the British Institute of Recorded Sound (now part of the British Library) while also seeking to make his collection accessible to the Ugandan people (*ibid.*). Tape reels were sent to the Uganda Museum in Kampala in the early 1960s, yet the local institution lacked the appropriate playback equipment (Kahunde 2012, 200). Much later the entire collection was digitized in 2006; however, access was initially restricted to institutions within the United Kingdom that had signed licensing agreements with the British Library (*ibid.*). Despite the stated goal of repatriation, the restriction of sonic access for nearly four decades reveals how centralized control over media technologies produces long-term authoritarian effects by denying nations and communities stewardship over their cultural belongings, including stories, songs, and ancestral voices that are actively sought out by community members in the present.

The next subsection builds on this long view of authoritarian technics to broaden understandings of technological diffusion in referring not only to the dissemination of an innovation for immediate adoption by another group, but also to the expansion of larger technical systems or operational chains that impose demands of assimilation onto other people.

A wide view of authoritarian diffusion

Throughout this dissertation I have posited authoritarian diffusion as a process whereby innovations are spread onto people without meaningful dialogue, thereby undermining peoples' self-authority over their technical milieu. For instance, the recent diffusion of Microsoft's AI Copilot for Word, which occurred as I was completing this chapter, is exemplary of this process at the level of everyday technical systems, insofar as it was forcibly (albeit briefly) pushed onto users through a product update without obvious recourse to opt out. This case also expands concerns about digital authoritarianism by intrusively capturing user attention with a colourful icon that hovers at the bottom of the page—even during focus mode—while simultaneously raising data surveillance concerns regarding how the words written on the page are being funneled into an AI system.

In contrast, by advancing a wide view of diffusion in this chapter, I emphasize how the diffusion process can occur more subtly, not through the immediate adoption of a singular innovation but through the gradual expansion and entrenchment of larger technical systems or operational chains that reorganize the technical milieus of people. While this deviates from Rogers's diffusion theory, it closely aligns with Leroi-Gourhan's writing on diffusion (2023) and Mumford's characterization of authoritarian technics as a system that is compulsively "expanded at whatever eventual cost to life" (1964, 5). At the same time, such unilateral expansion is not necessarily fully successful as groups subjected to authoritarian systems actively negotiate and resist their tendencies and effects through ongoing technical practices and strategies that can remain largely invisible or unintelligible to dominant regimes.

A wide view of diffusion thus examines how the expansion and entrenchment of a technical milieu places demands of assimilation and adaptation onto other people. This lens is productive for interpreting the developmental rhetoric commonly used by authoritarian regimes (Koch 2025) whereby the technical milieu of one group is not reorganized by a single innovation alone,

but through a much longer and wider process of disruption that restructures the technical milieus of other groups.³¹

This framework can be applied to interpret the history of salvage ethnography. Although anthropologists employed innovations in sound reproduction technology, this would not typically be treated as a case of diffusion except in terms of the adoption of the phonograph by the anthropologists themselves. Yet, the dissemination of the phonograph through salvage ethnography articulates a longer-term process of diffusion insofar as Indigenous peoples were later compelled to engage with the technology of colonial archives for purposes of cultural revitalization. Extending this long and wide view, a specific technique of listening—operationalized within audio ethnography—circulated through civilizing initiatives and operational chains such as the residential school system and day school systems, where Indigenous children were compelled to learn culturally unfamiliar modes of hungry listening.

As introduced in Chapter Two, Robinson characterizes hungry listening as a mode of listening that prioritizes the extractive capture of sound and informational certainty over the “affective, feel, timbre, touch, and texture of sound” (38). Hungry listening is a technique that reduces listening to a process of the ear, hearkening back to the convictions of Boas and his colleagues that the phonograph would resolve their incapacity for intercultural listening. A wide view of diffusion thus involves an inquiry that attends to how the technique of hungry listening became diffused through its embeddedness within myriad operational chains such as the school system, colonial archives, and the legal justice system (Robinson 2020). This aligns with Leroi-Gourhan’s conception of diffusion as “the ongoing development of a whole setup [tout un matériel] that allows it to gain hold over its neighbors and also of a political apparatus that pushes it outward” (2023, 140). Hungry listening reflects one such authoritarian theme of colonial expansion that was not voluntarily adopted but imposed through coercive assimilation of a whole setup of authoritarian technics.

³¹ For example, the developmental agenda of Prime Minister Mark Carney’s government for nation-building projects expresses authoritarian tendencies due to its lack of meaningful consultation with Indigenous nations and communities (Sanders and Pugliese 2025). A wide view of diffusion reveals how democratic regimes with authoritarian tendencies manage to consolidate power following the normalization of a whole setup of technologies and infrastructures that compels adaptation and dependency. Today this process has extended to the point that groups like the Métis Settlements of Alberta are pursuing partnership in the highly controversial oil pipeline proposal in Alberta (Stefanovich 2025) despite this posing a clear rupture with Métis values of ecological stewardship.

Hungry listening paradoxically works as a technique of authoritarian silencing and suppression. The extractive logic of hungry listening is extended by the practices of audio ethnography which together remove the speaking or singing subject from a “position of authority” over their cultural belongings (Landry 2022, 28). More specifically, the subject of recording is objectified according to the technological designs and cultural biases of the listener (ibid.). This leads to selective attention and significant editorializing of the archival record. For instance, very few sound recordings of Métis culture exist in Canadian archives before the 1950s, since the Métis people were not politically recognized by white settlers as a distinctive Indigenous nation in large part due to our mixed-race ancestry.³² Métis music was not intentionally sought out as authentically representative of Indigenous culture. Nonetheless, as Laxer notes, many voyageur songs or *chansons en laisse* of the fur trade era maintained within Red River Métis communities (2022, 153) have been collected as part of French folk culture rather than an expression of Métis identity. Authoritarian silencing is thus expressed both through what was excluded from ethnographic recording and through how archival records reassign cultural meaning through mishearing and classification. It is this complexity of authoritarian technics that reconciliation-era institutions such as the Canadian Museum of History continue to grapple with, and at times unintentionally reproduce.

The next subsection turns to the cumulative consequence of authoritarian practices, showing how authoritarian technics suppress cosmotechnical pluralism.

The suppression of pluralistic technics

This subsection adds to the prior discussion of diffusion by explaining how a central consequence of authoritarian technics is the suppression of pluralistic technical alternatives. Authoritarian systems expand violently and rapidly, as evidenced by the brutality of slavery, colonialism, and ecological destruction. As authoritarian technics expand, the space for pluralistic alternatives is diminished, policed, and forcibly constrained.

³² Alan Lomax made a recording of the Red River Jig from 1938 which is stored in the Library of Congress in Washington, DC. Some of the earliest ethnographic recordings of Métis music include the Richard Johnson Collection made in 1957 in Saskatchewan, the Henry Lane Collection made in 1961 in Manitoba, and the much larger Henri Letourneau collection which involved travelling around Manitoba, Saskatchewan, and North Dakota during the 1960s. I am grateful for Monique Giroux in sharing her report on Métis belongings (Giroux 2023).

If authoritarianism is typified by the suppression of political alternatives and the erosion of democratic values and institutions, authoritarian technics can be understood as the suppression of pluralistic technics. For Mumford, authoritarian technics is opposed to democratic technics: the technical activities, skills, and know-how of people, as well as communal forms of technological governance. For example, Chapter Four discussed volunteers' critique of Crisis Text Line's centralized decision-making model; as a more democratic alternative, Trans Lifeline is a peer-led crisis helpline that is run by and for trans and non-binary people. This grassroots organization shapes its technological orientation, as evidenced by its transparent stance against AI to prioritize the agency of help seekers.³³ Democratic technics then are not limited to democratic institutions such as electoral systems, but instead refer to a mode of public governance over technology that is opposed to the tendencies of authoritarian systems, including the suppression of dissent and grassroots technical self-determination.

Significantly, Mumford's stance is not inherently anti-technology but rather advocates for the reduction of authoritarian systems to give space for "human alternatives, and human destinations" (1964, 8). Yet the double-edge quality of Mumford's strategic essentialism is that it simultaneously gathers heterogeneous technical activities under the label of democratic technics while obscuring their internal differences. The concept of cosmotechnics offers a corrective in contesting the idea that technology is anthropologically universal and that there is thus only one proper understanding of technics and technology (Hui 2016, 11). From this perspective, democratic technics require further differentiation to account for the plurality of cosmotechnical alternatives that are suppressed by authoritarian systems.

The remainder of this subsection therefore turns to how authoritarian technics solidifies into a mode of governance through repeated authoritarian practices (Calhoun 2025) of surveillance, silencing, and acts of gatekeeping.

Surveillance represents a key strategy of cosmotechnical suppression that is made apparent through the striking inequalities of privacy in both democratic and authoritarian political regimes. In Chapter Two, I explored how privacy represents a pre-condition for alternative forms

³³ Trans Lifeline's privacy policy states explicit limits on its use of AI, excluding uses for predictive risk assessment, content generation, or as a substitute for trained staff. The policy further clarifies that collected data is not used to train external AI systems ("Terms of Service and Privacy Policy" 2025).

of technical practice and innovation. More specifically, I emphasized the motif of a retreat into the bush in Indigenous storytelling whereby a solitary human steps away from social intrusion to open space for sociotechnical relations with more-than-human relations. However, a hallmark of authoritarianism is the targeting of minorities and marginalized people (Jarret et al. 2025) that discriminately impinges upon peoples' capacity for withdrawal from privacy intrusions. In this way, spaces of cosmotechnical retreat are not freely given to those who are unevenly subjected to surveillance, but rather, must be actively reclaimed and protected.

Importantly, authoritarian effects do not depend on authoritarian intent (Pearson 2024). In an era of Indigenous reconciliation, colonial archives can continue reproducing authoritarian effects regardless of intent, as Indigenous people are compelled to engage dominant infrastructure to access their own cultural belongings while being subjected to practices of gatekeeping and surveillance. The stakes of engagement and repatriation are often governed by a Western legal regime and many archival collections carry uncertain copyright status and legal clearances, causing archives to restrict access to these materials even to their originating communities (Mills 2017). The centralized control of recordings means that "audiovisual archives are filled with hard-to-access recordings" (Seeger 2006, 76). Without access, these recordings cannot be heard, reintegrated into community standards of care (Reed 2016), or recirculated and revitalized as cultural belongings.

In the case of Métis music, gatekeeping of archival records also immobilizes songs in ways that conflict with Métis cosmotechnical principles of musicking. As Maria Campbell teaches, Métis people have always carried their songs with them whether travelling by canoe, on foot, or by red river cart (Campbell in Coyes 2002). Thus, the authoritarianism of the archive manifests through the restriction of sonic motion and the curtailment of a song's natural right to movement, a constraint, thereby suppressing the principle of mobility central to a Métis milieu.

The remainder of the chapter aims to counter authoritarian technics' suppression of pluralistic technics through a discussion of the mechanism of technical survivance, which underscores the conditions, practices, and pathways through which cosmotechnical diversity persists despite being obscured and displaced within authoritarian systems.

Technical survivance

The concept of technical survivance was introduced in Chapter Two to characterize the continuance of technical practices and technologies that endure by remaining partially concealed, opaque, or deliberately withheld from dominant regimes of perception and intelligibility.

Technical survivance can be motivated by cultural tradition, political convictions, or moral considerations, and is marked by intentionality rather than the passive persistence of inherited practices. The concept emerges from a fusion between Leroi-Gourhan's concept of technical survivals (2023, 137) and Vizenor's theorization of survivance, to describe the creative adaptation of a technical milieu to authoritarian practices, including strategies of surveillance. In this way, technical survivance names a mechanism for the continuance of cosmotechnical milieus that sit "side by side" with authoritarian technologies (Mumford 1964, 2).

Mumford himself implicitly describes a process of technical survivance in noting that even under the most expansive authoritarian systems the continuance of democratic technics can still be observed: "Even when paying tribute to the most oppressive authoritarian regimes, there yet remained within the workshop or the farmyard some degree of autonomy, selectivity, creativity" (1964, 3). By further conceptualizing technical survivance, this section lays out an analytic framework for understanding how the persistence of pluralistic technical milieus reflects a form of anti-authoritarian resistance. In what follows, I develop this framework and consider how technical survivance can also take shape through processes of reconnection and relearning that follow campaigns of silencing.

The moccasin telegraph offers a valuable example of technical survivance by demonstrating the continuance of Indigenous technical activities alongside encounters with Western new media. It also illustrates a long and wide view of technical survivance, in which cosmotechnical infrastructure persists not through the preservation of discrete tools but through the ongoing reconfiguration of operational chains of communication according to Indigenous worldviews. While the term has been racially trivialized in colonial usage to refer to the transmission of gossip or rumor, within Indigenous circles it continues to name informal, grassroots networks through which information circulates outside of dominant infrastructures. Historically, moccasins were integral to communication across Turtle Island, but the contemporary invocation of the moccasin telegraph reflects the cultural understanding that communication practices continue to

be inseparable from questions of positionality, territory, and land. Despite the obsolescence of the telegraph, the moccasin telegraph continues to be reconfigured as an operational chain that persists as a cultural touchstone of Indigenous communication infrastructure. The persistence of this metaphor then is revealing of the intentional maintenance of an Indigenous technical milieu under conditions of authoritarian diffusion.

In this chapter, I am particularly engaged with how the theme of silence can structure conditions and opportunities for technical survivance, which I further conceptualize here and in the research-creation project that follows.

The stories of Métis people are commonly marked by conditions of silence, yet as I explain in this section, silence itself has shifted in function over time from a tactic of survival to an expression of survivance, and eventually into a mode of technical survivance.

Silence as survival

After the defeat of the Métis Northwest Resistance and the execution of Louis Riel in 1885, Métis people faced growing marginalization in Canadian society through displacement and dispersal into smaller and more remote communities, and increasing pressure to assimilate. Self-silencing became a tactic of survival as it was “unwise and sometimes dangerous to publicly identify as Métis” (Russell and Wynko 2023, 24). Even strong Métis leaders like Maria Campbell were affected in this way growing up. She recounts that she noticed a change in her parents’ attitudes when they drove into town: “everyone became quiet and looked different” (1973, 37). Across the Métis homeland, some Métis chose to “suppress their dual heritage for the good of their children” by seeking to gain legal status as Indians while others sought to blend in as white (Devine 2010, 192).

In approaching my own family’s story, I am left speculating about when a tactic of self-silencing took hold. Through my maternal grandfather, my Métis kinship is rooted in maternal relations deeply rooted in Penetanguishene and the neighboring community of Lafontaine: Marguerite Dusome, Victoria Marchand, and Julia Alida Maurice. Yet it is probable that conditions of silence really took hold in my family’s story in the early 20th century, since my grandfather, who was born in 1940, does not recall ever being told he was Métis as a child. This timeline corresponds with the increasingly dismal economic and social reality faced by Métis community members at

the turn of the century in Penetanguishene, which put the community at the very bottom of the social ladder in terms of employment opportunities and educational advancement.

The gradual decline of the fur trade in the south and subsequent emphasis on mining and lumber in the Great Lakes region had serious implications for the French and Ojibwa, but the implications were quite severe for the Métis. Where they had previously held high status as middlemen...by the time of 1901 census their status had changed along with the economy. (Travers 2007, 230)

Survival-based silence functioned as a learned practice that disciplined how Métis people navigated language, identity, and belonging across everyday life and institutional spaces. In *Returning to Ceremony*, Fiola quotes Louis Soren, who grew up in Ste. Anne, Alberta with his family identifying as Catholic and French instead of Métis. He explains that it “was survival to identify as French; there were no benefits to identify yourself as Métis. Already as kids, we were discouraged from doing anything that could expose us [as Métis]. No [speaking an Indigenous] language” (Fiola 2021, 130) [insertions added in source]. Similarly, my great uncle René explained to me that the education system made him realize he was living between two worlds: a world of everyday life and one inside school where the way he spoke French was policed. He described going to school as like turning off a switch, as assimilation was enforced through discipline. Over time, such disciplinary silences reshaped the conditions under which stories and cultural knowledge was transmitted or withheld.

The common experience of self-silencing by Métis people, however, has established silence as a theme of survivance, as reflected in historiography that names it as a condition of withdrawal within a much longer history of resistance.

Silence as survivance

The silence that followed the defeat of the Northwest resistance represents a touchstone in Métis historiography. Métis historian, Jean Teillet (2021, 397) explains that after this point, “the Métis entered their bitter years of hiding, *le grand silence*. They were scattered and their leaders were silenced” (397, emphasis in original). *Le grand silence* refers to a period in which Métis people faced intense persecution and marginalization in society from 1885 into the mid-twentieth century, prior to the emergence of the modern Métis sovereignty and rights movement.

Survivance names an active assertion of presence (Vizenor 2000) through the continuance of stories that fuse together survival and resistance to cultural domination (Vizenor 2009, 24). From

this perspective, the re-presentation of conditions of silence in Métis stories illustrates how reactive survival is remediated into a mode of collective survivance.

Métis stories of survivance illustrate the felt and collective presence that silence has in Métis communities. Writing about her childhood experiences in northern Alberta in the 1960s, Devine writes (2010, 185-6):

There was another group of Native families in the community who were, for all intents and purposes, invisible from an “Aboriginal identity” point of view...Generally, these families were headed by one Native parent and one white parent, one or both of whom were gainfully employed, and were housed and conducted themselves in accordance with the mainstream. A discreet silence was maintained about their Native ancestry, though most long-term residents knew who was, and who was not, Native. When outsiders who looked Native moved into the community, subtle, and not so subtle, inquiries were made by white acquaintances: Do you speak French? Do you speak Cree? Métis ancestry was simply not discussed in the open in our town. Instead, the local whites arrived at their own conclusion and acted accordingly.

Silence in such accounts does not signal utter erasure or a loss of identity, but a shared Métis experience of cultural belonging amid structural marginalization. While silence unmistakably functioned as a tactic of survival, its ongoing recurrence as a narrative motif names the very conditions under which Métis sovereignty and stories have persisted. However, attention to the practices through which stories and cultural knowledge are transmitted or displaced reveals how silence also operates at the level of technical milieus, thereby marking a transition from survivance to technical survivance.

Silence and technical survivance

Conditions of silence threatened the continuance of storytelling practices for disconnected Métis people. As Michif Knowledge Keeper Mary SkyBlue Morin explains:

Telling stories has always been an essential part of who the Métis are as a People. It is a way in which we share life lessons, pass down our history and learn from each other. Storytelling is intergenerational; grandparents will pass their story on to their grandchildren, who will then pass those along to their own children and grandchildren. It is how we come to understand our family history and it is how we keep our culture alive. (Oster and Lizée 2021, 64)

Stories thus encode cosmotechnics, understood as the shared values and beliefs that organize technical action, guide practice, and gather people through social bonds. Yet technics must be learned and practiced in order to be passed down. After the danger that prompted tactics of silence has subsided, cultural techniques are not automatically revived but must instead be actively reclaimed and revitalized.

Silence then can disrupt cultural transmission, yet the naming of silence as a shared condition can foster the space necessary for relearning and renewal by inviting disconnected Métis to seek out old stories, traditions, and ways of life. Technical survivance in this case does not refer to unbroken transmission, but to the intentional recovery or reassembly of traditional knowledge and disrupted operational chains. This reframing allows silence to be understood not as a permanent erasure, but as an interruption and transitional condition through which disrupted cultural practices and technologies may later be recovered or retooled.

Technical survivance then can manifest through practices and programs of intentional relearning that require the unlearning of authoritarian technics. Beyond Indigenous contexts, this dynamic can be glimpsed in movements such as slow food and slow fashion, which consciously reject hyper consumerist technical modes in favour of revaluing artisan practices. The throughlines of technical survivance may not always be evident yet retain a latent or silent capacity for resurgence. Within Indigenous worlds, these throughlines are often even less visible: Indigenous technicity is frequently unrecognizable by Western regimes as a form of technics (see Chapter Two), allowing its continuance to remain unnoticed, particularly when technical survivance unfolds through gradual and diffuse processes of cosmotechnical revitalization, following centuries of attack and suppression. For instance, Indigenous language revitalization programs work hand-in-hand with the revitalization of cosmotechnics as gleaned in Chapter Two's discussion of the Anishinaabemowin word family of pipigwan (flute), pipigwis (woodpecker), and pipigwe (the language of the instrument). Language revitalization offers a stepping stone to reclaim traditional modes of technical thinking which in turn can reorganize technical activities according to Indigenous worldviews. Such revitalization practices make legible how other technical relations, practices, and modes of thought persist and can be defiantly replenished under authoritarian conditions.

In summary, technical survivance is conceptualized not as a static form of cultural maintenance, but as a set of adaptive processes that involve a continual reorganization of operational chains under changing conditions. The following section builds on this understanding by returning to the concept of indigetechnics, not to detail a repository of pre-contact techniques, but rather to further specify a cosmotechnical category of milieus that retain capacities for renewal, resistance, and innovation.

Indigetechnics

Indigetechnics helps diversify the field of technics to avoid reproducing a homogenous relation between human culture and technics (Hui 2016, 24). While Mumford's formulation of democratic technics is envisioned as anti-authoritarian, he himself notes that authoritarian technics has "insidiously" permeated Western society (1964, 4). Thus, it becomes productive to intentionally analyze technical milieus that can be overlooked or suppressed within Western technocultural frames as a means of contesting authoritarianism.

Indigetechnics refers to techniques and operational chains of technical action that materialize Indigenous worldviews. This includes practices governed by land-based relations and oriented toward maintaining balance with cyclical processes and more-than-human relations. Drawing from Urión (2022), listening figures prominently in my discussion of indigetechnics as a practice that is distinct from hungry forms of sonic extraction insofar as it draws the listener into a relationship of multimodal resonance with the world. The section concludes by returning to an indigetechnical trope concerning the importance of privacy and a degree of relational quietude for particular forms of technical practice and innovation.

'Indigenous' operates as a cultural signifier and strategic label that sets groups of people apart from the West. The term is applied to ethnic cultures that are place-based and maintain relationships with the territorial homeland of ancestors (Stewart 2018). However, definitions that involve land-based rootedness raise problems due to the displacement of Indigenous nations and communities by war and colonial policies, including the dispossession of ancestral territories and the relocation of groups onto reserves. Despite sometimes fractured relationships to place, Indigenous people understand themselves in close relation to the natural environment, cycles, and more-than-human relations—reflecting beliefs that materialize through technical actions and systems. Indigenous knowledge "is commonly associated in the Western context with the primitive, the wild" (Semali and Kincheloe 1999, 3) in large part because Indigenous people tend not to frame humanity as set apart from nature or regard the natural environment as something to be mastered. Yet as Stewart (2018) notes, the term Indigenous articulates a strategic essentialism (Spivak 1999) that is posed in distinction from global identity categories such as Western, when in reality both labels are "general words for heterogeneous groups of peoples, who nevertheless understand themselves as aligned in some way" (Stewart 2018, 740). Stewart describes this label

as a stratagem of asserting unifying difference to support the political projects of Indigenous groups (741). Without strategic reification of difference, oppression, and opposition to colonization, Indigenous people often remain politically unrecognized (*ibid.*). Similarly, the concept of indigetechnics is deployed to ensure the intelligibility of a technical milieu that is otherwise invisible under authoritarian regimes.

Indigeneity can be romanticized (Freire and Faundez 1989) and policed according to biased frameworks of authenticity that tend to misrepresent Indigenous groups and their technical milieus as static and uncontaminated by cultural exchange. Although Indigenous people can lean into tropes of authenticity for political or aesthetic purposes, authenticity discourse distorts the dynamic interaction of Indigenous milieus with other social groups and global technoculture. Romanticization of Indigenous authenticity leads to arguments about the need to “restore the indigene to a pure precolonial cosmos” (22). However, this repeats the authoritarian logic of salvage ethnographers who silenced Indigenous voices by similarly delimiting Indigenous authenticity within a precolonial past (Gruber 1970; Roe 2016). The concept of indigetechnics, that I further develop here, is informed by an anti-essentialist approach—recognizing that a return to a precolonial technical milieu is impossible (and undesirable for most), since “all cultures (especially colonized ones) are perpetually in a state of change” (22). The point of an indigetechnical inquiry then is not to reify authentic technics, but rather to trace cosmotechnical continuities within dynamic conditions of innovation and technical exchange.

The concept of indigetechnics itself emerges through cross-cultural exchange and reflection: Jessica Perea, a Dena’ina music scholar, develops the concept of Indigelogics in dialogue with George Lewis’s articulation of the Afrological, which emphasizes foundational differences with Eurological aesthetics and values (2021, 259). Indigelogics is formulated to counter the Western separation between song and law as well as art and politics (260). Drawing from Trevor Reed’s concept of sonic sovereignty, Perea shows how songs can perform sovereignty when they resonate “within a particular place, backed by the authority of a network of powerful, long-term relations existing there” (Reed 2019, 509). Giroux (2024) extends this framework in a Métis context by showing how fiddling, singing, dancing, and gathering at Back to Batoche Days activate Métis sovereignty at a site shaped by colonial resistance and ongoing resurgence.

Adding to this body of work, the framework of indigetechnics supports my practice-based inquiry into technique and technology.

Sharing from a Cree worldview, Union describes a cosmology in which singing and listening are practices that restore balance and resonance with cyclical processes (2022, 28). Read through the framework of indigetechnics, these culturally learned and repeated practices can be understood as technics insofar as they materially organize relations with land, more-than-human life, and ongoing cycles. Musical practices then can craft relations of resonance with cyclical processes and “the ongoing rhythms of the environment” (24). Listening here acts as a multimodal technic of “body listening” (32) whereby sounds—both audible and unsounded (Goodman 2009) impress themselves as a form of touch on the body, both inside and out. For example, low frequencies can induce eye movements that subtly blur distinctions between hearing and seeing. However, in this context, listening does not refer solely to vibratory resonance within the body but extends beyond it through cosmotechnical relations with more-than-human worlds and cyclical processes.

The next section lays out my approach to renewing a cyclical mode of indigetechnical listening that does not mount a return to a pre-contact technical milieu but rather crafts a method of technical survivance through the intentional reorganization of an operational chain of listening. The project turns to Métis belongings in sound archives as bundles to be gathered up again and recirculated in resonant motion with the land and natural cycles. Yet this method remains cognizant of the central problematic of the chapter, insofar as the renewal of indigetechnics is bound to face ongoing authoritarian pressures and practices, including archival gatekeeping and the looming technoculture of hungry listening. In response, the chapter returns to an indigetechnical insight from Chapter Two that certain forms of technical practice and innovation depend on spaces of withdrawal from observation. Thus, the remainder of the chapter leans into silence to craft a space of privacy for indigetechnical revitalization.

Silent records as indigetechnical innovation

Silent records represent a media form that disrupts cultural and audio-visual expectations, patterns, and operational chains. Put simply, silent records are photographs of sound media, musical technique, and song performance. As a visual re-presentation of sonic practice, these artefacts withhold sound without foreclosing possibilities of listening. Instead, silent records

defer and complicate listening itself. First, these photos can be re-presented in public talks and community gatherings. For instance, I've shared this project with audiences by singing over my own catalogue of silent records. Second, they complicate positivist certainties concerning listening by pushing the viewer to *listen to images* by looking beyond the visual register and connecting to "the event of the photo" (Camp 2017, 9), as well as its location, resonance, and cosmotechnical orientation.

Silent records reflect a creative response to authoritarian technics that engages a very simple and accessible form of handicraft that intentionally resists extraction, surveillance, and disruptive intrusions. Thus, silent records challenge authoritarian tendencies by recrafting boundaries of communication and access. Yet more than a simple withholding of sound, silent records are envisioned as communication channels for anti-authoritarian dialogue and diffusion. Rather than circulating songs as extractable objects, silent records diffuse a technicity of listening that can be adopted and retooled for purposes of cosmotechnical continuance under pressures of authoritarian technics. Thus, as communication channels, silent records allow for the diffusion of a pact of silence (see Chapter Three) that involves collective refusal and acts of mutual care for worlds beyond ourselves.

This approach to silent records emerged intuitively alongside engagement with Indigenous artistic practice, theory, and Métis histories of silencing. I came to this creative practice after reading Robinson's *Hungry Listening* (2020) and through reflection on the creative projects of the many inspiring Indigenous artists he discusses including Peter Morin, David Garneau, Cheryl L'Hirondelle, and Jeremy Dutcher whose works deal variously with themes of silence, resistance, and resurgence. At the same time, the practice certainly grew from an intuition rooted in my family's story of cultural disconnection and Métis silencing, although I did not fully recognize this until much later in the project. Intuition is a key aspect of Indigenous research (Wilson 2001, 178) and represents a common link with research-creation methods which require the practitioner to fully invest and trust in an original and untested process (Chapman and Sawchuk 2012, 12). From a Métis standpoint, the relevance of research creation is unsurprising as our great leader, Louis Riel affirmed: "My people will sleep for one hundred years, but when they awake, it will be the artists who give them their spirit back" (oral teaching). Silent records take up this call for creative continuance.

The project challenges the equation of indigetechnics as being nature-bound or utterly primitive by mobilizing silence as a technique of survivance. As Vizenor explains: “Nature has no silence. The poses of silence are never natural” (1994, 52). Rather silence represents a strategy of survivance (16) that can be operationalized through technique and technology. In this sense, the method discussion that follows reconstructs the gestures of research creation, “flake by flake” (Leroi-Gourhan 2023, 176), as a sequence of technical actions that use silence—and the privacy it affords—as a pathway for indigetechnical innovation.

Methodology

A paradigm refers to a set of beliefs—namely, ontological, epistemological, and axiological—that together gather and guide a set of actions that produce a researcher’s methodology (Wilson 2001, 175). Yet it is important to acknowledge that the technical actions that constitute Indigenous research methods are themselves expressions of survivance. As Kathleen Absolon explains: “Colonizing knowledges has attempted to silence Indigenous ways of coming to know and has fabricated notions that Indigenous methodologies do not exist or are wishy washy soft methodologies” (xv). The continuance of Indigenous methods is not an accidental survival, but an intentional and adaptive process sustained under authoritarian-colonial conditions. Absolon’s conception of *re-search* affirms this orientation by reframing Indigenous methodology as a restorative and reconnective process. Thus, Indigenous methodology enacts a process of technical survivance by involving techniques and protocols that are not remnants of the past, but rather “living, breathing fluid processes that will inevitably continue to emerge and shift” (2).

Within this framework, research-creation can be understood as one site where indigetechnical survivance is methodologically enacted. Indigenous research and research-creation are similarly oriented by creative and disruptive praxis that challenges “orthodoxies of thought and action” (de la Garza 2023, 380). Research creation, and particularly what Chapman and Sawchuk (2012) delineate as “creation-as-research”, remains a controversial category of inquiry that is well suited to disrupting established patterns of technical action and methodological doxa (19). By redirecting media technology, research creation can unsettle disciplinary logics and cultural relationships with technology while generating knowledge through the creative process itself (ibid.). In this way, creation-as-research can produce knowledge about technical survivance by following pathways of survivance involving Indigenous and creative research methods.

This cyclical orientation to technical survivance is central to the project's methodology which engages Indigenous methods to both enact and make perceptible the continuance of indigetechnics under authoritarian pressures. Cyclicity then is engaged as a guiding research principle consistent with what Sarah Amira de la Garza calls a "Four Seasons approach to methodology" (2007, 153), whereby certainty and closure in research are not sought out as research outcomes, but rather the cultivation of conditions for uncertainty, shifts in habits of thought and action, and most fundamentally, the renewal of relationships with natural cycles.

The remainder of the methods discussion recounts my orientation and intent to research creation, my preparation for the project, and the actions I took in archival and land-based re-search. By walking through the method in this way, the chapter establishes the conditions for a two-eyed dialogue in which Indigenous research creation is foregrounded as an anti-authoritarian paradigm. While Chapters Three and Four demonstrated how authoritarian diffusion can be analyzed through Western methods, here, the dialogue shifts to address the repeated failure of authoritarian systems to listen, recognize, and learn from other cosmotechnical orders.

Orientation and intent

In this subsection, I locate myself, my story, and the operational chain of listening that shapes the project's method.

This re-search grew from a lived experience of cultural disconnection and an intention to center my musical gifts in methodological practice (Absolon 2022). I grew up in a mixed-race household and heard no stories from my mom that taught me about being Métis. I knew I was Métis as an adolescent but had no idea what this meant. Growing up in Ottawa, my parents, sisters and I would pack in the family minivan for long summer drives to Penetanguishene to visit family. In addition to geographic distance, I felt significant cultural and linguistic difference from my Métis and French-Canadian family who lived there. Later, in my early adult years I became a professional touring musician but remained largely disconnected from Métis culture. As a result, I was a musician and knew I was Métis, but never considered myself to be a Métis musician. The irony of this disconnect is that I played violin as a kid without learning how to fiddle. This condition of cultural disconnection, together with the silent presence of Métis culture in my life, oriented my plans for research creation.

The project retraces the fur-trade migration and colonial displacement that marked the lives of my Métis ancestors. I am a member of the Georgian Bay and Environs community, belonging to the Dusome-Clermont family line that originally came from Red River and migrated from Drummond Island in Lake Huron. While most Drummond Islanders immediately resettled in Penetanguishene in 1828 after being displaced following the War of 1812 (Brumwell 2012),³⁴ the Dusome-Clermont family briefly lived in the Métis community in Sault Ste. Marie before eventually relocating to Penetanguishene. This intraregional mobility reflects a familiar voyageur story, marked by a “group identity which was less place-specific than regionally and occupationally defined” (Peterson 1985, 63). In my project, I returned to these locations to reconnect with the places my ancestors lived alongside the waterways and seasonal travel routes they were familiar with and depended upon.

I reflected on how to approach travel within my method and how to reintegrate the cyclical motion of music. During the fur trade, the music of voyageurs was heard across the waterways and many of these traditional songs have been maintained within Métis communities (Laxer 2022). For this reason, I knew early in the project that I wanted to sing Métis music in places where it was traditionally heard and sung, including at sites of cultural resonance.

I planned this as a summer road trip with my partner and son, mirroring older seasonal cycles of canoe travel that followed the long thaw of winter rivers. Alongside this physical travel, my research involved a kinship circle including my Great Uncle, mother, grandparents, and cousins in Penetanguishene, who helped piece together stories, memories, and gaps in knowledge. This moccasin telegraph involved phone calls, text messages, and social media, functioning as part of the project’s operational chain of listening. I also concluded the trip with a family gathering in Penetanguishene and returned the following year for the Métis Nation of Ontario’s annual assembly—echoing seasonal traditions of Métis rendezvous.

Archival research was integrated into the travelling methodology, including work in Winnipeg and a separate archival visit in Gatineau during a family visit to Ottawa. Although remote access to archival collections was offered to me, I chose to visit these sites in person to carry a slow and intentional ethic of re-search into the archive itself. This approach helped me to resist extractive

³⁴ Drummond Island Métis were forced to leave once the island became part of American territory with the Treaty of Ghent.

habits of hungry listening by stepping outside familiar patterns of remote access, digital convenience, and unmitigated cultural consumption. Archival research further spiralled outward to involve old family photo albums and conversations with family members. In this way, archival sites and materials were retooled within the project's operational chain of listening.

The next subsection recounts the preparatory stage of work that I undertook for the project. While this stage literally occurred in Spring, it also aligned with the Spring stage of research outlined in de la Garza's Four Seasons approach (2007), which involves preparation, imagination, and reflection to create a foundation for research.

Springtime preparation

In the Spring of 2023, I entered the preparatory stage of re-search that included speaking with my great uncle René Laurin and Métis fiddler Alyssa Delbaere-Sawchuck, planning the itinerary of my trip, learning and practicing songs, and organizing archival visits to the Centre du Patrimoine, the Saint-Boniface Museum, and the Canadian Museum of History.

I drew from historical Métis song collections, contemporary Michif compositions, and voyageurs' chansons d'aviron to engage with the density of Métis musical culture (see Appendix C for the song list). This approach resonates with Chris Andersen's argument that Indigeneity be approached through the lens of *density* rather than difference "which vastly oversimplifies the complex set of relations within and through which contemporary Indigenous collectivities and their histories are represented" (2009, 88). My own focus on Métis vocal music was a practical choice (since I can't fiddle) that also allowed me to sound out the density of Métis musical culture beyond fiddle traditions.³⁵

This stage of preparation involved learning, adapting, and arranging songs. I read lyrics, listened to song versions, rehearsed, and readapted several songs; in particular I adapted the voyageur songs on my list, many of which in the past would have been sung a capella by a group of men whilst canoeing. I arranged several of these songs for solo voice with guitar accompaniment. Rather than striving for historical authenticity, this approach engaged the density of contemporary musical Indigeneity. As Urion argues, "guitars are Indigenous drums and don't

³⁵ Fiddling is central to Métis musical culture and is frequently described as a key marker of Métis distinctiveness within Indigenous studies and ethnomusicological literature (Giroux 2024)

replace Indigenous drums” (2022, 26). Similarly, my guitar functioned analogously as a paddle, both in its shape and in its capacity to foster a rhythmic connection with the rivers and lakes while singing at the shores where many of these songs were once sung.

Spring transitioned into summer as a season of growth (de la Garza 2013) and movement. Long before modern highways were built, spring and summer were seasons for long-distance travel, as rivers functioned as a natural transportation infrastructure. In resonance with this cyclicity, I travelled throughout the summer months with my family.

Summertime growth

Within the Four Seasons methodology, summer is a period of gathering knowledge alongside personal growth for the researcher (de la Garza 2013).

Throughout the summer my family and I travelled throughout Ontario, Manitoba, and Michigan to Penetanguishene, Killarney, Sault Ste. Marie, Drummond Island, St. Joseph’s Island, Michilimackinac, Lake of the Woods, and Red River (i.e. Winnipeg). Along the way, we stopped at historic sites like Mica Bay near Sault Ste. Marie and Métis landmarks around Winnipeg like the Riel House, Riel’s gravesite, and the site of the Battle of Seven Oaks.

Archival research was undertaken alongside this land-based travel rather than as a separate phase of inquiry. Together, my relationship to my repertoire grew through repeated singing in different locations and through encounters of different versions of these songs in archival collections. Over time, I felt a deepening connection to this music in resonance with the Métis homeland. This pairing of archival and land-based research also helped me cultivate a space of reflection and indigetechnical practice that would have been less forthcoming through archival research alone.

My approach also involved ceremonial cycles at each stop in my travel to purposefully connect with each visit. I began with a “protocol attitude” (Urion 2022, 31) in acknowledging the field with personal respect and in attempting to situate myself as a “co-resonator” (28). I would smudge and sing Andrea’s Menard’s “Nitootimuk (Visiting Song)” (2022). I sang different songs at each place and my partner, Amanda, would take photos of my singing. I would then close each visiting with Menard’s “Nitootimuk (Leaving Song)” (2022).

Ekwa ee keewiyan (I am going home now)
Tahki nakiskisin (I will always remember)

Ooma nakomowin (This song)
Nanaskomowin (The feeling of gratitude)
Kisiwatissiwini owow (For your kindness)³⁶

Together, these actions and cycles created the conditions for the silent record methodology which is organized around a persistent problematic rather than fixed research questions. Rather than resolving the tensions engaged in this chapter, the outputs or autumn harvest of this project animate a process of technical survivance, showing the continuance and adaptation of indigetechnics under conditions of authoritarian technics.

An autumn harvest of silent records

This section shares the silent records produced from the project's operational chain of listening. Winter is typically associated with research publication and sharing "findings" in the Four Seasons framework (de la Garza 2013); however, I understand this section as an illustration of a fall harvest that prepares me for future work in community sharing and storytelling.

The first silent record I share did not emerge as part of the planned research activities during summer travel and creation, but resurfaced from the process of re-search itself, as analysis prompted me to revisit old memories, stories, and family photos. Put otherwise, the creative process led me to interpret a pre-existing photo as a silent record in its own right, especially since it similarly defers and complicates listening.

The second group of outputs are drawn from my visit to the Canadian Museum of History, centering photographs of wax cylinders. In this case, silent records are used to call attention to the ongoing authoritarian operation and governance over Indigenous cultural belongings in colonial archives.

The third group of outputs feature a small selection of photography of musical practice from my land-based fieldwork. The selection of silent records in remote areas affirms the significance of conditions of privacy—that is, of retreating to the bush—for purposes of indigetechnical practice and reconnection.

³⁶ Menard translated these lyrics with language keeper Tom McCallum.

Silent inheritance

Lèsé mwoi kawmansé dzu débu. Some of my fondest early memories are filled with music at home: the sounds of my father’s piano and guitar playing, his singing and the shared laughter of my parents and sisters. Yet these memories are not restricted to sound alone but include feeling very close to my father as I sat on his lap as a child while I watched his hands work their magic while bouncing up and down with his knee as he pedaled the piano. My dad was the dominant musical influence in our household, and my sisters and I certainly admired him for his gifts.

Growing up in Ottawa, we had many instruments at hand in our home, yet my sister, Jacquie, insisted from a young age that she wanted to learn the violin after watching an episode of Sesame Street. As the youngest of the family, I decided to follow in her footsteps. Both Jacquie and I took private classical violin lessons for several years, although I eventually quit out of frustration with the instrument and a lack of personal discipline for practice at a young age.

What sticks with me the most from this period of rudimentary musical training is a family reunion with my mother’s relatives in Penetanguishene where Jacquie and I – at ages 9 and 8 respectively – were asked to go on stage to perform. As I began to write this chapter I shared this memory with my mom, and she quickly dug out a photo of the occasion from a photo album (Figure 4). Looking back, I can’t hear music or even remember what we played yet I still sense “sound acting on me” (Heller 2024, 2) such as the ringing of the amplification system and applause from my extended family. From the photo I can also feel the warm trace of wet kisses on my face and the gritty sensation of rosined bow hair moving across strings. However, I also recollect a subtle mismatch of cultural expectations, as some relatives had hoped we would fiddle.



Figure 4: *Performing with my sister in Penetanguishene (1997)*

At the time, I didn't understand this distinction as I had never really heard fiddling before, so on the long drive home I inquired with my parents. While I cannot recall the specifics of the conversation, I was left with the impression from my father that fiddling was 'folksy' and 'low-class' music. This disdainful view reflects my father's upbringing in a household that revered the European classical music tradition and also speaks to broader racial and cultural distinctions shaping the Neville family's unmarked settler Canadian identity: as *Canadian* Canadians (Mackey 1998, 33) of Irish and English descent. From that point onward, I was left with the firm impression that fiddling was 'low culture' and so were my mother's family roots.

More recently I have come to realize that this narrative of cultural superiority was not only learned within my household but was inherited through generations of internalized racism and shame shaped by longstanding assimilationist policies and colonial ideologies in Canada targeting Indigenous peoples. My mom, Giselle Forget, was raised as French Canadian but learned shortly before I was born that her dad was Métis. When my mom asked about this for the first time, my grandfather sharply cut her short: "we're not Métis!".

In piecing together my family story for purposes of self-education, healing and reconnection, I have had to wade through layers of silence that Métis community members will recognize as familiar conditions of cultural disconnection and marginalization. As Métis historian Heather Devine explains, many Métis children including “offspring of those Métis forced to make their living in the mainstream towns and cities...met a wall of silence from their parents and grandparents when they asked questions about their Aboriginal past” (Devine 2010, 198, emphasis added). Hearing stories like this, among many others (Koebel 2007; Oster & Lizée 2021), has made me realize how my experiences are situated within a wider context of Métis silencing.

A photo, then, can be reapproached as a silent record that sets new conversations in motion around old silences. In writing this chapter, I vividly recalled this memory of mismatched expectations between fiddle and violin practice at the family reunion in Penetang. However, my mom’s retrieval of this old photo (Figure 4) brought the memory into greater clarity. Like me, she couldn’t recall the year this took place or which family the reunion was for since our kinship ties in Penetang are extensive and in many cases consanguineous. In response, my mom reopened old lines of communication by reaching out to a few cousins over the phone and on Facebook to collectively recall that the event was for a Robitaille family reunion in 1997. This Robitaille family link clarified the earlier mismatch in cultural expectations, since the Robitailles are a well-known musical family in the area with several generations of fiddlers. In this way, silent records can unsettle old silences, becoming technical elements within an operational chain of listening and remembrance.

Looking at this photo and reliving my memory of it prompted me to puncture small holes in the wall of silence upheld in our family. Mom and I spoke with grandpa—and to our complete surprise, we learned that his house was once full of music—with several members of his family fiddling, playing *musique à bouche* (harmonica), and spoons to pass the time when they were not working on the farm. Remarkably, upon hearing this fragment of a story, a distant memory from her childhood was brought back into focus. Mom remembers visiting Forget family relatives on the outskirts of Penetanguishene at her uncle’s house over the Christmas holiday. The memory is vague, but the warming rhythms of the happy occasion are vivid. Despite my best efforts since

then to learn more about the music played by the Forget family, I never press too hard against my grandpa's laconic defenses. His answers are brief, and his curtness cuts short further questions.

New conversations around old silences may also create pathways for technical survivance.

Looking back on this photo, I can recall childhood questions: What is this instrument in my hands? What is this music my mother's family is hoping to listen and dance to? I never took to the violin, but I wonder now whether my relationship to the instrument would have taken a different path had I known about the significance of fiddling to Métis community and about my own ancestors who had fiddled. In conversation with my Mémère, she told me that the reason that my sister and I were asked to play music on that occasion was because the family was still grieving the absence of my Gran Gran Pèpère, Phillipe Laurin, and his fiddling, some thirty years after he had passed. Philippe Laurin was an in-demand fiddler in our community, and his death left a musical absence in community gatherings, I'm told. If I had known back then what fiddling meant to my relatives in Penetanguishene, would this have nudged me to continue practicing as a boy or to implore my parents for fiddle lessons instead? While the repertoire and technics of fiddling were not passed directly down to me, I now understand these old silences and carry them with me as family stories of survivance. Today, an unforgotten fiddle sits in storage at home, waiting for my young son to pick up the instrument one day and to learn anew traditional melodies, rhythms, and techniques.

While old photos can help renew silenced technical practices and relations, the creative production of silent records within colonial-authoritarian structures can unearth surface different manifestations of silence and cosmotechnical suppression.

Silent archive

This chapter opened with a story about archival gatekeeping in which I was prevented from listening to the 1916 wax cylinder recording of "La chanson des Bois-Brûlés" at the Canadian Museum of History in Gatineau. Rather than recounting this experience chronologically, I move through a thematic sequence to trace how the persistence and revitalization of indigetechnics must navigate ongoing authoritarian pressures that constrain access, research creation activities, and pathways for technical survivance.

During earlier archival research in Winnipeg, by contrast, I was able to listen to sound recordings without restriction and in a manner that did not interrupt the land-based research creation activities I was already undertaking in Manitoba, Ontario, and Michigan. I also took photographs at the Centre du Patrimoine and Saint-Boniface Museum of tape reels, cassettes, and vinyl records, yet these silent records do not ring out in the same register because access was freely granted. As a result, these visits folded smoothly into the operational chain of listening I was developing, especially since I was able to hear old versions of songs that I was singing elsewhere. This stood in contrast to the authoritarian constraints I encountered at the Canadian Museum of History.

Before my long drive of over 500km to listen to this wax cylinder recording of “La chanson des Bois-Brûlés”, I was summarily given access to a transcription of the wax cylinder, which is publicly accessible (“La victoire des bois-brûlés” n.d.). No questions were asked in advance, including about my identity. Yet upon my arrival, when I self-identified as Métis in seeking to hear a Métis song, a straightforward request took a Kafkaesque turn. Doors to the archive that were open to me when I was silent about being Métis were suddenly closed with reference to the spirit of Indigenous reconciliation.

Access remained unrestricted until the recording was reframed as Indigenous and my relationship to it was made explicit. This delayed gatekeeping is explained by the recording’s archival misclassification: the song was performed by a French singer in Tadoussac, Quebec, recorded by Marius Barbeau, and catalogued as French-Canadian folk culture, despite its Michif provenance.³⁷ I was given two explanations for why I was being denied access to the sound recording: that the digital copy was misplaced and that control measures now govern access to the institution’s Indigenous collections in keeping with principles laid out in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).³⁸ I was told that any researcher would have previously been given access to Indigenous cultural belongings, whereas today,

³⁷ The presence of a recording of what is considered to be the Métis national anthem within a collection classified as French-Canadian folk culture does not constitute an archival silence in the sense of total absence or erasure (Moss and Thomas 2021) but rather speaks to an absent presence of misclassification and absentia (Langlois et al. forthcoming).

³⁸ Article 11 in UNDRIP dictates that Indigenous people should have control over any past, present, and future manifestations of their culture (United Nations General Assembly 2007).

reconciliation is invoked as the basis for gatekeeping. However, the rhetoric of reconciliation may reproduce the effects of colonial silencing when Indigeneity is voiced within the archive.

During my conversation with the archivist that day, nation-to-nation dialogue between the Canadian and Métis governments was briefly referenced as the appropriate protocol for determining access rights. Yet this appeal itself revealed a deeper impasse that I pointed out: contemporary Métis political representation is fractured, marked by unresolved disagreements between provincial organizations and the absence of a unified national council.³⁹ Invoking nation-to-nation dialogue in this case thus further defers access into an indeterminate future, raising a fundamental question that the archival institution cannot answer: who, precisely, is authorized to speak for the Métis?

I did eventually manage to hear a digital copy of the recording, yet this happened only months later after repeated follow-ups with museum staff. This did not provide a form of closure to my project, in part because of the long delay and disheartening friction, but also because I was never once asked to affirm my Métis citizenship in order to receive remote access. Authoritarian technics are expressed here as a form of centralized control over Métis culture that bypasses Métis protocol and sovereignty—even as Indigenous consultation is invoked as the basis for gatekeeping logics. Moreover, my listening access was limited to a thirty-day temporary network window, further reasserting control over Métis cultural belongings. In this way, conditions of Métis silence are not confined to the past but are inherited by Métis citizens and continually upheld through the operational chains of authoritarian systems.

This encounter at the Canadian Museum of History clarifies the need for a praxis of silent record re-search, which seeks to both contest histories and infrastructures of authoritarian technics while resurfacing pathways for technical survivance.

On the day of my visit to the archive, I was permitted to take a photograph of the wax cylinder (B-Aw-129.2). I was led down a long hallway into a cold climate-controlled storage room, lined with stacks of filing cabinets and industrial shelving. A stack of Edison wax cylinders—many

³⁹ For discussion of contemporary divisions in Métis national governance, see the longstanding disputes within the Métis National Council (MNC), including the withdrawal of the Manitoba Métis Federation and Métis Nation-Saskatchewan from the MNC amid disputes over Métis Nation of Ontario citizenship (“MNC president pushes back” 2024).

from Barbeau—lined one wall and we approached a shelf, labelled as part of a French-Canadian collection (Figure 5). The archivist proceeded to carefully pull out the cylinder from its casing, holding it with two fingers as I took a photo (Figure 6). The cylinder is in pristine condition with no notable playback grooves on its impressionable surface. This offers material evidence of limited playback—most likely to support Barbeau’s original musical transcriptions and later during conversion to tape and subsequent digitization. The archivist remarked how very few cylinders in their collection are in such excellent condition. As artefacts that are not meant to be played back or heard but rather remediated through transcriptions and new media transfers, the maintenance of wax cylinders in a state of silence ensures a peculiar form of permanence.



Figure 5: A cabinet filled with Barbeau’s wax cylinders (Photograph by the Author, 2023)

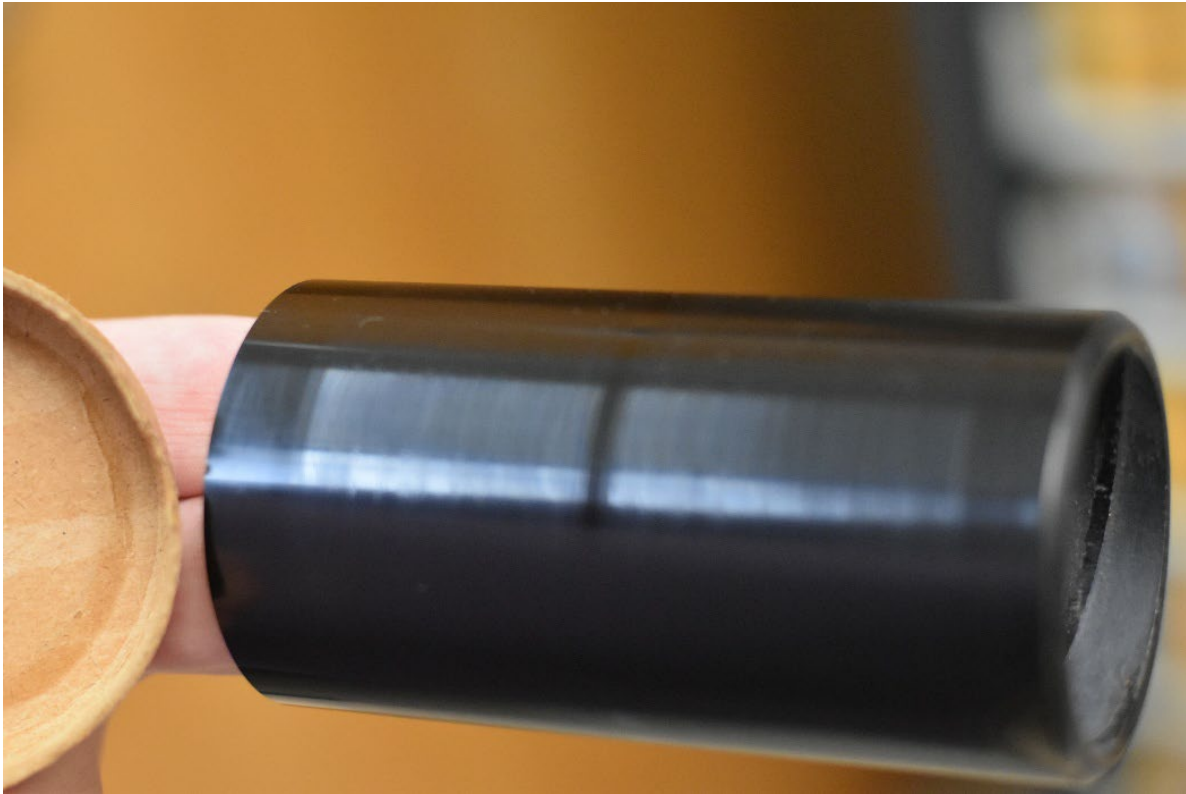


Figure 6: Wax cylinder, B-Aw-129.2 (Photograph by the Author, 2023)

Photos of sound reproduction media reveal conditions of authoritarian control in archives by drawing attention to the circumstances in which recordings remain unheard while being frozen in time and location. The handling of the wax cylinder in Figure 6 also speaks volumes, as it is the archivist's hands, rather than my own, that are pictured here. These photos are taken from within the infrastructure of authoritarian technics and reflect a relation of dependency on the caretakers of the archive who determine access. Silent records make these conditions perceptible by marking an event of silencing that is infrastructurally overdetermined by the archive and its ethnographic salvage.

Looking back across the operational chain of listening that produced these wax cylinders, the event of silencing reflects a predictable outcome stemming from practices of transcription, extraction, and authoritative appropriation.

At the turn of the 20th century, wax cylinders were used as a means of producing texts as opposed to permanent sound records. In some cases, wax cylinders were commonly discarded or reused following transcription by leveling out the cylinder. Erika Brady explains:

It was these “derived texts,” not the cylinders themselves, that represented the primary basis for descriptive and analytical work in folklore and anthropology...The cylinders were often discarded; the texts derived from them were subject to modification according to the needs, taste, ideology, or whim of the transcriber. (Brady 1999, 62)

As reflected by Benjamin Ives Gilman’s notion of “phonographic notation” that he applied to his research on *Hopi Songs* (1908), the sound recording apparatus mainly functioned “as a means to a documentary end rather than a documentary end in and of itself” (Hochman 2014, 104). This aligns with the technology’s material affordances. First, wax cylinders were limited in recording length – ranging between two to four minutes. As a result, a common practice was to record the main parts of a song and transcribe the rest by hand. Marius Barbeau himself used this method and in the case of B-Aw-129.2, the wax cylinder houses two separate abridged songs, each of approximately two minutes in length. Second, wax cylinders were very fragile and had a short life span because repeated playback of a cylinder gradually compromised the fidelity of a recording and eventually left playback etchings from the stylus, making the wax cylinder unplayable (Gitelman 2006). Wax cylinders served as a means to an end to support ethnographic observations, as evidenced by the archive’s own description of Barbeau’s collection:

Originally the goal was not to build an audio collection but rather they [wax cylinders] were used as a collection tool to compliment [*sic*] field notes...However, Barbeau, like other anthropologists kept all the recorded cylinders even though in principal, they had already extracted the required information. (“The Canadian Museum of Civilization’s Wax Cylinder Collection,” n.d.)

As sound reproduction media that were not intended to be reheard, wax cylinders were used to support the authority of anthropologists over Indigenous voices, stories, songs, and worlds. This represents a legacy that continues through institutional oversight and control.

Within colonial archives, silent records both look back on and disrupt a historical chain of listening, while showing that the entrenchment and dominance of authoritarian technics does not foreclose possibilities of technical survivance. “The camera captures others, not the experience of the photographer” (Vizenor 1994, 129). Similarly, photographs of sound media can represent authoritarian technics while pointing to the continuance of techniques and cosmotechnical orientations that persist outside the representational frame. Put otherwise, silent records do not visually picture technical survivance but materialize it as an analytic orientation through which others can look and listen.

This lens can be applied beyond archives and ethnographic media as the next subsection demonstrates to show how conditions of privacy and land-based resonance can sustain other pathways of indigetechnical survivance.

Silent retreat

In Chapter Two, I shared my experience of water testing and noted how conditions of privacy were integral to a two-eyed approach in blending Western and Indigenous techniques of water stewardship. As I recounted, being observed or overheard by others produced self-consciousness and silencing behaviours, limiting my capacity to listen and sing to the river. During my land-based research creation, retreating into the bush was similarly essential to sing freely and cultivate a deeper connection to place, including a quiet awareness of the resonance of Métis music within the traditional environs of my ancestors and kin.

The recurrent motif of going into the bush, figures prominently in my catalogue of silent records. Although I also visited and took photos in urban areas including in Winnipeg and Sault Ste. Marie, as well as the busy tourist site of Michilimackinac, I often felt quite rushed and constrained in my singing-listening practice due to a lack of privacy in these settings. Silent records inherently renegotiate boundaries of communication and access, yet it was only in retrospect that I recognized how withdrawal from observation represents a precondition for particular forms of indigetechnical practice, wayfinding, and innovation. Before interpreting this in terms of privacy, this understanding was initially present at the level of intuition, as expressed in practice and by subsequent curatorial decisions.

In one of my guest lectures on this topic for a graduate seminar on research methods, I received a valuable question about my choice to foreground land-based photography. One PhD student from Winnipeg, asked why the silent records I shared in my presentation seemed so removed from urban life when my itinerary included downtown sites. In particular she referenced the urban setting of the Battle of Seven Oaks monument on downtown Main Street. I explained that when I visited the monument, a group of unhoused men were gathered on the surrounding benches, which made it feel like an unsuitable place to pull out my camera, guitar, or even simply sing. However, a silent record created near the site remained important to my project, especially because my repertoire included “La chanson des Bois-Brûlés” which recounts the historic Métis

victory at Seven Oaks.⁴⁰ The site therefore resonates across multiple registers with Métis sovereignty, music, and resistance. Yet it is highly revealing that I chose to conduct my silent record protocol at the nearby Seven Oaks Park, where I was able to sing Falcon's song in a state of relative privacy (Figure 7). A retreat from the sounds of busy traffic and from unwanted overhearing of my song practice created the necessary conditions for indigetechnics to take place. Put otherwise, privacy offered the conditions for a moment of resonance between singing, listening, location, and cosmotechnical orientation.



Figure 7: Seven Oaks Park, Manitoba (Photograph by Amanda Tully, 2023)

Despite the relative remoteness of this location from the monument site, the oak tree I am leaned against is still nearby a parking lot, museum, as well as the playground and surrounding residential neighbourhood seen clearly in the background of the photo.

⁴⁰ Some accounts suggest Falcon personally witnessed the battle in 1816 and composed the song later that same evening during the celebrations in the Métis camp (Chartrand 2009, 6).

In fact, it was in places even more removed from observation and disruption that I felt my relationship with Métis music further growing—not only because I was able to sing without self-consciousness, but because I was able to hear the resonance of these songs with place, history, and Métis sovereignty. This included singing on the hiking trails of Drummond Island where my Métis ancestors once lived before being displaced by American settlement (Figure 8), and singing at Mica Bay where Métis community members living in Sault Ste. Marie once joined with the Anishinaabe in an armed resistance against the Quebec Mining Company's intrusion on their lands (Figure 9).⁴¹ These photos display privacy—as a strategy of withdrawal and technical survivance through which I could experience the continuance of a Métis cosmotechnical orientation to music in intimate resonance with location, natural cycles, and ancestral ties.



Figure 8: Drummond Island Trail, Michigan (Photograph by Amanda Tully, 2023)

⁴¹ This event, now known as the Mica Bay incident, played a large part in the signing of the Robinson-Huron Treaty (1850), yet the Métis were subsequently excluded from treaty negotiations despite the support and advocacy of Anishinaabe Chiefs Shingwaukonse and Nebainagoching. As a result, the Métis were displaced from their river lots in Sault Ste. Marie and forcibly uprooted in the surrounding area (Case 2023).



Figure 9: Mica Bay, Ontario (Photograph by Amanda Tully, 2023)

All this is not to say that the authentic place for Métis music is in natural settings, as this framing would confine Métis culture to a vanishing past presumed to be recoverable only within remote locations. Rather, it was the individually oriented design of the research creation that pulled me in this direction, since a silent record methodology in community gatherings would likely not require such a form of retreat. However, the renewal of indigetechnics is forced to navigate dynamics of authoritarian technoculture in everyday conditions, even simply in being overheard by observers who unintentionally extend an operational chain of hungry listening. Within this methodological context, a retreat into the bush provides an important defense against such intrusions, even if it is not always necessary when gathered with community or in other safe places.

In closing, a praxis of silent records offers both a defense against authoritarian technics and an invitation for cosmotechnical revitalization and dialogue. As a defensive praxis, silent records interrupt expectations of listening and appropriation, while redressing ongoing effects of

silencing and suppression. Yet more generatively, silent records share a technique of listening that prevents sound from being isolated as data, signal, or source of extraction while holding space for other technical practices, exchanges, and innovations to unfurl.

Conclusion: A winter pause before future cycles

This chapter has contended with the core problematic: that indigetechnical practices and milieus persistently navigate conditions dominated by authoritarian techniques and diffusion that suppress cosmotechnical difference. In response to this unresolved tension, the Four Seasons framework (de la Garza 2013) is taken up as a methodological orientation that is attentive to the limits of closure or resolution in research. With this problematic held in view, the chapter can be interpreted as a single annual cycle that works to interrupt and loosen authoritarian tendencies and operational chains.

Accordingly, I situate this concluding section within the Winter stage of research outlined by de la Garza (2013), which, as a season of rest, foregrounds reflection alongside practices of knowledge sharing. This concluding section revisits how the problematic was engaged through praxis before turning toward future directions or cycles of re-search. The chapter then closes with a brief reflection on the importance of centering the conditions and pathways of technical survivance in the systematic study of listening techniques and operational chains.

The problematic of the chapter is engaged structurally; the theoretical framework began by reopening conceptions of authoritarian techniques and diffusion before developing the concept of technical survivance to clarify how the persistence of techniques and technical milieus can articulate a mode of resistance through strategies of withdrawal and silencing within conditions dominated by authoritarian techniques.

In commentary on the recent academic turn to digital authoritarianism, the framework approaches authoritarian techniques through a long view that traces continuity across historical media, a wide view that attends to the diffuse expansion of operational chains rather than isolated innovations, and a pluralistic view that foregrounds the suppression and persistence of alternative techniques. In doing so, the framework engages Mumford's observation about the limits of technological perception: "If our eyes had been open, we might long ago have discovered this conflict deeply embedded in technology itself" (2). Building from this diagnosis, the chapter

extends Mumford's anti-authoritarian stance by further opening critical perspectives using a two-eyed approach that enacts a dialogue between Western and Indigenous technical milieus.

Importantly, the concepts of technical survivance and indigetechnics both emerge through cross-cultural dialogue. Technical survivance infuses the depoliticized concept of technical survivals (Leroi-Gourhan 2023) with the willful and creative energy of Indigenous survivance (Vizenor 2009). Foregrounding the continuance of technics clarifies how marginalized and oppressed peoples retain self-authority over their cosmotechnical milieus through practices that remain withdrawn or subtly quiet. Moreover, technical survivance names a more general praxis of resistance against authoritarian technics. Although this chapter centers on indigetechnical survivance, I have also gestured toward global examples of democratic technical survivance throughout this dissertation, such as the conscious return to the dumbphone, the valorization of slow food or slow fashion in challenge to fast consumerism, and the tech policies of the peer-led crisis platform, Trans Lifeline. In other words, this framework remains open to dialogue across worlds as a means of renewing older lines and opening new solidarities and channels of intellectual inquiry, creative practice, and technical innovation. In this way, the chapter strategically valorizes indigetechnical and other forms of cosmotechnical difference, not to close off relation with Western technocultures, but to recalibrate conditions of exchange and adoption that can contest processes of authoritarian diffusion.

From this orientation, research creation enacts this anti-authoritarian framework by reassembling, retracing, and performing alternative operational chains that retrace and extend paths for indigetechnical survivance. This methodology itself demonstrates that authoritarian diffusion is not an irreversible event, but a field of struggle that demands adaptation and innovation. Likewise, technical survivance should not be interpreted as a call to reject or dismantle dominant technologies and infrastructures in toto or to fully retreat into the bush of a pre-contact and "authentic" Indigenous milieu, but rather to creatively unsettle technocultural habits and structures.

The research creation methodology itself is driven and constrained by cosmotechnical conditions that are different from those of authoritarian-colonial technics. By retracing the travel routes of my Métis ancestors, returning to archival and land-based sites, and repeatedly performing Métis songs, I have sought to restore motion to archived recordings and to my own relation with old

Métis music and protocols. Yet this resonant motion with cultural sites and natural environs is itself constrained by the need for withdrawal from observation, since exposure can reactivate habits and histories of self-silencing. In this way my performances and the silent records that document them are not solely representational but operative—actively reshaping the conditions and possibilities of listening while continuing to retreat from or resist authoritarian control.

The movement across different field sites uses silent records as a way of retooling operational chains sedimented according to logics of hungry listening, particularly those organized through archival custody of sound recordings. In my project, this simple retooling involves taking photographs of sound media and musical practice, yet silent records function as only one element within a larger performative and itinerant methodology that retraces old paths and extends them by rebinding cyclical relationships of singing, travel, and withdrawal. More broadly, retooling operational chains involves reimagining pluralistic conditions of technical practice, innovation, and diffusion that remain resistant to authoritarian strategies of surveillance, infrastructural dependency, and oppressive forms of silencing.

Across the sites discussed below, the project enacts its objective by reassembling an operational chain of listening that remains resistant to authoritarian technics while opening space through conditions of privacy for renewed cycles of indigetechnical innovation.

The first site was created by revisiting old memories in conversation with family, which led my mother to recall a photograph she had taken nearly two decades ago, showing me playing the violin in a context where fiddling techniques and musicality were culturally expected.

Incorporating this within my silent record inquiry, the photo became a focal point that reactivated old lines and topics of conversation amongst my extended family. However, my family story is indelibly marked by conditions of silence that began as a tactic of survival and led to intergenerational disconnection from Métis culture. Reframed as a silent record, this family photo renews communication channels without turning away from the shared legacy of silence, but rather reengaging these conditions as a pathway of survivance.

The second site demonstrates how Indigenous engagement with ethnographic and colonial archives must wade through authoritarian logics, including infrastructural dependencies and barriers to access, even during a contemporary age of reconciliation in Canada. Silent records produced in this site generate friction with authoritarian technics through the obsolete media of

wax cylinders that anthropologists once used to salvage Indigenous cultural belongings—often without consent and in collaboration with colonial authorities. Photographs of wax cylinders draw attention to old authoritarian logics that have been preserved within archives, where recordings sit unheard and untouched by community members, but also, in the case of “La chanson des Bois-Brûlés”, misclassified as French Canadian. As an indigetechnical mode of inquiry, silent records navigate these pressures by reengaging obsolete media and the old institutions that maintain them within a longer cyclical process of cosmotechnical revitalization.

The third and final site foregrounds land-based photography as an illustration of an indigetechnical principle first discussed in Chapter Two: that particular practices or stages of innovation require conditions of privacy. As a throughline in the dissertation, a retreat into the bush does not denote a complete withdrawal from the world, but rather names a condition through which relations of resonance with place, cycles, and environs can be recrafted. Silent records here represent an early stage of wayfinding in my creative re-search that recenters the need for communication boundaries, or what I have described as a silent retreat, to guard against multiple forms of intrusion in the work of technical survivance.

Briefly, the silent records produced from these three sites are regenerative for me on a personal level in giving me something from my family trip to look back on fondly, to reexperience the feeling of singing and listening in a Métis milieu of resonant motion, and to remind myself of the generative role silence might play for purposes of resistance and indigetechnical renewal.

Despite the odd mismatch in writing about *limitations* in research creation, it is important to note how I originally envisioned this project as more of a collaborative project. Specifically, I imagined visiting with other Métis musicians throughout my trip to share songs, stories, and to play together. This scope proved too expansive for the dissertation, yet in keeping with a Four Seasons paradigm, I hope to return to such a collaborative research design within future cycles of personal growth, musical practice, and community engagement.

In terms of knowledge sharing, silent records can be stored in family photo albums, circulated in community contexts, and used to support storytelling across academic and cultural settings. Most fundamentally, I envision silent records as a media form that denies unmitigated listening access while planting seeds for future cosmotechnical resurgence. As Shawn Wilson writes, research “is something that you’re building for yourself and for your community” (2001, 179). In keeping

with this, I view silent records not simply as a creative withholding of sound, but as communication channels in their own right that are well suited for anti-authoritarian dialogue and diffusion.

In disrupting an operational chain of hungry listening, silent records invite others to adopt or adapt this reorientation toward listening. This invitation may take form through similar photographic practices or through other creative acts of refusal that hold space for dialogue. Put otherwise, silent records model a mode of diffusion that is not forced onto others by remaining rooted in principles of privacy and non-interference. Accordingly, the operational chain of listening enacted by my silent record inquiry extends far beyond the photographs themselves, as I have returned from the bush with stories to tell, songs to sing, and an innovation to share.

Future research might similarly explore how the framework of technical survivance is productive for the analysis of different forms of creative and strategic retreat that navigate pressures of digital authoritarianism. In the music industry, artists are increasingly withdrawing their catalogues from streaming platforms in part because of the widespread, exploitative devaluation of their art and labour. More recently, in the case of Spotify, artists and audiences are protesting the explicit alignment of platform-based forms of digital authoritarianism with contemporary military violence, exemplified by CEO Daniel Ek's investments in the AI military company, Helsing (Snapes 2025), as well as the circulation of ICE recruitment ads during the Trump Administration's massive deportation push (Eqbal 2025). In this context, artists are returning to earlier media formats including records and cassette tapes as a mode of technical survivance. While the earlier valorization of vinyl in the early 2000s may have been written off as a form of aesthetic nostalgia, musicians are increasingly reasserting creative and political agency through decisions to stop uploading music to the cloud altogether while making the rationale for these decisions public through social media. In this context, technical survivance offers an important corrective against strawman Luddite framings by centering the process by which communities of practice creatively adapt, withdraw, and rebuild alternative milieus within authoritarian conditions.

Finally, silent records are relevant to the dissertation's broader reorientation of machine listening as a mode of inquiry that is not overdetermined by the dual application of digital sound processing and machine learning techniques. The chapter demonstrates that extractive modes of

listening have been disseminated and normalized through earlier infrastructures and media practices, such as salvage ethnography. By decentering digital technology in this chapter, I have traced authoritarian continuities that span long histories and wide operational chains. In resonance with the dissertation's broader critiques, silent records offer a simple yet creative affirmation of the significance of privacy as a condition of cosmotechnical inquiry and resistance. Similarly, when faced with digital technologies that datafy sound (Chapter Three) or listening techniques (Chapter Four), the principles of a silent record praxis can defy strategies of authoritarian diffusion and reclaim space for pluralistic technical survivance.

Chapter Six: Inconclusive Listening

In Chapter One, I opened the dissertation with a challenge from Te Hiku Media—the developer of the Papa Reo system—regarding OpenAI’s release of an automatic speech recognition model for te reo Māori and Ōlelo Hawai‘i. In addition to their critique of the authoritarian terms of appropriation and diffusion, Papa Reo’s multilingual language platform presents an indigetechnical mode of diffusion: the sharing of a technical substrate of natural language processing, such as speech recognition techniques, with other Indigenous nations and language communities to cultivate solidarities around language revitalization (Hao 2022). To begin implementing this, Te Hiku used the te reo data as a base language model to support smaller Indigenous language groups across the Pacific region that share common linguistic roots with the Māori. As the co-founder of Te Hiku Media, Keoni Mahelona, put it: “It’s no longer just about teaching computers to speak te reo Māori...It’s about building a language foundation for Pacific languages. We’re all struggling to keep our languages alive” (qtd. in Hao 2022). What distinguishes this form of diffusion from projects such as OpenAI’s is not simply a commitment to dialogue with Indigenous partners, but a cosmotechnical substrate that organizes the very conditions and pathways through which innovation and diffusion take shape.

Te Hiku Media developed its language models largely through a community-led campaign for voluntary contributions of audio and transductive labour: te reo language speakers were asked to record themselves reading a series of sentences designed to capture the phonetic range of the language (ibid.). Participation in the campaign was motivated by trust in Te Hiku Media’s governance practices, which abide by the principle of kaitiakitanga—or guardianship—as formally encoded within the Papa Reo data license agreement (Te Hiku Media n.d.). In contrast to dominant monetary and proprietary models, Te Hiku Media does not claim ownership over language data but rather assumes a caretaker role with an obligation to “ensure that all decisions made about the use of that data respect its mana and that of the people from whom it descends” (ibid.). This governance model is not limited to the Māori people but is extended to other Indigenous language communities through the Papa Reo infrastructure. Thus, what this indigetechnical organization of technology makes room for is an anti-authoritarian model of diffusion, as innovations are shared without seeking to assert authority or control over the cosmotechnical milieus of others.

As Indigenous cosmotronics comes to guide technical action, innovation, and exchange around AI, new pathways of dialogue and collaboration are being opened. Te Hiku's first speech recognition model was built on an open-source model from the Mozilla Foundation, and its broader goals of integration across handheld devices and voice interfaces will require ongoing tech company partnerships (Hao 2022). Yet open-source initiatives, such as the original vision for Mozilla Common Voice, are incompatible with data sovereignty principles because they allow anyone to download datasets for secondary and decontextualized purposes. In response to dialogue with Indigenous organizations including Te Hiku Media, the Mozilla Data Collective platform was released in 2025, giving language communities new control over how their data can be accessed and used according to customizable community licenses (Mozilla Foundation 2025). As an offshoot of the Common Voice project—which supports community-driven voice technology—the Mozilla Data Collective platform creates new opportunities for innovation and exchange without demanding assimilation to an open-source ethos that would foreclose necessary data sovereignty and stewardship principles.

Control over data and the maintenance of communication boundaries remain at the center of Indigenous approaches to AI, revealing that new developments in technology do not present a binary choice between a rejection of technology and total exposure to data surveillance. Instead, Indigenous AI centers on projects that recraft operational chains through new data and technology licenses, privacy-preserving technologies (Cordes 2020), and more fundamentally, moral-technical orientations that guide decisions about technological design and adoption. However, the mass extraction and appropriation of Indigenous knowledge and practices by AI companies and systems is threatening to community-driven revitalization efforts (Whaanga 2020). For instance, recent scrutiny over social media was directed at a series of AI-generated Indigenous language books in Plains Cree, Ojibwe, Blackfoot, and other languages being sold on Amazon that contained incorrect translations and fabricated words (Bettens 2024).⁴² In the context of Indigenous language education, such AI slop raises added concerns as linguistic misinformation interferes with genuine efforts to learn and pass on endangered languages.

⁴² Related concerns have been raised over social media by Indigenous critics regarding the propensity of large language model chatbots like ChatGPT to fabricate nonsensical words and generate erroneous cultural knowledge in Indigenous languages.

Against this backdrop of data colonization, new strategies of technical survivance are taking shape to uphold principles of data sovereignty.⁴³

Within technological domains commonly described as machine listening—specifically AI systems that process audio data—Indigenous initiatives like the SkoBot and First Languages AI Reality (FLAIR) present alternatives to surveillance-based voice assistants like Siri and Alexa. Ojibwe technologist Danielle Boyer designed a talking robot for Indigenous STEM curriculum called the SkoBot that speaks Anishinaabemowin; the SkoBot operates offline to foreclose cloud-based data extraction, protect voice recordings donated from community members, and respect the ownership rights of language communities (Witze 2025). Similarly, Northern Cheyenne computer engineer and former Amazon Alexa engineer Michael Running Wolf shared his vision for Indigenous machine listening in a TED Talk, presenting a prototype of a cedar-enclosed offline edge AI—that he calls a “language in a box” (Running Wolf 2023). As he explains, this design can support Indigenous people’s “agency over their language journey” (ibid.), thereby routing away from the privacy harms and risks embedded in Big Tech voice AI systems. What these initiatives underscore is how indigetechnical survivance is predicated on creative strategies of retreat from data surveillance infrastructures and authoritarian logics of gatekeeping and control. Put otherwise, these machine listening initiatives echo a central indigetechnical motif highlighted throughout this dissertation in laying out a path of retreat into the bush—with and through new technology.

Although many Indigenous people and groups reject the proposition of “making kin with AI” (Lewis et al. 2018), this resistance is perhaps better understood as a response to the authoritarian diffusion of AI products, which continues to advance without any measure of community consent or accountability (Running Wolf qtd. in Heidt 2025, n.p.) while further entrenching exploitative monopolies and dependencies (see Pechawis in Lewis et al. 2018). Leaders in Indigenous machine listening point to a different pathway of diffusion (Arista 2021, 11), as Boyer, Running Wolf, and Te Hiku Media all similarly emphasize AI’s role as a provisional steppingstone in language revitalization that can be proliferated widely. In these initiatives, AI does not represent a technofix that would preserve Indigenous languages or replace the role of Elders and language

⁴³ For an international statement of concern about Indigenous data and the need for culturally grounded governance frameworks for AI, see UNESCO’s recent call for normative frameworks for generative AI governance to ensure the protection of Indigenous knowledge and cultural expressions (UNESCO 2023).

keepers but rather functions as a technical update within an operational chain of language revitalization.

As this discussion shows, different cosmotechnical orientations shape distinct pathways of technological innovation, adoption, and exchange. These differences and divergences matter as assumptions about technological superiority create blind spots and incapacities to learn from the contributions of other perspectives and worldviews. The chapter summaries that follow analyze the process of authoritarian diffusion across a range of technologies and milieus that help recenter the technicity of listening as a basis for anti-authoritarian dialogue and resistance.

Chapter contributions

Chapter Two mobilized the ethical-epistemological paradigm of two-eyed seeing to reopen possibilities of dialogue across distinct cosmotechnical orders—specifically by deliberating upon the technicity of listening. The chapter addressed the repeated failure of listening articulated through authoritarian diffusion by positing that the very assumptions and certainties we have about technics and technology can obstruct the very possibility of listening, communicating, and learning from others. As part of the dissertation’s broader objective to unsettle machine listening as a field of study, the chapter developed a foundation that loosened Western epistemic authority over technics and listening. In this dialogue, positivist conceptions of listening and its distinction from hearing were challenged by centering multi-modal practices and conceptions of listening. Moreover, the assumption that the ear or an analogous mechanical transducer, such as a microphone, serves as an obligatory passage point for listening technics was critiqued for foreclosing recognition of the technicity of extra-aural and non-aural listening practices and metaphors. As a generative challenge to this foreclosure, the chapter identified convergences between Western techniques like active listening and Indigenous multi-modal techniques as sites of dialogue across cosmotechnical milieus.

Centering three listening stories from First Nations and Métis Elders, the chapter emphasized the importance of privacy or a retreat into the bush as a precondition for certain indigetechnical practices and innovations. Put otherwise, withdrawal or protection from unwanted observation and intrusion can create and hold space for operational chains of listening that exceed human hearing. From this, the dissertation carried forward the insight that surveillance can foreclose or constrain cosmotechnical plurality. In this chapter and throughout the dissertation, privacy was

reframed not as resistance to innovation per se, but as a pathway for sustaining cosmotechnical plurality—what I theorize as technical survivance to describe the maintenance and adaptation of techniques under the pressure of authoritarian technics.

Chapter Three traced the development and diffusion of health-related machine listening (HML) in the ten-year company history of Sonde Health and its acquisition of NeuroLex Health. In contrast with more familiar listening modes (Chion 1994), the chapter distinguished the signalitic mode of listening mobilized through HML apps in its bracketing of semantic content of speech to derive medical risk inferences or signals from the human voice. However, rather than interpreting HML apps as inherently authoritarian or ‘creepy’, the chapter argued that authoritarian effects are produced as signalitic listening becomes disseminated through a particular process of diffusion.

To support this empirically, the chapter analyzed the changing functions and sectoral deployments of HML promoted online using the Wayback Machine and interpreted how these patterns align with notions of function creep—the slow and gradual expansion of a technological system away from its original purpose. Supported by the study’s findings, the chapter advanced a conception of function sweep to characterize a short-term, two-stage diffusion process, involving an initial rapid expansion of functions followed by a period of product refinement—as exemplified by Sonde’s acquisition of NeuroLex. Complementing this diachronic analysis, the study explored how privacy was rhetorically framed to obscure surveillance concerns, relational harms, and power asymmetries posed by the technology’s diffusion and appropriation of data. In summary, three communicative strategies—namely, function creep, function sweep, and privacy washing—masked the technology’s expansion beyond medical research and clinical settings into workplaces and other social microclimates while minimizing or obscuring privacy harms and risks. To close, the chapter shows why individualistic models of data privacy fall short and why the authoritarian diffusion of HML necessitates collective withholding of consent and data to uphold privacy as a shared protection against uneven exposure produced by the discriminatory logics of surveillance medicine.

Chapter Four returned to a core premise of my reorientation of machine listening as a field of inquiry by centering the technicity of active listening on the Crisis Text Line (CTL) platform. Through interview-based research with CTL volunteer counsellors, I explored how volunteers’

listening practices unfold within an unstable operational chain of text-based listening involving transcript logs, algorithmic nudges, supervisory oversight, and GenAI systems such as ChatGPT. In this context, the introduction of new technology left many volunteer counsellors feeling conflicted about help seeker consent, trust, and privacy, as well as whether the space for human judgement and intervention was increasingly constrained as active listening became procedurally transduced according to algorithmic logics and startup norms.

This context sets up the chapter's central argument that the Loris.ai scandal was not an anomalous ethical misstep, but a predictable and disturbing outcome of authoritarian diffusion. Put differently, CTL's operational chain of listening created conditions under which crisis data and the transductive labour of both volunteer counsellors and help seekers alike could be repurposed through secondary processes of diffusion, as CTL reapplied learnings and techniques to the domain of customer service.

The study explored how listening is practiced and negotiated within CTL's text-based platform, how supervision, surveillance, and automation govern volunteers' listening work, and how volunteers interpret and contest the repurposing of crisis data and their listening labour in relation to the Loris.ai scandal. In summary, the chapter shows how the milieu of crisis counselling became a site of authoritarian diffusion and how this process generates uneven forms of moral-technical adoption, negotiation, and rejection among the volunteer counsellors who sustain this vital lifeline. By centering the frontline perspectives of volunteer counsellors, the chapter challenges the devaluation of listening labour and techniques that is frequently articulated by authoritarian diffusion and makes legible a set of newly contestable forms of extraction, surveillance, and technological disruption that increasingly penetrate the fragile listening milieu of crisis counselling.

In Chapter Five, I discussed the history of salvage ethnography and the mass recording of Indigenous oral culture through the framework of authoritarian diffusion. Much like contemporary concerns of digital authoritarianism involving platform actors, anthropological uses of technology raise similar historical critiques of extractivism, silencing, and the production of infrastructural dependencies. In response to these parallels, the chapter proposed that the framework of diffusion be rethought according to three reorientations: first, according to a long view that recognizes historical continuities and enduring effects of authoritarian technics;

second, a wide view of diffusion that attends to the expansion of complex operational chains rather than isolated innovations; and third, a pluralistic view that foregrounds how authoritarian practices suppress cosmotechnical difference.

From this rethinking, I discussed the specific history of Métis silencing in Canada and devised a research-creation project that engaged a core problematic: that Indigenous technical practices and milieus navigate and persist within conditions dominated by authoritarian technics that suppress cosmotechnical difference. More specifically, the project sought to challenge the pervasive conditions of hungry listening (Robinson 2020) and to restore communication boundaries and control over Métis music through the medium of silent records. In doing so, the chapter demonstrates how creative withdrawal, silence, and strategic withholding create space for operational chains of listening to be reorganized according to indigetechnical principles that include resonant motion of music with natural cycles, traditional places, and environs. From this, the chapter affirmed the generative possibilities afforded by a retreat into the bush for purposes of technical survivance, innovation, and exchange.

This intervention clarifies that failures of dialogue in the diffusion of innovations are not merely ethical shortcomings but are rather rooted in the technical values and biases that precondition—and potentially foreclose—possibilities of listening across worlds.

Broader applicability of the dissertation's argument and contributions

The core problem addressed in this dissertation concerns the way technologies are diffused without dialogue. While listening might appear to offer an obvious answer to the issues raised by authoritarian diffusion, failures or shortcomings of listening are often preconditioned by technical biases that shape the listening orientations of people and technical systems in the first place.

A recent development in the Toronto area helps to affirm the recurring pattern of authoritarian diffusion. Days before the official announcement of a new technology partnership with a startup called Hyper, a superintendent with the Toronto Police Service (TPS) made a post on social media (Watts 2026):

Today the team from HYPER spent time with us inside your 911 centre, listening in and seeing firsthand what it's really like to be a 911 communications operator in Toronto.

If you want to kick off meaningful change, this is where it starts. You start by listening. By taking the time to understand the work, the pressure, and the responsibility that comes with every call.

The new system concerns a voice AI platform like Alexa or Siri, but for 911 and 811 calls to the police. While we might decry the reference to listening as a disingenuous public relations maneuver, doing so overlooks a more foundational problem: the appeal to listening here may be sincere, yet as a practice it is already constrained by underlying beliefs and attitudes about technology. Specifically, automation is already regarded by TPS decision makers as a scalable solution within an emergency listening milieu. However, the roll-out of Hyper by the TPS proceeds without addressing the preexisting lack of trust, accountability, and community consultation concerning TPS uses of new technology—including bodycams (Pearson 2016), facial recognition (Kosseim 2020), and ShotSpotter (Robertson et al. 2020). In this context, the case raises familiar harms and risks discussed throughout the chapter such as how surveillance fears might dissuade people from calling the police when their calls are screened and handled by a commercial AI system—not to mention issues of privacy, consent, and function creep if and how call data is repurposed for secondary commercial and surveillance ends.

As I have argued throughout the dissertation, authoritarian diffusion—the unilateral rollout of new technologies and the incumbent expectation for adoption and compliant conformity—is rationalized when the technicity of a people or social microclimate is devalued or appears outdated to outsiders or decision makers. This pattern frequently recurs in milieus that revolve around or are built upon a substrate of listening practices, precisely because such practices are not easily recognizable as technical according to perspectives that equate technology with what is industrialized, mechanized, computational, or scientifically rationalized. As a result, heterogeneous domains such as emergency and crisis services, healthcare, customer service, education, and other milieus where listening is integral—albeit commonly taken-for-granted and devalued—are especially vulnerable to similar forms of technological disruption.

As a corrective to authoritarian diffusion, this dissertation advances an analytic reorientation of machine listening. Whereas the technicity of listening easily goes unseen and unnoticed, machine listening denotes an explicitly technological mode of inquiry that makes listening legible across divergent technological milieus. Although machine listening is typically used to reference a category of technologies, involving the joint application of machine learning and audio signal

processing techniques (Parker and Dockray 2023), I have unsettled this definition along three axes.

First, I have decentered sound in my conceptualization of listening to highlight the technicity of extra-aural listening techniques, such as active listening, and to trace processes of procedural transduction as this is remade into a non-aural technique of text-based listening. Second, I have decentered AI to draw attention to wider, foundational technical elements within emerging operational chains of listening, including phonography, archives, and colonial practices of hungry listening. Third, I have decentered a Western technological lens through a two-eyed dialogue that draws out convergences and incommensurable divergences across cosmotechnical orders and perspectives. Together, these three axes mobilize machine listening as a general diagnostic and dialogic framework that centers the technicity of listening to restore possibilities of equitable communication and diffusion.

Despite this unsettled and uncertain orientation to listening and technology, I have argued that privacy, and the felt security afforded by retreat from unwanted observation or overhearing, represents a precondition for certain forms of technical practice, skill development, and innovation. Having disrupted quotidian conceptions of listening and machine listening, the discussion has emphasized that some alternative technical practices and orientations remain constricted, silenced, or submerged so long as they are exposed to surveillance or denied space to go “back stage” (Goffman 1971).

The proposition that a space of retreat allows for quiet awareness of other technical possibilities and orientations conflicts with contemporary doxa on the relationship between privacy and innovation. For instance, in organizational settings, the openness of coworking spaces has become a central aspect of innovation strategy (Chesbrough 2003) for startups and other companies that want to foster collaboration between workers. However, such openness and the accompanying exposure to observation and sensory overload can suppress particular forms of collaboration, experimentation, and innovation (Yacoub and Haefliger 2022)—not to mention thinking and moral-technical reflection. Moreover, organizational approaches to innovation already presuppose technocultural conformity with institutional objectives and operational norms—a conformity that is typically screened and disciplined through hiring, onboarding, and management practices. If innovation can be suppressed within a relatively homogenous work

environment, the stifling effects of surveillance and extraction will only be compounded under pluralistic conditions of diffusion involving groups with deep-seated commitments to technical survivance. In this sense, my call to unsettle machine listening does not involve resignation to surveillance but rather challenges dominant assumptions that frame privacy (be it spatial or informational) as an impediment to innovation.

Crucially, my rethinking of machine listening as a mode of inquiry has sought to unsettle any clear demarcation between listening technique and technology. This rethinking has supported empirical contributions that can be extended to other research areas concerning media, technology, and culture.

Based on the patterns and logics evidenced by the case studies in Chapters Three and Four, concepts of function creep, function sweep, and procedural transduction were used to trace the dynamics of change as techniques and technologies are circulated and readapted into new domains. With the push to artificial general intelligence (AGI) by Big Tech and tech bros, concepts and methodologies are urgently needed to help trace and interpret the movement of technical products and solutions across a range of contexts. The premise of AGI not only involves surpassing human intelligence, but in developing AI systems that can seamlessly adapt to unfamiliar problem areas and tasks in any knowledge domain. Procedural transduction puts into focus that technical elements are not the only things that must adapt upon entering a new domain, but rather that the introduction of technology involves a process of mutual shaping that can be transformative of milieus of practice. Whereas generalizable technological solutions render domain-specific considerations as invisible or inconsequential, humanistic and social science research, involving the perspectives of workers and domain experts can help center situated concerns and consequences.

Despite perennial calls concerning the death of privacy, privacy frameworks remain important to addressing personal, social, and moral injuries related to data collection, processing, and disclosure. However, AI systems use technical processes of aggregation and anonymization as a smokescreen for controversial and contestable data practices that sit within regulatory grey zones due to privacy legislation's focus on personally identifying—or in Canada's case—identifiable data. Privacy washing techniques can further conceal contestable data practices, especially when these complicate mental models about privacy invasions and personal data harms. Despite this

smokescreen, AI systems that repurpose data from individuals for controversial secondary ends—such as the repurposing of crisis data for a customer service venture or the repurposing of a mental health self-tracking tool for a workplace wellness program—may likely trigger personal reservations from the original data subjects or labourers. To make the point clearly, the obfuscated movement of technological systems into new domains—as through processes of function creep—raise questions about autonomy, consent, and moral injury when anonymized data is repurposed in the process, and especially for secondary ends that the original data subjects find politically disagreeable or morally reprehensible.

The methodological contributions of the dissertation can be extended to other topics. Digital research methods such as diachronic analysis of webpages can be used more generally to follow the early history of tech startups alongside corporate inflection points such as financial mergers and acquisitions, as this offers a means of tracking and forecasting technological change propelled by secondary uses of data. Interview methods concerning data controversies and public relations scandals are also valuable in centering frontline perspectives and moral-technical disagreements about unstable, surveilled operational chains such as in platform gig work, content moderation, call center industries, and in human-in-the-loop automated systems more broadly. Finally, the research-creation design in Chapter Five reflects a response to technological and informational hegemonies that can be extended to other contexts where communities seek to reclaim technological agency while resisting authoritarian practices and logics including surveillance and infrastructural dependency. This includes projects such as community archives, activist political movements, and data sovereignty initiatives that must balance principles of access, visibility, and technological modernization against unwanted forms of exposure and extractive appropriation.

In the following section, I briefly address several limitations and gaps that follow from the breadth of technocultural topics and approaches covered in this dissertation.

Limitations and future directions

In the first empirical study of the dissertation, Chapter Three analyzed the web history of a convergent case study involving NeuroLex and Sonde Health. There are dozens of other vendors that develop similar health-related machine listening products including self-tracking apps and application programming interfaces that can be integrated into smart home settings, call centre

platforms, and other milieus. Moreover, Big Tech companies including Amazon, Google, and Apple have displayed interest in applications that analyze audio data to make health-related inferences, as evidenced in patents (Jin and Wang 2017), research partnerships (Vecchione 2024), and emerging product deployments (Apple Newsroom 2025). The empirical limitations of Chapter Three—as with most case study research—largely pertain to the study’s lack of generalizability and the relative obscurity of the two firms. Moreover, research findings concerning new media technologies are inherently ephemeral, especially when dealing with tech startups that quickly come and go such as when unviable products are abandoned or when companies are rebranded or acquired by competitors. Nonetheless, industry-wide oversight of startup trajectories and Big Tech partnerships related to contestable data practices and uses of surveillance technology is needed to mitigate the seemingly inexorable information asymmetries related to tech development and diffusion that restrict informed deliberation.

In response to this methodological and political challenge, I have begun pursuing a research design that begins with a descriptive mapping of the emerging industry of health-related machine listening with a research team at the Infoscope Lab at Toronto Metropolitan University. From this we have identified 21 firms with active market deployments of HML products as well as dozens of additional companies that have secured patents in this area. The research involves documenting corporate relationships with parent companies, Big Tech investments and partnerships, as well as information about data practices such as the targeted data subject (e.g. adult consumers, children, patients, employees), the use environment (e.g. clinics, workplaces, homes), and relationships with pharmaceutical and insurance industries. Together this provides a systematic overview of the HML industry, offering a high-level analysis of the types of information privacy concerns that emerge across cases and how privacy risks vary across use environment, user bases, and interpersonal oversight relationships (e.g. clinician-patient, employer-employee, commercial firm-customer). Building on this analytical framework, the methodology used in Chapter Three will be fine-tuned to collect the web history of these firms to identify and track patterns of function creep and function sweep to provide a more robust analysis of the emerging HML industry and its privacy risks. In this ongoing qualitative research program, a major challenge involves developing and implementing repeatable protocols and systems that can be audited through peer-review, scaled to large datasets, and readapted to other

technological domains where tracking of emerging patterns of product development and diffusion is needed to establish critical oversight of fast-moving digital industries.

In Chapter Four I decided to foreground the perspectives of volunteer counsellors at Crisis Text Line as these people provide frontline insight into the data harms related to the scandal involving Loris.ai, while being insulated from ethical risks that would stem from direct research with help seekers. At the time of the interviews, many of the volunteer counsellors I spoke with had stopped volunteering at CTL years before. As a result, their recollection of the CTL platform and its algorithmic supports may be lower in fidelity and does not reflect recent platform changes. Moreover, volunteer accounts of the data scandal were highly varied and included fundamentally inaccurate understandings of the data sharing agreements between CTL and Loris that lay at the center of public controversy. This confirms that volunteer counsellors like other workers often have incomplete or inaccurate information about institutional practices and partnerships. Despite the value of their perspectives, these gaps show that the study did not present a definitive ground truth concerning CTL's highly dynamic operational chain.

Future research concerning adoption of new technology such as GenAI at crisis helplines might address such limitations through mixed-method research that seeks out multi-sided perspectives to further locate and analyze moral-technical disagreements and concerns. More specifically, surveys, interviews, walkthrough research, and document analysis could be used to document the varied perspectives, degrees of informedness, and innovation tolerance of help seekers, counsellors, supervisors, and institutional decision-makers regarding AI and other algorithmic tools. Such research could identify disconnects or conflicts between the expectations and knowledge of help seekers regarding technology use, counselling practices, supervisory monitoring, and institutional policies. From such an approach, clear gaps could be identified in the data and technology practices of crisis counselling that undermine consent principles. Gaps and tensions could then serve as a basis for more structural interventions and reflections through institutional review, workforce training, and most importantly, community consultation.

Finally, the Métis research-creation approach in Chapter Five was the result of deliberate changes to my own listening and musical practices in reflection of a deeply personal and private journey of “re-search” (Absolon 2022) and cultural reconnection. Much like other autoethnographic and autobiographical approaches to research (Ellis 2004; Whitinui 2014;

Chang 2008), this is not a limitation per se but rather affirms the importance of a cyclical orientation to research by necessitating future work in knowledge sharing and community-engaged research. Silent records offer a valuable tool for exploratory wayfinding, especially in stages where the researcher senses they remain on the threshold of locating themselves or finding a voice. However, the lessons from this method concerning technical survivance and the need for communication boundaries, privacy, and sovereignty are relevant within other technological milieus. For instance, sharing cultural knowledge, stories, and songs through hegemonic informational platforms, such as YouTube and other social media platforms, helps reach wider and diffuse community audiences, yet this risks entrenching problematic infrastructural dependencies that expose Indigenous cultural knowledge to extractive practices of data colonialism.

To redress a history of silencing, Métis community infrastructures of re-search are needed so that old stories, songs, material objects (e.g. furs, blankets, art), and other cultural practices can be documented from Elders, knowledge keepers, and artists, and circulated within communities according to varying arrangements of access; for instance, some data may be publicly available whereas other data may be restricted within the Métis Nation or kept private for direct family descendants or other specific audiences—as recommended to me by Métis Knowledge Holder Ed Hass. Moreover, such an infrastructure must be given space to move so that data can be carried the Métis way in and out of communities in keeping with seasonal cycles and cultural needs. Research-creation can remain an important part of such a research program to avoid cultural belongings becoming frozen in a state of archival storage. For instance, curatorial gatherings and events in community spaces and cultural buildings like the new Powley Institute in Sault Ste. Marie could offer space for cultural belongings and data to circulate while retaining meaningful community stewardship. The overarching goal of this research program would be the development and maintenance of creative pathways for future cycles of cultural revitalization, community diffusion, and indigetechnical survivance in which community members and cultural belongings are not exposed to undesirable or inappropriate forms of observation and appropriation. Having completed this project in a rather independent spirit, I dream of contributing to a collective infrastructure for Métis re-search—an infrastructure in motion that retains a relationship to the bush and all the technical possibilities that such a retreat affords.

In closing, this dissertation has planted epistemic seeds of future collaborations and solidarities. A two-eyed framework remains responsive to convergences and other contact points as the basis for intercultural dialogue—across worlds, yes, but also across more proximal milieus where open-minded and open-eared people remain deeply committed and attuned to numerous and dire problems facing our shared world. In this context, resistance against authoritarian diffusion need not only continue in silos but may advance through new pathways of technical exchange. In pursuit of cosmotechnical intersections and resonances, let us remain open to other technological facts and uncertainties—holding space for possibilities of listening that might otherwise be technologically foreclosed.

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Appendix A. Sectoral domains identified by year

2015

Health and Life Sciences

Clinical Care

Organizational and Corporate Settings

0

Consumer and Smart Home Technology

0

Mobility and Transport

0

Defense and Security

0

Education, Events and Sports

0

Industrial

0

Finance

0

2016

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance

Organizational and Corporate Settings

0

Consumer and Smart Home Technology

0

Mobility and Transport

0

Defense and Security

0

Education, Events and Sports

0

Industrial

0

Finance

0

2017

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry

Organizational and Corporate Settings

0

Consumer and Smart Home Technology

0

Mobility and Transport

0

Defense and Security

0

Education, Events and Sports

0

Industrial

0

Finance

0

2018

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry

Organizational and Corporate Settings

Human Relations, Marketing Research

Consumer and Smart Home Technology

0

Mobility and Transport

0

Defense and Security

0

Education, Events and Sports

0

Industrial

0

Finance

0

2019

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry, Wellness Wearables

Organizational and Corporate Settings

Human Relations, Marketing Research, Industry Research

Consumer and Smart Home Technology

0

Mobility and Transport

0

Defense and Security

0

Education, Events and Sports

0

Industrial

0

Finance

0

2020

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry; Wellness Wearables*

Organizational and Corporate Settings

Human Relations, Marketing Research, Industry Research, Political Research

Consumer and Smart Home Technology

Smart Home, Wellness Wearables*

Mobility and Transport

0

Defense and Security

0

Education, Events and Sports

Education, Hospitality and Events

Industrial

0

Finance

Venture Capitalism

2021

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry; Wellness Wearables*

Organizational and Corporate Settings

Call Centres

Consumer and Smart Home Technology

Smart Home, Wellness Wearables*

Mobility and Transport

Automobiles

Defense and Security

Military (Air Force)

Education, Events and Sports

0

Industrial

0

Finance

0

2022

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry; Wellness Wearables*

Organizational and Corporate Settings

Call Centres

Consumer and Smart Home Technology

Smart Home, Wellness Wearables*, Video Gaming

Mobility and Transport

Automobiles

Defense and Security

Military (Air Force)

Education, Events and Sports

0

Industrial

0

Finance

0

2023

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry; Wellness Wearables*; Aging in Place*

Organizational and Corporate Settings

Call Centres

Consumer and Smart Home Technology

Smart Home, Wellness Wearables*, Video Gaming; Aging in Place*

Mobility and Transport

Automobiles; Transportation and Logistics

Defense and Security

Military (Air Force)

Education, Events and Sports

0

Industrial

0

Finance

0

2024

Health and Life Sciences

Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry; Wellness Wearables*; Aging in Place*

Organizational and Corporate Settings

Call Centres; Human Relations

Consumer and Smart Home Technology

Smart Home, Wellness Wearables*, Video Gaming; Aging in Place*

Mobility and Transport

Automobiles; Transportation and Logistics

Defense and Security

Military (Air Force)

Education, Events and Sports

0

2025	Industrial
	0
2025	Finance
	0
2025	Health and Life Sciences
	Clinical Research; Clinical Care; Hospitals; Insurance; Telehealth; Pharmaceutical Industry; Wellness Wearables*; Aging in Place*
2025	Organizational and Corporate Settings
	Call Centres; Human Relations
2025	Consumer and Smart Home Technology
	Smart Home, Wellness Wearables*, Video Gaming; Aging in Place*
2025	Mobility and Transport
	Automobiles; Transportation and Logistics
2025	Defense and Security
	Military (Air Force)
2025	Education, Events and Sports
	Athletics
2025	Industrial
	Construction; Mining; Oil and Gas
2025	Finance
	0

*Wellness Wearables and Aging in Place technology are duplicated in **Health and Life Sciences** as well as **Consumer and Smart Home Technology Categories**, as these complicate simple Sectoral divisions.

Appendix B. Semi-structured interview questions for volunteer counsellors

Question 1:

Can you please tell me about your motivations for volunteering at Crisis Text Line?

Question 2:

When and how long did you volunteer there?

Question 3:

Can you describe the recruitment process for volunteers?

Question 4:

Can you describe the training process for volunteers?

Question 5:

A. In the course of your work history at Crisis Text Line, did the organization emphasize specific skills and competencies to help people experiencing a crisis?

B. Was the term “active listening” ever referenced by the organization as an important skill?

C. In your opinion what are the advantages of a crisis help line that lets users text instead of talk on the phone?

D. What are the disadvantages in your opinion?

E. Do you think it’s possible to be a good active listener while texting? How so?

Question 6:

A. During the course of your work history, did you ever have any questions or concerns about the Crisis Text Line platform?

Question 7:

A. From the perspective of a volunteer, can you walk me through how a typical conversation starts on Crisis Text Line, beginning with the first text message that a user sends and ending with the conclusion of a conversation?

B. Can you identify any steps throughout this process where the technology intervenes or assists you as a volunteer?

C. Were there any things that you wanted the technology to do differently?

Question 8:

A. Did the system help you out at all? How?

Question 9:

A. Were there any significant changes made to the platform during the course of your work history?

Question 10:

A. During the course of your work history, did the organization ever seek input from you as a volunteer about how to better improve its service?

Question 11:

A. What's your knowledge about the Crisis Text Line data controversy with Loris.ai?

B. Prior to the controversy, did you have suspicions or knowledge that this kind of thing was going on?

Question 12:

A. Were you volunteering at Crisis Text Line at the time of the controversy with Loris.ai?

- If yes: Did you have any questions or concerns about the data controversy and were you able to voice these concerns to someone?
 - If yes: what were these concerns?
 - Did these concerns affect your confidence in volunteering in your role?
 - How were your concerns addressed?

B. Did Crisis Text Line provide you with any documents or talking points to explain the data controversy and how they were handling it?

Question 13:

A. To the best of your knowledge, why do you think Loris.ai wanted or needed data from Crisis Text Line?

B. In your opinion what are some of the ethical issues that this data transfer presents?

Question 14:

A. Is there anything else that you want to share with me about your perspective on this?

B. Do you have any questions for me?

Appendix C. Song repertoire for research-creation

The following song repertoire was performed throughout the travelling research-creation component of this chapter. Songs were selected to reflect the density of Métis musical culture (Andersen 2009; Giroux 2024), including historical compositions, voyageur chansons, Michif and Cree songs, and contemporary Métis works.

A. Métis historical songs

1. “Riel’s Farewell” / “Riel’s Song” (attributed to Louis Riel)
2. “La chanson des Bois-Brûlés” (Pierre Falcon)
3. “Les tribulations d’un roi malheureux” (Pierre Falcon)

B. Chansons d’aviron and other voyageur songs

4. “La Belle Françoise”
5. “J’ai cueilli la belle rose”
6. “En roulant ma boule”
7. “À la claire fontaine”
8. “J’ai trop grand peur des loups”

C. Michif and Cree songs

9. “Kîspin kisâkihin”
10. “Asay niganun takasin”

D. Contemporary Métis compositions

11. “Nitootimuk (Visiting Song)” – Andrea Menard
12. “Nitootimuk (Leaving Song)” – Andrea Menard