Sound Art: Hearing in Particular

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Abstract

Extoling and promoting listening is deeply ingrained, even on occasion *raison d'être,* in sound art practice and discourse, where listening is understood as a wholly congenial, benign activity. This can be seen through the routine use of affirmative tropes such as – through listening we: connect, locate, are embodied, discern, are immersed or enveloped. And through specific listening methods such as Deep Listening, we are offered 'expand[ed] consciousness to the whole space/time continuum of sound/silences' (Oliveros 2005:xxiv). Refocusing from the act of listening to the audiological – the mechanisms related to the sense of hearing – from the findings of the author's recent research, in particular his review on the noise impact of high-speed hand dryers (Drever 2013), the author feels obliged to propose that the contrary is a reality for many – hearing, from time to time or incessantly: perturbs, isolates, excludes, disconnects, disembodies, and dislocates, hearing hurts! This will be familiar for those living with hyperacusis, misophonia, and phonophobia, but it can also be the case for those with particular hearing needs such as the partially sighted, hearing aid users or those with sensitive hearing such as infants and ASD. Bringing audiology into the sphere of sound art, this chapter recognises a prevailing sensitisation of hearing in the culture at large, and proposes a paradigm for situating hearing that diverges from a singular, idealized, symmetrical model of hearing, the auraltypical, that has predominated. In its place, we are beginning to enjoy a fluidity and openness to diverse forms of hearing and sensitive hearers in sound art, on embracing the emerging agenda of *auraldiversity*.

Keywords: auraltypical, auraldiversity, hearing, hand dryer noise, listening, sound art

We are in the noises of the world, we cannot close our door to their reception, and we evolve, rolling in this incalculable swell.

Michel Serres, Le Parasite (2007:126)

Aural Sensitisation

In 1973 R. Murray Schafer alerted humanity to global impending, self-inflicted hearing loss: 'Noise pollution is now a world problem. It would seem that the world soundscape has reached an apex of vulgarity in our time, and many experts have predicted universal deafness as the ultimate consequence unless the problem can be brought quickly under control' (Schafer 2017:32; first published in 1973). In abridged form, Schafer surmises that the escalation of sound levels is coupled with a dearth of education on listening – 'Noise pollution results when man [sic] does not listen carefully' (ibid.). Revolutionising this assumed prevalent attitude to sound, his response was to foster aural sensitisation, 'that encourages a person to listen more discriminately through a series of exercises' towards a state if hearing he named clairaudience: 'exceptional hearing ability, particularly with regard to environmental sound' (Schafer 1994:272): 'Clairaudience not ear muffs.'

Shifting to the present day, in March 2019, the WHO announced that '5% of the world's population… has disabling hearing loss'[1], leading to 'one in every ten by 2050'. Whilst a segment will be congenital, especially in childhood, the majority of hearing loss is due to prolonged exposure to loud sound. Resigning to the noise, contrasting Schafer's pedagogic mission, Marek Kultys' ironic approach to this predicament takes the form of elective hearing impairment. His speculative proposal, *The Otomixer*, one of a series of science-fiction prototypes from The *End of Hearing* (2011), offers a posthuman device that distributes a

bespoke broth of temporary hearing impairment chemicals in order to regulate sensitivity to intolerable noise pollution.

Regardless (or otherwise) of the longitudinal impact of Schafer's (and others) efforts, I would claim that society has not relinquished hearing, rather it is undergoing an intense period of aural sensitisation and awareness.

Crucially, scientific underpinnings of the intricacies and eccentricities of our sense of hearing and its elegantly designed yet physiologically complex set of linked bilateral external and internal mechanisms and materials that we call a pair of ears, is coalescing. For example:

- the evolution and its vestiges, from aqueous fishy existence, primate, to homo sapiens, typified by the eponymously named Darwin's tubercle;

- the development from embryo to adult, such as the coalescing of the Tolkienian named hillocks of Hiss;

- the astonishing Ligo-like sensitivity of the ear-cocking register of a solitary pin drop and yet, in the given *al fresco* state, the propensity for damage due to puny defences against the sound pressures of everyday urban environments;

- the nuanced binaural reading of spatial cues such as distance and dimensions and the immersive experience of envelopment;

- the psychological grouping of multiple distinct sound sources extrapolated from an ochlophonic (i.e. crowded) soundscape;

- the profound neurological interconnection with the other senses, remembering that the inner ear also houses the organ responsible for balance;

- the overall bearing on wellbeing and social participation.

To all intents and purposes, in concert with this growing body of knowledge and the establishment of ever more nuanced sub-disciplines, is an intensification in the perceptual awareness of hearing. This aural sensitisation, indicating a prevailing auditory threshold shift can be witnessed in public consciousness and discourse:

- the fevered quest for augmentation, repair and renewal due to cognitively controlled and bone-conducting hearing devices, cochlear implants, and cell and gene therapy;

- DEFRA's findings of an increased societal sensitivity to and annoyance by "noise" between 2000 and 2012 (DEFRA 2012)[2];

- wide industrial take-up of the *Quiet Mark,* the International Eco-Award Scheme for excellence in quiet product design (Quiet Mark 2018);

- the popularity of initiatives to present everyday experiences from the perspective of the blind and visually impaired, such as *Dialogue in the Dark* and pitch-black dinning, *Dans Le Noir?;*

- the adoption of "relaxed" performance events and the inaugural "quiet hour" to create a more autism-friendly (including quieter) shopping experience (National Autistic Society 2018);

- the cushioning of four-year-old Prince George's royal ears by "colour-coordinated" blue ear defenders whilst accompanying his parents on an official engagement at a military airshow (Daily Mail 2016);

- the adoption of quieter fireworks – spearheaded by the government of Collecchio, Italy (Lonely Planet 2018) – in acknowledgment of the stress incurred by pets and wild birds by traditional fireworks;

The list could go on. Hunting down the elusive affective atmospheres of infrathin, and the 'particularity and patina' (Common Ground 2018) of local distinctiveness, with the shared commonality of relative quietness, Siobhan Wall's popular alternative city guides series, which commenced with a limited edition art book, *Quiet Amsterdam* (2008), inadvertently tuned into a rich vein of counter culture that cherishes off the beaten track urban soniferous discernment. Reconciled to the inherent pitfalls of widely advertising such prudently selected, treasured "hush-hush" locations, evoked in the predominantly black and white representative photographs bereft of human inhabitants, Wall harnessed a hybrid methodology of *derivé* and local knowledge orientated on relative auditory tranquillity:

> Everyone I spoke to in the locations I visited shared my appreciation of quiet places – it was like belonging to a secret club where the only rules were that if you wanted to,

you could share your delight about a tranquil place with someone else in the idyllic spot you'd both discovered. (Wall 2011:9)

Ruminating on these assorted exemplars, it is clear hearing is finding a seat at the table in the culture and society at large, and we can find this new-found attention (quietly) resonating and reverberating in recent sound art practice and experimental music in varying guises:

- Jacob Kirkegaard's ongoing foray into the involuntary spontaneous and evoked otoacoustic emissions from individuals' ears – the erstwhile diagnostic territory of the audiologist – resembling low-intensity pure tones emanating from the cochlea, deep in the inner ear, explored in works such as the 16 channel *Labyrinthitis* (2007).

- The foregrounding of quiet listening experiences, with a penchant for vacillating on the threshold of audibility, whilst drawing attention to the actual acoustic artefacts of unconventional locations promoted in Emma Welton and Tony Whitehead's concert series, *A Quiet Night In*.

- John Wynne's meticulous installing of the utmost intimate audiological curiosity, in the form of his late-father's assorted hearing aids in *Hearing Loss* and *Cold Atlantic* – 'It was literally through these objects that he heard the world during the final years of his life' (Wynne 2019) – arranged in a diorama to establish and maintain a subtle 'conversation between the six diminutive objects as feedback builds up and subsides in complex polyphonic patterns' (Wynne 2007:31).

- Sandra Boss' reassessment of an archaic German portable audiometer (or hearing test machine) and its diagnostic procedures, in *The Acoustic Appraiser* (2016), where she increasingly recomposes the investigative sine tones, interspliced by the acousmatic instructor's authoritative instruction. Boss says of the work: 'The sonic narratives …have evolved through an exploration of sound as an alternating sonic signal which encourages us to hear, that is, to approach the sound without attaching further meaning to what is heard beyond its aspect of being heard and also as part of an artistic expression in the form of music which encourages listening to the content of the heard' (Boss 2018:186).

- The hazardous participant observation/audition of artist, Angus Carlyle and sensory anthropologist, Rupert Cox, informed by acoustic scientist, Kozo Hiramatsu, in *Air Pressure* (2012): a study on the precarious existence of the Shimamura family whose farm and home is flanked by the runways of Narita International Airport, hence characterised by all-pervading extreme aircraft noise and its consequences and (limited) mitigation. A project, that due to its focus on individual's auditory experience, exposes the shortcomings of acoustic standards predicated on averaging.

In the mid-Twentieth Century modernist composers' had a predilection for an idealised prescribed listener, typified in the divisive polemic scribed by integral serial composer Milton Babbitt in *Who Cares if you listen?* (Babbitt 1998; first published in 1958)[3]. Babbitt demanded 'a suitably equipped receptor' (i.e. the audience) (Babbitt 1998:38) whose erudition of musical form and structure and auditory acuity matched a highly determined sonic art form of 'five-dimensional musical space determined by pitch-class, register, dynamic, duration' and 'timbre' (Babbitt 1998:37). Sound art, on the other hand, is helping

undermine the imposition of such salient orthodox implied notions of hearing, inclusively affirming it in all its heterogeneity and particularity. Cognisant that the 'ear is one of the most complex and compact' and due to its multiple interconnected and interdependent components and processes, precarious 'parts of the body' (Balkany & Brown: 2017:3), the emerging paradigm of auraldiversity, as opposed to the monolithic construct of normative hearing, the auraltypical, is pivotal to the unfolding this agenda[4]. On embracing auraldiversity, the default normative metrics of auditory acuity (or the need for recourse to metrics at all) that are customarily implemented as natural and universal, such as the thresholds of audibility and pain[5] are problematized, and, as we acknowledge other variants on aural experience that human life – from foetus to old age – has to offer, hearing inevitably becomes an unstable subject.

Hearing or Listening

To diminish a superfluity of meaning, it is prescient to clarify the specific terms of reference for *hearing*, and how this is differentiated from its customary partner, *listening*. Sound art and discourse related to sound studies, experimental music and sonic arts are abounding with the classification of ever more nuanced listening categories or behaviours: Schaeffer's *four listening modes* that includes *reduced listening* (Schaeffer 2017: 80-93); Smalley's *nine indicative listening fields* (Smalley 1986: 87)*;* Truax's *listening-in-search* and *listening-in-*readiness (Truax 2001: 21-4); Clarke's *ecological approach* (Clarke 2005); Norman's *referential* and *reflective listening* (Norman 1996); Gaver's *everyday listening* (Gaver 1993:2); Kassabian's *ubiquitous listening* (Kassaibian 2013); Back's *sociological listening* (Back 2007:8); Mullender's *elite-level listener* of the hostage negotiator (Mullender 2018); and on a meta-level, Sterne's timely critical account of *audile techniques* (Sterne 2003:138). Reconciling social sciences, urban studies and applied acoustics, listening *in situ* is probed

and categorised to the max in Augoyard and Torgue glossary/handbook, *Sonic Experience: A Guide to Everyday Sound* (2005), a compendium of terms formulated over more than a decade by CRESSON (Centre for Research on Sonic Space and the Urban Environment).

Exhibiting the 'elegance and parsimony' (Friedman 1998:250) of a do it yourself Fluxus event score, by employing just one word, 'LISTEN', in a number of participatory art works from 1966 onwards, Max Neuhaus helped raise listening to its rightful place in the Pantheon of sound art (despite deliberately eschewing the term sound art himself). With the overriding goal of refocusing 'people's aural perspective', with an implied imperative, he rubber stamped 'LISTEN' in capital letters on the back of participants' hands. This tag was subsequently reiterated on posters and postcards (Neuhaus 2018). Within this frame, 'LISTEN', functioned as a prompt to consciously apprehend the here and now of the *in situ* acoustic environment. Resounding Cage's mantra, 'physicality of sound and the activity of listening' (Cage quoted in Kostelanetz 1988:180), today's prevailing attitude in sound art redoubles this sentiment, deeming listening a participatory, creative and compositional act in its own right.

The expression, *hearing*, routinely finds itself demarcated as a kind of non-listening, in part due to human's physiological inability of external (and internal) sound shut off than say eyelids provide sight . The notion of earlids or eyelid envy is a common trope of sound studies most poignantly portrayed in Elias Canetti's *Auto Da Fé* (first published in 1935, titled *Die Blendung* (The Blinding)). The protagonist, Peter Kien, had a vivid dream of growing soundproof earlids that 'fitted exactly' (Canetti 2005:109) through the elongation of the tragus (named after its resemblance to a goat's beard), with which he had the playful option of opening and closing. When he awoke, he mourned: 'ears are a prey to every

onslaught' (Canetti 2006:110). In this context, it is more apt to refer to this type of listening as, 'background listening' (Truax 2001:25): a kind of activity where 'we are not listening for a particular sound, and when its occurrence has no special or immediate significance to us' (Truax 2001:25). Of course, this is an inherently volatile form of listening, as background and foreground may abruptly flip in the complex context of everyday soundscapes. We may postulate, if Neuhaus had opted for listening's passive, involuntary partner, "HEAR" as the tag *du jour*, would some of that tacit, active traction be lost through the inference of the participants?

Reorienting the prevailing discourse from a mosaic of dovetailing listening modes of which hearing (albeit passive) finds itself a discrete category, onto our actual auditory system which comprises the workings of the outer, inner and middle ear, the peripheral nervous system and central nervous system including the brain, engineered by the quirks of natural selection, here we subscribe to the parlance on hearing from otolaryngology, and more specifically, otology, neuro-otology, audiology, phonation, acoustics and psychoacoustics.

10 Minutes of Nothing

On the 10th July 2015 in The Clore Studio, South London Gallery, I attended a performance that turned Babbitt's dogmatic modernist audience strictures on its head. Elaborating on Cage's take on silence and indeterminacy encapsulated in *4'33"* (1952), *10 Minutes of Nothing* – a performance piece created collaboratively by Jess Thom and Matthew Pountney from Touretteshero and artist/technologist Will Renel, – framed what ten minutes of doing nothing "looks like for Jess". Due to her Tourette's Syndrome, Jess is predisposed to making involuntary movements and noises including a small repertoire of spoken words such as 'biscuit' and 'hedgehog', called tics. In conjunction with the performance, Will developed a

computational system that captured, converted and visualised her physical tics in realtime, to be displayed at the end of the performance.

This performance was far from the customary reverent concert hall fidgeting I had occasion to experience in a performance of *4'33"* in Glasgow by the Whistlebinkies in 1990, with the added frisson of John Cage presiding in the audience towards the back of the room. As the ten minutes progressed, Jess' experience of 'nothing', manifested as a dexterous choreography with increasing exuberance: sonically as well as visually, as her verbal tics dialogued with the lexically distinct verbal (often admonishing) tics of an audience member. Such audience response, which would normally be regarded as intrusion, is entirely permissible within Jess' audience-performance framework, as she would find herself in a similar yet distinct predicament as an audience member.

The conceptual, aesthetic and cultural leap, from Babbitt's infeasibly over-determined composer-performance-audience relationship, to Cage's stifling concert hall convention-bound, *4'33"*, to the ostensibly undetermined (save the 10 minute fixed duration), involuntary sociopetal performance of *10 Minutes of Nothing* is vast.

'Richest of all the sense departments'

Many of us who find ourselves engrossed in the labyrinthine constellation of practices, activities and tropes of sound art and related practices, have an insatiable urge to wax lyrical on sound's capacity to engender interplay and engagement among individuals and their surroundings (not excluding telepresence(s)) in a joyful and beguiling manner, thanks to the sense of hearing. Like a sommelier for the ears, with evangelical verve we effuse on how, through the eloquence of this most perspicacious of senses, one is enabled to discern, locate,

orientate, liaise, connect, bridge, embody, relate, travel, fascinate, transfix and transcend: 'immersion is the new orthodox' (Schrimshaw 2017:1). Despite, what this litany of experiential, benefactive and locative verbs that populate sound art discourse, may attest to, we are customarily rebuked by the population at large. The received opinion on hearing is that of a supportive role to vision within the mix that constitutes our sensorium. This standpoint harks back to the early days of psychology and psychophysics as academic disciplines. Surmised through rudimentary empirical research on comparative sensory resolution (i.e. measuring physical stimuli to the corresponding sensory response), James Drever's introductory text on the nascent discipline, *The Psychology of Everyday Life* (first published in 1921) regards vision and hearing as 'the higher senses' (Drever 1923:87), conferring vision as:

> the richest of all the sense departments, in the number and variety of experiences it yields, as well as in the value of these experiences for our knowledge and appreciation of the world in which we live. (Drever 1923:92)

This judgement is reinforced by current trends in neuroscience with the promise of an 'objective measure' thanks to brain imagining techniques (i.e. CT, MRI and fMRI and EEG): statements such as, 'vision is our best developed sense' is justified by the evidential fact that 'about half the cortex (the convoluted grey matter in the brain) is related to vision' (Butler & McManus 1998:16).

Poignantly, for the more visile/ less audile[6] of the population than say our waxing lyrical sound evangelists portrayed above, this hitherto prosaic sense modality is acutely brought to mind through sensory privation, in its most palpable instantiation, through conductive and or

sensorineural hearing impairment. Bella Bathurst's mindful introspection informed by relentless self-education on the loss of her aural acuity due to otosclerosis[7], and thanks to a microscopic operation, her remarkable recovery, articulates that the fundamental value of hearing is based around human 'relationships':

> If sight gives you the world, hearing gives you other people. It gives you your capacity to interact, to use the gift of language and contact, to be heard and understood in the world. Take it away and you don't just remove the simple pleasure of sound, you remove your route through to humanity[…] Above all, it threatens to change your relationships. (Bathurst 2017:53)

We bear witness to these 'relationships' thanks to numerous film clips available online, displaying the cathartic moment the microscopic electrodes of cochlear implants[8] (CI) are switched on for the first time: a mother is permitted to hear her son's voice; an 8-month old baby accesses the profundity of its mother's voice. Although CI have limitations and are not a seamless substitute, for example musical qualities such as pitch and dynamics are poorly conveyed (an aspect that is particularly perplexing for those who have an aural memory of music prior to hearing loss), the vivid transformation of the users' facial expressions that communicate a veritable opening up to the world, are compelling. Circumventing conventional musical parameters, Tom Tlalim's 'Tonotopia: Listening Through Cochlear Implants' (Tlalim 2019) project assiduously explored specific audiology engendered via CI through the co-designing of sound art with six CI users, resulting in six complementary, personalised sound worlds.

Deep Blindness

Loss or impairment of sight can propel hearing to the fore. With intimate candour and meticulously detail, John Hull's journey towards 'deep blindness' (Hull 1997) due to cataracts and retinal detachment, candidly captured and preserved through his sporadic cassette diary entries, published in *On Sight and Insight: A Journey into the World of Blindness* (1997), provides a valuable first-hand account of shifting sensorial sensibilities. The sound of falling rain that Hull encounters in his entry of the 9th September 1983, becomes much, much, more than a white noise generator, a masker of sonic cues:

> the rain gives a sense of perspective and of actual relationships of one part of the world and another[…] I am presented with a totality, a world which speaks to me. (Hull 1997:27)

Hull's account gives testament to the acuity and nuance of what *in situ* listening can be. It is not merely a textural description of his surroundings and its affordances that are garnered, it extends into the aesthetic and notions of the sublime:

> When what there is to know is in itself varied, intricate and harmonious, then the knowledge of that reality shares the same characteristics. I am filled internally with a sense of variety, intricacy and harmony. (Hull 1997:27)

For his ability to meticulously verbalise everyday auditory experience, I had the honour of hosting Hull on two occasions as a plenary speaker for symposia on sound and soundscape studies[9]. At *Sound Practice* (2001) in Dartington College of Arts, Hull referred to the amassed audience of academics and professionals that had assembled, as 'a group of sighted people who are so amazingly sensitive to sound' (Hull 10:2001). This was a milieu that he

seldom encountered in his day to day life, but the profound difference between the delegates and him was an existential one: 'I don't study sound, I live in sound.' (ibid.)

Sharawdji Effect

On directing *Sounding Dartmoor* (2000-2), a public soundscape study of Dartmoor National Park, I was struck by the nuanced aural sensibilities habitually practiced by the inhabitants, epitomised by the choice of public nomination of specific sounds to be included in the study, the most subtle of them being the atomised sound of a gorse seed ballistically popping on the heathlands in the summer sun. This was one of the quieter, fleeing sounds perceptible by the human ear, sun and season permitting, nevertheless, cherished and prioritised by a Dartmoor in habitant. (Drever 2007:100) Such aural revelations is reminiscent of the soundscape composer, Claude Schryer's quest for the *sharawdji effect*:

> Searching for the Sharawadji Effect is essentially a state of awareness, in which one tends an open ear in the hopes of experiencing the sublime beauty of a given sound in an unexpected context. (Schryer 2009:125)

The *sharawdji effect* as relayed in *Sound Effects (2005)*, in short, articulates the complex, "feeling of plenitude that is sometimes created by the contemplation of a sound motif or a complex soundscape of inexplicable beauty". (Augoyard & Torgue 2005: 117) And yet, despite its exotic sounding nature, "sharawadji sounds belong to the everyday […] through decontextualization, through rupture of meaning". (Augoyard & Torgue 2005: 118)

Notwithstanding the plenitude of good intentions, enmeshed with this kind of sound (albeit ecumenical) evangelising, promoting such mercurial quests as the *sharawdji effect* (of which

I include myself), we risk adopting an uncritical essentialist attitude to hearing: compartmentalising[10] and placing it on a pedestal as a fundamental human trait where the experience of external relationships in its fullness is the preserve of those who hear. Such thinking may be regarded as aping themes of ableism and more specifically, audism: "the notion that one is superior based on one's ability to hear or behave in the manner of one who hears" (Humphries quoted in Bauman 2004:246).

In this regard, it is important to remind ourselves that instead of some kind of miraculous gift bestowed by science, for the deaf community, the marketing of CI by the USA's Food and Drug Administration in the early 1990s was regarded as a threatening political act, threatening a linguistic and cultural minority, as articulated by the National Association of the Deaf (NAD) position statement of 1991:

> Many Americans, perhaps most, would agree that as a society we should not seek the scientific tools nor use them, if available, to change a child biologically so he or she will belong to the majority rather than the minority – even if we believe that this biological engineering might reduce the burdens the child will bear as a member of a minority. (NAD 1991)

With the widespread take up of CI[11] along with 'the ever-increasing range of communication and assistive technology options' (NAD 2000), NAD revised their position statement in 2000 to be more accepting of choice, yet, still holding steadfast to deafness as a healthy and potentially fulfilling way of being, with the adoption of a 'Wellness Model:

> Many within the medical profession continue to view deafness essentially as a disability and an abnormality and believe that deaf and hard of hearing individuals need to be "fixed" by cochlear implants. This pathological view must be challenged and corrected by greater exposure to and interaction with well-adjusted and successful deaf and hard of hearing individuals. (NAD 2000)

Visual Experience of Sound

Inconceivable within Babbitt's dogma, the sound art practice of the Christine Sun Kim, who was born deaf, an issue that she is up front about, expands the realm of the typical sound evangelist. With American Sign Language (ASL) as her first language, she recounts that despite being taught to believe that sound was not part of her life she was hypervigilance around sound and developed a kind of displaced concern for 'sonic etiquette', such as: 'don't scrape your utensils on your plate!' During a residency in 2008, as a visiting visual artist, she was exposed to the burgeoning *klangkunst* milieu of Berlin. In a seismic artistic shift, through a series of visual art work such as *How to Measure Quietness* (2014) instead of using the acoustician's meter of the decibel (dB), a metric predicated on a model of hearing based on a 'healthy person', aged between 18 to 25 years old, referred to as the otologically normal (BS ISO 226:2003), she perceptively applied the dynamic markings of *mp* through to *pppppppppp*[12] to her own explicitly subjective examples. She continues to work with a range of media and approaches, often blending ASL with music notation, exploring 'the materiality of sound through its visualization in drawing, painting, and performance' (Christine Sun Kim 2019).

Auraldiversity

From the findings and further public response to my study on the noise effects of ultra-rapid "ecological" hand dryers in publicly accessible toilets (Drever 2013) I was propelled to rethink my tacit understanding of sound and hearing. I learnt that hearing perturbs, isolates, excludes, disconnects, disembodies, and dislocates. It can precipitate emotions of fear, repulsion, nausea, embarrassment, shame, alienation, bereavement, stage fright, flashback, threat, hallucination, disorientation, insecurity, exposure, vulnerability, dizziness, rage and sensory shut down. And it can cause severe pain. In extremes, this is the case for many living with hyperacusis, misophonia, phonophobia and post-traumatic stress syndrome, but it can also negatively impact on those with particular hearing needs such as the partially sighted or hearing aid users or those with sensitive hearing such as children and ASD.

Beyond bog-standard acoustics testing of hand dyers (and the rooms acoustics of which they are situated) including sound power test and *in situ* sound pressure measurements using the customary ontologically normal metrics I endeavoured to communicate my findings on specific loudness perception through a range of sound works.

In *sanitary tones*: ayre #2[Dan Dryer] instead of working directly with hand dryer sound recordings and my own hearing, as I had done in previous work, I utilised the pioneering audiologist Tomatis' Law on Audition and phonation which postulates that: 'The voice reproduces only what the ear can hear' (Tomatis 1996:87, first published in 1963), therefore 'with all subjects presenting an auditory loss, the harmonics related to that auditory loss are absent from the voice of the subject.' I made *in situ* recordings of the Danish hand dryer brand, Dan Dryer, emblazoned by the logo of a Viking man in the colours of the Danish flag. I became particularly interested in dryers which had faulty motors, resulting in the emitting of a more muscular, vocal-like quality. I opened up the project to public participation inviting

Danes from kindergarten kids to older women in their 80s, to phonate (i.e. imitate with their voices) these recordings with their voices as best they could. The voices were played back generatively, spatially elaborated through a range of spatial trajectories, back into a cloak room and toilet through a bespoke 16 speaker surround sound system in Radar, a music venue in Aarhus. If we adhere to Tomatis' law, the listener of the installation will hear a blending of renditions of the dryers as heard by and vocally reproduced by the participants, and consequently impart something of how each participant heard in particular.

Conclusion

Sterne writes, 'sound studies has a creeping normalism to it that is, an epistemological and political bias towards an idealized, normal, nondisabled hearing subject' (Sterne in Novak & Sakakeeny 2015:73). In contrast, I have shown that there a modes of current sound art practice that circumnavigate or actively negotiate with these normative tendencies, but we can go further. Hyperacusis, presbycusis, sensorineural endocochlear hearing loss, central auditory processing disorder, and so on, are forms of natural human variation, as are the more transitory hearing issue such as occlusion do to earwax, but since our state of hearing profoundly effects what is heard and how it is affectively perceived and experience, it is imperative to bring audiology into sound art practice and discourse. Auraldiverse hearing should become the new orthodoxy and orthopraxy. Auraltypical work and thinking should be call out when encountered. We can draw awareness to the vicissitudes of our own hearing and adopt an *auralrelative* approach, a kind of meta-cognitive awareness vis-à-vis hearing, to go somewhere on the road - to hijack a well-used visual Foucauldian maxim – 'to [hear] the pathological world with the [ears] of the patient himself [sic]' (Foucault quoted in Sacks, 1996, xviii–xix). I argue that it is naive to dive too deeply into the never-ending shades of listening until we have a fuller grasp of what hearing entails, and the complex interplay

betwee hearing and listening. And of course this exploration can and should go beyond the human to include the audiology of other species. If we are working with sound and anticipated that it should be listened to, why would we not consider whose/who's hearing?

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[1] 'Disabling hearing loss refers to hearing loss greater than 40 dB in the better hearing ear in adults and a hearing loss greater than 30dB in the better hearing ear in children.' (WHO, 2019).
[2] 'Between 2000 and 2012 there was an increase of between 11% and 17% in the proportion of people surveyed who feel that they are to some extent adversely affected by the four most commonly heard sources of noise ('road traffic', 'neighbours and/or other people nearby', 'aircraft, airports and airfields' and 'building, construction, demolition, renovation and road works' (DEFRA 2012: 4).
[3] For a discussion on auraldiversity in modern in music and sonic arts see Drever 2019.
[4] The concepts of auraltypical and auraldiversity were first proposed by Drever in his presentation, 'Topophonophobia – the space and place of acute hearing', at Hearing Landscape Critically: Music, Place, and the Spaces of Sound at Harvard University in 2015, and subsequently in Drever 2017.
[5] Most text books state the limit for frequency perception lies between 20 Hz and 20 kHz. For sound pressure level, the auditory threshold, 0dB, refers to 20 micropascals at 1,000Hz. On the same scale, the threshold for pain is 140dB.
[6] *Audile* is an archaic term recently refashioned by Sterne (Sterne 2003:96). Here I am reverting back to the archaic form to help acknowledge those who habitually prioritise hearing as set out by William James in his *Psychology: Briefer Course* (1892).

[7] A form of conductive hearing loss known as when the innermost of the tiny bones that transmit sound through the middle ear, the stapes or stirrup, fuses with the bone of the cochlea
[8] An electronic device that restores hearing to severely and profoundly hearing impaired adults and children by bypassing the damaged hair cells.
[9] *Sound Practice: the 1st UKISC conference on sound, culture and environments*, Dartington College of Arts (2001); *Sonic Subjects & Acoustic Objects*, Goldsmiths, University of London (2004)

[10] As Merleau-Ponty notes, the human experience is synaesthetic by nature and cannot be reduced to what is experienced with a single sense: 'Synaesthetic perception is the rule' (Merleau-Ponty 2005:266).

[11] In April 2016 there was12,000 users in the UK. (Action on Hearing Loss, 2016) file:///Users/johndrever/Downloads/Facts%20and%20figures.pdf

[12] *ppp* is the softest dynamic marking according to Rudiments and Theory of Music, Associated Board of the Royal Schools of Music (1958). La Monte Young's *Trio for Stings (1958)* uses *pppppp* (Potter 2000:35) and Luigi Nono's *Prometeo: tragedia dell'ascolto* (*a tragedy of listening*) (1984) uses *ppppp*.