'Primacy of the Ear' – But Whose Ear?: The case for auraldiversity in sonic arts practice and discourse

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Sixty years on from Pierre Schaeffer's call for 'primacy of the ear' (*primauté de l'oreille*), this article asks an ostensibly simple question: whose ear/aural perception is being referred to when we talk of and compose under this guiding principle? Is there a tacit preselected audiometric norm or even a pair of golden ears, at its core? The article will problematise the uncompromising modernist notion espoused by Babbitt of a 'suitably equipped receptor' (Babbitt 1958), and posit examples of well-known composers whose hearing markedly diverged from the otologically normal, an acoustics standard from which A-weighted decibels is predicated (ISO 226:2003). In conclusion the concept of auraldiverse hearing is proposed and creative strategies that eschew or problematise auraltypical archetypes in sonic arts practice and theory wherever they may lie are encouraged.

1. 'PRIMACY OF AURAL PERCEPTION'

The year 1986 saw the publication of Simon Emmerson's seminal *The Language of Electroacoustic Music* (Emmerson 1986): a judiciously selected compilation of articles by composers – typically all male and from WEIRD[1] societies – representing the dominant, albeit in some cases idiosyncratic, standpoints of the day, including new methods of analysis and classification. In the introduction, Emmerson explains that all the approaches, albeit on a spectrum (i.e., from Boulez to Wishart), share 'in the commitment to communication and an acceptance of the proper role of the listener's perception in the musical process' (Emmerson 1986: 2). Included in the mix is an early version of Denis Smalley's articulation on spectromorphology, titled, 'Spectro-morphology and Structuring Processes' (Smalley 1986) – the original version of which had been presented five years earlier at a conference in EMS, Stockholm in 1981. It cannot be overestimated how compelling the ideas it contained became, and continue to be, in subsequent sonic arts practice and discourse. One measure of influence is citation: a subsequent revision published in *Organised Sound* in 1997, and in less strident language than the 1986 version, has become by far the most cited paper in the history of the journal (*Organised Sound* 2018).

In the concluding remarks of *The Language of Electroacoustic Music* version, Smalley asserts:

> Spectro-morphology reaffirms the primacy of aural perception which has been so heinously ignored in the recent past, and warns composers, researchers and technologists that unless aural judgment is permitted to triumph over technology, electroacoustic music will attract deserved condemnation. (Smalley 1986: 93)

2. 'PRIMACY OF THE EAR' ('*PRIMAUTÉ DE L'OREILLE*')

Smalley's meticulously detailed and granular spectromorphological criteria were an advancement on the foundations proposed by Pierre Schaeffer and the Groupe Solfège at the GRM (Groupe de recherches musicales), expounded in the eight years of fastidious study into sound morphology and typology that resulted in the *Traité des Objets Musicaux* (Schaeffer 2017, first published in 1966), with accompanying sound examples, *Le Solfège de l'Objet Sonore* (Schaeffer and Reibel 1998, first published in 1967). With the clarifying amendment of the synecdochical 'ear' for 'aural perception', Smalley's thesis revivified Pierre Schaeffer's oft-cited refrain: 'primacy of the ear [*primauté de l'oreille*]', a term that is said to have originated from Olivier Messiaen, teacher of Pierre Henry and an early collaborator of the Groupe de Recherches de Musique Concrète (GRMC) (Spence and Swayne 1981: 196) and well-known synesthete.[2]

This radical foregrounding of the sense of hearing with its various modes of listening, which seems second

[1]'Behavioral scientists routinely publish broad claims about human psychology and behavior in the world's top journals based on samples drawn entirely from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies. Researchers – often implicitly – assume that either there is little variation across human populations, or that these "standard subjects" are as representative of the species as any other population' (Henrich, Heine and Norenzayan 2010: 61).

[2]Not too distant from Schaeffer's *reduced listening*, where he systematically applied an aural approach to Husserl's method of *bracketing*, Messiaen talked of encouraging a kind of 'aural virginity' (*virginité d'oreille*) approach for the uninitiated audience member (*Entretien avec Olivier Messiaen*, 11–13 October 1961, in Sholl 2010: 206).

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nature from today's perspective,[3] was first articulated by Schaeffer in *Vers une musique expérimentale: Revue musicale*, no. 236 (1957), a review of the *First International Ten Days of Experimental Music*, which took place at UNESCO in Paris in 1953. Schaeffer spelt out three 'postulates and practical rules for *musique concrète*', the first and pre-eminent being:

> Primacy of the ear. – The potential for development, along with the boundaries of any new music, depends on the capacity of our hearing. (Terrugi 2015: 52)

Schaeffer's dictum was reiterated in '*La Musique Concrète. Que Sais-je?*', a publication aimed at a more general reader (Schaeffer 1967: 29).[4] He declares:

> The potential for evolution (and also the limits) of all new music lie in the resources of the ear. (Schaeffer 1967: 29)

The importance Schaeffer placed on first-person perception – '[p]erception with its primordial dator quality, and external perception, of course, in particular, has advantages of its own compared with all form of representation' (Husserl 2012: 371) – partly resembles an aural turn on the transcendental phenomenology method espoused by Husserl in his *Ideas: General Introduction to Pure Phenomenology* (2012, first published in 1913), that the Groupe Solfège had unwittingly practised – 'for years, we have time and again been doing phenomenology without realizing it, which is better, all things considered, than talking about phenomenology without doing it' (Schaeffer 2017: 26). Offering a sensory shift from Husserl's predilection for visual and tactile sensation, in his endeavour for 'a radical renovation of' (Schaeffer and Reibel 1998: 13) music theory and in turn engender fresh approaches to composition, Schaeffer would consequently cherry pick from Husserl's method, championing hearing, at the expense of the other senses.

It is worth reminding ourselves that an entrenched ocularcentric hierarchy of the senses has been sustained throughout twentieth-century Western thought. For example, in *The Psychology of Everyday Life* (1923, originally published in 1921), the pioneering experimental psychologist James Drever pontificates:

> Vision is 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. (Drever 1923: 92)

Speaking with a voice of authority, Drever goes on to scientifically evidence this conjecture, through empirical qualitative and quantitative data, a veritable weighing up of the senses. An immediately graspable concept, 'primacy of the ear', on the other hand, proclaims a superior role over this assumed prevailing cultural dominance of the eye and visual perception. It also eloquently encapsulates the salient tropes of musique concrète – the sound object, reduced listening, acousmatic listening, etc.

Meanwhile in the same vein, phenomenology was gaining traction on the other side of the Atlantic: James Tenney was applying concepts of perception to music theory as a teaching tool, articulated in *META † HODOS: A Phenomenology of Twentieth-Century Musical Materials and an Approach to the Study of Form* (Tenney 1992; originally written in 1961) and *META Meta † Hodos* (Tenney 1992; originally written in 1975). Tenney, who opted for the term 'clang or aural gestalt' (Tenney 1992: 24) over Schaeffer's sound object, considered that Schaeffer's 'definitions refer less to the perceptual events in music (or rather, in the musical experience) than to the physical or acoustic materials that are manipulated in the process of composition' (Tenney 1992: 25).

3. WHOSE EAR/AURAL PERCEPTION?

Although Smalley understands spectromorphology's primary contribution 'as tools for describing and analysing listening experience' (Smalley 1997: 107), in acousmatic music the role of composer/listener is multiple, as crucially their first-person auditory perception is implied in the process of recording, editing, mixing, manipulation and mastering. Here, fellow acousmatic composer Jonty Harrison admires the vital role played by Smalley's acute aural perception that is made audible in the composition themselves, in works such as *Valley Flow* (1991–92) and *Wind Chimes* (1987). In a short text written for the CD booklet *Impacts intérieurs*, again under the heading of *The Primacy of the Ear*, Harrison expertly opines:

> The sensitive ear interacts with sound, constantly experimenting, probing, assessing. What is 'right' is what works for the ear and for the perceptual/intellectual mechanism of interaction we call listening. Listen. (Smalley 1987)

In this themed issue of *Organised Sound* on 'Perceptual Issues Surrounding the Electroacoustic Listening Experience', 30 years on from the original publication of 'Spectro-morphology and structuring processes' and 60 years on from '*Vers une musique expérimentale*', this article asks an ostensibly simple question: whose ear/aural perception is being referred to when we talk of and compose under the guiding principle of 'primacy of the ear/aural perception'? Is there a tacit preselected audiometric norm (e.g., 'audiometric thresholds within the normal range for young adults', Frisina 2010: 12) or even a pair of what is colloquially referred to as *golden ears*, at its core? And what if the composer/listener does not or no

[3]The tasks of studio recording – manipulation, editing, mastering, that is, the core activities of the recording studio today – are fundamentally reliant on auditory perception of the composer/sound engineer/sound designer.

[4]It was subsequently re-echoed in *Machines à Communiquer* (Schaeffer 189: 1970).

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longer possesses auraltypical hearing (i.e., normative hearing), what then? In this endeavour, as a composer/listener the author will take the liberty of referring to his own first-person, lived experience of hearing, in an attempt to limit the positing of implicit generalisations on others' hearing (i.e., one is the authority on one's own hearing).

4. PERCEPTUAL (UN)LEARNING

It goes without saying that musical and/or auditory perception skills are not mystically decreed. From an ecological perception approach, Eric Clarke elucidates that they are contingent on a combination of 'perception/action; adaption; perceptual learning':[5]

> a newborn infant … has a limited range of powerful perceptual capacities and predispositions that give it a foothold in the world; but the overwhelming majority of an adult's more differentiated perception develops from these simple but powerful beginnings by virtue of environmental exposure/exploration and enculturation. (Clarke 2005: 24)

The music psychologist John Sloboda, taking lead from cognitive psychology discourse, states that:

> musical ability is a particular sort of acquired cognitive expertise, entailing at its core the ability to make sense of musical sequences, through the mental operations that are performed on sounds (whether real or imagined). (Sloboda 2004: 265)

Just as music is 'deeply embedded in human culture' (Cook 2000: ii), musical ability is not miraculously devoid of enculturation, acculturation or assimilation. This 'making sense' 'conforms to a cultural "language"' (Sloboda 2004: 225), 'cultural rules' (ibid.: 226) and collective consensus 'on mood or emotion of a musical passage' (ibid.). Thus, Schaeffer regularly stresses the need to unlearn in order to move forward:

> But everyone will finally have to admit that each one of us hears with different ears: sometimes too refined, sometimes too coarse, but in any event always informed by all kinds of prejudices and preconditioned by education. (Schaeffer and Reibel 1998: 13)

5. WHO CARES IF YOU LISTEN?

Schaeffer's acknowledgement of 'different ears' (ibid.) was not universally accepted, the place of hearing, as advocated within much of the dominant trends of modernist music of the mid-twentieth century (which Emmerson alludes to in his introduction of 1986), had a vexed history, typified in the divisive polemic of Babbitt's *Who Cares If You Listen?* (Babbitt 1998): a stand point that Rose Rosengard Subotnik has referred to as an 'ideal of compositional individualism' (Subotnik 1991: 249). Nestled betwixt ultramodern advertisements for the Globemaster AM-FM-SW Hi-Fi Tuner and the Audax Stylus Balance, the February 1958 issue of the audio aficionado's magazine *High Fidelity* published an analogous hi-fi/hi-tech/high-brow opinion piece by Princeton composer and mathematician, direct inheritor and zealot of Schoenberg's twelve-tone technique doctrine Milton Babbitt. The article's audacious title was not recognised by the author, *High Fidelity*'s editor deviating from Babbitt's original, less grabbing headline, *The Composer as Specialist*.

Augmenting a position proposed in Adorno's *On the Fetish-Character in Music and the Regression of Listening* (Adorno 2002, first published in 1938),[6] in loquacious prose, Babbitt, the academy-sponsored composer, promulgated an unabashed steadfast attitude of modernist conceit, talking of the 'divergence between contemporary serious music and its listeners' (Babbitt 1998: 36) and 'the condition of musical and societal "isolation"' (ibid.) of which to some degree he lamented, while simultaneously regarding this hermetic stance as a virtue, even historical necessity. In contradistinction to the prevailing commercial music culture that panders to what Adorno called 'infantile hearing' which 'demands sensually rich and full sonority, sometimes represented by the abundant thirds … always demands the most comfortable and fluent resolutions' (Adorno 2002: 308), Babbitt was referring to a scrupulous compositional practice engendered by its desire for an unprecedented 'efficient' 'tonal vocabulary' and reduced 'redundancy' (Babbitt 1998: 36). Such granularity would be achieved by assiduous and stringent focusing on a 'five-dimensional musical space determined by pitch-class, register, dynamic, duration' and 'timbre' (ibid.: 37). Babbitt's demarcation of parameters (conspicuously omitting *silence*, a theme that preoccupied his compatriot and in many way his philosophical antithesis, Cage) is a mishmash of the nuts and bolts of composition: music notation, composition technique, orchestration, organology, but also incorporates skills in auditory perception and musical ability of the audience – the listener.

Coupled with the unprecedented scrutiny that postwar modernist composers were paying to new dimensions in music, including spatial movement and deployment, and its perception thereof – embraced by

[5]In the introduction to Eric Clarke's *Ways of Listening*, where he addresses the auditory gap in J. J. Gibson's *ecological perceptual theory* (Gibson 1966, 1979), he postulates, 'perhaps because of his own progressive deafness, Gibson developed his ideas much less in relation to auditory perception than vision' (Clarke 2005: 6).

[6]Adorno, being another Schoenbergian devotee, through dialogue with Benjamin wrote: 'they listen atomistically and dissociate what they hear, but precisely in this dissociation they develop certain capacities which accord less with the concepts of traditional aesthetics than with those of football and motoring' (Adorno 2002: 303).

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Karlheinz Stockhausen in his *Gruppen* and *Gesang der Jünglinge* from 1955 – were the 'demands [for] increased accuracy from the transmitter (the performer) and activity from the receiver (the listener)' (Babbitt 1998: 36). The performer, Babbitt presciently announced, could be replaced by 'purely electronic media', but what of the audience with the 'heavier demands' placed upon their 'perceptual capacities' (ibid.)? Equating this variable human component to high-end hi-fi audio gear (corresponding with *High Fidelity*'s editorial), and aping information theory of the day,[7] Babbitt stipulated:

> Like all communication, this music presupposes a suitably equipped receptor. (Ibid.:38)

This was not mere hyperbole directed at the *High Fidelity* readership; the argument ran deep; it was a matter of success or failure for this highly determined strain of composition, necessitating *high fidelity* auditory perception and cognition. Babbitt imparts:

> Inability to perceive and remember precisely the values of any of these components results in a dislocation of the event in the work's musical space, an alternation of its relation to all other events in the work, and-thus-a falsification of the composition's total structure. (Ibid.:37)[8]

Babbitt's pre/proscribed hearing of the audience extends beyond an assumed normative standard of concert-going perception to a highly receptive, eagle-eared, state of exceptional auditory acuity reserved for DC Comics' Kryptonians and Daxamites, whose alien hearing is unrestricted by frequency or sound-pressure-level thresholds, or the 'auditory super sensitivity' (Ballard 2009: 113) of J. G. Ballard's mute sound-sweep, Mangon. Moreover, an unbiased auditory perception and musical ability (with the cultural caveats by Sloboda, referred to above) and expansive attention and retention management (depending on the duration of the work) are requisite.

Let us assume for a moment that an audience member is endowed with optimum sensory-cognitive functions and is 'suitably' enculturated, and attends a faithful interpretation of Babbitt's *Philomel* (1964) (comprising fixed tape part with synthesised sound and pre-recorded soprano voice, projected over four loudspeakers, combined with live soprano) in an uncompromised acoustic. But what if, midst performance, they sneeze, causing an involuntary auditory reflex, experience the whistles, clicks and signal drop-out of transient ear noise; they are struck with the ototoxic effects of an antibiotic medication, swallow or yawn, opening up the Eustachian tubes (which links their nose to their ears); an allergic reaction blocks their sinuses causing the Eustachian tubes to swell up, affecting the regulation of the pressure within the middle ear, resulting in an uncomfortable feeling of 'ear fullness'; they are at the tail end of a common cold, with fluid filling the middle ear; they blow their nose, enacting a kind of Valsalva manoeuvre, temporarily impairing their hearing but helping equalise the pressure between the outside and inside of the middle ears, but each ear equalising independently, at its own pace; maybe they are anxious, not helped by their neighbour's incessant programme thumbing; they are hit with the onset of a migraine decreasing their tolerance to loud sounds; their asymmetric intermittent tinnitus is set-off, and in general their hearing acuity is abruptly diminished (i.e., temporary threshold shift) from the piercing brass attacks punctuating the previous work in the programme, while noise induced fight-or-flight stress hormones are still flushing around their blood system intensifying their attention skills (i.e., corticotropin-releasing hormone and adrenocorticotropic hormone). Perhaps the listener is male, aged 42 say (i.e., Babbitt at the time of publishing the above article): overlooking any other accumulated hearing damage over the years of serious music concert going and/or performing, gender-specific degrees of age-related hearing loss (presbycusis)[9] in the high frequency range becomes a prominent feature for reception of music that takes timbre to the *n*th degree; a foible of hearing well-recognised by ornithologists undertaking bird surveys, who fail to register bird calls in the upper frequency range such as Goldcrest and Treecreeper (Tucker, Musgrove and Reese 2014). Will these run-of-the-mill, transient, auditory occurrences not disenfranchise their erstwhile privileged status as 'suitably equipped receptor', and thus compromise the composer's intentions, hence jeopardising the whole enterprise? Is there a place for the tin-eared, albeit fluctuating and fleeting, in modern music?

6. EXTREMITIES OF AUDIBLE SPECTRUM

Matching CD quality audio file format, the BBC regard the range of 20 Hz to 20 kHz as 'full audio bandwidth' (BBC 2017: 8). Their Audio Quality Information and Standards for BBC Radio (BBC 2017) prudently warns against 'extraneous noises' in

[7]For a rigorous attempt to apply information theory to music aesthetics, see Moles 1968.

[8]In Emmerson's chapter in *The Language of Electroacoustic Music*, he classifies Babbitt's strict application of serial principles as: 'aural discourse: abstract syntax', as 'they concern the creation and manipulation of abstract shapes created independently of the perceptual qualities of the materials used' (Emmerson 1986: 26).

[9]The ISO document on *Acoustics – Statistical Distribution of Hearing Thresholds Related to Age and Gender* states: 'The sensitivity of human hearing is well known to decrease with age and the impairment of hearing develops more rapidly for sound at high frequencies than at low frequencies. Moreover, the magnitude of this effect varies considerably among individuals … Distinction is made between males and females since the difference is found to be of significance in the case of older age groups' (ISO 2017: V).

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the upper and lower regions of the possible audible spectrum:

> These are sometimes inaudible to those monitoring in the studio, only to cause problems further down the signal chain. A good example is TV line frequency interference (15.625 kHz) from old CRT monitors, that is present on some archive recordings. This is sufficiently high in frequency as to be inaudible to many people over 40 years of age, but may be heard by younger listeners (or dogs!). (BBC 2017: 8)

This age-related sensitivity to very high frequency and ultrasound (16–80 kHz) has been harnessed/exploited by Compound Security Systems' anti-loitering device, the Mosquito. The devices, currently unregulated due to lack of research, can emit intense sounds at around 15–18 kHz with the specific goal of creating a distress response in young people, a demographic group who are extremely perceptible to *non-audible* sounds. The array of subjective effects to this sound frequency range include: nausea, dizziness, migraine, fatigue, tinnitus and 'pressure in the ears' (Leighton 2016).

Through the author's research into the high speed hand dryer noise, he was invited to become a member of Health Effects of Ultrasound in Air (HEFUA) led by Prof Timothy Leighton at the University of Southampton, a consortium 'that addresses the fact that humans are being increasingly exposed to ultrasound in the air through commercial devices' and yet there is 'insufficient understanding of how these devices affect health' (HEFUA 2018). In 2016 Leighton published a paper titled, 'Are some people suffering as a result of increasing mass exposure of the public to ultrasound in air?' (Leighton 2016) which clearly sets out the issues, including questioning the poor quality of extant research that has been used and reused as the basis for international standards. Similarly, there are numerous reports of negative effects due to exposure to low frequency sound and infrasound (i.e., 4–16 Hz) (Leventhall 2003). Naturally many sonic artists are attracted to these extremities of the audible spectrum, so called 'invisible sounds' and beyond.[10]

7. AUDIOLOGICAL RAMIFICATIONS ON COMPOSERS AND THEIR COMPOSITIONS

In the most renowned case study of audiological ramifications on composers and their compositional oeuvre, Ludwig van Beethoven exemplifies the range of hearing impairments, which in part has added to his heroic status. Don Ihde celebrates Beethoven's amazing capacity to 'imaginatively "hear" an entire symphony at will' (Ihde 2007: 118) despite his deafness. Oliver Sacks even postulates that Beethoven's:

> musical imagery was even intensified by deafness, for the removal of normal auditory input, the auditory cortex may become hypersensitive, with heightened powers of musical imagery. (Sacks 2007: 33–4)

This positive spin is only part of the picture; we have learnt that Beethoven's progressive hearing loss from the age of 27 onwards was not his only hearing impairment, but also tinnitus – 'my ears whistle and buzz continually, day and night … such a condition is truly frightful' (Huxtable 2000: 3) – and hyperacusis,[11] which as a comorbidity led to 'fear, lack of self-esteem, emotional disarray, increasing isolation, and self-neglect' (Kubba and Young 1996: 167) and precipitated feelings of 'despair and suicidal thoughts' (Huxtable 2000: 3). Beethoven was forced to retreat from what he perceived as an increasingly intolerable noisy city, mythologised in his solitary walks in the Vienna Woods, heeding the words of Michel Serres's maxim: 'noise is what defines the social' (Serres 2008: 107).

Another composer with a well-known audiological case history, Bedřich Smetana, had a panoply of hearing issues later in life. In a letter of 1874, he attempted to describe his hearing:

> in one of my ears the notes in the higher octaves were pitched differently than in the other and that at times I had a tingling feeling in my ears and heard a noise as though I was standing by a mighty waterfall. (Smetana quoted in Pesic and Pesic 2015: 9)

His tinnitus has a momentary sounding in his String Quartet No.1 in E minor, *From my Life* (1876), represented by a high E. He accounts for this shrill tone as:

> that fateful ringing of high-pitched tones in my ear which in 1874 announced the beginning of my deafness. (Ibid.)

Iannis Xenakis on the other hand was not so forthcoming about his hearing damage, resulting from being wounded by a British tank shell in Greece in 1944, which blinded him in one eye. Writing on *The Electroacoustic Music of Iannis Xenakis*, in parenthesis, James Harley speculates:

[10]For an example of infrasound in sonic art, see Angliss (2018); for a review of the uses of ultrasound see Dotolo (2010).

[11]Auditory science has tended to focus on hearing loss, which is not surprising as there are currently '11 million people with hearing loss across the UK' (Action on Hearing Loss 2018). In contrast to hearing loss, hyperacusis is 'excessively sensitive hearing', where people 'find it difficult to tolerate ordinary day-to-day sounds that most people would regard as quiet or unintrusive' (McKenna, Baguley and McFerran 2010: 5). Hyperacusis often accompanies hearing loss and tinnitus, but not as a rule. Distinct from hyperacusis, hyperacute, or its reverse hypo-acute, hearing is also often experienced by people with autism (see Grandin and Panek 2014), and there are people with significant hearing impairment due to acoustic trauma in specific areas of the frequency spectrum and increased acuity in others, which is referred to as recruitment.

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> that the hearing loss, particularly in the higher frequencies, Xenakis suffered from his injuries during that time would have shaped, to some extent, his attraction to 'noisy' sounds and to high-decibel playback levels. (Harley 2002: 35)

Schaeffer certainly found Xenakis's sound world out of kilter with his expectation of musique concrète aesthetics. In 1997 Xenakis recounted Schaeffer's reception of *Bohor* (1962), an eight channel electroacoustic work by Xenakis generously dedicated to Schaeffer:

> This piece horrified him! He said that it was killing the eardrums, that it was dangerous to health, that I went too far, that I was crazy, that I had to obey certain rules and go humbly to learn from him how to make concrete music. (Serrou quoted in Paparrigopoulos 2012: 3)

Towards the latter part of his life, Henri Pousseur struggled with what may be assumed as hyperacusis: 'the musical sounds that he had manipulated all his life' had transformed 'into an excruciating torment' (Whiting 2009). In December 2007 Pousseur attended the UK premiere of his *Voix et vues planétaires*, an audiovisual work where he had been 'aided' by his son Denis while he strategically developed new skills around visual manipulation. John Dack who organised the performance recounted that after the concert Pousseur was unable to enter an Italian restaurant due to perceived excessive noise, the intensity of which was not audible by the other guests (Dack 2015).

8. HOW, WHO AND FOR WHOM? A PERSONAL INTERJECTION

Amid PhD, in a somewhat unpolished and searching paper for *Organised Sound* in 1999, I posited and prodded some increasingly vexing research practice issues that were troubling me to such extent that they were actually curbing my compositional output. This act of self-examination coalesced around these questions: 'How was I representing?' 'Who was I representing?' and 'For whom was I representing?' (Drever 1999: 28). My articulations came at a time when sonic art practice was preoccupied with spectromorphology; soundscape composition was pretty well marginalised within the academic sonic arts scene in the UK. In a follow-up article, with an arguably more scholarly discourse, I stretched out towards ethnographic methods to help deal with these seemingly unanswerable questions of motivation and means (Drever 2002). Since the early 2000s the conversation and the practice have moved on; ethnography and sonic arts collaboration and hybridisation is standard, with many fruitful projects to savour and learn from (e.g., see Cox, Irving and Wright 2016), although I would still stress that those questions of representation demand perennial status.

My interrogative mode of how, who and for whom persists however; the fundamental tenet of musique concrète has come to the fore, the acousmatic meme par excellence: 'primacy of the ear'. Unwittingly this term has become part and parcel of my practice: composition, performance practice, consumption and discourse, and spills into my work on applied soundscapes and environmental noise activism, and most of all it is a concept that I have also fostered through teaching.

My initiation into the world of spatio- and spectromorphologies as explicitly expressed through composition and its performance was an acousmatic music concert presented by BEAST (Birmingham Electro-Acoustic Sound Theatre) in the Queen's Hall as part of the Edinburgh International Festival on 18 August 1990 in a programme of Trevor Wishart's *Vox V* and new works by Jonty Harrison and Jonathan Harvey. Via my 17-year-old *golden ears*, throughout the concert I was struck that my auditory perception was being beguiled and massaged in a way I was unaccustomed, from my erstwhile concert-going and general music consumption. It was loud and intense at times; in fact there were gestures of vast muscularity that I had not heard out in the Edinburgh streets, but there was also detail, in turn exciting the entire audible frequency range of my naive hearing. And, I was quite content with the severing of visual cues, traded for a large mixing desk and battery of loudspeakers as the mode of performance practice. If I had known the term, 'primacy of the ear', I would have found it fitting.

Five years later, at one of my first ever acousmatic music concerts as composer, I had an uncomfortable memory of my wonderfully supportive mum being silenced by an over zealot PhD candidate: before the second half of the concert commenced, he turned round – 'You are not going to shake your programme through the rest of the concert, are you?' In fact, my mum had progressive hearing loss, significantly more than the expected age-related hearing loss, and would have been pretty well unaware of her sonic intervention akin to a performance of Murray Schafer's no. 74 of *100 Exercises in Listening and Sound-Making*: 'How many different sounds can you make with' (Schafer 1992: 104) a sheet of paper – an impromptu performance that was truly agonising my PhD colleague.

Ten years on, I am presenting my research, 'Sanitary Soundscapes: The Noise Effects from Ultra-Rapid "Ecological" Hand Dryers on Vulnerable Subgroups in Publicly Accessible Toilets' at the 2nd International Conference on Hyperacusis (Drever 2015). I am shamed by the conference chair who warns me off playing any sound examples of hand dryers as 'there will be people with hyperacusis in the room'. Here, the customary clapping of hands to show our appreciation after presentations was substituted for the waving of hands in the air. Like most of the population, including

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the majority of GPs, prior to the conference, my awareness of the complexities and challenges of living with hyperacusis in a *loud* world were limited.

And so until today, June 2018, deprived of my auraltypical hearing status, notwithstanding my age, I am awaiting a hearing aid fitting. Following 'a pure-tone air-conduction and bone-conduction threshold audiometry with and without masking' (i.e., a standard hearing test following British Society of Audiology 2011) – along with the MRI scan, fascinating sonic experiences in their own right – prompted by the presence of continuous high-pitched tinnitus, that has been accompanying me for several years, and which I localise deep in my right ear, my audiogram confirmed that I have a right-sided high frequency sensorineural hearing loss above 4 kHz. The standard only measures the response, or lack of, to pure tones up to 8 kHz, which those of us who wish to explore the more accepted standard range of human hearing, ubiquitously cited as 20 Hz to 20 kHz (so-called 'audio sound'), in our line of work find frustrating.

Unlike the adverse effects outlined in Leighton (2016) and Leventhall (2003), my hearing condition, which I have to say is trivial if I did not work with sound, does not impact on my general well-being. But does this mean I will never achieve the promise of Murray Schafer's 'clairaudience – literally, clear hearing': 'exceptional hearing ability, particularly with regard to environmental sound' (Schafer 1994: 272) – regardless of how many ear cleaning exercises I practice?

I am reminded of Don Ihde's predicament. In the revised SUNY Press Edition of his groundbreaking first-person golden-eared aural phenomenology expressed in *Listening and Voice: Phenomenologies of Sound* (2007, first published in 1976), Ihde added a new chapter where he tells us of his attempts to embody and adapt to hearing aids due to age-related hearing loss. He recalls how, in *Listening and Voice*, he exulted in his faculty of perceiving sound that, 'is simultaneously experienced as both surrounding and directional. Hearing aids, however, cannot simply match this phenomenon' (Ihde 2007: 246).

9. SUBJECTIVE/OBJECTIVE/ INTERSUBJECTIVE

These biographical examples of shifting auditory experience prompts us to ponder on the veracity and general applicability of the default model of hearing and aural perception that we perpetually return to, albeit tacitly or deeply encoded within the tools and techniques we practice.[12] Schaeffer, Schafer, Tenney, Smalley, Ihde et al. do not present their work as robust scientific studies or methods in the manner of Warren's *Auditory Perception* (1999), Bregman's *Auditory Scene Analysis* (1990) or Blauert's *Spatial Hearing* (1996) are.[13] That is, they are not subject to the key scientific foundations of reproducibility, replication, reliability and generalisability; they are creative cultural practitioners. So what do they offer: a subjective, objective or intersubjective perspective? Well, as per Emmerson's introduction above, they are all committed to 'the proper role of the listener's perception' (Emmerson 1986: 2), and this a long way from Babbitt's ostensibly solipsistic, 'ideal of compositional individualism' (Subotnik 1991: 249).

On working on the *Solfège de L'Objet Sonore* (Schaeffer 1967; Schaeffer and Reibel 1998), Beatriz Ferreyra talked about how, 'the systematic procedures for collective listening brought out new phenomena for the typology and morphology of the sound object' (Schaeffer and Reibel 1998 :9). Does this 'collective listening' not resemble a small and select (if not self-appointed) qualitative sampling method? Smalley also acknowledges the fundamental need of shared auditory experience in his learning:

> If a group of listeners finds a piece of electroacoustic music 'rewarding' it is because there is some shared experiential basis both inside and behind that music. We need to be able to discuss musical experiences, to describe the features we hear and explain how they work in the context of the music. (Smalley 1997: 107)

Giving some intersubjective credence, in the original introduction, Ihde wrote:

> while the style of the illustrations here is autobiographical, the investigations themselves took place over seven years and involved classroom investigation and much intersubjective research. (Ihde 2007: xix)

10. OTOLOGICALLY NORMAL

In the professional field of acoustics and noise control, there is a ubiquitous standard model of human hearing that a number of standards and metrics are predicated on. This model is derived from the 'Acoustics – Normal equal-loudness-level contours ISO 226: 2003' from which A-weighted decibels are derived. The equal-loudness-level contour is an exemplar of the idealised hearing subject. For the test, it requires what it calls an 'otologically normal person'. That is a 'person in a normal state of health who is free from all signs or symptoms of ear disease and from obstructing wax in the ear canals, and who has no history of undue

[12]'Perhaps every sound technology in human history contains within it some model or script for hearing and an imagined, ideal auditor' (Sterne 2012: 2).

[13]Although phenomenology is often regarded as a school of philosophy, Husserl certainly desired for his practice to have scientific status. In the preface to the English Edition of Ideas he writes: 'The work here presented seeks to found a new science … a science covering a new field of experience' (Husserl 2012: i).

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exposure to noise, exposure to potentially ototoxic drugs or familial hearing loss' (ISO 226: 2003). On top of that it stipulates an age range, 18–25 years. Thus the model is derived from the demographic group that customarily represents the strongest and healthiest stage in human life.[14]

The attempt to establish, ossify and maintain a hearing norm for sonic art practices has been a central concern and preoccupation: 'a norm seems to be something that develops out of practical motivation to facilitate cooperation and intersubjective communication' (Wehrle 2015: 128).

And it dwells throughout our theory:

> Sound studies has a creeping *normalism* to it that is, an epistemological and political bias towards an idealized, normal, nondisabled hearing subject. (Sterne 2015: 73)

Like the classification of the otologically normal, it appears that the norms in sonic art are not defined by the average response of the population but by the healthy young WEIRD adults. Ihde created a rich and nuanced phenomenology when he was young and his hearing was *unimpaired*; now that he is older his phenomenology does not fit; he has deviated from the norm which he himself set.

Smalley acknowledges that the challenges in this endeavour of dealing with such a physiologically and neurologically complex sense modality as hearing are great:

> Aural perception is fragile, fickle, empirical, and thus presents a threat to those musicians and researchers who have difficulty in coming to terms with the insecurity of their subjectivity. (Smalley 1986: 63)

But rather than working with the fragile and fickle, he looks towards the reliable and reproducible, for that is how the work will be judged. In the studio we are encouraged to achieve this by excessive repetition at high sound pressure levels.

The questioning of the establishment and maintenance of norms in society has been a major focus in the work of Foucault (2001) and Butler (1993) and more recently Sara Ahmed (2006) who revisited Husserl's *Ideas* from a queer perspective. It is high time that we question assumed perception norms in the practice and theory of sonic art. For one thing, the norms are going to find themselves very quickly out of date:

> [D]evelopments in surgery, pharmacology, and other consumer technologies are rapidly transforming notions of 'normal ability.' Today's 'normals' may end up being tomorrow's abnormals, and what seem like hyperabilities can become standards of future ability. (Adams, Reiss and Serlin 2015: 13)

11. HEARING AS TOUCH

The celebrated percussionist Evelyn Glennie penned a short essay, unambiguously named the *Hearing Essay* (2015), in an attempt to assuage the incessant questioning and reference to her assumed incongruous status as *deaf* musician.[15] She informs us:

> Hearing is basically a specialized form of touch. Sound is simply vibrating air which the ear picks up and converts to electrical signals, which are then interpreted by the brain. The sense of hearing is not the only sense that can do this, touch can do this too ... Deafness does not mean that you can't hear, only that there is something wrong with the ears. Even someone who is totally deaf can still hear/feel sounds. (Glennie 2015)

Glennie's hearing perception of music deviates so profoundly from the above models, models which assert authority to some sort of normativity over aural perception of music and everyday sound via the ear. Michael Stocker explains our tactile interface with sound in more physiological and neurological terms:

> We feel sound in our chest cavities and against the broad plain of muscle and skin of our backs. The nerves surrounding our hair follicles, the positioning sensors of our skeleton and the delicate nerves on our cheeks are all sensorineural pathways that stimulate auditory processing in our brains. Our sense of sound includes the embrace of our body by the environment. (Stocker 2013: Kindle Locations 367–9)

Glennie goes on to make an irrefutable statement, and sums up succinctly what this article wishes to communicate:

> Who can say that when two normally hearing people hear a sound they hear the same sound? I would suggest that everyone's hearing is different. (Glennie 2015)

12. AURALTYPICAL/AURALDIVERSE

From the research into the effects of hand dryer noise on the non-otologically normal (Drever 2017), the author has learnt to conceptualise hearing as a highly complex spectrum of human experience, not a fixed entity that a series of received metrics can contain, notwithstanding the multimodal experience: in its most idiosyncratic, synesthesia. And this spectrum of

[14]To begin to address issues related to this disparity, the EMRP EARs and EARs 2 project is developing a Universal Ear Simulator, 'with devices targeting nominal age groups of 3 months, 24 months and adults' (EARs 2 2018).

[15]For an in-depth discussion on the issues related to music and deafness, see Jessica Holme's 'Expert Listening Beyond the Limits of Hearing: Music and Deafness' (2017). Holmes reminds us that: 'd/Deaf people relate to "deafness" in vastly different ways: deafness entails a combination of individual audiological characteristics, linguistic preferences, identity politics, and in some cases technological constraints — what amount to an idiosyncratic set of variables that shape musical experiences in profound ways' (Holmes 2017: 175).

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hearing will fluctuate throughout the day and throughout our lives. There are the rare extreme examples of neurological hearing conditions that you can read about in Oliver Sacks *Musicophilia* (2007), but the tenor of this article is very much about everyday experience, such as those transient ear noises of whistles, clicks and signal drop-out referred to above that we all experience from time to time.

To help discuss this apparent yet somewhat invisible diversity, the author has coined the terms *auraltypical* and its converse *auraldiverse*,[16] terms that consciously echo *neurotypical* and *neurodiverse*[17] – in some occasions auraldiversity may intersect with someone's neurodiversity, such as the case of autism with hyperacute hearing – aural neurotypical being a more political and socio-cultural term than the more medical and pathological otologically normal.

13. CREATIVE PROPOSITION

So in conclusion, this article proposes that as creative sonic practitioners:

- First, we embrace our own auraldiversity and empathetically that of others, for that is what our auditory experience is predicated on and that is our auditive commonality with others.
- Second, devise new first person and/or co-composed new work which savours, not denies, the spectrum of hearing that humanity has to offer.
- Third, eschew or problematise auraltypical archetypes in our practice wherever they may lie.
- Fourth, take great care of your hearing, while it is encouraged to celebrate your hearing and the hearing of others, some hearing conditions are debilitating and painful.

The composer Andrew Hugill, who experiences an auditory phenomenon called diplacusis, where he perceives two notes from the presence of only one acoustical note, which is one of the many effects on his hearing related to his Ménière's Disease, balances the desire to compose with the concomitant challenges hand in hand:

> I certainly find myself at a compositional crossroads. If I continue to create normal music, I will have to revert to writing dots on paper because I can no longer hear digital sound accurately enough. At least my aural imagination is intact. If, on the other hand, I want my music to reflect my own experiences, then I have to start engaging with my aural limitations by introducing into my sound world those elements that I actually hear (including such disturbing things as diplacusis and tinnitus). How to do this yet still create beautiful music is a real challenge. (Hugill 2018)

[16]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.

[17]For reading on neurodiversity, see Armstrong (2010) or Ford (2010).

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