

Aural Diversity Infographic

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SLIDE 1

Hi everybody!

People who attended the first workshop and the subsequent discussions will recall that an issue was raised about what we mean by the phrase “aural diversity”, not so much in terms of its semantic value but rather in terms of its delineation of a field. What is the scope of the subject? It was noted that our website, which contains some extensive statements about aural diversity, does not actually say what it is.

The suggestion at the time was that an infographic should be created to address this question. I set about creating this infographic and shared it widely in the network, seeking comments. It was designed using Powerpoint and was quite interactive. The lack of response to the call for comments suggested to me that it was probably too interactive for its own good. I think the navigation and the gaps in information were probably too daunting.

With that in mind, I have set about creating a much simpler infographic. This is ‘flat’ and not interactive at all. It will work well as a poster and is made in A3 landscape format with that in mind. It is this version that I, somewhat nervously, want to share with you all today. I am interested to hear whether there are any gaps, anything that is obviously wrong, or anything that needs to be presented differently. I will publish this within the next few weeks, so please do take a good look and let me know, if not now then within a few days.

SLIDE 2

So here it is. This is a high-level mapping of the field. Along the bottom is an account of the progression of so-called “normal” hearing, as experienced by roughly 5 out of every 6 people. It's interesting to note that the auditory system continues to develop six months after birth. Presbycusis typically begins in early adulthood, although usually goes unnoticed until our 40s. It develops at varying rates between the sexes and between ethnic groups. Within this line of development, we find the group that is deemed by the International Standards Authority to possess “otologically normal” hearing:

[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 exposure to noise, exposure to potentially ototoxic drugs or familial hearing loss (BS ISO 226:2003).

We may well ask: *who are these listeners?* The charts presented in the standard literature show a statistical blend of data from 12 studies conducted between 1983 and 2002, based on people aged 18 to 25 years old. We could argue that this seven-year bracket is a surprisingly small subset to stand in for the whole of human auditory perception. But this is the assumption embedded in most of our acoustical design and technology as a tacitly agreed standard. It is rarely mentioned because it is so foundational, so obvious, as to be unworthy of comment. As the rest of the infographic shows, this is quite a misrepresentation of the reality of aural diversity.

The green area gives an impression of the variety of medically identified hearing differences. These affect about one in six people and range from congenital characteristics that are

present from birth through to heightened aural awareness that may be present in a number of different scenarios. Sensorineural conditions affecting the inner ear or hearing nerves are the majority and include those caused by drugs, by trauma, by noise, by viruses, etc.

Conductive issues result when there is a problem sending sound waves through the ear due to blockages, inflammations, inner ear conditions, and so on. Sensorineural and conductive differences, and indeed mixtures of the two, can all create tinnitus, which is the perception of sound when none is present, experienced as everything from whistling and buzzing to whooshing and crackling and even music or singing. Tinnitus affects 10%-15% of people and can have profound consequences for lives. It certainly changes listening behaviour.

This brings us on to the auditory system. Here there is a great deal of new research in hearing science. Conditions such as hyperacusis (an increased sensitivity to sound) and misophonia (negative emotional reactions to certain trigger sounds) have only recently been clinically identified. But they have, of course, been a reality for people throughout human history, as literature attests. Hyperacusis is more common than people realise, from children covering their ears in toilets due to hand dryer noise to a decreased tolerance of everyday environmental sounds among adults. A relative lack of robust epidemiological data hampers our understanding of the extent of hyperacusis. However, I note with interest a recent study which revealed that it is disproportionately common amongst musicians. So, for example, of 241 symphony orchestra musicians surveyed, 79% experienced hyperacusis, and 10% of them severely so.

This illustrates an important point. Aural Diversity is not simply about deafness or hearing loss. An *increased* sense of hearing is also part of the picture. For some neurodivergent and autistic people, it is foundational to their entire lived experience. In our forthcoming book on Aural Diversity, Bill Davies observes that most autistic people experience heightened sensitivity to sound or texture, possessing strengths in aural awareness, in soundscape decomposition, and in sensitivity to small changes at different scales. Yet nearly all autism research uses a deficit model, where differences between autistic and non-autistic people are characterised as impairments of the autistic people. Even the usually superior pitch recognition of autistic people is framed as a deficit.

This raises the issue of language. You will notice that I have tried to avoid medicalised words such as "impairment", "deficit" and "defect". The social model of disability tells us that it is the environment that is disabling, rather than a deficit of the individual. Our language needs to evolve to reflect this. This is not to deny the real consequences of hearing loss, but to acknowledge and affirm that people's lived experiences vary and that being deaf or neurodivergent are not problems from which we "suffer", but rather integral states of being that identify us as people.

The grey part of the infographic points to certain universal variations that guarantee diversity of hearing. Socioeconomic, environmental and geographical, ethnic and cultural differences all profoundly affect the way we hear. Hillel Schwartz has described how people heard differently in previous centuries. Numerous studies have shown that white people have a higher prevalence of hearing loss than black people. And d/Deaf culture has effectively redefined what is meant by "hearing" itself, extending it into touch, into sight and into language.

The purple section denotes animal hearing, which obviously surpasses everything else in this infographic in terms of diversity. The hearing of bats and elephants is fairly well known to exceed human capabilities, but there are other animals, such as pigeons and moths who have extraordinary hearing.

The pink part considers the changes brought about by our technologies. Meri Kytö calls the cochlear implant a "soundscape arranger". Hearing aids do rather more than simply amplify sound: they re-engineer the act of listening. I can hear things now that I could never hear before I wore hearing aids. And those things I used to hear have also been transformed, sometimes in ways which are welcome and sometimes not, but they are always different. The prosthetic hearing aid or cochlear implant represents a transformation of the sensory world, a new kind of heard reality. Such technologies come close to machine listening, especially to the extent that AI processes are embedded. The transformation of hearing they bring about introduces a mediated diversity. Like many pervasive media today, they have become so intertwined with everyday existence that there is even discussion of them as "transhuman ears". Yet the fact remains that only 17% of people who could in theory benefit from wearing a hearing aid actually do so (WHO 2020). So, any discussion of these devices must be framed within the wider auditory context in which actual aural diversity is barely acknowledged.

So, please do study this infographic and perhaps we could discuss any points that arise?