

“Friends, Romans, countrymen....” 3 September 2016

After morning refreshments we willingly lent John Rubin our ears for a fascinating and thought-provoking session on hearing.

Early (wo)man’s survival depended on hearing a predator approaching, and having 2 ears gave our ancestors important information about the relative size of the predator and which direction it was coming from. An evolutionary success story, human ears have remained unchanged for about 10,000 years. John was, as usual, full of interesting facts: did you know that the cochlea is “tuned” in a similar way to a piano, spiralling round from high frequencies on its outside and base, to low frequencies inside the apex? Or that the reason we can feel lower frequency sounds in, for instance, an IMAX cinema, is that low frequency sounds have longer wavelengths so they “leak” into your body, whereas high frequency sounds have short wavelengths and therefore do not travel as far?

We then looked at a concerning table of industrial standards in exposure to sound; exposure to a relatively quiet 50 dB conversation at 3 metres is considered safe for 4 hours. At the other end of the scale, the 105 dB of a rock concert is safe for only 4 minutes. Perhaps of particular concern to parents, an MP3 player at about half full volume is still only safe by industrial noise standards for an hour.

Recent literature has suggested that noise in the classroom does not pose a risk to hearing – however it has also found that teachers speak with raised voices 61% of the time, with obvious implications for their voices. Poor acoustics in schools, as well as having implications for hearing, were a factor associated with voice symptoms, and there was an association between noise exposure, vocal load, voice symptoms and cognitive fatigue after work. Key risk factors for vocal strain in teachers, although interlinked, varied for each learning stage, with classroom noise being the key factor in Nursery, raising the voice in Primary and the struggle to keep order in Secondary.

The literature concerning hearing loss in musicians is inconclusive at present and more research needs doing in this area. In a recent study, although 17.5% of the singers tested had hearing loss, this incidence (perhaps surprisingly) was not higher than the non-performers. Noise-induced hearing loss can occur in Pop and Classical musicians and the risk factors identified for hearing loss included age, years of singing, the male voice and the baritone range.

John then moved on to look at ideas about how we protect our clients - reduction of environmental noise, ear protection, improved sound monitoring/voice amplification. Here are his Top Tips for teachers, vocalists and musicians:

- ✓ Ear protectors (vented/tuned or custom moulded)
- ✓ Ear monitors (acoustic and in-ear)
- ✓ Orient loudspeakers (stand beside rather than in front or behind) and elevate trebles (because, as you will remember, high frequencies travel shorter distances)
- ✓ Keep singers away from drummers!

- ✓ Don't practice for 16 hours after a session or concert (to give those hair cells a chance to settle)

Thank you John – to slip from Shakespeare to the (paraphrased) Book of Common Prayer: “we have heard you with our ears”.

Caroline Denby

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