Canadian Audiologist
The Official Publication of the Canadian Academy of Audiology

What About Sex, Gender, Hearing, and Aging?

Published March 8th, 2023

Kathy Pichora-Fuller, PhD, Aud(C), RAUD, FCAHS



In the wake of Valentine's Day, I'm sure Canadian audiologists have been asking themselves this intriguing question: What about sex, gender, hearing, and aging? Indeed, sex and gender do seem to matter as causes and consequences of age-related hearing loss (ARHL). In a 2023 paper, experts (including four Canadians) involved in hearing research on topics ranging from drug development to psycho-social aspects of audiologic rehabilitation concluded that sex-linked biological and gender-related research is essential to advancing hearing health (Reavis et al., 2023). Notably, as in many other health research domains, males (animals and humans) have often been included and females excluded (for a perspectives paper by a leading Canadian researcher and her colleagues, see Tannenbaum et al. 2019). Even in research that has included both sexes, the data are often not analyzed separately, so important differences are not discovered. Reavis and her colleagues (2023) underscore that sex and gender must be studied to translate hearing research into practices and policies. They also provide definitions to guide hearing health researchers and professionals using sex and gender terminology. Typical binary terms (male, female) distinguish sexes whereas other terms (men, women) are used to distinguish between genders; however, binary categories may overlook biological variations, and it is increasingly recognized that gender is better conceptualized as a continuum rather than in terms of overly simplistic categories.

Nature vs Nurture

Development continues over the life course, including throughout adulthood. It is driven by biological factors (nature) and environmental factors (nurture). Sex as a biological factor (e.g., sex-linked genetics or sex hormones that may be characterized anatomically or physiologically) may affect hearing. In contrast to sex, gender is primarily a social factor that depends on cultural context and influences health-related behaviours. There may be gender-related differences in environmental or social determinants of health, such as education, occupation, or health beliefs and attitudes; for example, more men than women may have an increased risk of hearing loss because they have higher levels of noise exposure in occupational or recreational activities and they are more likely to be smokers. Furthermore, environmental factors may be shared by those in a cohort who experienced the same historical conditions; for example, people born 100 years ago may have been exposed to military and/or industrial noise before laws in the 1970s began to mandate the use of ear protection to reduce potentially damaging noise exposures. Public health and social policies have reduced some environmental risks and modified some health-related behaviours (e.g., noise exposure and smoking). Environmental factors may also be idiosyncratic; for example, an individual may have a head injury that damages the auditory system. Of course, there is also an interplay of nature and nurture. Not only does biology influence behaviour, but behaviour can influence biology. New approaches to person-centered hearing healthcare could be informed by increased awareness of how sex and gender influence ARHL at the population and individual levels.

Ten intriguing findings:

1. Sex- and gender-related differences in hearing begin prenatally and continue throughout life (more men than women have hearing loss, and men have greater degrees of hearing loss, although these differences decrease in old age).
2. Sex hormones can affect the auditory system from cochlea to cortex. For example, changes in hearing sensitivity occur during phases of the menstrual cycle, pregnancy, and menopause. Effects on thresholds and supra-threshold auditory processing may depend on if and what type of hormone replacement treatments are taken.
3. Sex-linked biological differences may protect females from noise-induced hearing loss, and gender-related noise exposures may put men at greater risk.
4. Sex-linked biology may influence the efficacy of potential hearing loss therapeutics.
5. Differences in oto-protective and oto-therapeutic medications and adverse reactions to certain medications may be sex-dependent.
6. Sex-linked biology (e.g., genetics) and/or gendered experiences (e.g., diet, exercise) may underlie the differences in audiometric phenotypes observed in metabolic or sensory subtypes of ARHL.
7. There are sex-related differences in cardiovascular disease, and sex modifies the associations between cardiovascular disease, its risk factors, and hearing, with women at increased risk compared to men.
8. There are sex-related differences in dementia and auditory-cognitive associations that may be stronger in women than in men.

9. Men report greater perceived hearing difficulties than women, but men delay longer in seeking help, and women with self-reported hearing loss more often use hearing aids.
10. The gender of hearing care providers may affect hearing aid adoption rates, with lower rates for men who report less positive attitudes towards providing care from a patient-centered perspective.

To learn more about these and other intriguing findings, read the paper by Reavis et al. (2023)!

References

1. Reavis, K. M., Bisgaard, N., Canlon, B., Dubno, J. R., Frisina, R. D., Hertzano, R., Humes, L. E., Mick, P., Phillips, N. A., Pichora-Fuller, M. K., Shuster, B., & Singh, G. (2023). Sex-linked biology and gender-related research is essential to advancing hearing health. *Ear and Hearing*, *44*(1), 10–27. https://doi.org/10.1097/AUD.0000000000001291
2. Tannenbaum, C., Ellis, R.P., Eyssel, F., Zou, J., & Schiebinger, L. (2019). Sex and gender analysis improves science and engineering. *Nature, 575*, 137–146. https://doi.org/10.1038/s41586-019-1657-6