

Sex Differences in Otoacoustic Emissions

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The purpose of this project is to describe the extent to which differences in underlying cochlear processes explain why some otoacoustic emissions (OAEs) are smaller in men than in women while other OAEs are similar in both sexes. An OAE is a sound emitted that is produced by the cochlea in response to external sound. The presence of OAEs suggests a healthy cochlea and normal hearing. OAEs serve as a measure for various auditory tests clinically and are widely used to screen newborns and also have been used to noninvasively test cochlear function. OAEs have also been used to explore the differences in the auditory system between sexes, a number of studies suggesting that women have larger OAEs than men, presumably due to prenatal androgen exposure. This difference between the sexes has been observed for some, but not all, types of OAEs. Modern theories of OAE generation, however, suggest that the various OAE types may differ not just in terms of the stimuli used to elicit the response but also in terms of the cochlear processes underlying the generation of the response.

The project will test two hypotheses: (1) Due to similarities in the cochlear mechanisms involved in their generation, both SFOAEs and TEOAEs will show evidence of differences in OAE response level between males and females; (2) When recorded with only the distortion mechanism contribution to the response, DPOAEs will be equal in level for males and females because the distortion mechanism is not influenced by prenatal androgen exposure.