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Versatile fields of application of frequency following responses

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The determination of neurophysiological responses by means of electroencephalography (EEG) has become an elementary component of auditory research over the last decades. Especially the Frequency Following Response (FFR) and the Envelope Following Response (EFR) to complex acoustic stimuli allow conclusions about auditory neuronal coding in the subcortex and cortex.

The presentation will introduce the methodology of objective measurements via FFR and EFR, as well as their areas of application. Among other applications the derived neural coding provides important information for speech understanding in noise (Anderson et al., 2013). Furthermore, universal applications range from the diagnosis of head trauma (Kraus & White-Schwoch, 2020), inclusion in clinical testing protocols (Kraus et al., 2016), the study of neural plasticity in athletes, musicians, in students of a foreign language and to validate novel signal processing strategies in hearing aids (Slugocki et al., 2020).

This talk will allow for an overview of recent research by Nina Kraus, PhD (Northwestern University - Illinois, USA). The author of the talk is not affiliated with any of this presented research.

Anderson S., White-Schwoch T., Parbery-Clark A. & Kraus N. (2013) A dynamic auditory-cognitive system supports speech-in-noise perception in older adults. *Hearing Research* (2013) 18 - 32

Kraus N., Thompson E.C., Krizman J., Cook K., White-Schwoch T. & LaBella C.R. (2016) Auditory biological marker of concussion in children. *Sci Rep* 6, 39009 (2016).

Kraus N. & White-Schwoch T. (2020) Concussion Management: The Role for Audiology, *The Hearing Journal*: April 2020 - Volume 73 - Issue 4 - p 44,45 doi: 10.1097/01.HJ.0000661628.24080.68

Slugocki C., Kuk F., Korhonen P. & Ruperto N. (2020) Neural Encoding of the stimulus envelope facilitated by Widex ZeroDelay technology. *Hearing Review*. 2020;27(8):28-31.