

# Objectively measuring speech intelligibility: impact of individual participant factors

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Objective measures of hearing are essential to on the one hand complement behavioural measures in difficult to test populations such as young children, and on the other hand enable fully automatic fitting of auditory prostheses. Most current objective measures use artificial stimuli, such as repeated pulses, tones or single vowels, which are far from natural speech. We recently developed an EEG-based objective measure of hearing using fully natural speech, based on a measure of neural tracking of the speech envelope. In an evaluation with young normal-hearing listeners we found that the objective measure was strongly correlated with the behaviourally measured speech reception threshold.

For clinical application, our measure needs to be valid across the life span and for all levels of hearing impairment and cognitive function. We therefore investigated the effect of the following factors on neural tracking of the speech envelope: task (active or passive listening), listening effort, attention, age and hearing impairment. While most of these factors influenced the degree of neural envelope tracking, we found an increase in neural envelope tracking with increasing stimulus signal-to-noise ratio in all participants and conditions, allowing to derive our objective measure of speech intelligibility.

## Acknowledgements:

This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 637424, ERC starting grant to Tom Francart). Research funded by a PhD grant of the Research Foundation Flanders (FWO) to Jonas Vanthornhout and Eline Verschueren.