

Diversity of irony production (by SAG speakers) and perception (by normal hearing and CI listeners)

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The ability of listeners to discriminate literal meanings from figurative language, affective language, or rhetorical devices such as irony or sarcasm is crucial for a successful social interaction. This discriminative ability might be reduced in listeners supplied with cochlear implants (CIs), widely used auditory prostheses that restore auditory perception in the deaf or hard-of-hearing. Irony is acoustically characterized by especially a lower fundamental frequency (F0), a lower intensity and a longer duration in comparison to literal utterances (e.g., Schmiedel 2016; Scharrer and Christmann 2011). In auditory perception experiments, listeners mainly rely on F0 and intensity values to distinguish between context-free ironic and literal utterances (Schmiedel 2016). As CI listeners have great difficulties in F0 perception (Carlyon and Deeks 2015), the use of frequency information for the detection of irony is impaired. However, irony is often additionally conveyed by characteristic facial expressions (see Attardo et al. 2003).

The aim of the study is two-fold: First, the acoustic cues present in verbal irony of Standard Austrian German (SAG) speakers will be investigated. Hereby, following Schmiedel (2016), 20 speakers will be presented with scenarios that either evoke a literal or an ironic utterance. Ten different disyllabic words or two-word utterances will be elicited in this way. The response utterances will be audio- and video-recorded. Subsequently, the thus obtained context-free stimuli will be presented in a discrimination test to normal hearing and to postlingually deafened CI listeners in three modes: auditory only, auditory+visual, visual only. During the test, the reaction time will be measured.

It is hypothesized that the acoustic production patterns of verbal irony by SAG speakers resemble those of speakers of Standard German German (see Schmiedel 2016). In the auditory-only condition of the perception task, the normal hearing listeners are expected to perform better than CI listeners. It is anticipated that the additional presentation of visual stimuli will enhance the recognition in both groups of listeners (Campbell 2008). The advantage will be greater for CI users, as in general speech understanding, CI listeners show large audio-visual synergy effects: They have a high ability to use visual cues to better understand acoustic speech signals (e.g., Winn et al. 2013). This leads to the hypothesis that visual cues can also improve the perception of paraverbal information by CI users.

In addition to a global overview of the state of research and a detailed presentation and discussion of the investigation methods, until the conference, the first recordings will have been conducted and analyzed. Moreover, the first results of a pilot study investigating the irony perception of normal hearing and CI listeners will be available. The results will not only provide information on irony production in SAG and on multimodal irony perception and processing, but will, most importantly, identify the cues that need to be improved in cochlear implants in order to allow CI listeners full participation in daily life.

References

- Attardo, Salvatore; Eisterhold, Jodi; Hay, Jennifer & Poggi, Isabella (2003). Multimodal markers of irony and sarcasm. *Humor - International Journal of Humor Research* 16(2), 243–260.
- Campbell, Ruth (2008). The processing of audio-visual speech: empirical and neural bases. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences* 363(1493), 1001–1010.
- Carlyon, Robert P. & Deeks, John M. (2015). Combined neural and behavioural measures of temporal pitch perception in cochlear implant users. *The Journal of the Acoustical Society of America* 138(5), 2885–2905.
- Scharrer, Lisa & Christmann, Ursula (2011). Voice modulations in German ironic speech. *Language and Speech* 54(4), 435–465.
- Schmiedel, Astrid (2016). *Phonetik ironischer Sprechweise. Produktion und Perzeption sarkastisch ironischer und freundlich ironischer Äußerungen*. Dissertation. University of Trier.
- Winn, Matthew B.; Rhone, Ariane E.; Chatterjee, Monita & Idsardi, William J. (2013). The use of auditory and visual context in speech perception by listeners with normal hearing and listeners with cochlear implants. *Frontiers in psychology* 4, article 824, 1–13.