Overview of new outcome tools addressing auditory ecological validity: Analyses of behavior in real life listening environments

INTRODUCTION: ECOLOGICAL VALIDITY

- Currently: Efficiency measurements, such as PTA, speech in noise tests, and questionnaires. Problems: high reliability, but low ecological validity. Often a mismatch between laboratory data and field data, see e.g., Paluch et al. (2016)
- Quality of Life measurements are related to the subjective perception from the perspective of the users and have impact on health economical evaluations, subjective bias because of retrospective report of 2-4 weeks intervals.
- Future research: Demands for a more realistic, everyday, and ecological valid evaluation of hearing aids reflecting not only subjective perception, but also behavioral data from the user along classified dimensions, e.g. the concept of the International Classification of Functioning, Disability and Health (ICF), see Granberg et al. (2014)

STARTING POINT: BEHAVIOR ANALYSES

- Method: Video-based analyses of Intercultural Communication in Acoustical Realistic Experimental Settings (VIB-AICRAS®); external rating of subject’s communication behavior
- Evaluation of hearing aid (HA) algorithms (e.g., directional vs. omnidirectional microphone model) in semi-natural environments (lab); development of a code system (video recordings and annotation) as a new outcome tool linked to ICF codes
- Development of annotation scheme I (Paluch et al. 2016). Effects of different microphone modes regarding face-to-face vs. group communication and ratio of symbolic gestures vs. spoken words.
- Further development of an annotation scheme II (Meis et al. 2016). Benchmark of 3 ITE devices with significant differences regarding face-to-face and group communication, as well as in the choice of the communication partner: ICF relevant regarding participation
- Annotation of nearly 3,000 behavioral units (high Inter-rater reliability (IRR)): a resolution of 13 s / observation unit per test person

ETHNOGRAPHY

- Ethnographic research: Record one’s observation in field notes: (1) Empirical notes, (2) methodological notes and (3) theoretical notes (Strass, 1987)
- Further classifications: Observation in form of empirical notes, information regarding the context and reflection of one’s role, methods, and theoretical assumptions (Przyborski and Wohlrab-Sahr 2009).
- In Audiology: Observation of the user’s behavior in real life without manipulating the “field” by cameras or microphones. Tools: field notes of behavior induced by HA algorithms and HA provision
- First research steps to classify hearing-impaired users by means of ethnographical walks ➔ Poster 421 (Paluch et al., 2016)

ICF DRIVEN QUALITY OF LIFE

- Develop assessment tools for momentary Quality of Life (“M-Qol”) by Ecological Momentary Assessment (EMA ➔ Poster 251) and external ratings of the participants’ behavior in the field according to the ICF model, ethnographic walks and an expert review; see IRG project “Individual Hearing Aid Benefit in Real Life (IHAV-RL)
- ICF dimensions: d160 ‘Focusing attention’, b140 ‘Attention functions’, d3503 ‘Conversing with one person’, d3504 ‘Conversing with many people’ in sum 15 ICF extensions, e.g. d3504 with the sub-code_3 ‘Communication partner: distant vs. near’
- Test of the codes during 4 video sessions with induced communication, rated by 3 raters ➔ rater sheet d3504b140. Results: Slight to fair IRR (Cohen’s Kappa = 0.2-0.4) for questions 2, 6, 7, and 8; moderate to substantial IRR (Cohen’s Kappa = 0.41-0.65) for questions 1, 3, 4, and 5 when using a reduced 3-point scale. Problem: low resolution, caused by rating per observation unit every 3 min. Solution: increase of resolution with instantaneous tapping via replacement of a layered code set

REFERENCES


Ethinographical walks


Rater sheet ICF d3504/b140 with extensions


Benchmark of 3 ITE devices with significant differences regarding choice of near or distant communication partner
