Introduction
Age-related decline of:
• Speech perception in difficult listening conditions
• Speech comprehension and production

Open issue in current research:
• Neural correlates of speech-related attention (early components)

Research questions:
• Does speech-related attention modulate N1- / P2- components?
• Age-related differences in these neurophysiologic responses?

Methods
• Sample:
  • N = 41 (21 female, 20 male)
  • Right-handed, healthy adults
  • First language German / Swiss German
  • Young Adults (YA): 20-32 years (n=21, M= 22.7; SD= 3.3)
  • Older Adults (OA): 60–74 years (n = 20, M= 68.1; SD= 3.4)
• Stimulus material:
  • 120 German words (nouns), 120 pseudo words
  • White noise stimuli: 500ms / 1000ms duration
• Data acquisition:
  • Behavioural examination: information processing speed (IFS), auditory memory, hearing performance (only in OA)
  • EEG: 128 electrodes, sampling rate: 500Hz, online filters: 0.3 – 100Hz, offline filters: 1 – 15Hz, BC -100 - 0ms, re-referencing to linked mastoids

Preliminary Results

Behavioural Data:
• No sign. difference in task-accuracy between YA / OA (p = .496)
• Sign. longer RT in OA vs. YA in both conditions (p = .009; p = .000)
• RT correlated with information processing speed (r = -.583)

EEG-Data:
• Both tasks: N1- and P2- latency enhanced in OA (p = .000)
• Implicit task: stronger N1-amplitude in OA (p = .017)
• Explicit task: stronger P2-amplitude in YA (p = .016)
• RT correlated with N1- / P2-latency (r = .535; r = .386)
• IFS correlates in both tasks with N1-latency (r = -.583; r = -.489) and P2-latency (r = -.529 / r = -.523)

Discussion
• Auditory top-down and bottom-up speech processing differentially modulates N1/P2-complex.
• Enhanced neurophysiologic parameters may indicate differential processing mode in young and older adults.
• Speech-specific vs. general decline of information processing speed in older adults?

References: