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Speech perception, healthy aging, and Alzheimer’s disease
Basic research questions

• What are the sensory and cognitive declines that result in age-related impairments in speech perception?
  – Compare young and older (often an inherent confound)
  – Compare healthy older with Alzheimer’s patients

• What cognitive factors are important for understanding speech (especially in noise)?
  – Role of cognitive control
    • False hearing in older adults (inability to resist contextual influences)

• Talker information available from the speech signal
  – Credibility assessment
  – Height
  – Age

• Can training (auditory, cognitive) improve speech perception?
Impact on Speech technology

• Auditory-visual speech perception
  – Has large effect on human speech perception
    • As good or better than a well fit hearing aid
  – Incorporate visual speech (seeing the talker) in automatic speech recognition?

• Talker characteristics from speech
  – Use in automatic speaker identification?
• Auditory training
  – Development of game-based training
  – Development of automatic on-line recording and editing
    • Records voice of any individual and these stimuli can then be instantly incorporated into any of the training games
    • Train with words by frequent communication partners
      – Summer camp with HI kids listening to next year’s teacher
• Same games can be used to improve perception and production by non-native speakers
Funding considerations

• Research areas
  – Interdisciplinary (including international) research
    • Similar to Interdisciplinary behavioral and social science research program
    • Integration of ASR and speech researchers
    • Conference grants
  – Training studies
    • Almost no research on what makes training effective
      – Nature of the input
      – Amount
      – How long do improvements last
      – Predictors of benefit/expected benefit
  – Computational modeling of speech perception
    • Compare to visual word recognition
Funding considerations (cont’d)

• Integration of imaging and behavioral methodologies
  – Focus on resolving discrepancies
  – Establish standard methodologies
    • The case of perceptual effort

• Integrating studies of speech perception and production
  – Similar issues but rarely studied together.

• Exciting opportunity for interactions between researchers approaching speech perception and speech technology from different perspectives.