

Hearing, Remembering, and Living Well: Paying Attention to Challenges that Older Adults Face in Noisy Environments

Collaborative Partners

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Hearing problems affect the lives of seniors in a number of ways.

- By reducing the ability to communicate
- By limiting social interaction
- By interfering with cognitive functioning in everyday situations



Hearing difficulties in older adults are prevalent

- Approximately one-third of older adults complain that they cannot understand conversation in everyday situations
- Hearing and comprehension difficulties can occur in the absence of clinically significant hearing loss
- Hearing aids are sometimes ineffective in alleviating this problem

Some common complaints

- "I can hear but sounds seem all jumbled up."
- "If I try hard I can sometimes understand what is being said."
- "People talk too fast."
- "I can't follow a conversation when there are more than two people talking."

Consequences: Communication difficulties can have an adverse effect on social interaction. Older adults tend not to participate in social situations in which they are likely to encounter communication problems. When they do participate, they often misinterpret or cannot follow what is being said. This can lead to feelings of isolation, neglect, and even paranoia. Typical comments are:

- “When I don’t hear someone right, people think I’m senile.”
- “I don’t like to go to family gatherings, nobody talks to me.”
- “I don’t enjoy eating out anymore because I can’t hear what anyone is saying.”
- “Just because I can’t understand them people think I’m stupid.”

Research Goals

- Identify the communication challenges faced by older adults in the noisy situations characteristic of everyday life.
- Determine the underlying causes of these communication difficulties.
- Investigate the consequences of these difficulties.
- Develop ways to make public spaces “communication accessible” to older adults.
- Recommend interventions that older adults and their communication partners can employ to help them overcome or compensate for their communication difficulties.

Possible perceptual and cognitive causes for these communication difficulties

- Hearing losses
- Attention deficits
- Generalized slowing
- Language comprehension disorders
- Short and long term memory losses

Personal, social, and physical factors that either exacerbate or alleviate communication difficulties

- The misattribution of the sources of the communication difficulties of older adults by family member, caregivers, and the general public.
- The degree to which communication partners (including caregivers) have the willingness and knowhow to adjust their communication styles to alleviate these difficulties in older adults.
- The existence of communication barriers in public places.

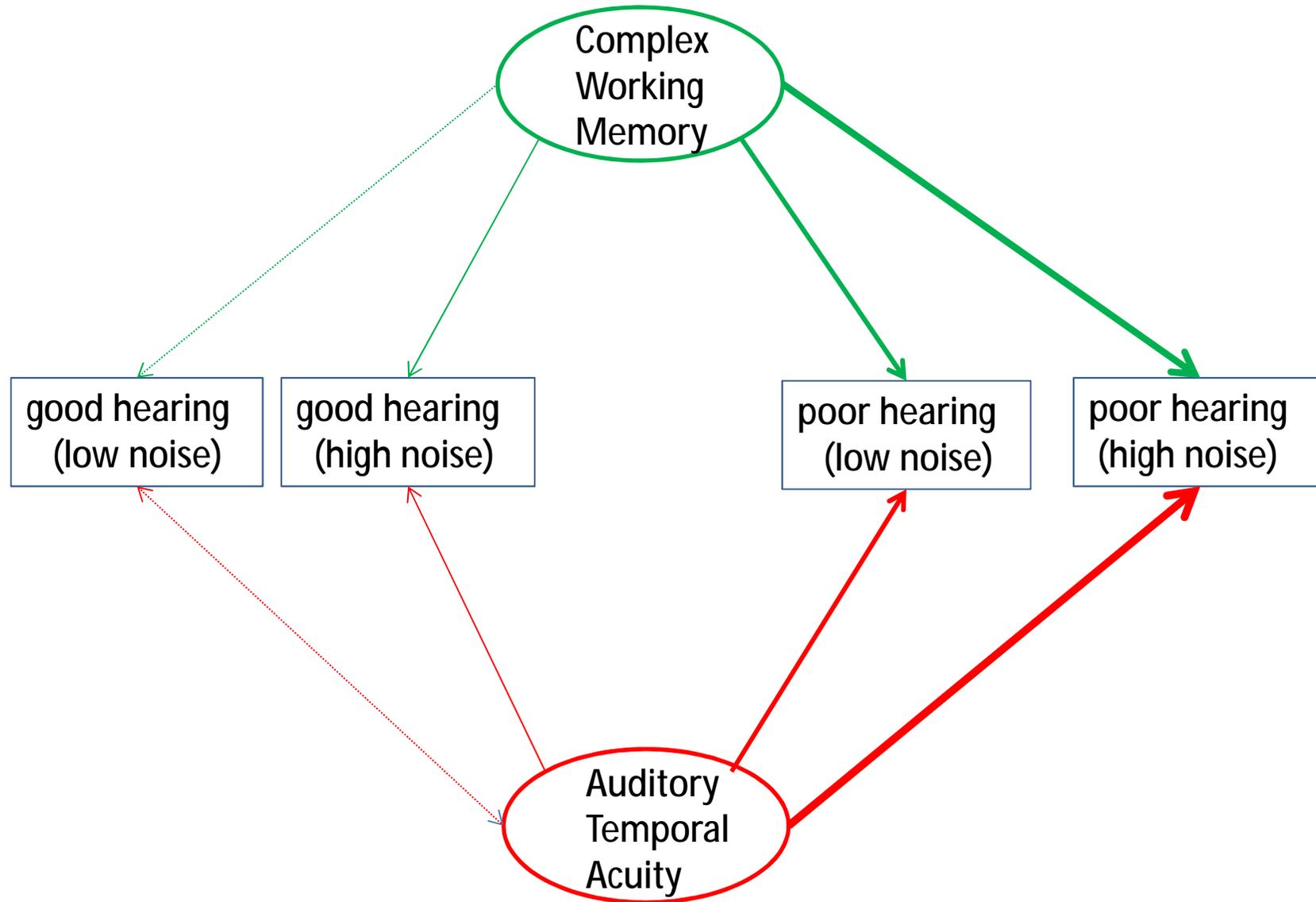
The delivery of appropriate health care

- The importance of assessing both the sensory and cognitive factors that contribute to the communication difficulties of older adults.
- Understanding the reasons why people are reluctant to see audiologists, and reluctant to use assistive listening devices when they would be beneficial (social stigma).
- Alerting audiologists and other health care professionals of the need to consider the social and cognitive factors that contribute to the communication difficulties of older adults.

Progress: Sensory and Cognitive Factors

1. The degree to which selective sensory and cognitive abilities contribute to listening comprehension differs with the listening situation and with the amount of hearing loss.

Participants: Older, community-living adults with various degrees of hearing loss

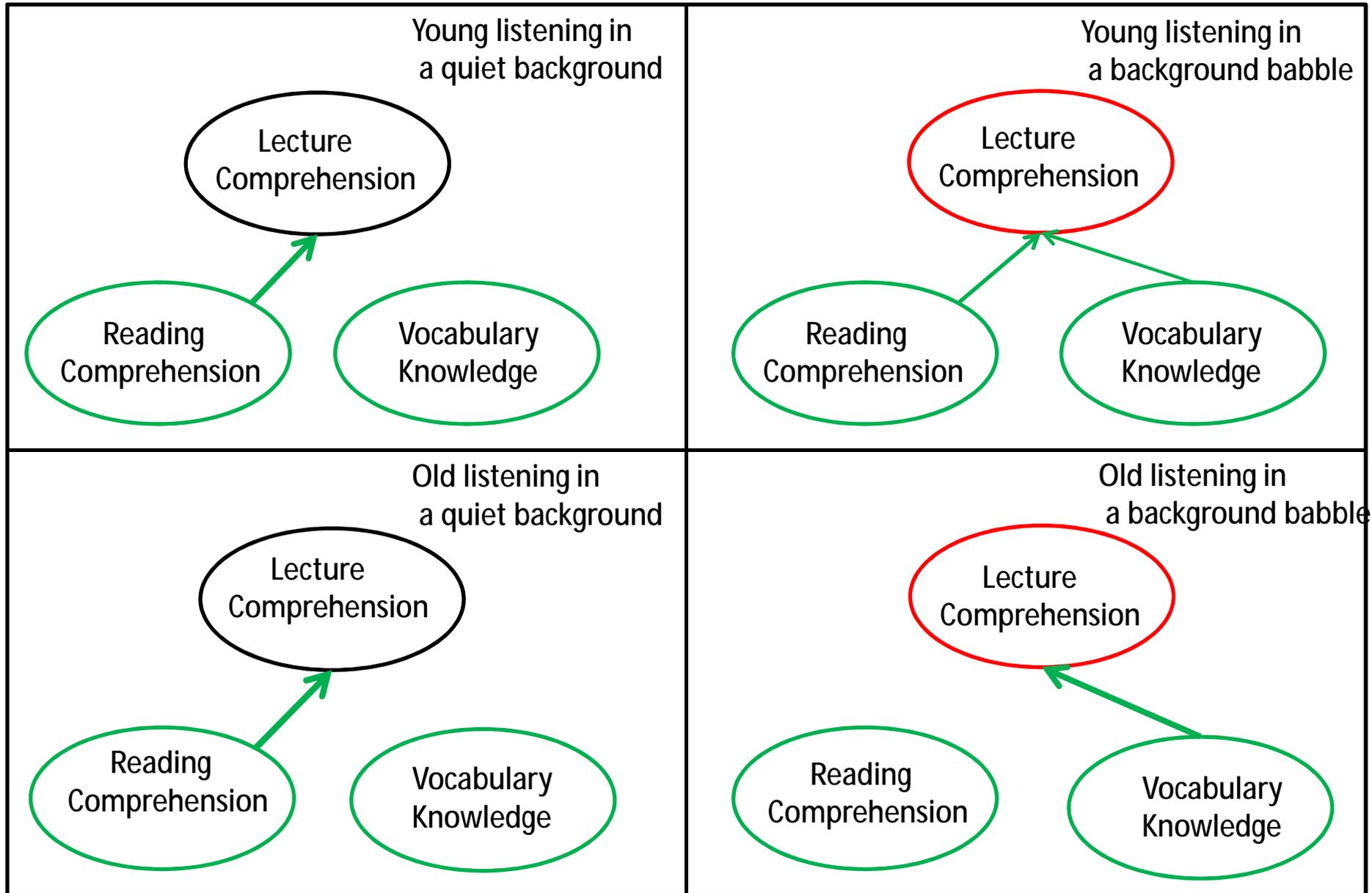


Task: Perceiving words in sentences masked by noise

Progress: Sensory and Cognitive Factors

- 2. When younger and older adults are equated for ability to recognize words in the absence of contextual support, age-related differences in listening comprehension are minimized and in most cases disappear when listening to lectures, dialogues, and multi-person conversations. In addition, the relative contribution of different cognitive processes to listening comprehension, when all individuals are equated for word recognition, depends on the age of the listener and the difficulty of the listening situation.

Comprehending a lecture when listening conditions are individually adjusted to ensure equal word recognition by good-hearing younger and older adults

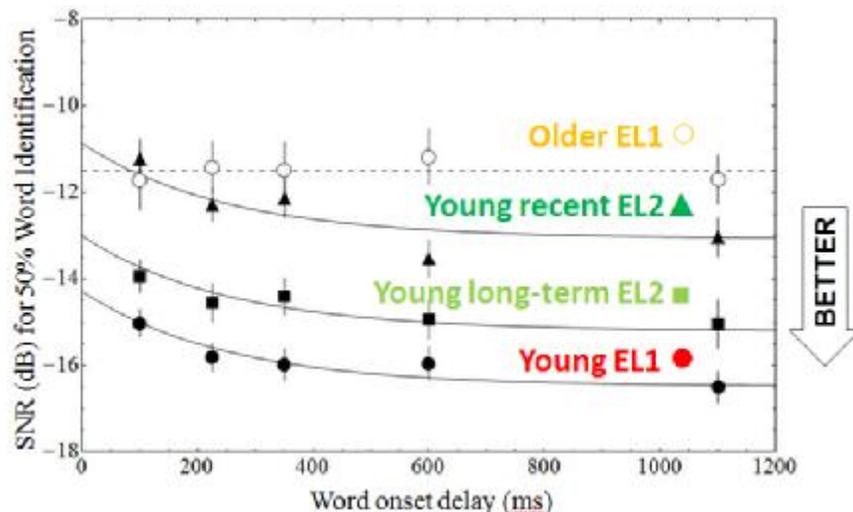


Progress: Sensory and Cognitive Factors

- 3. Segregation and Orientation. The ability to segregate target speech from background noise is more sluggish in older adults than in younger adults when the listening situation is difficult, but not when it is easy. Although older adults are somewhat slower to orient to the spatial location of a target, they benefit slightly more than younger adults from an advance cue as to its location, and recover almost as fast as younger adults when the cue is misleading.

Orientation and Attention in multi-talker conversations:

1. Older adults need a higher signal-to-noise ratio and more time to segregate the target voice from a background of voices than do young adults whose first (young EL1s) or second language (young EL2s) is English.



Segregating a target voice from the background is more sluggish in older adults than in younger adults when the masker is other people talking but not when the masker is a steady-state noise.

Facial cues (commonly referred to as lip reading) boosts word recognition in difficult listening situations. Hence it is important in multi-talker conversations to visually orient on the person who is talking.

1. Visual orientation to a object is slower in older than in younger adults.
2. But, older adults benefit more than younger adults from advanced knowledge of the object's location.
3. When given misleading information concerning the expected location of the target, older adults are almost as good as younger adults at recovering from this misleading information.

Progress: The cost of communication difficulties in older adults

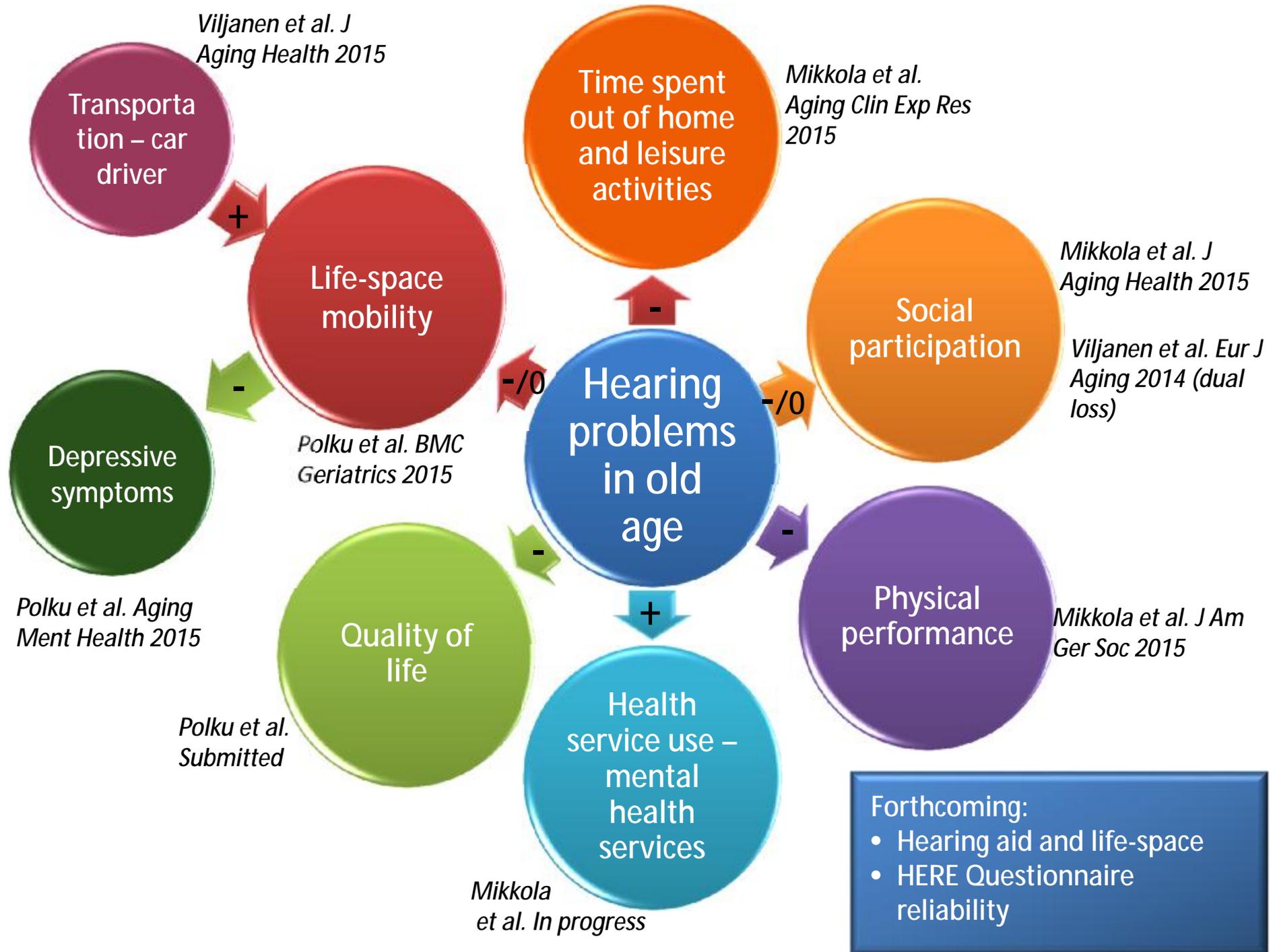
4. Age-related auditory, visual, and cognitive declines increase the effort involved in attempting to communicate in difficult listening situations, and lead to fatigue and disengagement from social situations.

Dual task situations

- Evaluate performance on a listening task alone.
- Evaluate performance on a secondary task alone.
- Require the participant to perform both tasks simultaneously, but give priority to listening.
- Under dual task situations both younger and older adults exhibit the same small decrement in word recognition, but with older adults showing a much larger decrement in performance on the secondary task than younger adults.
- Either older adults have fewer resources to deploy, or the primary task requires a greater degree of engagement of available resources in older than in younger adults.
- Hence, when older and younger adults are performing equally in difficult situations it is quite likely that listening is more effortful for the older adults.

Progress: The cost of communication difficulties in older adults

5. Hearing losses have negative effects on a number of personal and social factors that support an active and satisfying lifestyle.



What we have learned so far

The more difficult the listening situation, the greater the need to engage a host of perceptual and cognitive resources to be able to comprehend what is said.

To do well, the perceptual and cognitive resources must be available to be deployed.

With aging, the perceptual resources are greatly diminished.

However, older individuals with good cognitive skills can compensate for impoverished sensory resources, by engaging higher-level, knowledge-based resources .

This engagement may be strategic (e.g., a greater dependence on linguistic abilities, and a greater dependence on context).

The engagement of these resources may deplete the pool of resources that are available for other tasks more in older than in younger adults.

Hence, fatigue may set in sooner in older than in younger adults when faced with difficult listening situations.

These difficulties, and the tendency of others to attribute them to dementia, lead to reduced life-space mobility, less time spent outside the home, higher risk for withdrawal from leisure activities and less frequent participation in some social activities. Further, older persons with hearing problems have poorer physical performance and lower quality of life, and they use more mental health services than those with good hearing.

Thank you for listening