

SuperAging: Rethinking Resilience, Hearing, and Communication in Older Adults

Angela Roberts, PhD
Western University, Canada Research Chair Data Analytics and Digital Health in Cognitive Aging and Dementia

Conflicts of Interest and Acknowledgements

- No conflicts
- Funding
  - Canada Research Chairs Program
  - National Institutes of Health/National Institute on Aging
  - Canadian Institutes of Health Research
- Our participants and families

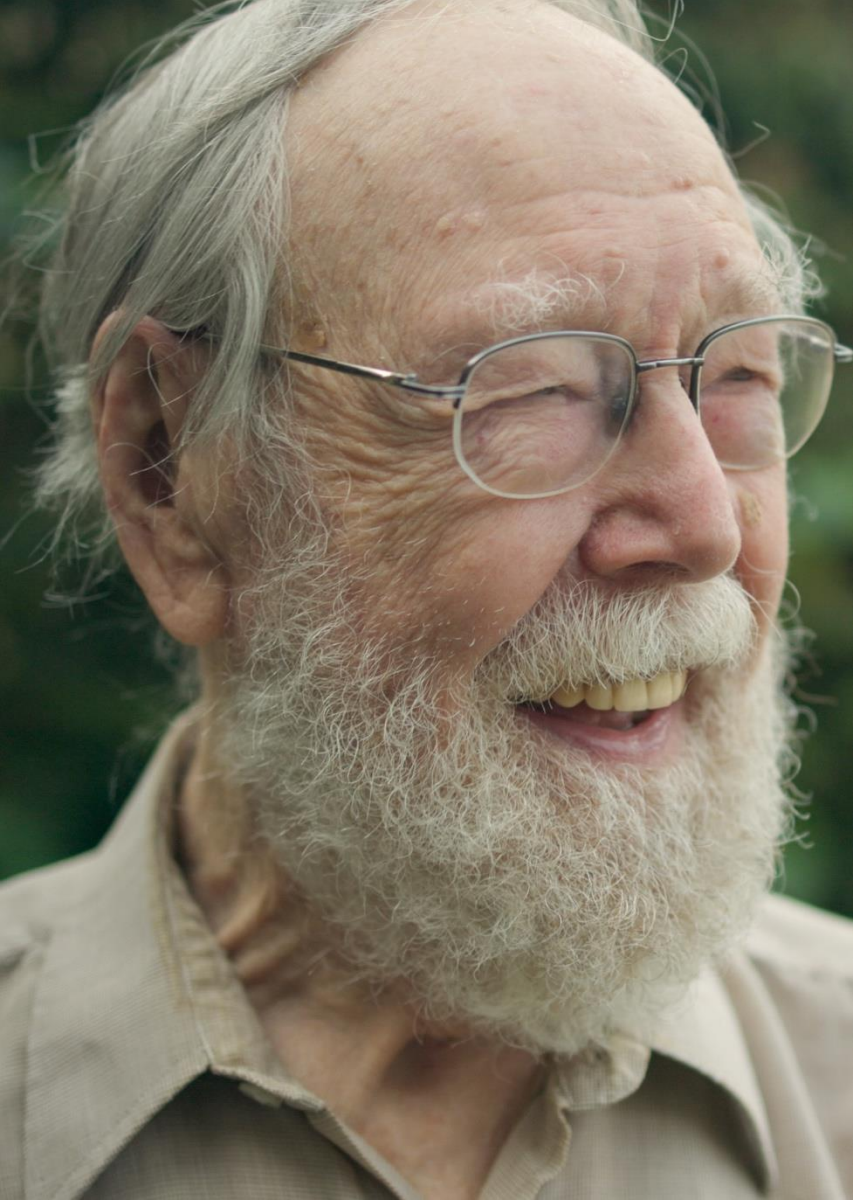
Learning Objectives

1. Describe the concept of SuperAging and identify factors associated with cognitive and functional resilience in adults 80 and older, including biological, behavioural, and social factors.

2. Explain how hearing and communication function within resilient aging, including why hearing loss does not uniformly lead to reduced participation or functional decline.

3. Apply an asset-based, participation-centred approach to audiology practice by incorporating patient strengths and contextual factors into assessment and intervention planning for adults 80 and older.





How SuperAgers are defined

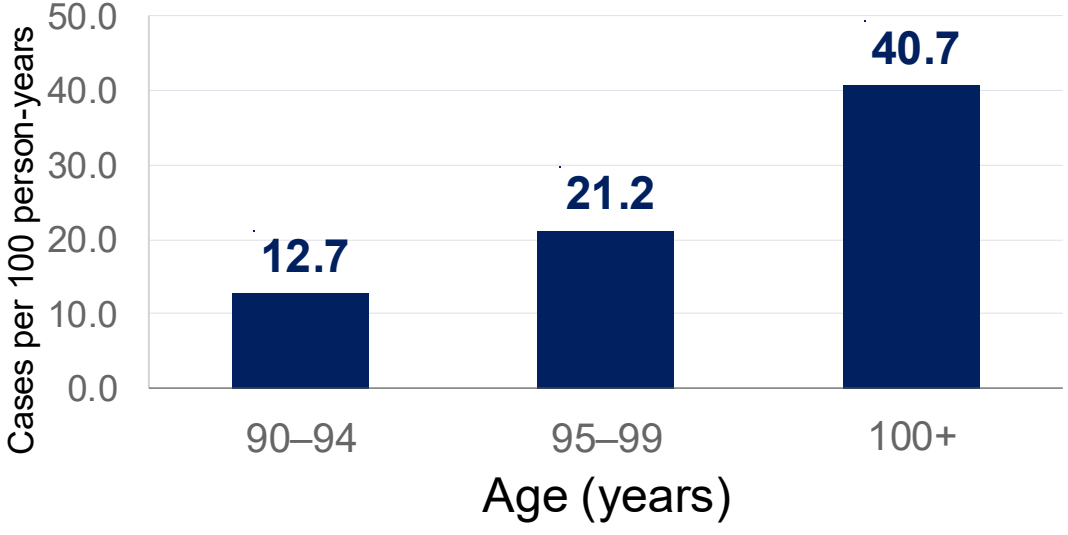
- Age 80+
- Verbal episodic memory comparable to adults 20–30 years younger
- Age-typical performance in other domains

SuperAging
RESEARCH INITIATIVE

Why focus on cognitive health after 80?

Dementia incidence continues to rise in very late life

The 90+ Study: 330 initially dementia-free adults



95% CIs: 9.4–16.8, 16.5–26.7, 24.9–62.8, respectively.

High dementia incidence makes preserved cognition especially informative.

SuperAging offers a contrast for investigating resilience after 80.

Corrada et al., Annals of Neurology, 2010. doi:10.1002/ana.21915. These estimates concern ages 90+.

Why younger-cohort findings may differ after 80

Risk-factor and pathology associations can change with age

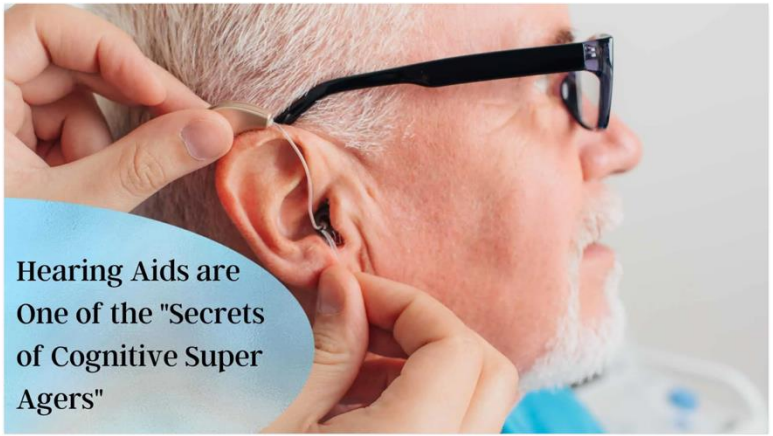
Very-late-life studies show that exposure timing (e.g., hypertension, viral exposures) and the relationship between Alzheimer's pathology and dementia matter.

Age-group averages do not establish individual trajectories

Preserved cognition and decline coexist after 80. Understanding these different trajectories requires longitudinal measurement.

Corrada et al. (2017), Alzheimer’s & Dementia. Savva et al. (2009), New England Journal of Medicine.

SuperAging in hearing-health messaging



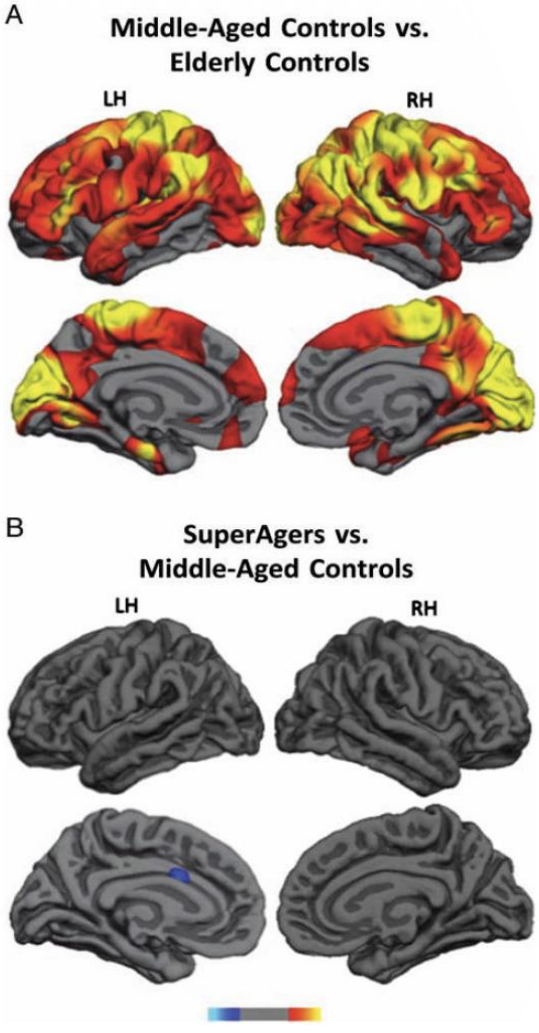
- Proxy and coordinator observation reports (good, moderate, poor, very poor).
- It did not test a hearing-aid intervention or report hearing aid use.
- Did not use published SuperAger criteria.

- **What the study did find?**
  - Memory and global cognition declined while visual spatial, executive function, and attention/speed of processing remained stable.
  - ‘Good’ hearing status was associated with better attention/processing speed.
  - ‘Good’ hearing status was the only variable associated with faster global cognitive decline.

Cited the Beker et al. (2021) study: 330 participants at baseline. Followed every 1.6 to 2 years. Only 8 participants at 4 years.

Otolaryngology Associates blog. Centenarian citation: Beker et al., JAMA Network Open, 2021.

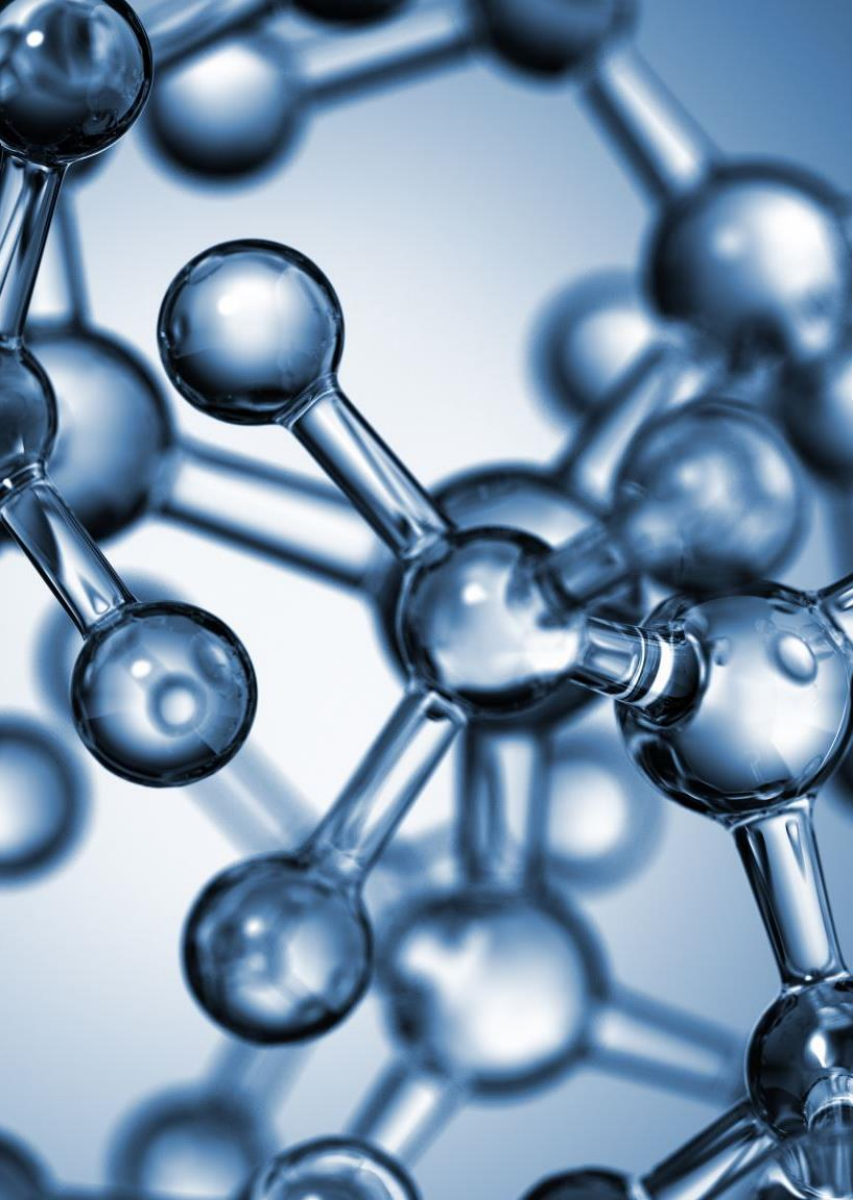

Part 1: Biology



Rogalski et al., 2013, *J Cognitive Neurosci.* And Harrison et al., 2012

SuperAging Neuroimaging Findings

- Relatively preserved cortical integrity (Harrison et al., 2012; Rogalski et al., 2013)
- Thicker anterior cingulate cortex (Harrison et al., 2012; Rogalski et al., 2013)
- Slower rates of *in vivo* atrophy when compared to matched peers with average cognitive performance for age (Cook et al., 2017)



Genetic Risk and Cognitive Resilience

APOE ε4 increases Alzheimer's risk, but does not determine an individual's outcome

The North American cohort shows no difference in the distribution of APOE ε4 or ε2. Some European centenarian studies have reported differences.

- In 231 adults 80+, APOE and ancestry-aware Alzheimer's polygenic risk scores did not distinguish SuperAgers from controls (Piras et al., 2026)

Rogalski et al., 2013; Corrada et al., 2012; Kawas et al., 2006; Piras et al., 2026)


Part 2: Lifestyle

Activity in adults 80+

Canadian guidelines for adults 65+: at least 30 minutes of moderate-to-vigorous activity (MVPA) daily.

Our wearable data: 48 SuperAgers, 50 controls, all 80+

SuperAgers vs controls

+27%

more daily MVPA minutes

Variability is high in both groups, leading to non-significant differences

Female vs Male

−19%

day-to-day variation in MVPA

Possibly steadier; not conclusive

MVPA trends higher in SuperAgers, but current activity alone doesn't separate them from their peers.



Sleep in adults 80+

Fewer sleep disorders linked to SuperAging in an 80+ cohort (Trammell et al., 2024).

Our wearable data: 48 SuperAgers, 51 controls, all 80+

Consistency

21% less

night-to-night variation in SuperAgers' sleep efficiency

Significantly less variability in SuperAgers

Average sleep efficiency

86%

SuperAger median; 81% in controls

Significant sex difference

How consistently people sleep may tell us more than how long they sleep on average.





A Healthy Social Portfolio

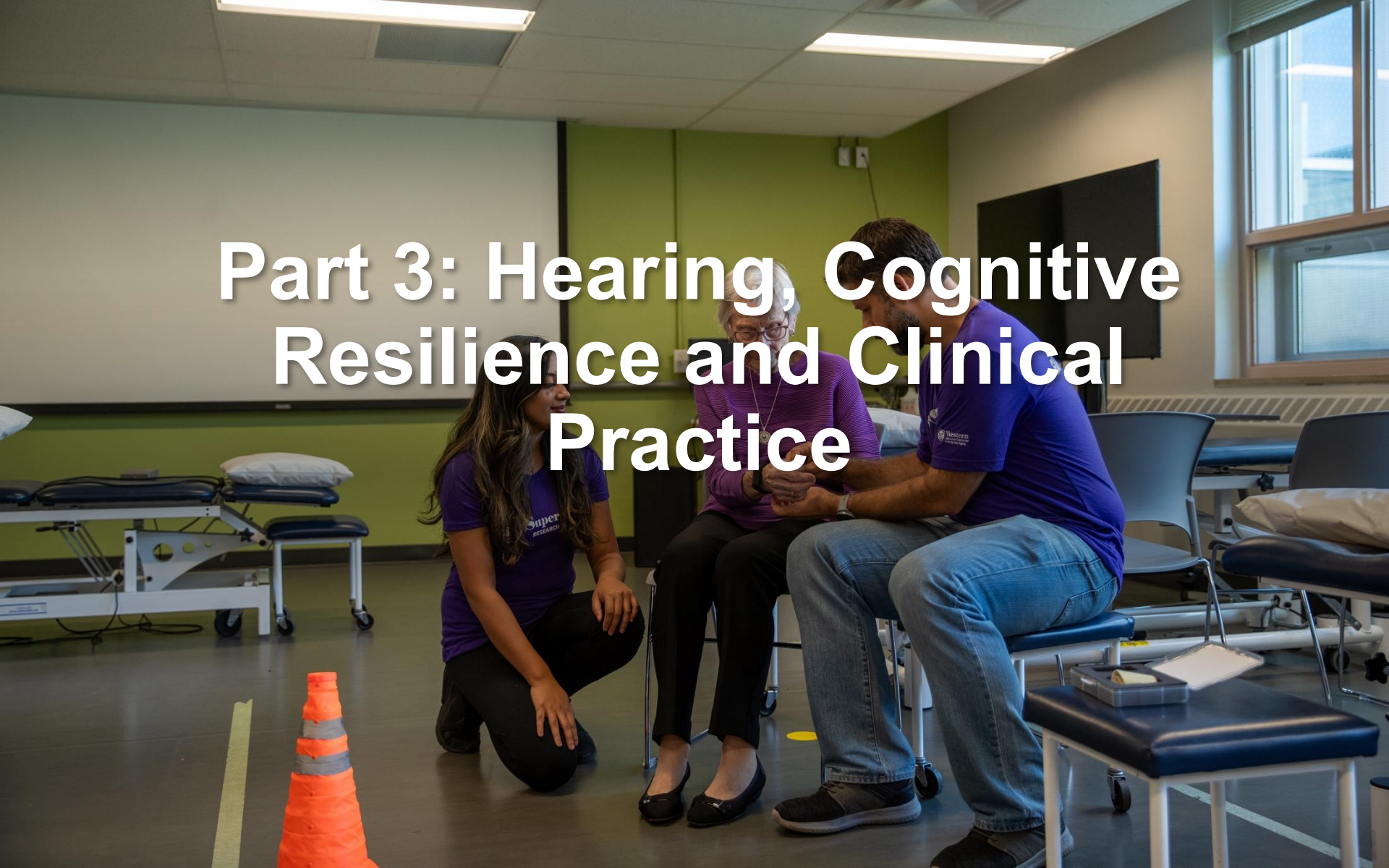
- The number and types of social contacts are less significant than the depth and meaning of engagement (Calandri et al., 2020; Cook Maher et al., 2017; Saint Martin et al., 2017; Garcia-Chanes et al., 2022; Miceli et al., 2019)

- Positive and supportive relationships in older life and strong mental health are particularly critical in cognitive resilience in 80+ (Cook Maher et al., 2017; Garo-Pascual et al., 2023; Watson et al., 2024; Alexander et al., 2026)

- Chronic loneliness is associated with higher dementia risk, independent of depression and cardiovascular disease (Holwerda et al., 2014)

- Loneliness is linked to higher cortical amyloid in cognitively normal older adults (Donovan et al., 2016)





Part 3: Hearing, Cognitive Resilience and Clinical Practice

Hearing trajectories change after 80

Wattamwar et al., 2017: clinic audiometry, n = 647, ages 80–106 (mean 90)

141 patients with repeat audiograms

9th decade compared to the 8th decade **~3.8 dB** HL/year at 0.25 and 0.5 kHz, and **~3.2 dB** HL/year at 1 kHz.

Hearing loss increases at a faster rate at 80 and older

Age-bracket differences in hearing were larger in the 90s than in the 80s across all tested frequencies.

Not only the high frequencies

The clearest acceleration of hearing loss was at 0.25–1 kHz.

Change across age bands

Largest in the 10th decade, 5.4-11.9 dB HL

Wattamwar K, et al. Increases in the rate of age-related hearing loss in the older old. JAMA Otolaryngol Head Neck Surg. 2017. doi:10.1001/jamaoto.2016.2661

CLSA: hearing–cognition links grow with age

Phillips et al., 2022: CLSA baseline, n = 30,029, ages 45–85, better-ear PTA

Hearing-device use did not change the association

Age

2.6×

stronger hearing–executive function link at age 75 than at 50

Effect size

2.3 yrs

of cognitive aging per 10 dB worse hearing (executive function)

Health

+10%

stronger link with each added chronic condition

CLSA stops enrolment at 85. The authors suggest these links “might be even stronger” beyond 85. In ongoing work, we are testing this in the follow-up waves in CLSA participants allocated to SuperAging and typical aging groups.

Phillips NA, et al. Hearing and visual acuity predict cognitive function in adults aged 45–85 years. Psychol Aging. 2022;37(8):891–912. doi:10.1037/pag0000716

Hearing and cognition after 80

Vella Azzopardi et al., 2023 (BUTTERFLY): n = 126, ages 80–91, non-frail, MMSE >23

Aided (n = 26)

49.5 dB HL

better-ear PTA4

17 dB worse hearing, yet similar MoCA and MMSE

No significant hearing–cognition correlations (small, self-selected group)

Unaided (n = 100)

32.2 dB HL

better-ear PTA4

Worse SRT → lower MMSE and slower visual reaction time, even when controlling for AGE and PTA

The only large RCT stops enrolment at age 84 years. ACHIEVE (Lin et al., 2023). Limited efficacy evidence in those 80 and older.

Vella Azzopardi R, et al. Aging Ment Health. 2023;27(1):184–92. doi:10.1080/13607863.2021.2007355. Lin FR, et al. Lancet. 2023;402:786–97.

Hearing in defined superagers

McPhee et al., 2025: online Brain Health Assessment, n = 469, ages 80–89, 67% female

SuperAger: face–name memory ≥ mean for ages 50–69, and z ≥ −1 on all four tasks

Unlike RAVLT delayed recall, this is visual recognition tested right after learning.

superagers
n = 162

47%

reported hearing loss

Typical agers
n = 307

56%

reported hearing loss

Adjusted odds ratio
SuperAger status

0.69

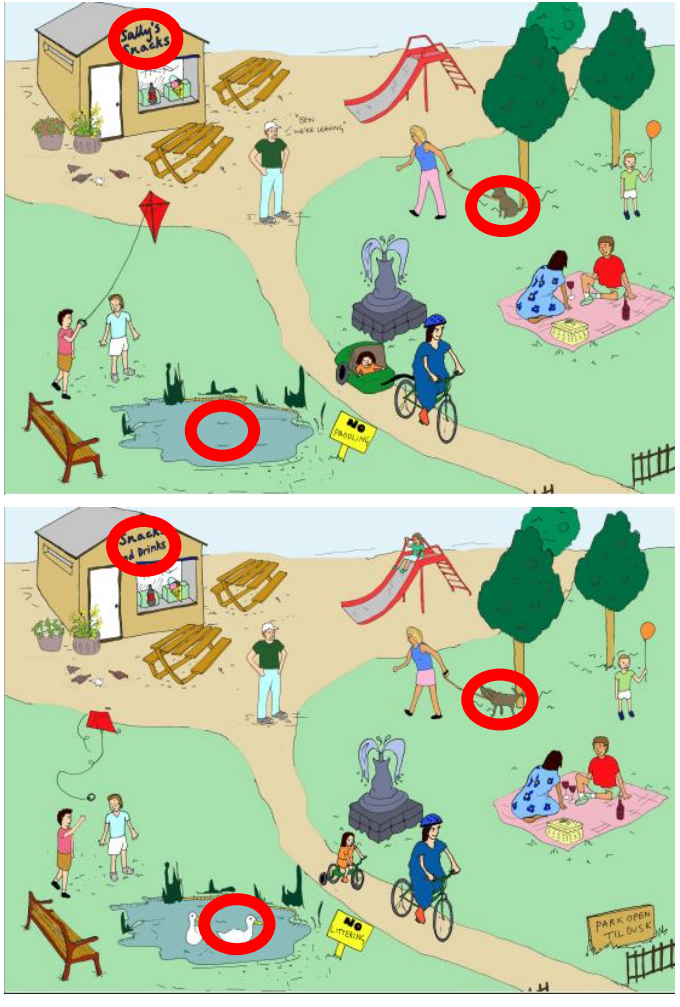
95% CI 0.47–1.02
p = .060; CI includes 1

Hearing was a single self-reported yes/no item. No audiometry, severity or aided status; online, self-selected, high-functioning sample.

McPhee MD, et al. Sex matters: association with superager classification and risk factors. Arch Clin Neuropsychol. 2025;40(1):13–21. doi:10.1093/arclin/acae064

Diapix Task

- A joint problem-solving communication task
- Associates everyday communication in a clinical setting
- A “spot the difference” task



Sample Versions Park A and B (Hazan and Baker, 2011)

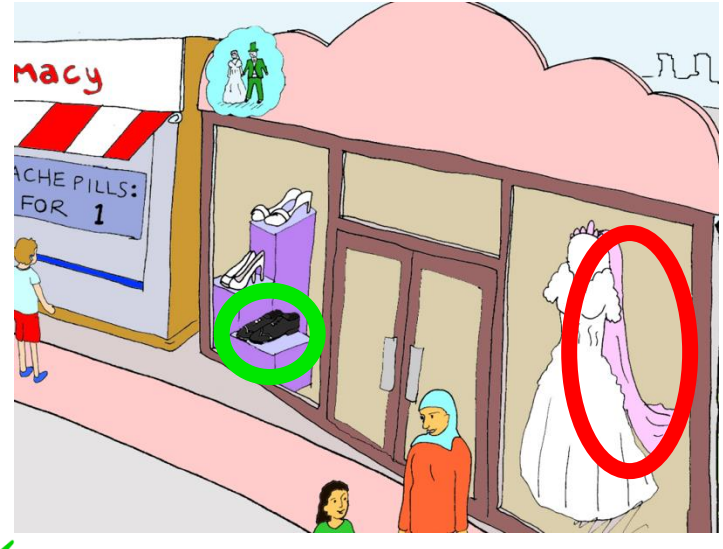
Communication Effectiveness and Efficiency

Version A



Speaker B: ”Okay, well, that one’s missing. The black shoes are missing.”

Speaker B: “Okay, I have a wedding dress with a white veil.”



Speaker A: “I have two pairs of heels and then one pair of black shoes.”

Speaker A: “I have a wedding dress with a pink veil.”

Version B

After 80: same success, different route

Diapix pilot by age: 16 aged 67–79 vs 16 aged 80–100, all with hearing loss

All (N=32): worse hearing, more conversation breakdowns (ρ = .44), No-significant correlation with task accuracy scores

	Ages 67–79	Ages 80+
Better-ear hearing (median PTA4 better ear)	42 dB HL	45 dB HL
Differences found (of 36)	35.5	35
Faster by trial 3	13 of 16	14 of 16
Clarification requests by the older adult, per trial**	**7**	**12**
Share of the talk	47%	43%
Cognition vs clarification requests (ρ)**	**−.22**	**−.65**

Adults 80+ succeeded just as often but asked more questions, and the frequency of their questions tracked cognition, not hearing. Better cognition – fewer clarification questions in 80+

Louis et al., MSc thesis (2026). ** p < .01 (for ρ, 80+ group only). Cognition = composite z-score. Exploratory pilot, n = 32.

Three things to take back to clinic

1
Trajectories vary

After 80
Decline and preserved function coexist; age alone doesn't set the path.

Hearing
Hearing keeps changing into the 90s. Re-test and re-fit.

2
Aging well is multidimensional

After 80
Brain, sleep, activity and relationships all play a part.

Hearing
Conversation carries social life. Assess hearing as whole-person health.

3
Participation is the goal

After 80
What matters is doing what the person values.

Hearing
Measure SRT, everyday impact (HFEQ; Karlsson), and communication; set goals with the person.

Hearing well is part of aging well after 80.

Corrada 2010, 2017; Wattamwar 2017; Cook Maher 2017; Phillips 2022; Vella Azzopardi 2023; Roberts, in revision; CASLPO 2026.

SuperAging Research Initiative and THRIVE-80 Information

Western University
SuperAgingCanada@uwo.ca
1-888-688-8368

Website:
https://superagingcanada.uwo.ca/

