

# Relationship between subjective hearing and memory complaints in late middle-aged adults at risk for Alzheimer's disease

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## BACKGROUND

- Subjective memory impairment may be one of the earliest indications of subsequent cognitive decline in adults who later develop dementia
  - Longitudinal studies have shown subjective memory complaints (SMCs) are predictive of cognitive decline and dementia<sup>1</sup>
  - SMCs have been associated with biomarkers of Alzheimer's disease (AD), even in the absence of objective cognitive impairments<sup>2</sup>
- Auditory dysfunction is also a risk factor for cognitive decline and dementia,<sup>3</sup> but whether it is associated with SMCs has never been investigated

## OBJECTIVE

- In a late middle-aged cohort at risk for AD, determine whether subjective hearing complaints are associated with:
  - 1.) Subjective memory complaint
  - 2.) Different domains of subjective memory function

## METHODS

### Participants:

- N= 192 cognitively healthy adults, enriched for parental history of AD and APOE ε4 genotype, from the Wisconsin Registry for Alzheimer's Prevention (see **Table 1**)

### Subjective Hearing Complaints

- Average of responses to 4 questionnaire items assessing subjective perception of overall hearing problems, listening effort, sound clarity, and spatial hearing ability on a ten-point scale

### Subjective Memory Complaint (SMC)

- Single question: "Do you think you have a problem with your memory?"

### Domains of Subjective Memory Function

- 54 items from the Memory Functioning Questionnaire (MFQ),<sup>4</sup> which includes questions pertaining to four domains:

- Frequency of forgetting (e.g. *How often do names present a problem for you?*)
- Seriousness of forgetting (i.e. *When you actually forget in these situations, how serious of a problem do you consider the memory failure to be?*)
- Retrospective functioning (e.g. *How is your memory compared to the way it was one year ago?*)
- Mnemonics usage (e.g. *How often do you make lists of things to do to remind yourself about things?*)

- Participants rate responses on a seven-point scale

### Statistical Analyses

- Binary logistic regression used to estimate odds of SMC
  - N=30 participants who responded "I don't know" excluded for this analysis only
  - Subjective hearing complaints treated as continuous in analysis but displayed in quartiles (**Figure 1**) for clarity
- Separate linear regressions used to assess relationship between subjective memory complaints and each MFQ domain
- All regressions adjusted for age, sex, education, and subjective health rating

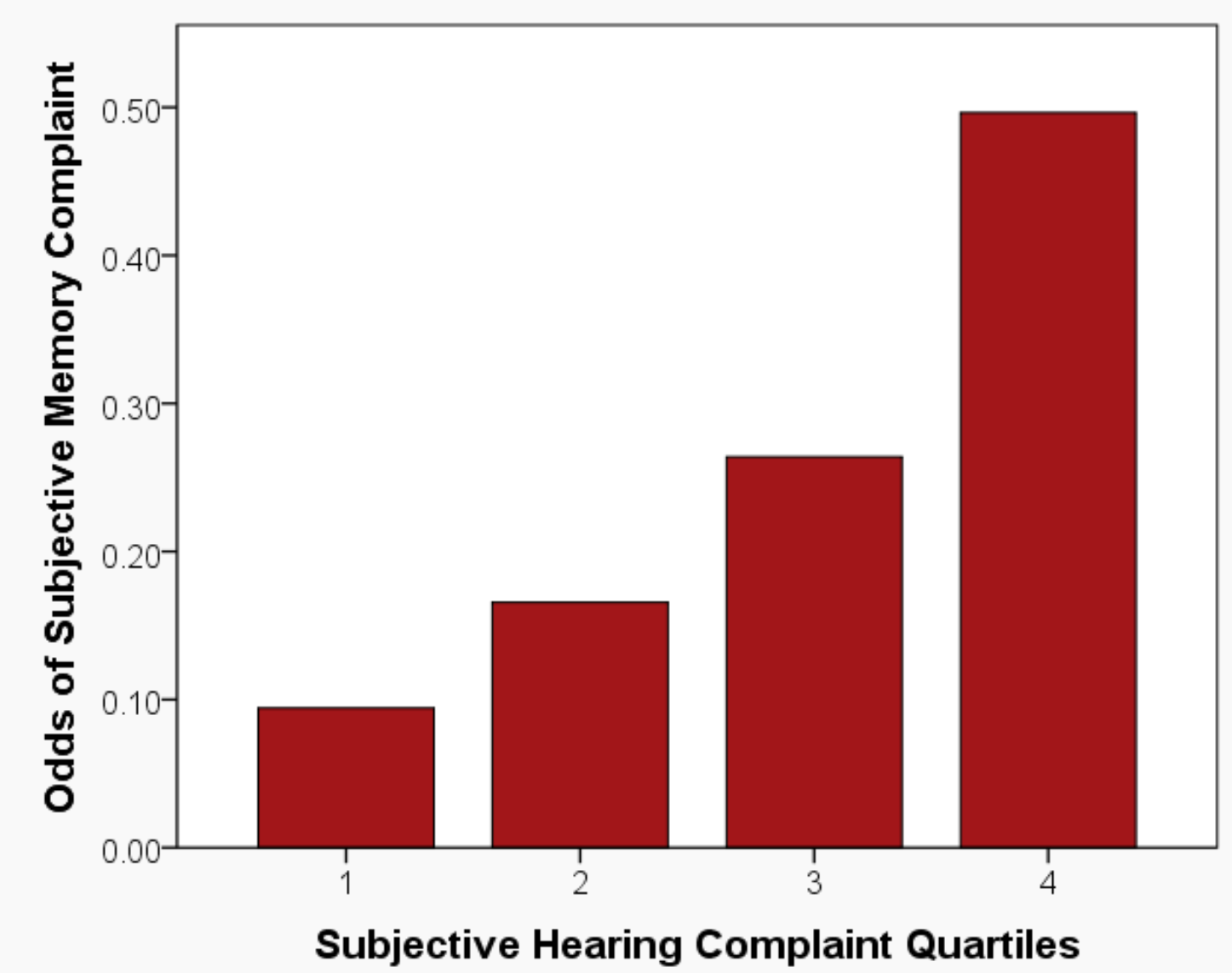
## RESULTS

**Table 1.** Participant characteristics.

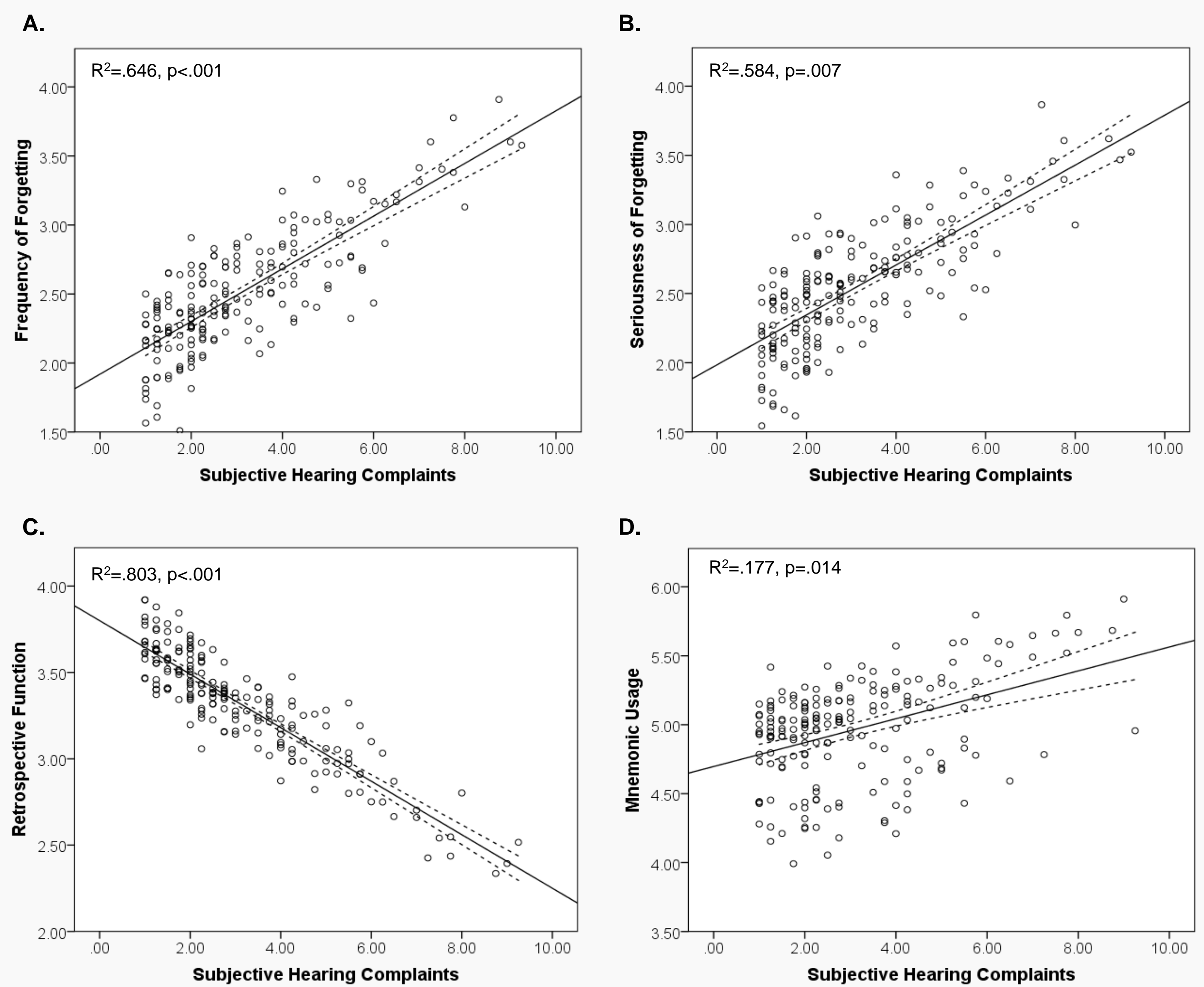
Characteristic	Value
Age, y, mean (SD)	64.21 (6.74)
Education, y, mean (SD)	15.96 (2.72)
Female, %	72.4
Family History Positive, %	70.8
APOE4 Carriers, %	37.5

**Table 2, Figure 1.** Greater odds of subjective memory complaint with increasing levels of subjective hearing complaints.

	OR [95% CI]	p
Age	1.11 [1.03-1.19]	.005
Female	1.12 [.45-2.80]	.815
Education	1.02 [.88-1.18]	.779
Subjective overall health rating (1-5)	.63 [.37-1.10]	.104
Subjective hearing complaints (1-10)	1.54 [1.23-1.93]	<.001



**Figure 2.** Subjective hearing complaints are associated with multiple domains of subjective memory function.



## DISCUSSION

- Increasing levels of subjective hearing complaints were associated with greater odds of SMC ( $p<.001$ , **Figure 1**)
- Subjective hearing complaints were associated with all four domains of subjective memory function assessed by the MFQ (all  $p<.05$ , **Figure 2**)
  - Strong association with "Frequency of Forgetting" ( $p<.001$ , **Figure 2a**) – accounts for greatest variance in self-rated memory and is one of the most frequently studied aspects of memory self-appraisal<sup>5</sup>
  - Strong association with "Seriousness of Forgetting" ( $p=.007$ , **Figure 2b**) – reflects anxiety about memory
  - Strong association with "Retrospective Function" ( $p<.001$ , **Figure 2c**) – reflects perceived declines in memory; tends to increase with increasing age and is correlated with neuroticism<sup>5</sup>
  - Moderate association with mnemonics usage ( $p=.014$ , **Figure 2d**) – reflects proactive prevention of memory failures; also tends to increase with increasing age<sup>5</sup>
- Would be interesting to investigate how mood and personality factors (e.g. neuroticism, depression) may effect these relationships in future analyses

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