

Models of late life cognition and dementia: the role of occupation and time use

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Outline

- Early life social disadvantages create risks in midlife for later life cognition.
- Focus on four pathways
 - ✓ Employment
 - ✓ Leisure time
 - ✓ Sleep quality
 - ✓ Sense function, with focus on hearing
- Data sets and methodologies for these life course processes
- Conclusions: Most critical data and methodological needs

Multiple roles in midlife produce pathways for cognitive function later in life: e.g., earning capacity, intergenerational support, shifts in safety nets, reposition at work.

Focus on four pathways:

- Employment
- Leisure time use
- Sleep quality
- Sense function, with focus on hearing





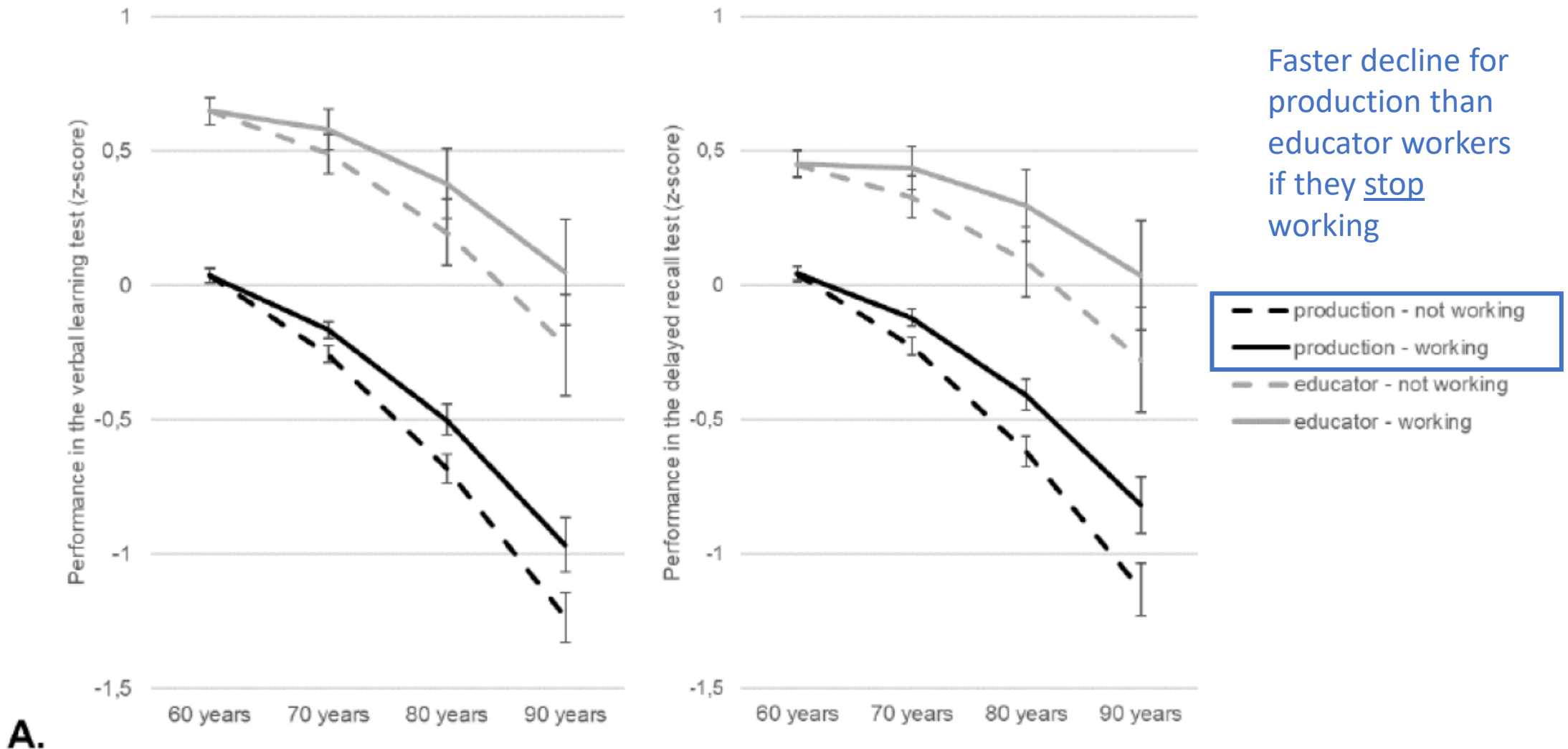
Employment/ Retirement



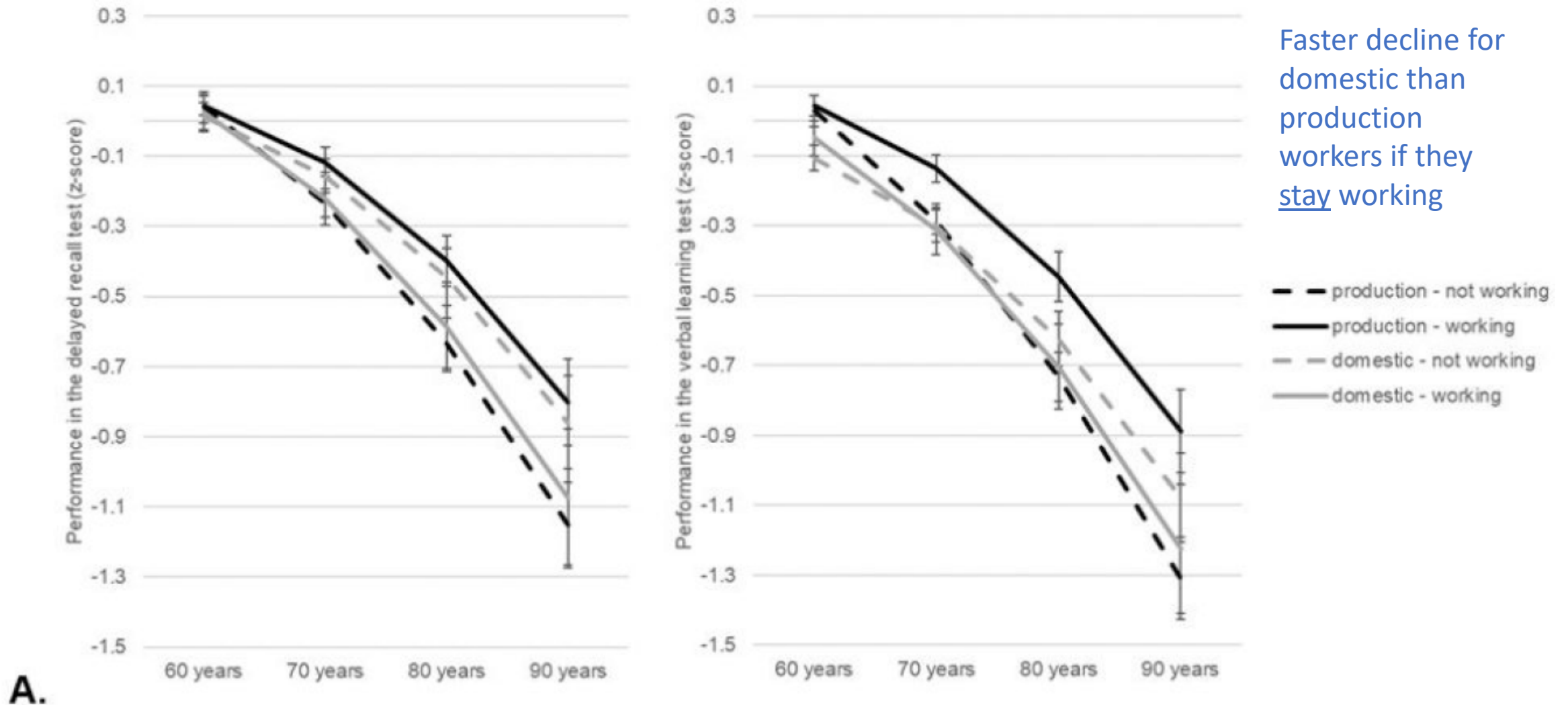
Employment in mid-late life and cognitive function.

- Mid-life can be the peak years in terms of earning, position, leadership in work and community.
- Ability and decisions on remaining at work or leaving early (voluntary or not) are linked to early life work experiences.
- Remaining active in the labor force can have positive influence in cognitive function in old age (lose-it-or-lose-it effect).
- Is the potential benefit of staying active the same for all?

Effect of working on cognition: beneficial only for certain occupations, for example production workers



Effect of working on cognition: not beneficial for domestic workers



Conclude employment in middle-and old age

- Working *per se* does-not lead to better cognitive function. Occupations with low cognitive demand seem to be associated with no benefit/faster decline from working.
- Context and exposures of the occupations may determine the risks of cognitive impairment and dementia in old age.
- Policy decisions may cater to certain occupations differently.
- Data needed to document, over the life course: exposures to occupational risks, use of proper protection at work, work with chronic diseases; work benefits, security, stress (Wahrendorf et al. 2023).



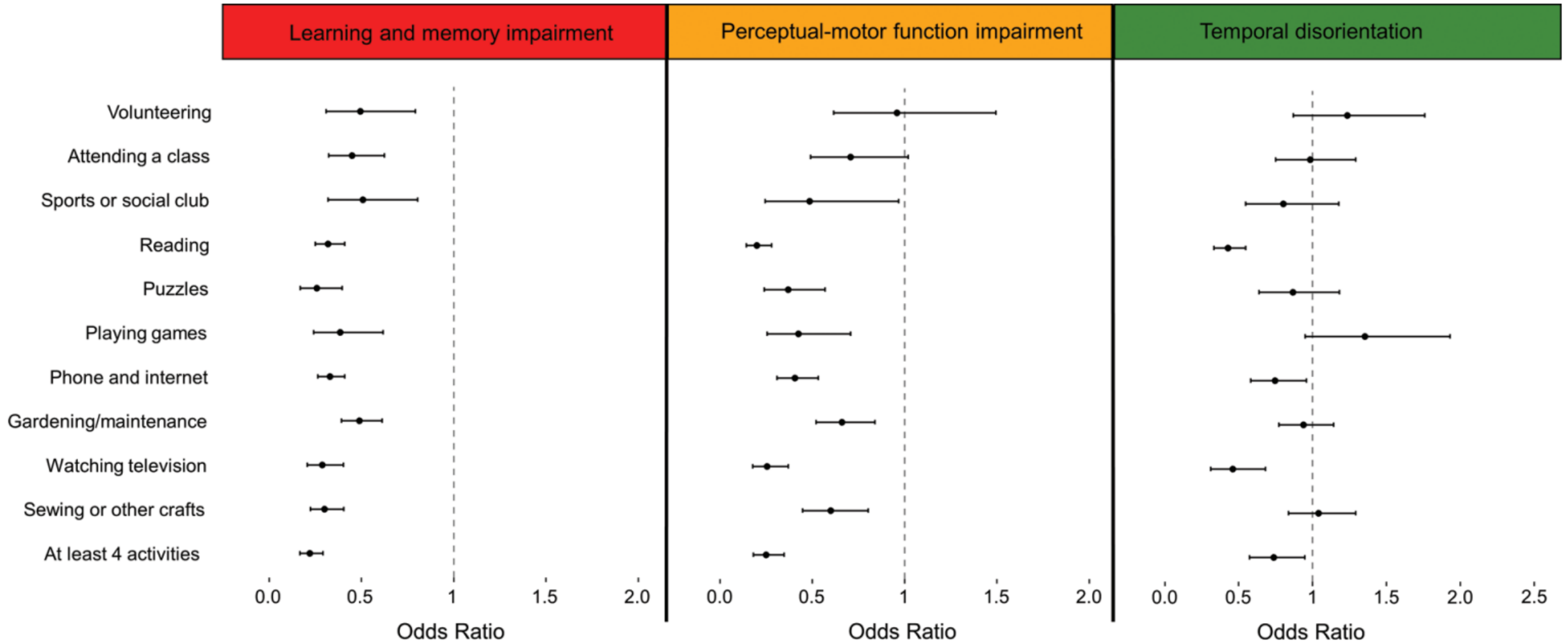
Use of Leisure Time



Beyond work, how do other activities associate with cognitive function?

- Does use of leisure time create benefits for later life cognitive decline?
- Do different activities have differential effects?
- Do different cognitive domains seem to show different beneficial association?

Association of social/leisure activities varies by cognitive domain (Mexican older adults aged 60+)



Use of leisure time

- Social and leisure activities were associated with reduced odds of death and disadvantageous cognitive transitions, as well as increased odds of beneficial transitions.
- Methods: Reverse causality of cognitive impairment and participation in social and leisure activities needs to be addressed systematically. More work on understudied populations as well.
- Data: Long follow-up allowed the examination of cognitive impairment, mortality, engagement in activities.

Ability to stay active (work or leisure) depends on health

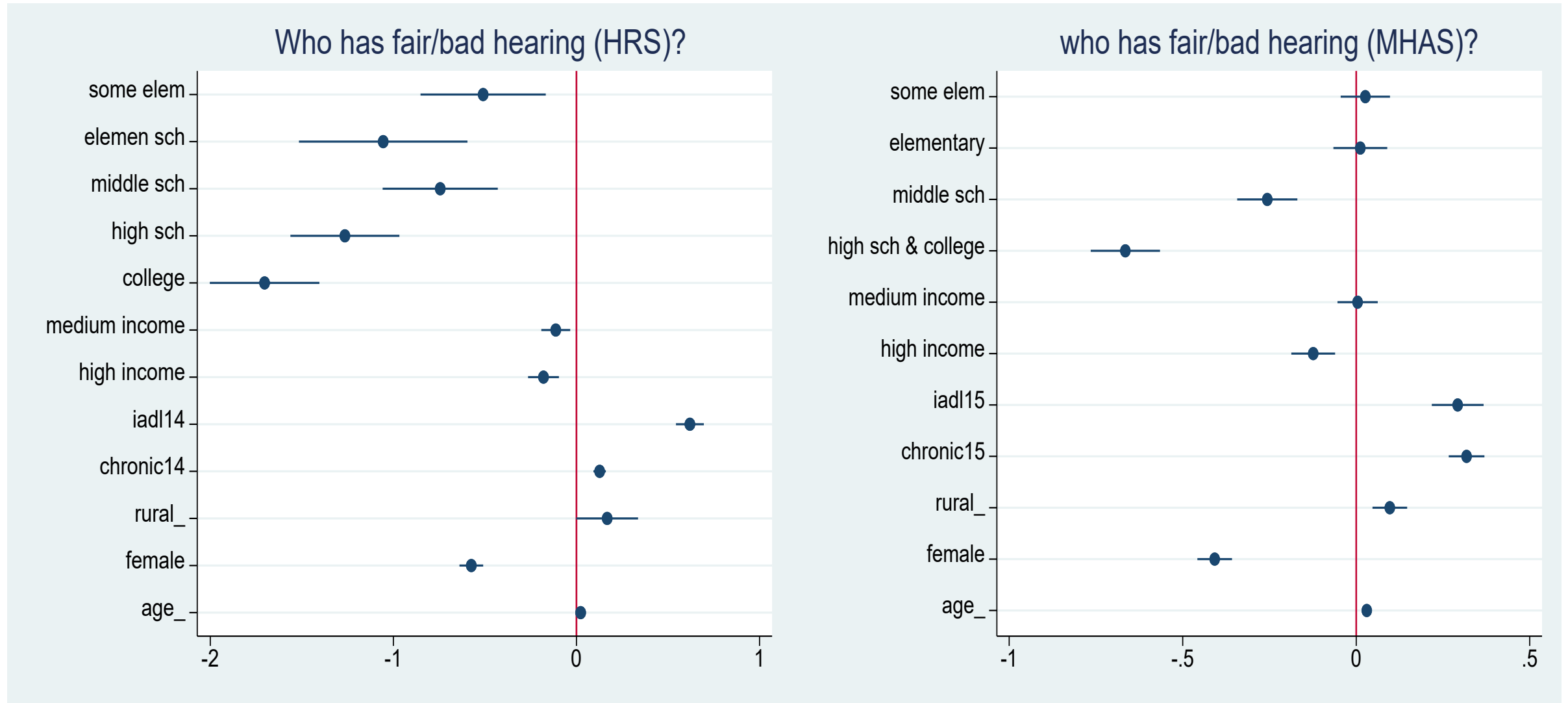
- Hearing and vision impairment may limit work and leisure activities, and these sense limitations manifest and deteriorate much more in midlife.
- Loss of hearing/vision may partly depend on earlier life health and occupational exposures.
- Hearing loss (especially if untreated) is associated with deteriorated quality of life, wellbeing, and higher risk of loneliness, social isolation, and mortality (Holge et al., 2023), and with lower cognitive function (Croll et al. 2021).



Hearing Impairment



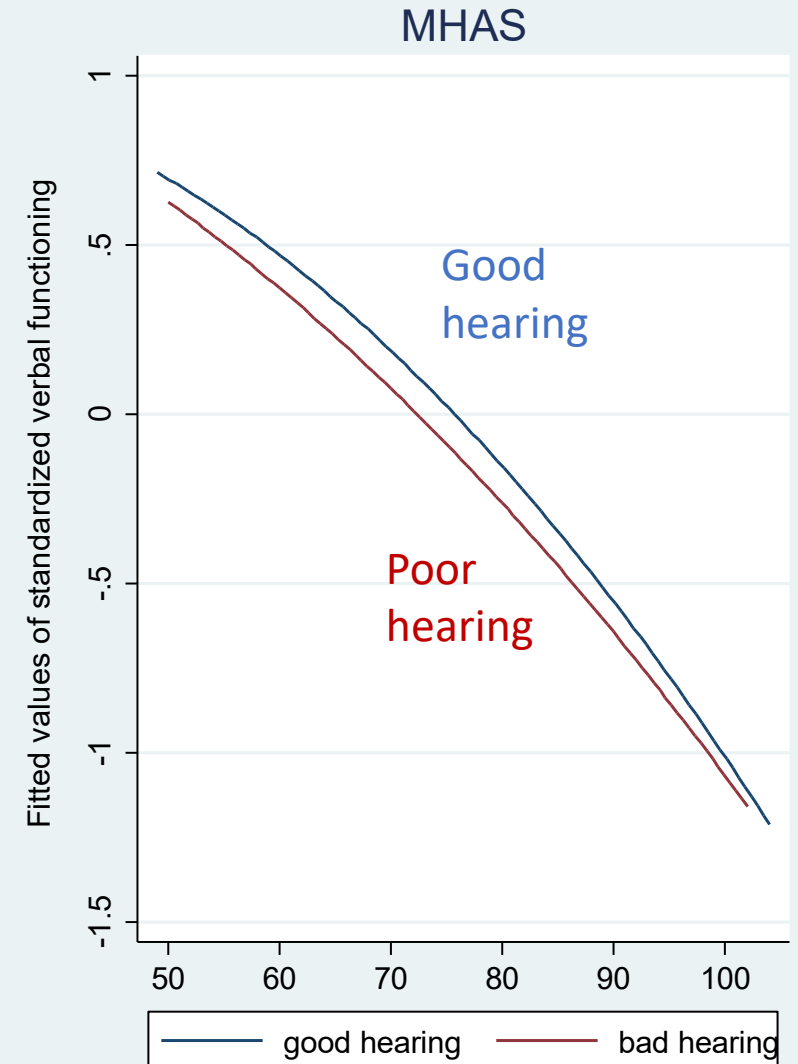
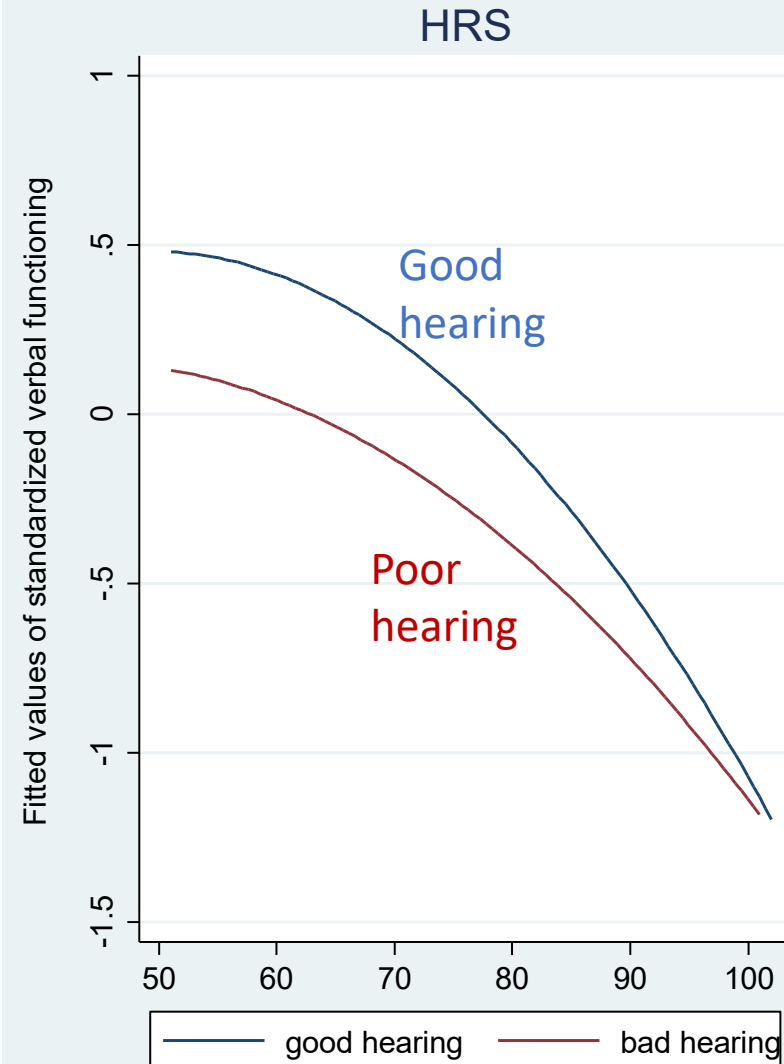
Wider contrasts of SES hearing covariates in U.S. compared to Mexico (HRS and MHAS data aged 50+)



SOURCE: Han, Chengming et al. (2024) Working paper. Hearing impairment and its association with cognitive function in the U.S. and Mexico

Poor hearing (with hearing aid if applicable) is associated with verbal function decline

- Hearing limitations at baseline are associated with significant lower cognition **in 6-year follow-up in both countries.**
- Adjusted for education, income, IADL, chronic conditions, rural resident, age, gender



Sleep Difficulties



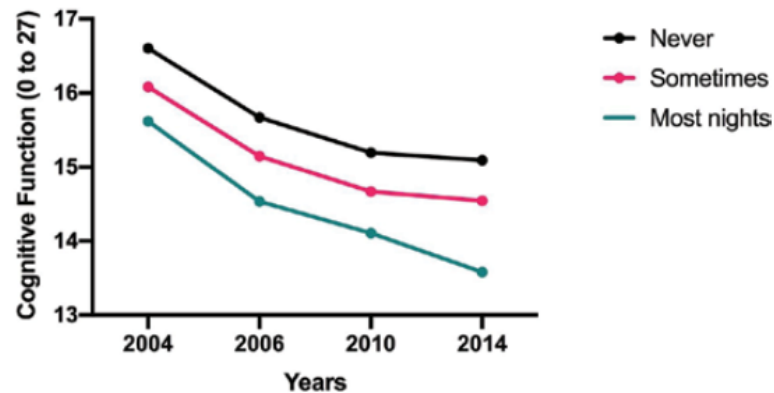
Sleep concerns change across the life course, with heterogeneous influence of early life conditions

- Sleep problems may exist at any age but most commonly start in young adulthood. The type of problem varies with age. Problems getting to sleep are more common among young adults. “Problems staying asleep are more common among middle-aged and older adults.” (Amer Psych Assoc)
- Childhood socioeconomic conditions affect sleep difficulties in older age for *women*. *For men*, it is current SES that seems to influence sleep problems (van de Straat et al. 2018 using SHARE data).

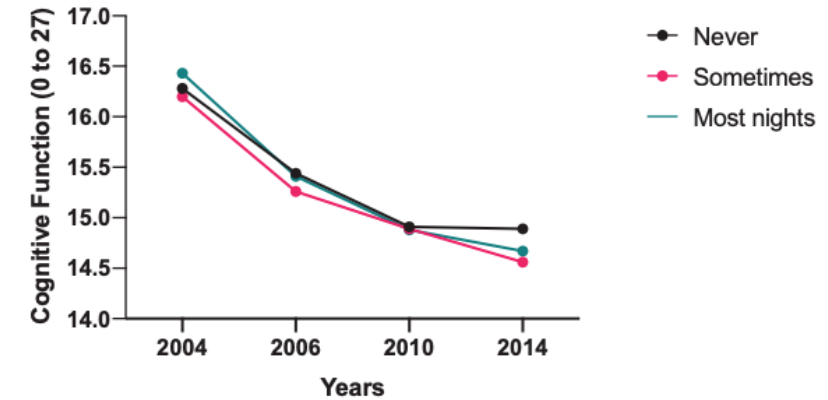
Cognition over time associated with different type of sleep problems (10 years HRS data for U.S. adults)

- Cognitive function level and trajectory are altered for *some* dimensions of sleep concerns

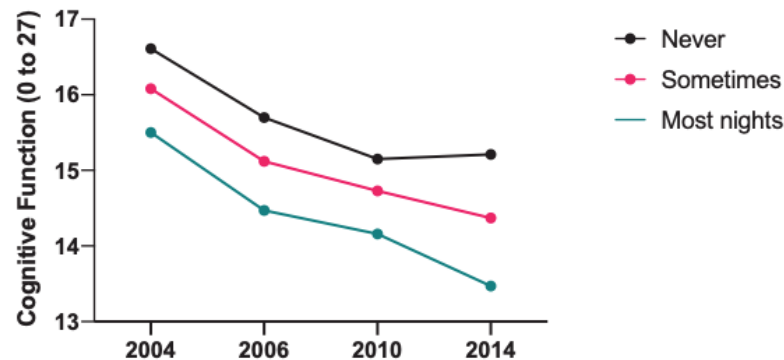
A Trouble initiating sleep



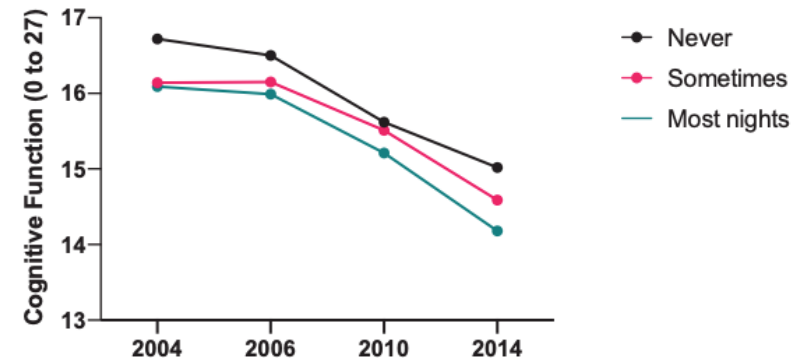
B Nocturnal awakenings



C Early morning awakenings



D Waking feeling rested



Conclusion



Conclusions: Data

- Midlife adults conduct multiple roles as they transition in work, social, cultural, and economic environments.
- Combining a variety of sources of information may be useful to capture these transitions and related stressors (Infurna et al. 2020)
 - ✓ Self-reports, informant reports, semi-structured interviews, performance measures, dyads approaches
 - ✓ Longitudinal data with long follow-up could be optimal, but retrospective data may be a good substitute
 - ✓ Life histories data seems time- and cost-intensive. Consider to prioritize the most critical measures to collect on the aspects of life histories -- data that would pay off.
- Life course of occupational risks, time use, ability to use time as desired (work, leisure, volunteer, civic life, community, family care, rest/sleep)
 - ✓ Consider capturing the drivers of wellbeing with preferences or satisfaction. For example, we mostly measure use of time, but not satisfaction with the use of time.
- More data on these dimensions for racial/ethnic groups is obviously needed to advance research.

Conclusions: Methods

Methods should aim to address:

- ✓ Reverse causality, bidirectionality -- of cognitive function and time use (work, leisure, sleep)
- ✓ Endogeneity of earlier life exposures to later life outcomes. This applies to childhood conditions affecting midlife, and midlife exposures affecting old age cognition.
- ✓ Models with parallel outcomes that capture the multiple roles (worker, caregiver, family and community responsibilities). How do midlife and old age adults allocate time and efforts?

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