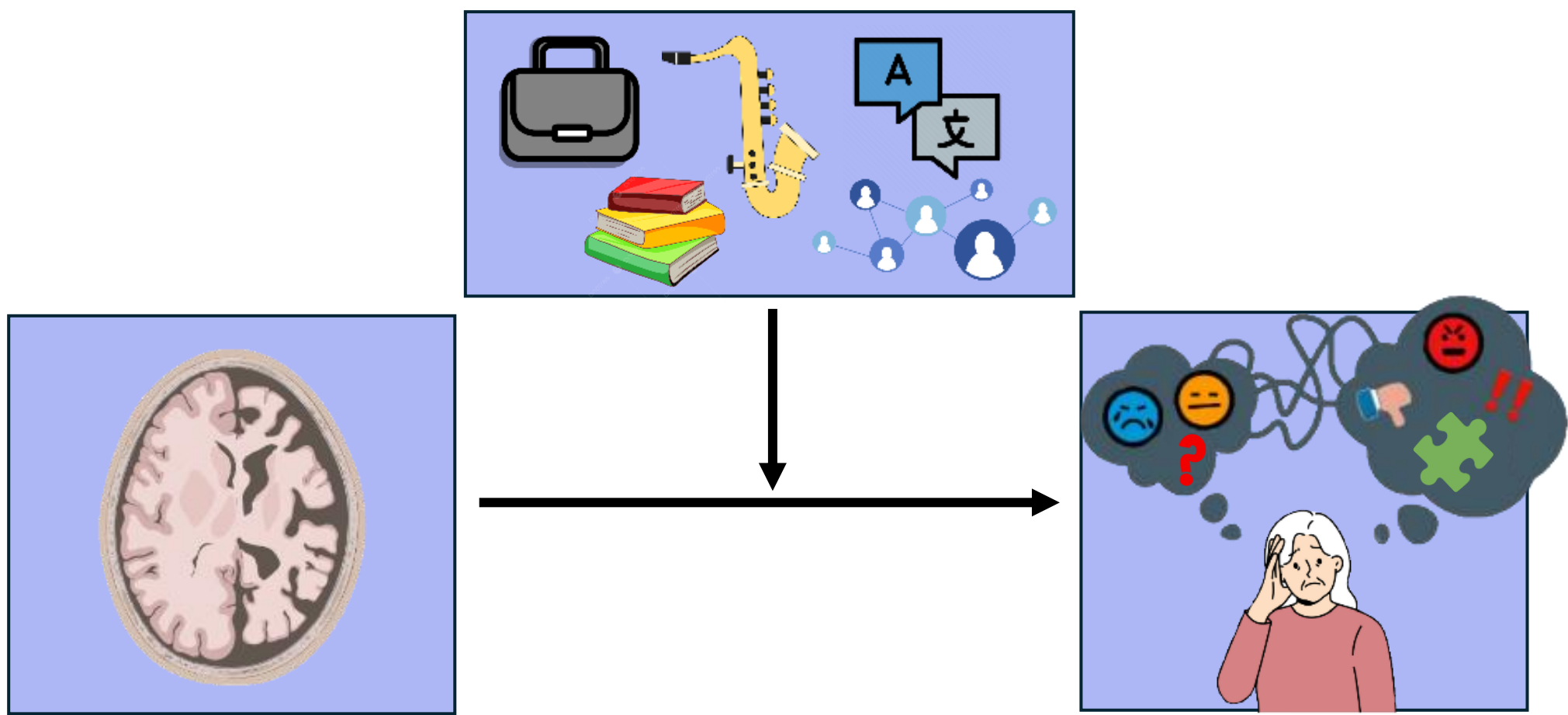


Cognitive reserve in relation to gait, hearing, and vision in older adults: associations with plasma p-tau217

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BACKGROUND

- Cognitive reserve (CR) is resilience against brain dysfunction, built through lifelong experiences like education, occupation, and mentally stimulating activities.¹
- CR buffers against cognitive decline due to Alzheimer Disease (AD).²
- Recent studies suggest that CR may also protect against non-cognitive manifestations of dementia, such as neuropsychiatric symptoms.^{3,4}



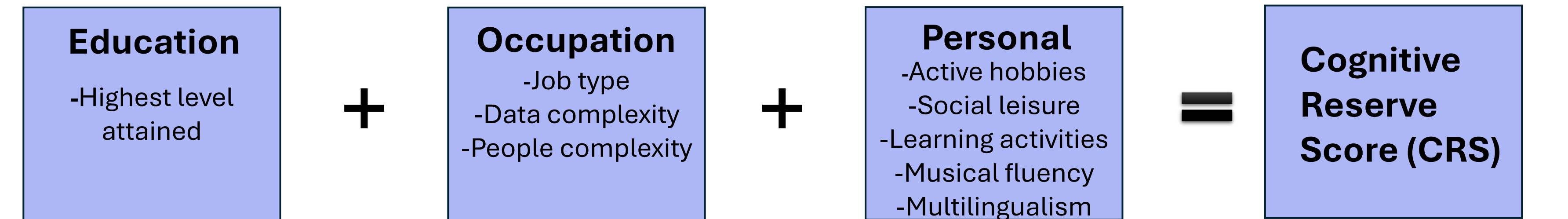
- However, less is known about whether CR extends to other non-cognitive outcomes of AD, including gait, hearing, and vision.

RESEARCH QUESTIONS

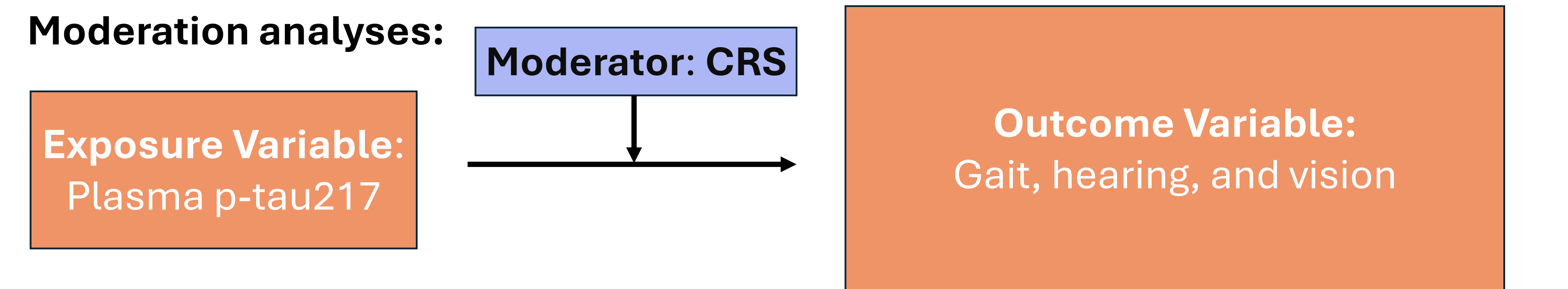
- Is there a direct association between CR and gait, hearing, and vision?
- Does CR modify the associations between AD pathology and gait, hearing, and vision?

METHODS

- Participants** (n=131) aged ≥ 50 years were from the Biomarker, Cognition, and Behaviour (BAMBI) study. Characteristics are shown in **Table 1**.



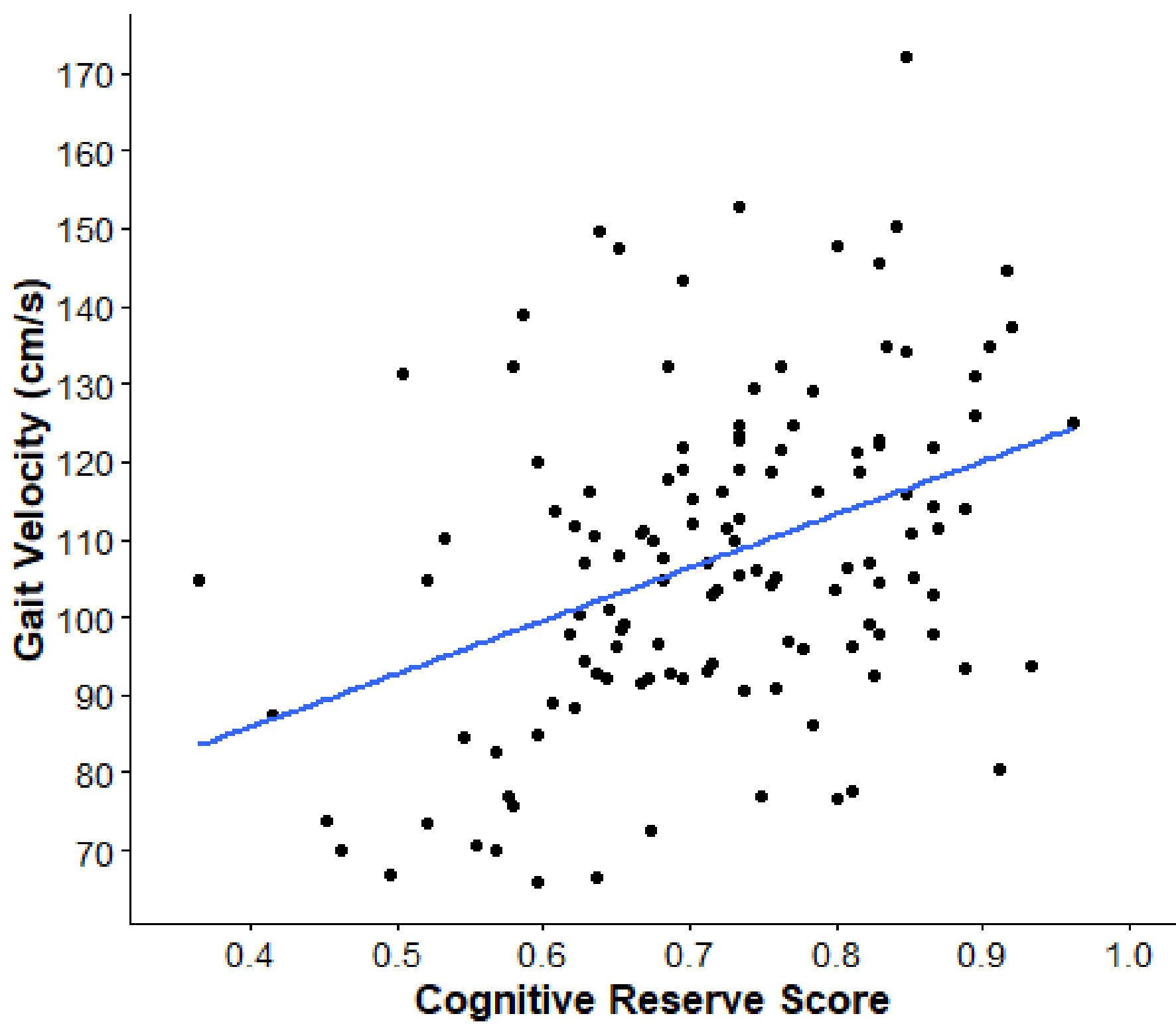
- AD pathology** was quantified using plasma phosphorylated-tau217 (p-tau217) measured by the Quanterix ALZpath Simoa assay.
- Gait** was assessed by gait velocity and serial/animal fluency dual-task gait cost (DTGC)⁵; **hearing** by the HearWHO speech-in-noise test⁶; and **vision** by self-report.
- Direct CRS associations:** linear regression (for gait and hearing) and ordinal logistic regression (for vision).
- Moderation analyses:**



- Adjusted for age, sex, and Montreal Cognitive Assessment (MoCA).

RESULTS

- Higher CRS** was associated with **faster gait** ($\beta = 2.28$, $p=.001$).
- CRS was not associated with DTGC ($\beta = 0.23$, $p=.77$), hearing ($\beta = 0.02$, $p=.97$), or vision ($\beta = 1.95$, $p=.21$). (**Table 2**).
- p-tau217 was associated with higher serial DTGC ($\beta = 6.84$, $p = .030$); but not with hearing, vision, gait speed, or animal DTGC.
- CRS*p-tau217 interaction terms were non-significant across all outcomes, as shown in **Table 3**.



Sample	Total
Sample size (N)	131
Age, mean (sd)	71.4 (9.9)
Female, n (%)	87 (66.4)
Education, mean (sd)	16.2 (3.0)
MoCA total, mean (sd)	26.0 (3.4)
CRS, mean (sd)	0.72 (0.12)
MCI, n (%)	16 (12.2)
Mild dementia, n (%)	2 (1.5)

Table 1. Participant characteristics. MCI, Mild Cognitive Impairment.

CRS Associations with Gait, Hearing, and Vision			
Outcome	β	95% CI	p
Gait velocity	2.28	0.93, 3.63	.001
DTGC (serial)	0.23	-1.36, 1.82	.77
DTGC (animal)	0.17	-1.40, 1.73	.83
HearWHO score	0.02	-1.25, 1.30	.97
Vision	1.95	0.12, 32.43	.21

Table 2. β represents the standardized coefficient, except for vision it represents the odds ratio. Vision was modelled using ordinal logistic regression, all other outcomes were modeled using linear regression.

CRS*p-tau217 Interaction Terms			
Outcome	β	95% CI	p
Gait velocity	2.38	-1.03, 5.79	.17
DTGC (serial)	0.37	-3.61, 4.36	.86
DTGC (animal)	-2.50	-6.41, 1.42	.21
HearWHO score	1.41	-1.77, 4.59	.38
Vision	-4.31	-11.07, 2.42	.21

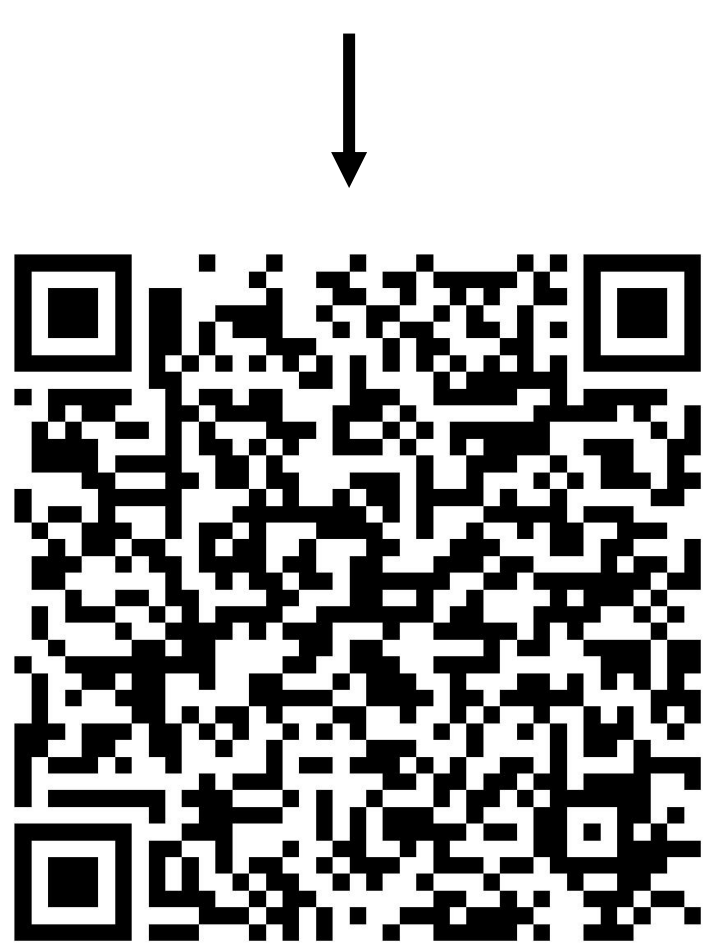
Table 3. β represents the standardized coefficient for the CRS*p-tau217 interaction term.

CONCLUSION & NEXT STEPS

- CR may be associated with gait speed in older adults, though there were no significant associations with DTGC, hearing, and vision.
- CR did not moderate the relationship between AD pathology and gait, hearing, and vision.
- Future work will examine mechanisms linking CR and gait speed.
- We will also explore potential domain weightings for CRS.

REFERENCES & ACKNOWLEDGEMENTS

Scan the QR code for references and author information



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