



Uncontrolled midlife hypertension is associated with subtle executive dysfunction phenotypes in cognitively unimpaired older adults: Results from the ARIC Study

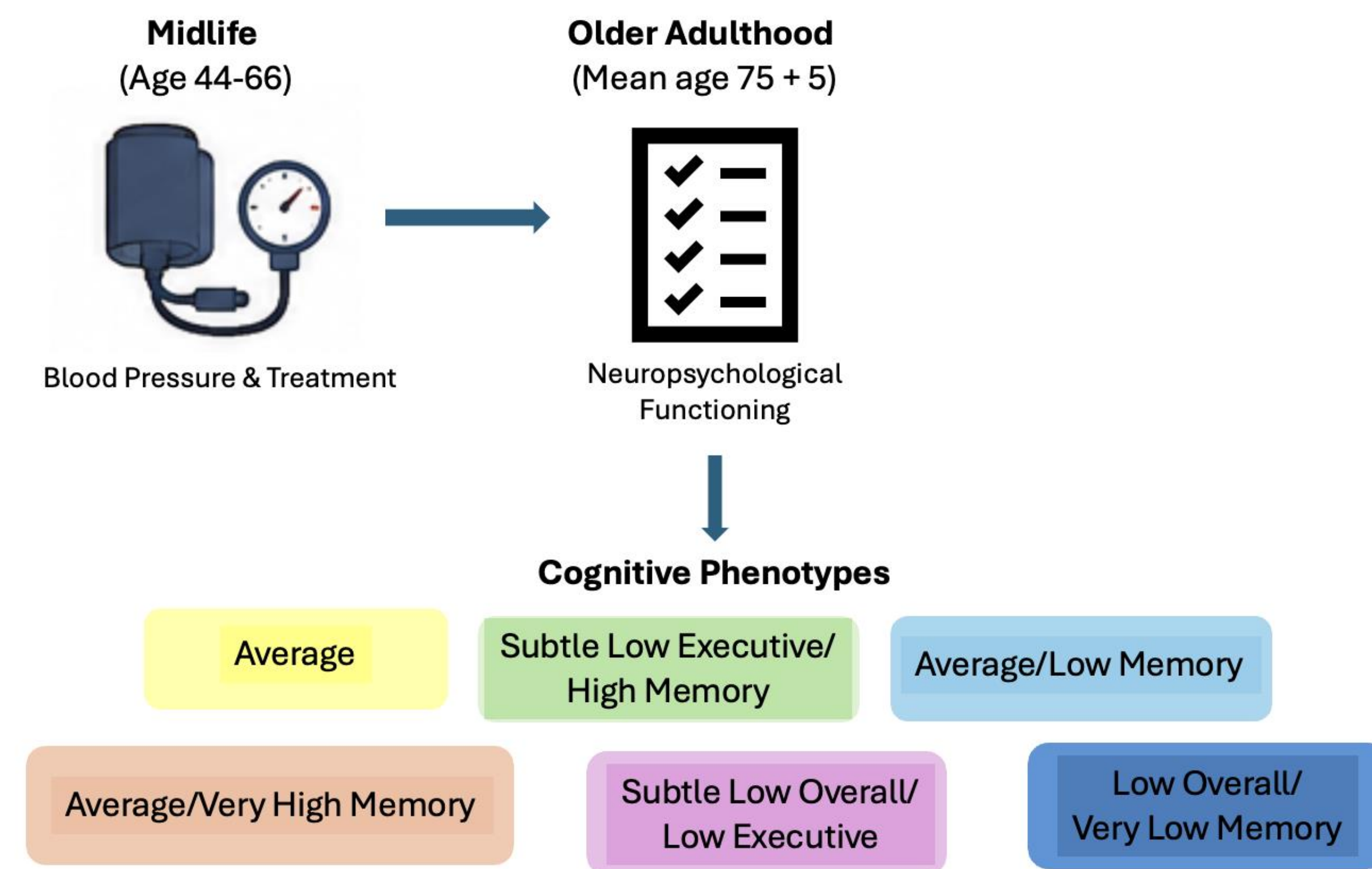
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BACKGROUND

- Hypertension (HTN) has been linked to cognitive and brain health¹
- Unclear how midlife HTN relates to heterogeneity of neuropsychological functioning in cognitively unimpaired older adults²



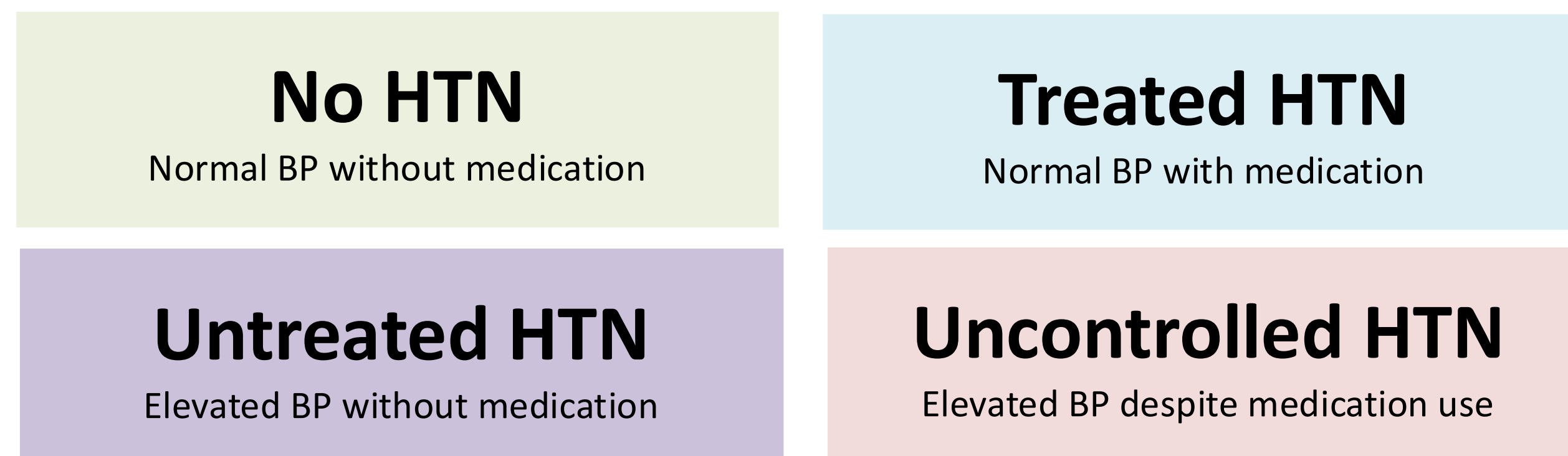
STUDY AIM: Examine associations between midlife HTN status and cognitive phenotypes of cognitively unimpaired older adults

METHODS

- Between- and within-subjects retrospective study using data from the Atherosclerosis Risk in Communities (ARIC) study³
- Participants: 4,166 cognitively unimpaired older adults at a late-life ARIC visit (Visit 5; mean age=75.1 ± 5 years) with available midlife HTN (Visit 1; mean age=51.5 ± 5 years) data

HTN: Systolic blood pressure (BP) >140mmHG and/or diastolic BP >90mmHg and/or use of antihypertensive medications

HTN groups (*HTN persistence based on participants remaining in same groups from Visit 1-Visit 3; n=3,269*):



	No HTN n=2544 (78%)	Treated n=56 (2%)	Untreated n=65 (2%)	Uncontrolled n=604 (18%)	p-value
Gender (Female)	1529 (60%)	48 (86%)	35 (54%)	383 (63%)	0.11
Age at Visit 1	51.2 (4.8)	51.2 (4.6)	53.3 (5.9)	52.7 (4.9)	<.001
Age at Visit 5	74.8 (4.9)	74.8 (4.7)	77.1 (6.1)	76.4 (4.9)	<.001

Statistical Analyses

- Multinomial logistic regression models to examine odds ratio (OR)
 - IVs: HTN groups, age, sex, education, and race/center
 - DVs: LPA-derived cognitive phenotypes

BACKGROUND – LPA-derived cognitive phenotypes and progression to dementia

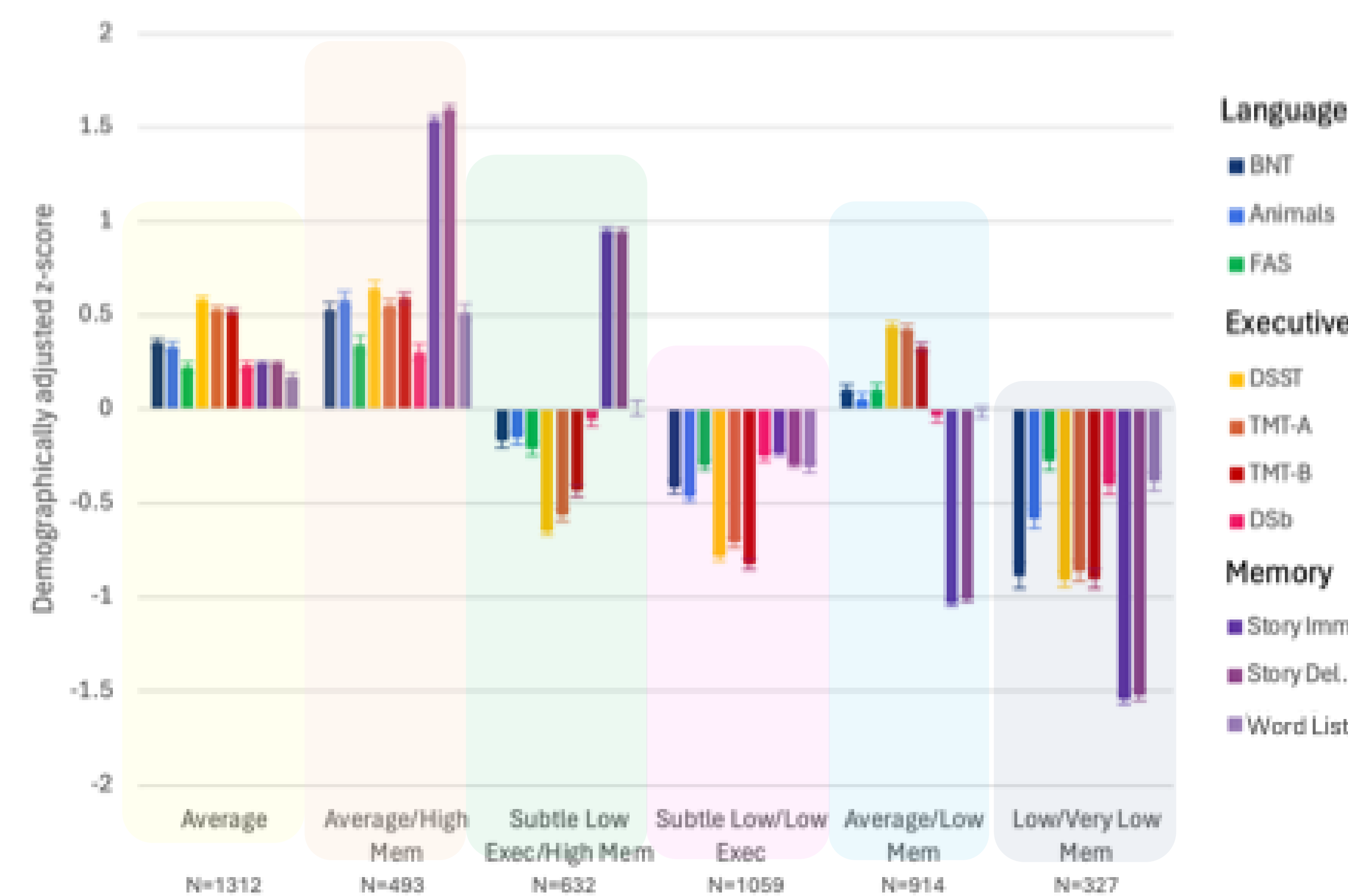


Figure 1. Mean demographically adjusted z-score values across 10 neuropsychological indicators clustered by LPA-derived 6 subtle cognitive decline phenotypes

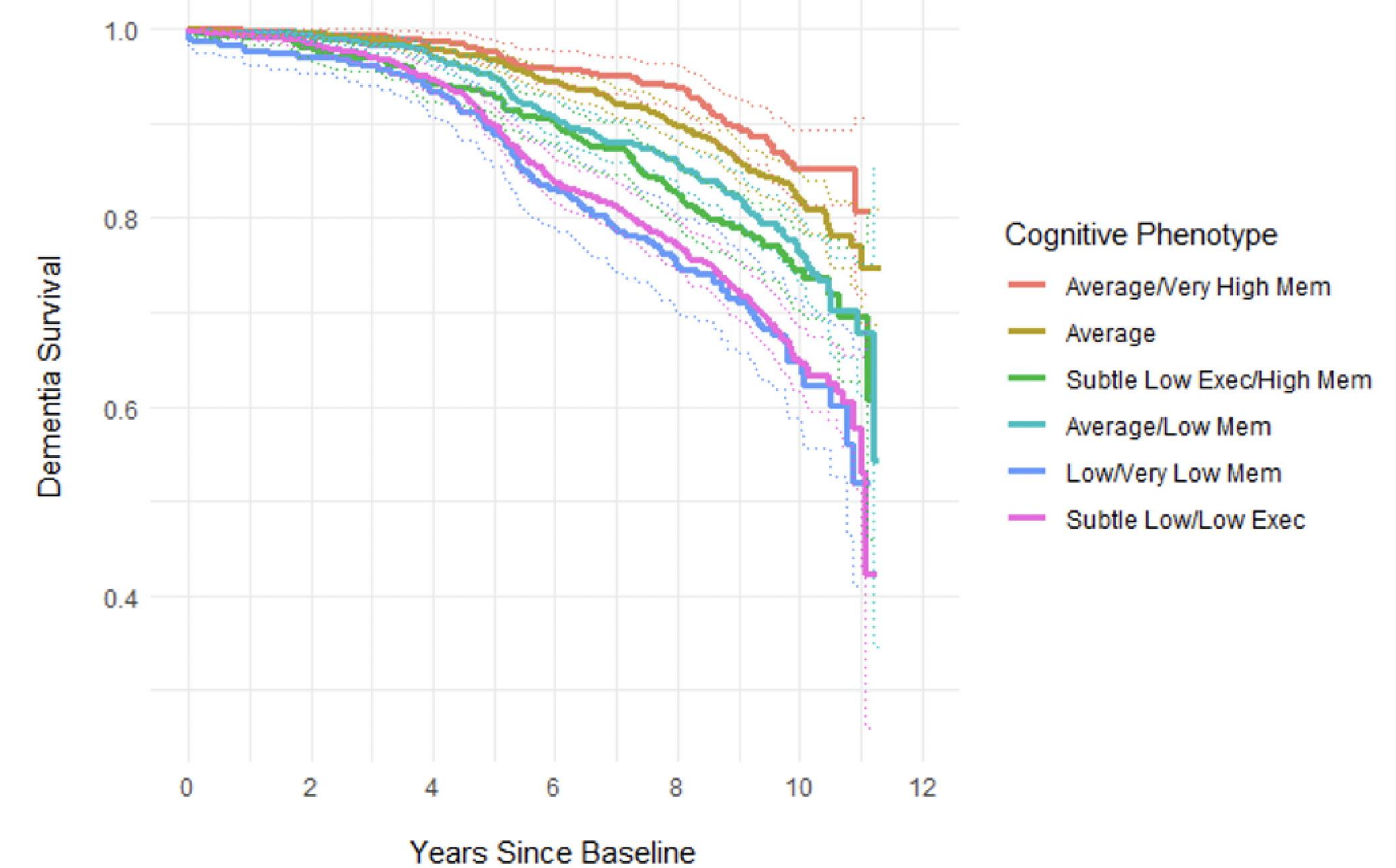


Figure 2. Kaplan-Meier survival curves showing rates of progression to dementia across LPA-derived subtle cognitive decline phenotypes.

RESULTS

HTN group and cognitive phenotype membership

Reference groups: No HTN and Average phenotype

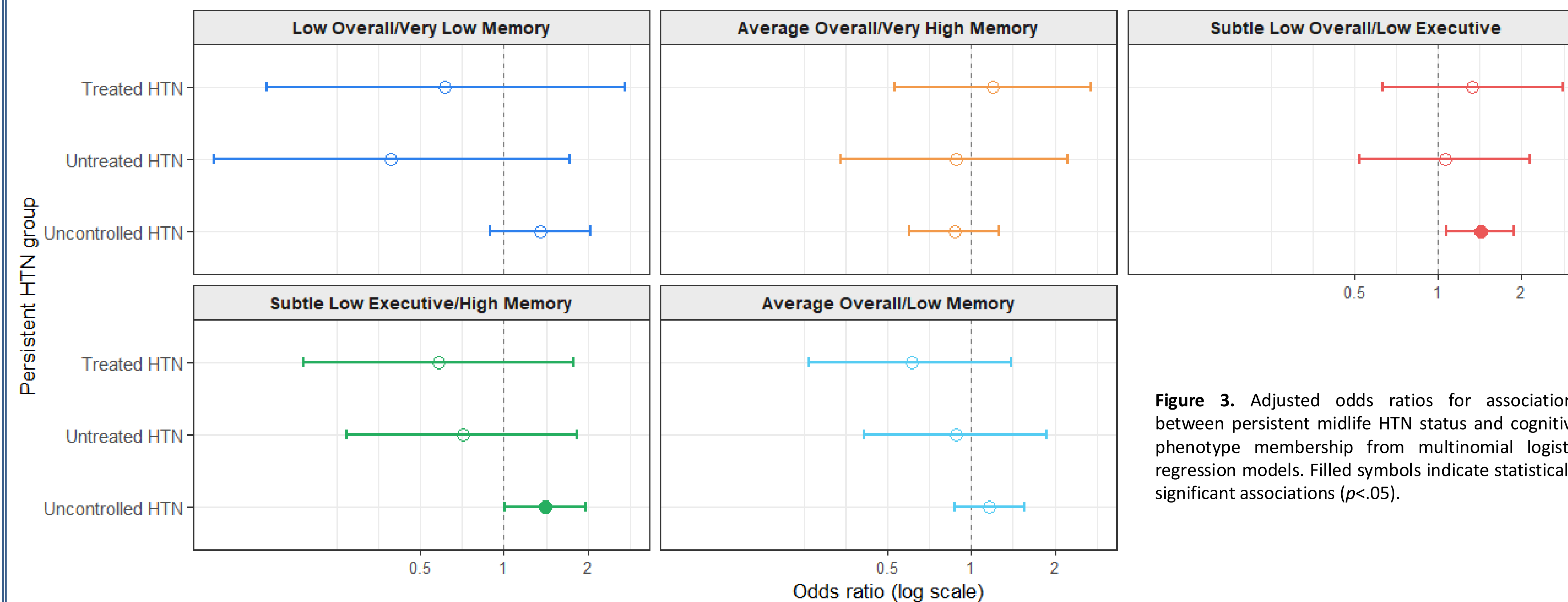


Figure 3. Adjusted odds ratios for associations between persistent midlife HTN status and cognitive phenotype membership from multinomial logistic regression models. Filled symbols indicate statistically significant associations ($p<.05$).

- Uncontrolled HTN** was associated with greater odds of membership in the **Subtle Low Overall/Low Executive** (OR=1.42, 95% CI: 1.07, 1.88, $p=.02$) phenotype

- Uncontrolled HTN** was associated with greater odds of membership in the **Subtle Low Executive/High Memory** (OR=1.41, 95% CI: 1.01, 1.96, $p=.04$) phenotype

- Treated and Untreated HTN were not associated with cognitive phenotype membership

SUMMARY OF CONCLUSIONS

- Uncontrolled midlife HTN associated with subtle executive dysfunction among cognitively unimpaired older adults
- Highlights importance of early BP control
- Supports hypotheses around a vascular pathway underlying early executive, but not memory, changes that may begin in midlife

Limitations & Future Directions: Sample demographics, unequal sample sizes (smaller Treated and Untreated HTN group sizes), investigate associations of additional midlife vascular risk factors

REFERENCES: ¹Elaekola C, Yaffe K, Biller J, ... Al Hazzouri AZ (2016). Impact of hypertension on cognitive function: A scientific statement from the American Heart Association. *Hypertension*. 68(6). ²Joyce, Orlin Cormack; McHugh, Clodhna; Mockler, David; Wilson, Fiona; Kelly, Aine M.a. Midlife hypertension is a risk factor for some, but not all, domains of cognitive decline in later life: a systematic review and meta-analysis. *Journal of Hypertension* 42(2):p 205-223, DOI: 10.1097/HJH.00000000000003614 ³THE ARIC INVESTIGATORS. THE ATHEROSCLEROSIS RISK IN COMMUNITIES (ARIC) STUDY: DESIGN AND OBJECTIVES. *American Journal of Epidemiology*. Volume 129, Issue 4, April 1989, 687–702. <https://doi.org/10.1093/oxfordjournals.aje.a115186>

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