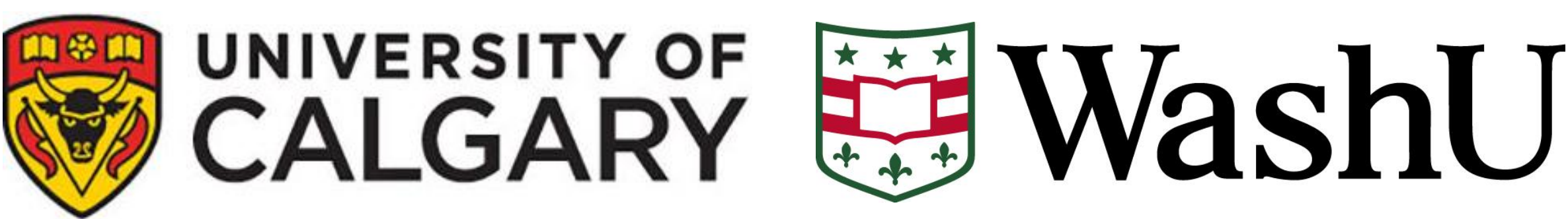
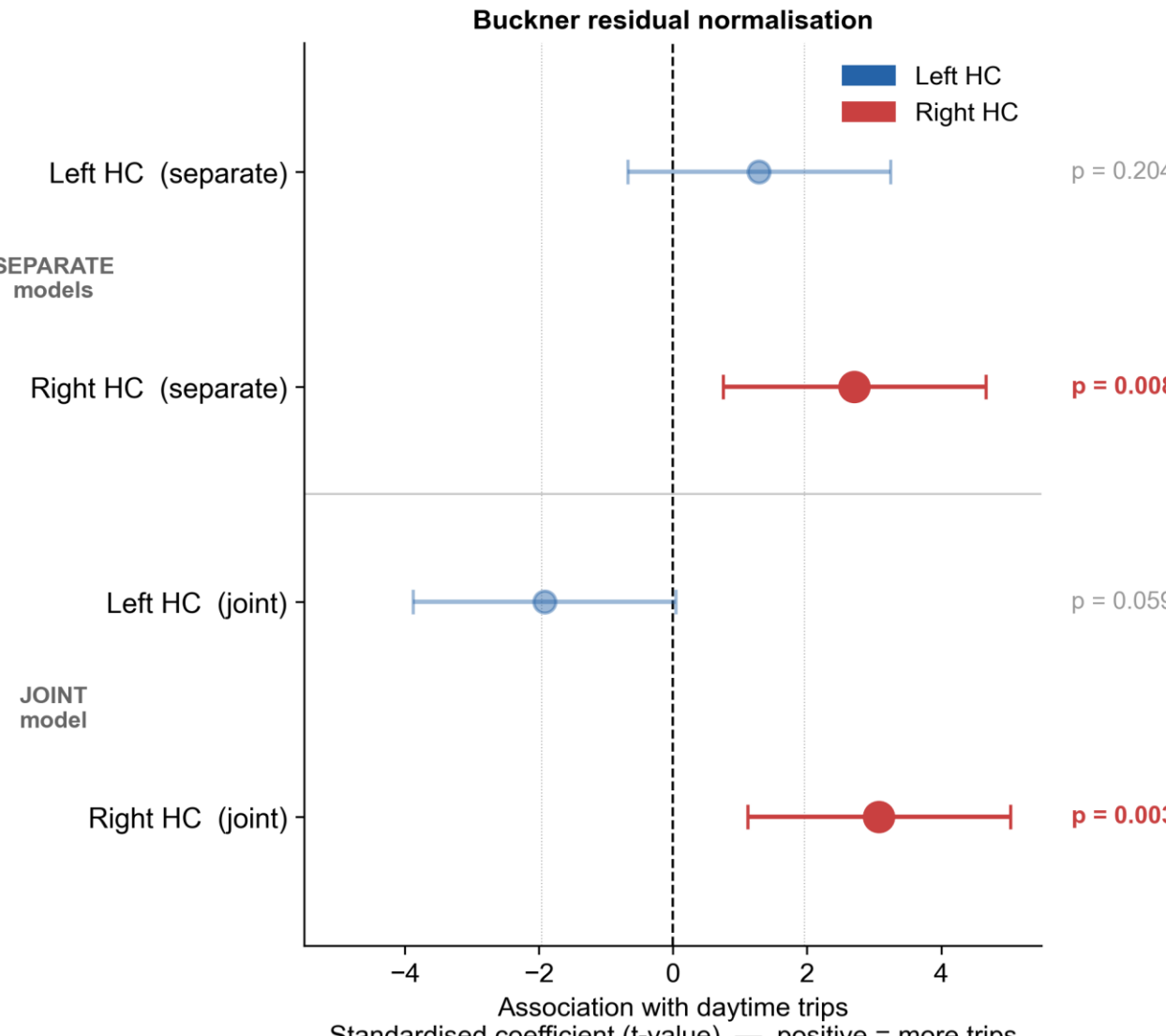
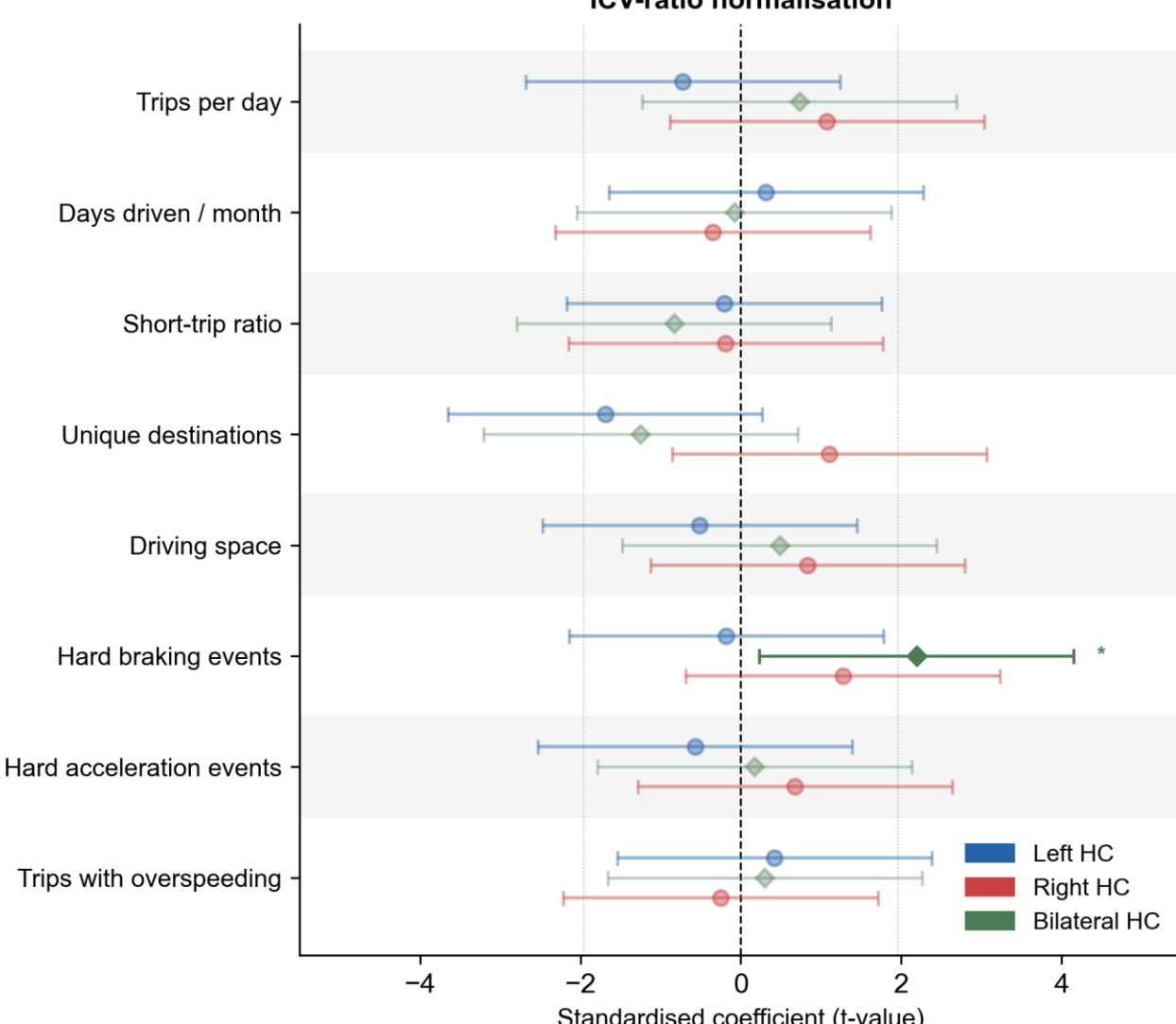


Lateralised And Global Hippocampal Volume Contributions To Real-World Driving Behaviour Among Older Adults: Evidence From A US Cohort

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- Everyday driving behaviour is associated with hippocampal structure in cognitively healthy older adults.
- Examining hippocampal laterality may provide insight into functional changes that may be missed when considering global hippocampal volume alone.

INTRODUCTION	METHODS	RESULTS	CONCLUSIONS	REFERENCES
• Driving is a vital activity of daily living in older age, with spatial orientation a key cognitive component [1]. • Active older drivers show larger hippocampal (HC) volume than non-drivers [2]. • Human and animal work shows robust left-right HC asymmetries in connectivity and function – right-side preferential with spatial processes [3]. • Objective: Assess whether left and right HC volumes show distinct associations with naturalistic driving outcomes.	Participants • 89 older drivers • Mean age: 73.8 ± 5.3 years • 48.3% female • No neurological conditions affecting cognition or driving 3T Structural MRI • L/R HC volumes via FreeSurfer • Normalised using ICV-ratio and Buckner residuals Naturalistic Driving • ~1 year continuous GPS monitoring (DRIVES [4]) • Exposure, spatial extent, safety metrics assessed Statistical Analysis • Separate covariate-adj. linear regressions (age, sex, education, driving coverage)	 Buckner residual normalisation Left HC (separate) p = 0.204 Right HC (separate) p = 0.008 * Left HC (joint) p = 0.059 Right HC (joint) p = 0.003 * Association with daytime trips Standardised coefficient (t-value) — positive = more trips  ICV-ratio normalisation Trips per day Days driven / month Short-trip ratio Unique destinations Driving space Hard braking events Hard acceleration events Trips with speeding Left HC Right HC Bilateral HC Standardised coefficient (t-value)	• Greater right HC volume is associated with more frequent driving in older adults. • Hippocampal laterality (or relative hemispheric balance) may provide insight relevant to real-world mobility beyond global HC volume alone. • Naturalistic driving behaviour may provide an ecologically valid marker of brain health and functional ageing. • HC laterality may contribute to understanding functional resilience in ageing, with relevance to prevention in cognitive decline and Alzheimer's disease.	[1] Morrissey, S et al. <i>The Journals of Gerontology</i>. 2024. [2] Shimada, H et al. <i>Experimental Gerontology</i>. 2023. [3] Nedelska, Z et al. <i>PNAS</i>. 2012. [4] Blake, M et al. <i>Scientific Data</i>. 2025. CONTACT sol.morrissey@ucalgary.ca  ALZHEIMER'S ASSOCIATION AAIC 26