Post-Stroke Cognitive Impairments (PSCI): Effects of Handedness and Stroke Side

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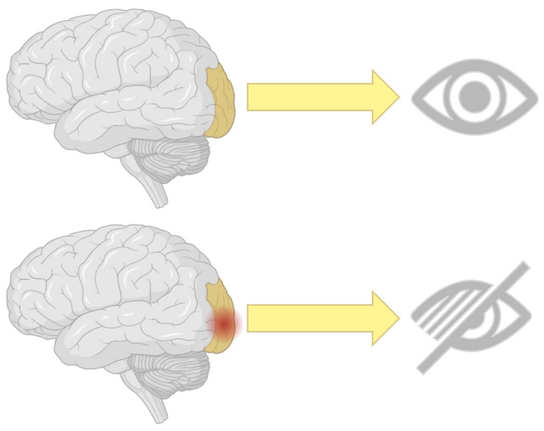
Classic functional specialization challenged by:



1. Individual variability in PSCI
   → source of this variability not completely understood yet

2. Individual variability in functional specialization in healthy population
   → associations with handedness

Does handedness, as a proxy for variability in functional specialization, interact with stroke side to explain individual differences in PSCI?

Retrospective cohort study of stroke survivors (N = 443) in the subacute phase (<90 days) with first-ever, unifocal lesions

SAMPLE DISTRIBUTION

Handedness x Stroke Side

TOTAL SAMPLE: *N = 443*

	LEFT LESION (N = 198)	RIGHT LESION (N = 245)
LEFT-HANDED (N = 44)	N = 16 3.6% of total sample	N = 28 6.3% of total sample
RIGHT-HANDED (N = 399)	N = 182 41.1% of total sample	N = 217 49.0% of total sample

By Handedness

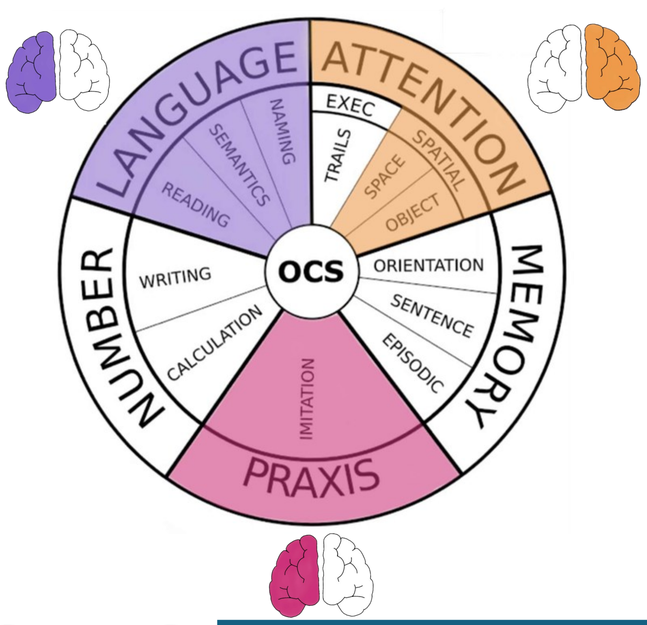
Left-handed: **44** (9.9%)
Right-handed: **399** (90.1%)

By Stroke Side

Left hemisphere: **198** (44.7%)
Right hemisphere: **245** (55.3%)

HOW COGNITION WAS ASSESSED

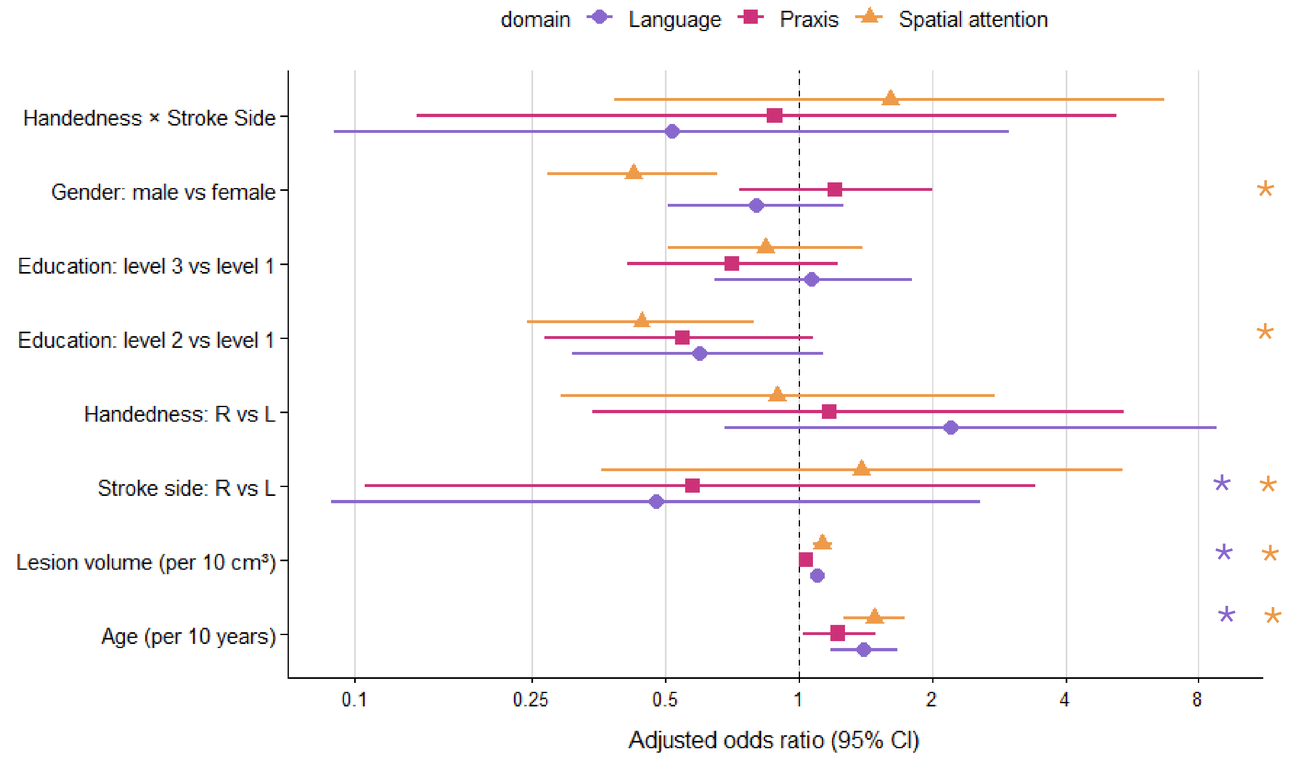
Oxford Cognitive Screen to evaluate cognition across three domains traditionally assumed to be lateralized



- *<u>Univariate level</u>: assess whether likelihood of impairment varied as a function of handedness, stroke side, or their combined effect.*
- *<u>Multivariate level:</u> investigate patterns of co-occurring impairments across cognitive domains*

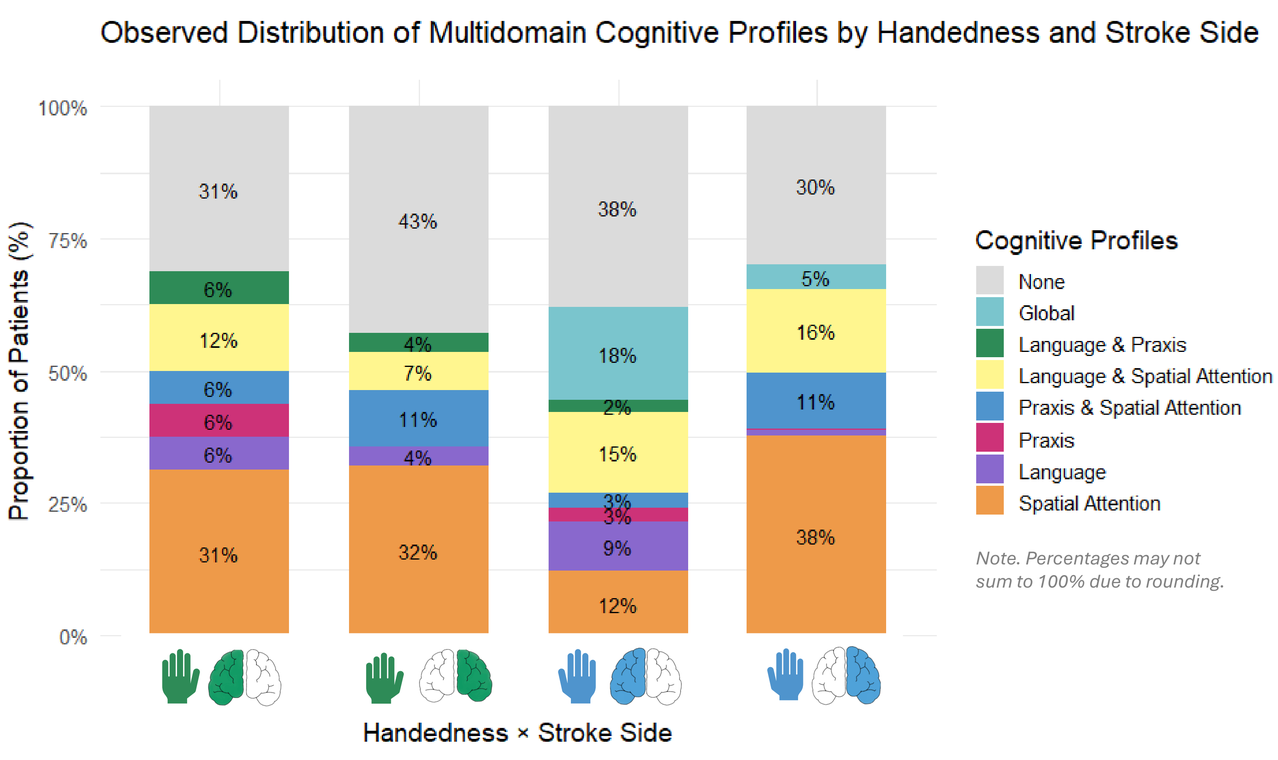
RESULTS

1 Domain-Specific Logistic Modelling



Odds ratios are adjusted for all covariates included in the logistic regression models. Continuous predictors are scaled per 10-unit increase. Stroke-side estimates are conditional on reference handedness (i.e., left-handed) because of the handedness × stroke-side interaction. Type-II likelihood-ratio tests, with Holm corrections for multiple comparisons were used to assess overall predictor significance.

2 Modelling Deficit Patterns Across Domains



Across domains, **stroke side**, **lesion volume**, and **age** were the most consistent predictors of impairment, while **handedness** and its **interaction** with stroke side showed no significant associations with the odds of impairment after adjustment for covariates and multiple testing.

Effects of stroke side in line with **population biases** of **hemispheric lateralization**:
higher odds of language impairment after left-hemisphere stroke and spatial attention impairment after right-hemisphere stroke; weaker lateralization effect of praxis/apraxia

Profile membership was significantly associated with **stroke side** (*LR $\chi^2(7) = 79.76$, $p < .001$, Cramer's V=0.403*), whereas associations with **handedness** were not significant (*LR $\chi^2(7) = 12.94$, $p = .074$, Cramér's V=0.155*).

↑ isolated language, language + praxis, global impairment
↑ isolated spatial attention profile

Notably, some **atypical patterns** were descriptively more prominent in right-handers: global impairment occurred exclusively in right-handers, and language–spatial co-occurrence was relatively frequent, especially after RH lesions.

Strong **population-level lateralization**, but **substantial individual variability** in **PSCI**.

Stroke side was the primary determinant of domain-specific impairments and multidomain profiles, consistent with population-level lateralization.
No evidence that **handedness** systematically modified these effects:
neither handedness nor its interaction with stroke side significantly explained variability in impairment patterns.

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