Investigating Cognitive and Motor Performance in Chronic Stroke Survivors from the TSTAR-2 Cohort

Nina Hilton [1], Catharina Zich [2,3], Charlotte J. Stagg [2,3]

[1] Department of Experimental Psychology, University of Oxford, UK;
[2] Oxford Centre for Integrative Neuroimaging, FMRIB, NDCN, University of Oxford, UK;
[3] Medical Research Council Brain Dynamics Unit, NDCN, University of Oxford, UK.

Background

Motor and cognitive impairment is prevalent post-stroke: more than 70% of stroke survivors experience motor impairment and up to 80% experience post-stroke cognitive impairment.

Despite evidence for co-occurrence, few studies have investigated the relationship between motor and cognition.

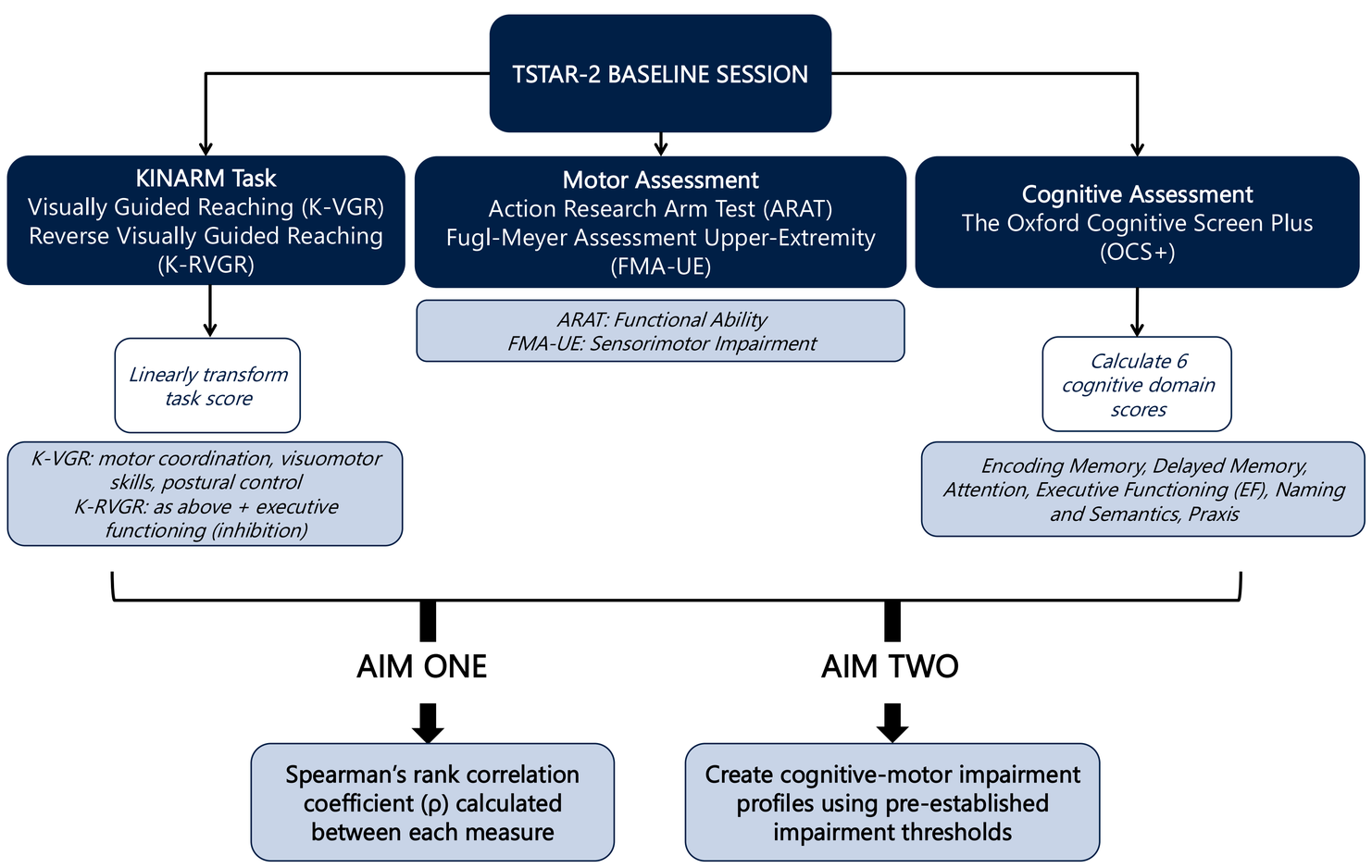
Clinical guidelines for stroke recommends adjusting motor rehabilitation for those with cognitive impairments.

Aims

1) **Investigate the relationship between motor and cognitive performance in chronic stroke survivors.**

2) **Explore a method to produce accessible cognitive-motor impairment profiles, which could inform rehabilitation offerings.**

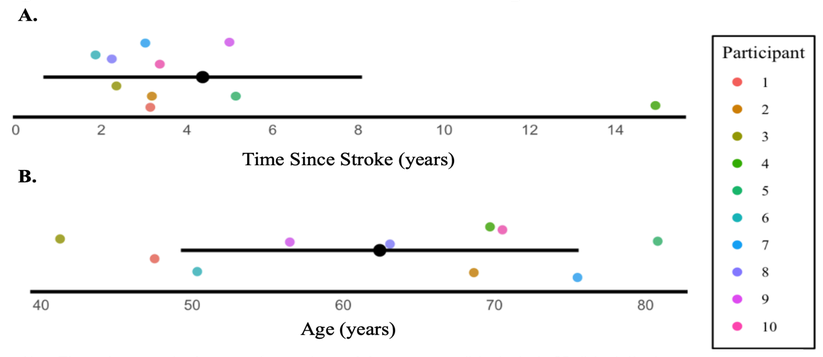
Method



Sample Characteristics

10 chronic stroke survivors (8 male) were included. Most of the sample were White British (8), with 6 experiencing ischemic stroke and 4 hemorrhagic stroke.

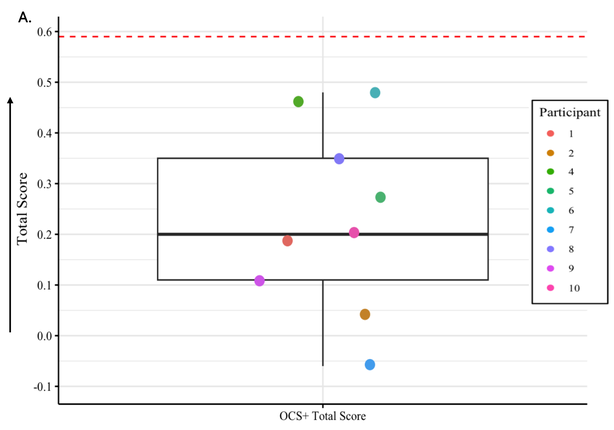
Figure 1. Distribution of Time Since Stroke and Age in Cohort



A) Time since stroke in years for each participant; mean (black dot), SD (black line).
B) Age in years for each participant; mean (black dot), SD (black line).

Oxford Cognitive Screen + Performance

Figure 2. Performance on the OCS+: Total Score and Domain Score

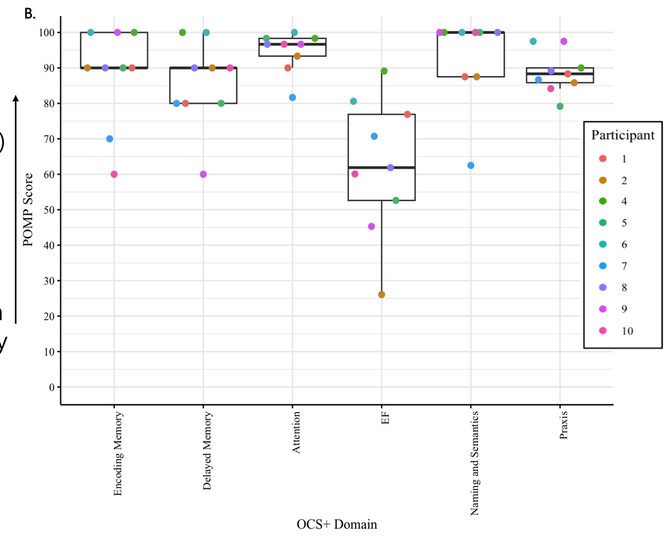


A. Boxplot of OCS+ Total Score; median (line), IQR (box), min/max (whiskers), impairment threshold (red dash, <0.59), direction of scoring (arrow).

B. Boxplot of OCS+ Domain scores; median (line), IQR (box), min/max (whiskers), direction of scoring (arrow).

Domain scores were calculated by converting each contributory subtest score to a percentage of maximum possible (POMP) score, and then averaging these values to obtain an overall domain POMP score.

Impairment status for each domain was determined by classifying the domain as impaired if at least one of its contributory subtests was impaired, based on age-group-matched normative data.



RESULTS: Aim One

Pairwise correlations were conducted between OCS+ Domain POMP scores, ARAT and FMA-UE total score, and KINARM VGR and RVGR task score for the most affected limb.

*A total of 45 unique correlations were performed. Significance at the uncorrected α = 0.05 level is indicated by *. After Bonferroni correction for multiple comparisons (α =0.001), no correlations remained significant.*

Figure 3. Correlation Matrix

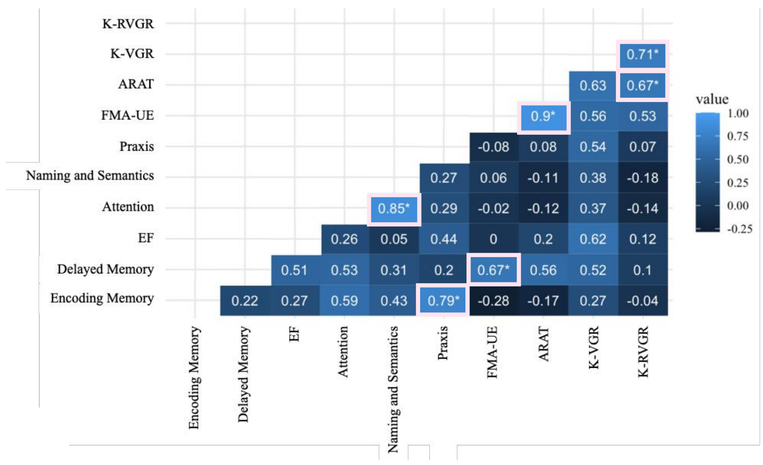
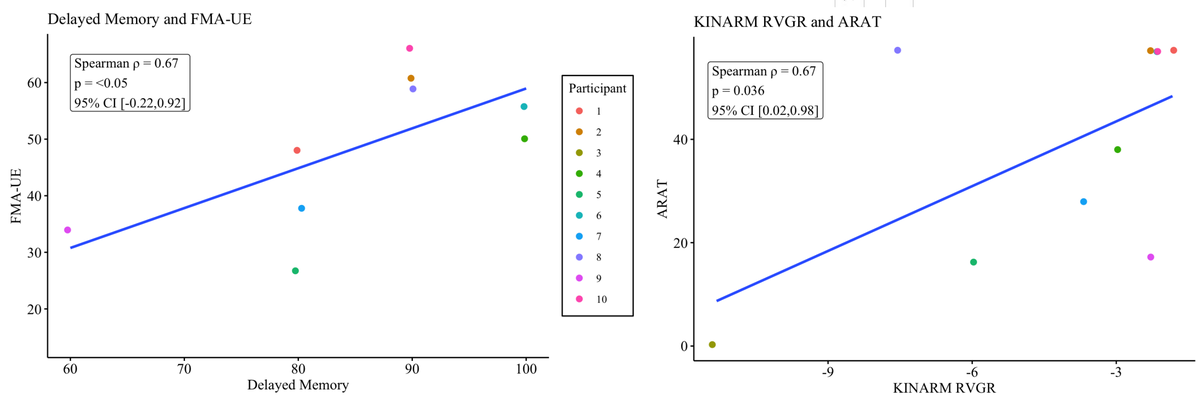


Figure 4. Select Significant Correlations



Scatterplots to show the correlation between measures significant at the uncorrected value of α = < 0.05. Bonferroni correction at α = 0.001. Regression lines displayed for visualisation purposes only.

Confirmatory evidence for the relationship between motor and cognition, particularly between delayed memory and sensorimotor functioning.

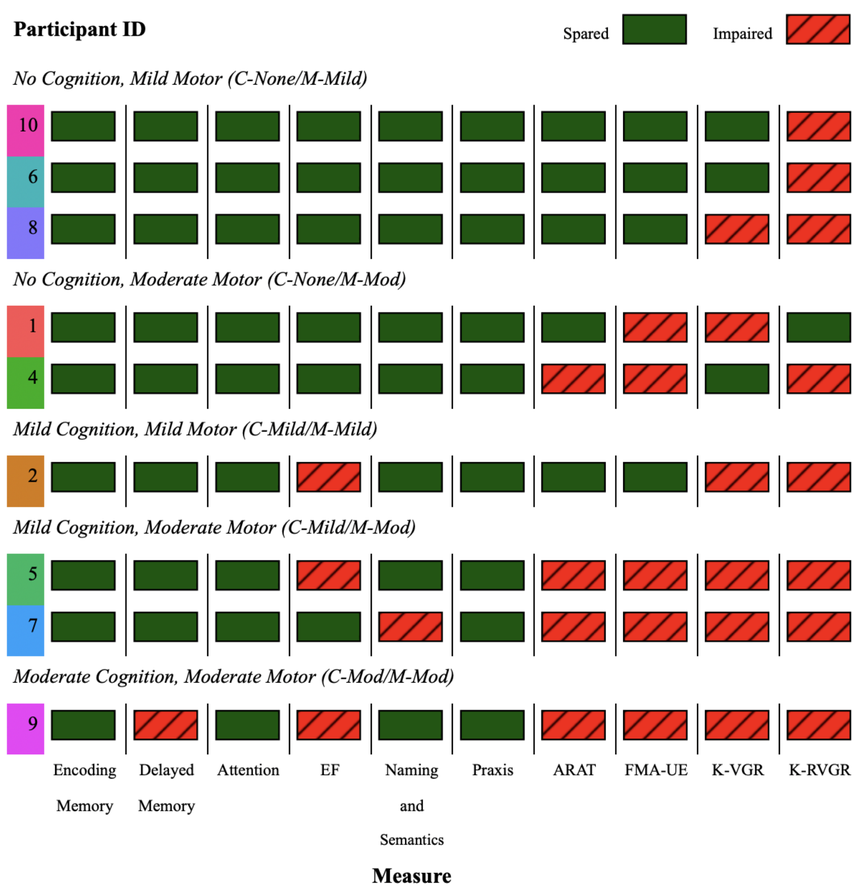
RESULTS: Aim Two

Binarised impairment status for each measure was calculated, using pre-determined impairment thresholds.

Motor and cognitive impairment was then grouped (none, mild, moderate, severe), creating 16 possible profiles. 5 were observed in the cohort.

None
Mild
Moderate
Severe

Figure 5. Participant Impairment Profiles



With future refinement, **easily interpretable cognitive/motor impairment profiles** may represent a **feasible strategy to guide the tailoring of rehabilitation strategies.**

Limitations

- Sample: selection criteria of TSTAR-2 clinical trial limits impairment profiles eligible for participation, sample size, and homogeneity.
- Lack of standardised impairment threshold on ARAT and FMA-UE.
- Number of simultaneous comparisons.

References

- Demeyere et al., 2021
- Einstad et al., 2021
- Kobayashi-Cuya et al., 2018
- Lawrence et al., 2001
- Lee & Kim, 2023
- Mullick et al., 2015
- National Clinical Guidelines for Stroke, 2023
- Sun et al., 2014

Acknowledgements & Contact

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Nina Hilton nina.hilton@ndcn.ox.ac.uk