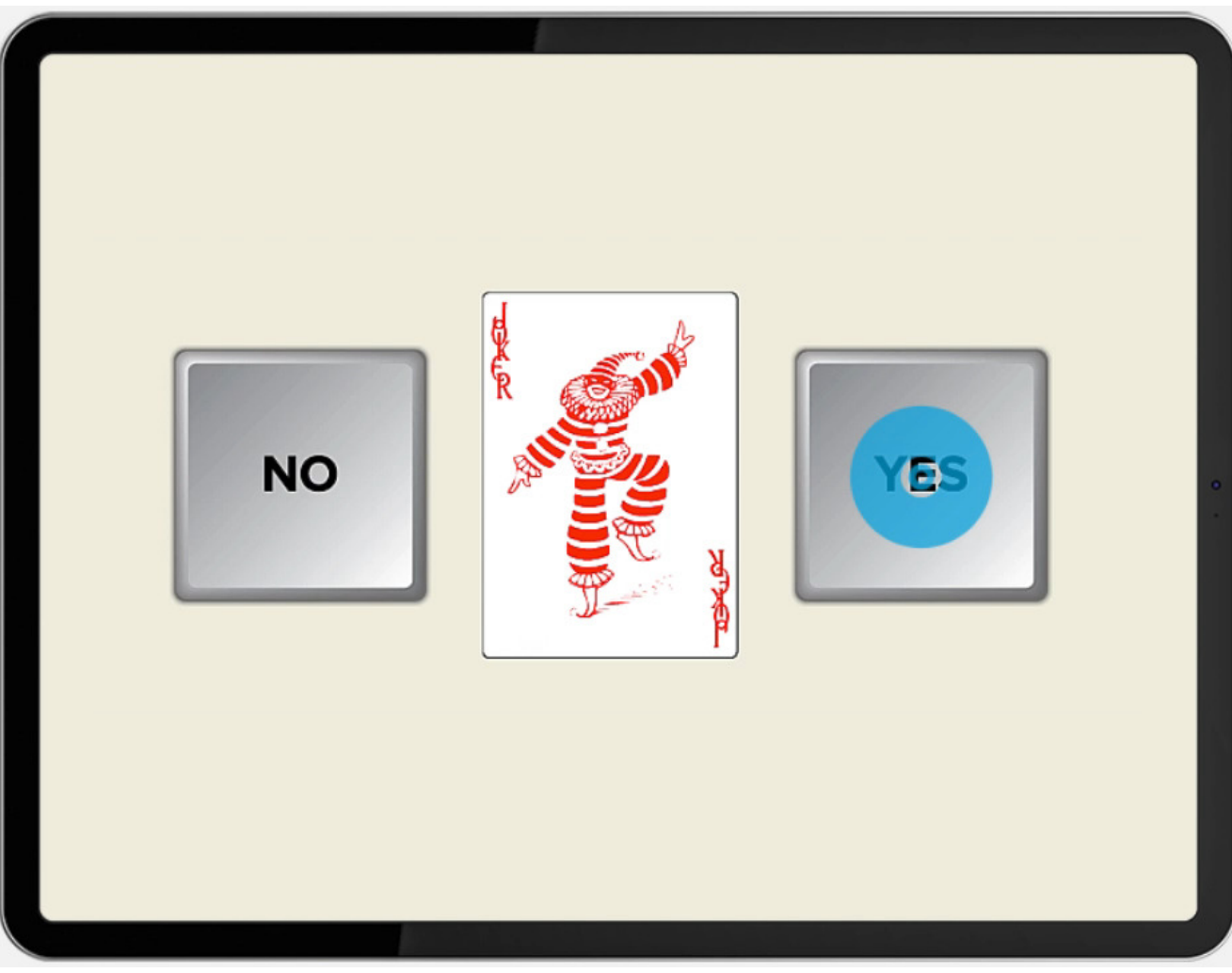


Computerised cognitive testing in low-income South Africa:

- is **feasible**, and **replicates** a known clinical effect
- measures global processing **speed, accuracy**, and "**tradeoff**"
- performs better with **Principal Component Analysis**



CogState Brief Battery

- Computerised cognitive testing product
- Novel playing card based tests
- Applicable without skilled testers
- Claimed to be culture neutral and resistant to practice



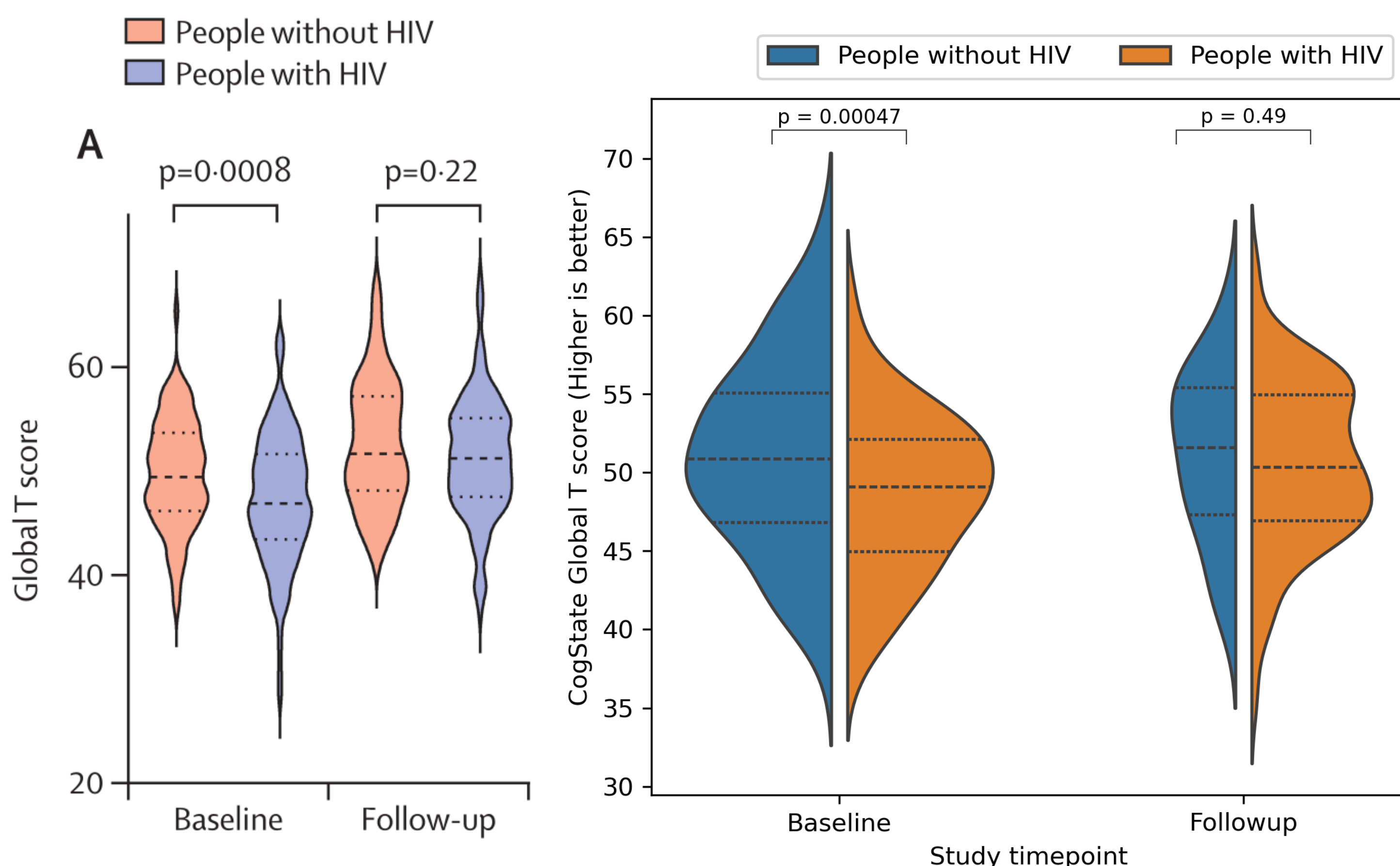
CONNECT study

- Gugulethu community clinic - low-income peri-urban township of Cape Town
- Cohort undergoing national programmatic switch from efavirenz to dolutegravir based antiretroviral treatment
- 170 people living with HIV, 91 people without HIV
- Cohort representative of low-income southern Africa more generally
- Psychosocial factors previously studied in this dataset



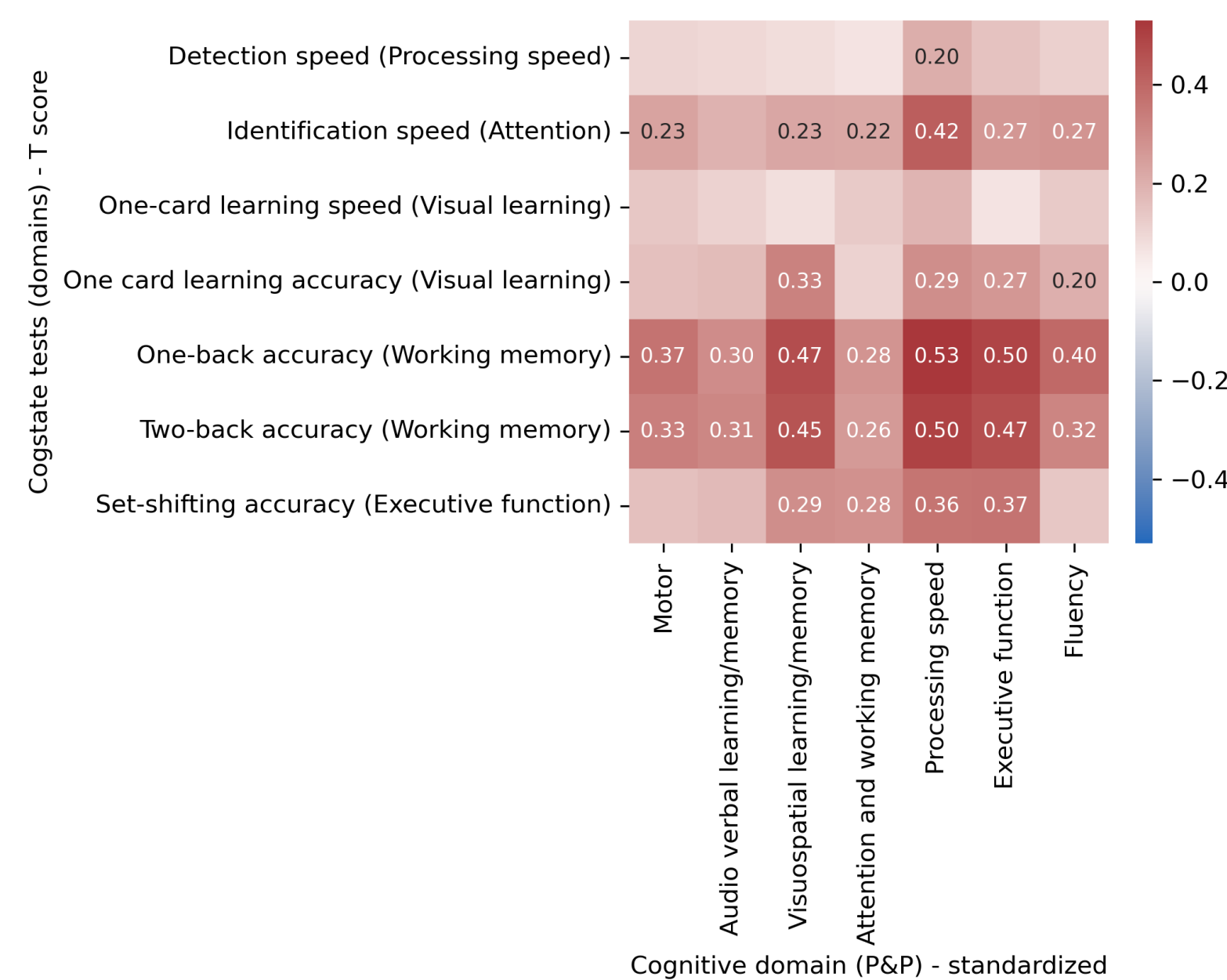
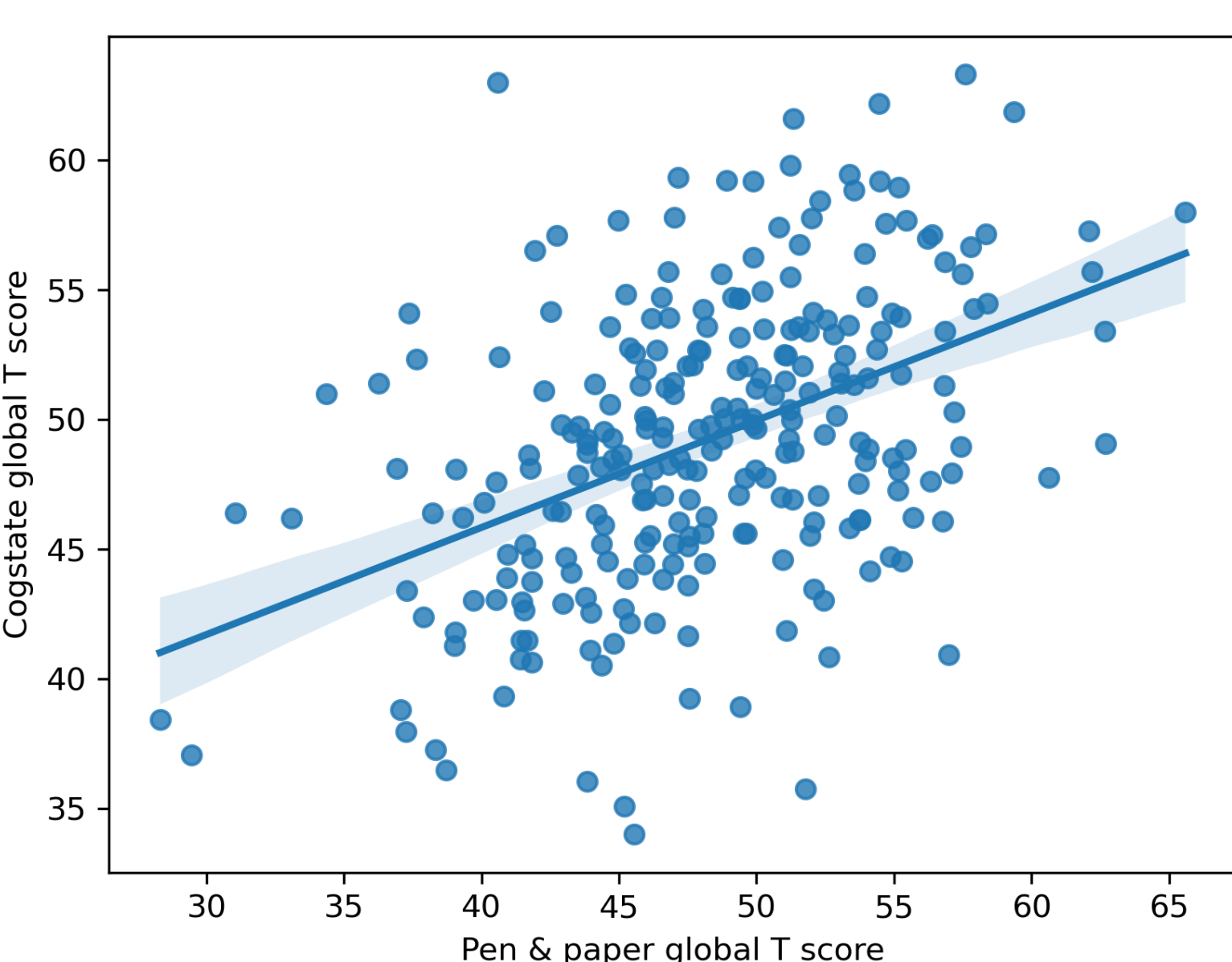
Computerised vs. Pen & Paper testing - group effect

We replicated the finding of lower cognitive performance in people with HIV (due predominantly to efavirenz) found using conventional testing prior to the ARV switch.



What can individual-level data tell us?

We found low to moderate correlation of individual CogState tests with pen & paper cognitive domains and moderate global correlation ($R = 0.45$). Classification performance (low vs. normal cognitive performance using Global Deficit Score) was also moderate - ROC AUC 0.7.

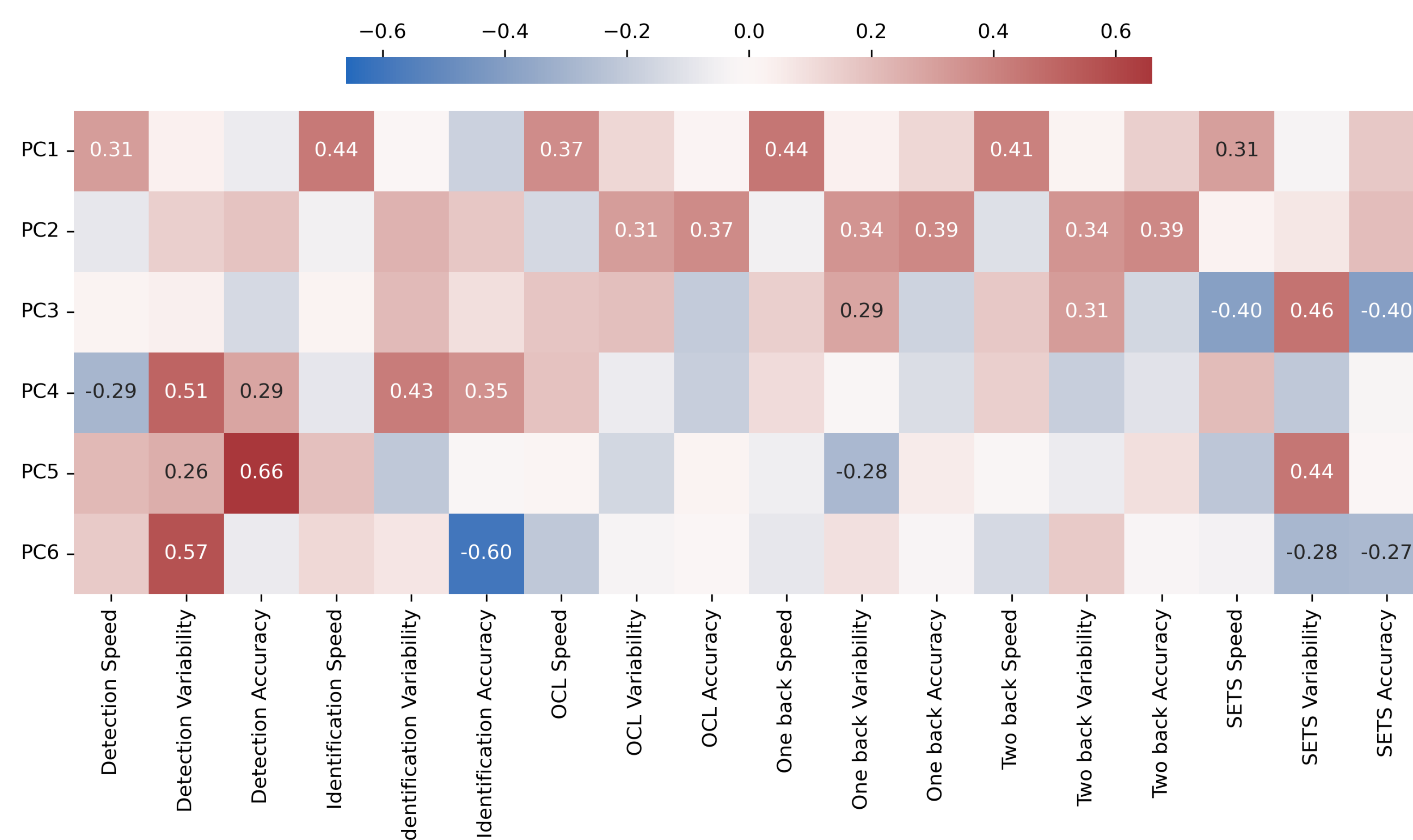


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² Cambridge University Hospitals NHS Foundation Trust, UK

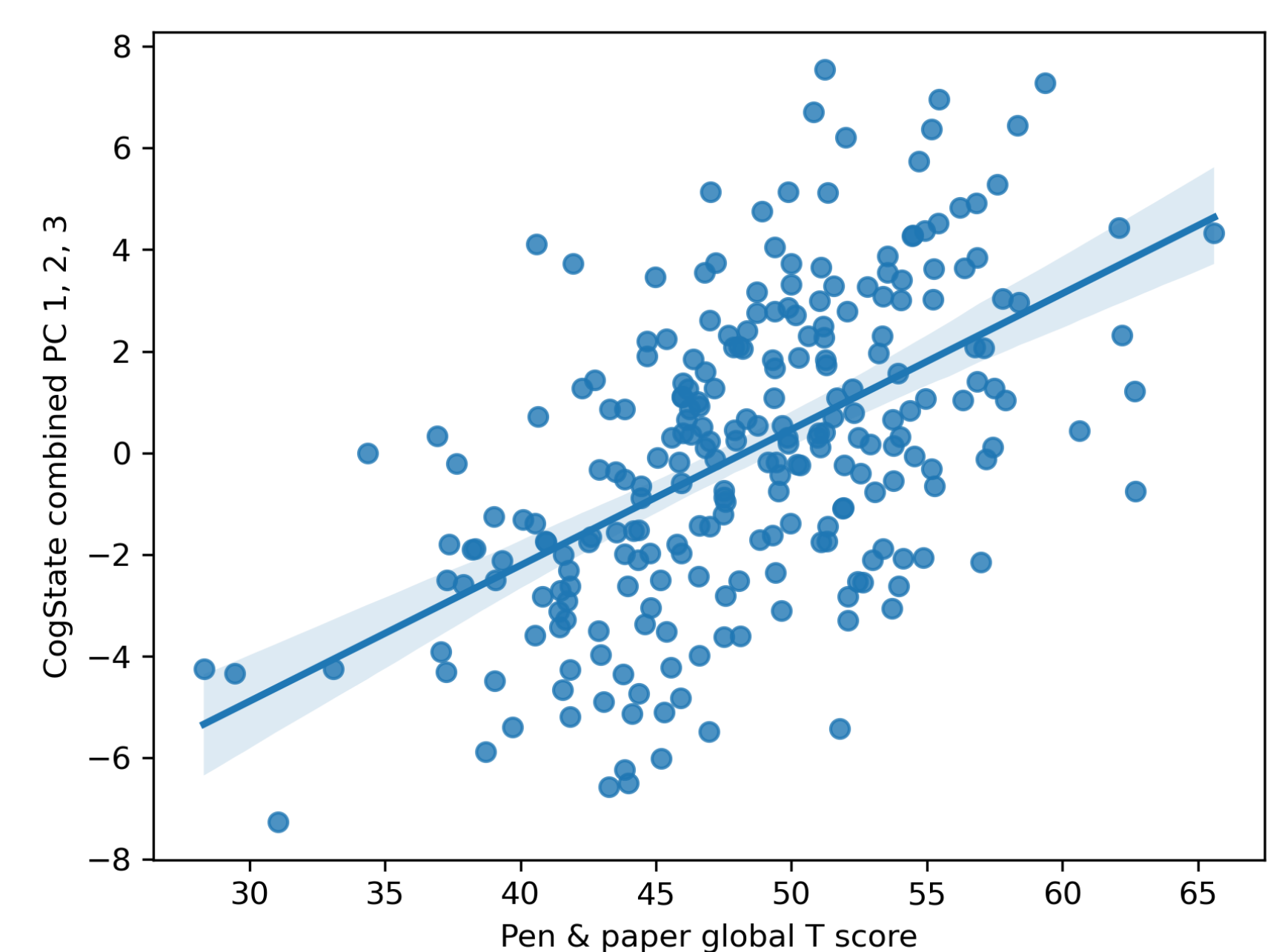
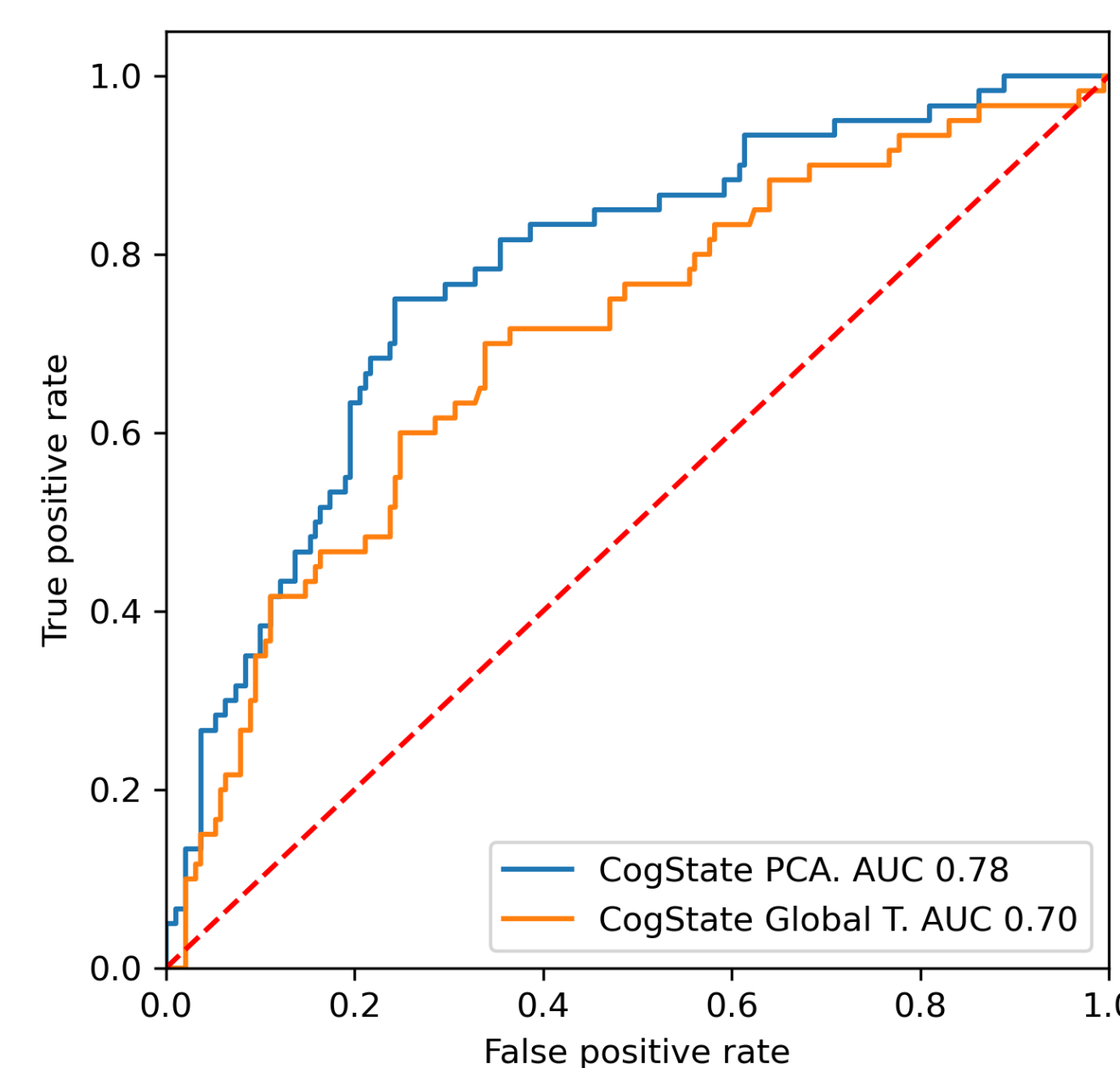
³ Department of Clinical Neurosciences, University of Cambridge, UK



Principal component analysis of CogState data

PCA can be effective to explore data structure, separate noise, and reduce dimensionality, yielding global measures of processing speed, accuracy, and speed/accuracy tradeoffs

- PCA-derived GDS classification improves area under curve (AUC 0.78) and PCA-derived global T score is more strongly correlated with pen & paper global T score ($R = 0.55$)



So what?

- Computerised cognitive testing is feasible in low-income southern African clinical settings and not affected by technology familiarity and use (see preprint)
- This tool generates global measures that may be applicable to detect both group-level clinical effects and global individual cognitive measures
- PCA suggests these global individual measures relate to processing speed, accuracy, and "tradeoffs". Applying PCA improves classification performance and correlation with pen & paper data.

Download the poster and preprint here.

