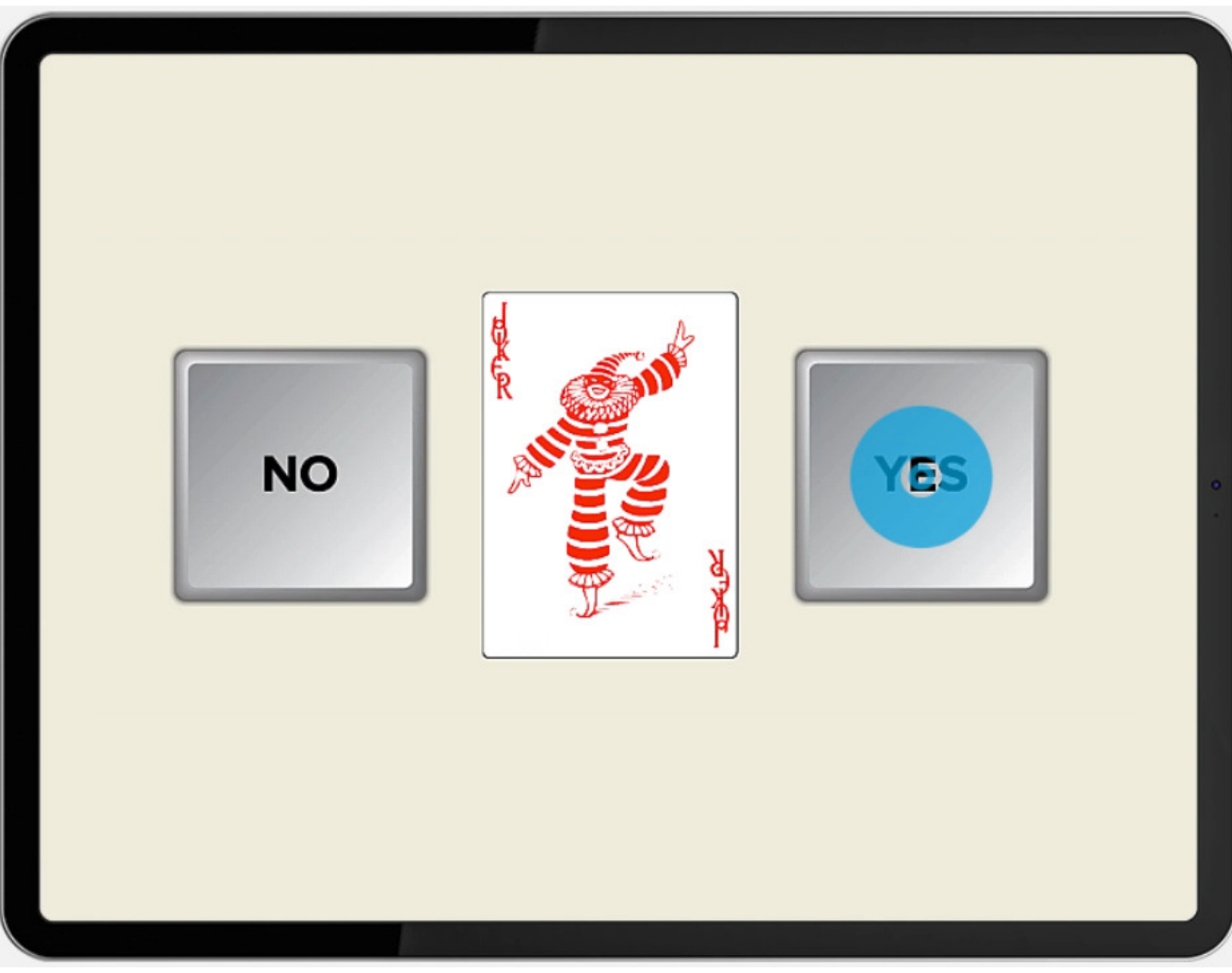


Computerised cognitive testing in low-income South Africa:

- 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



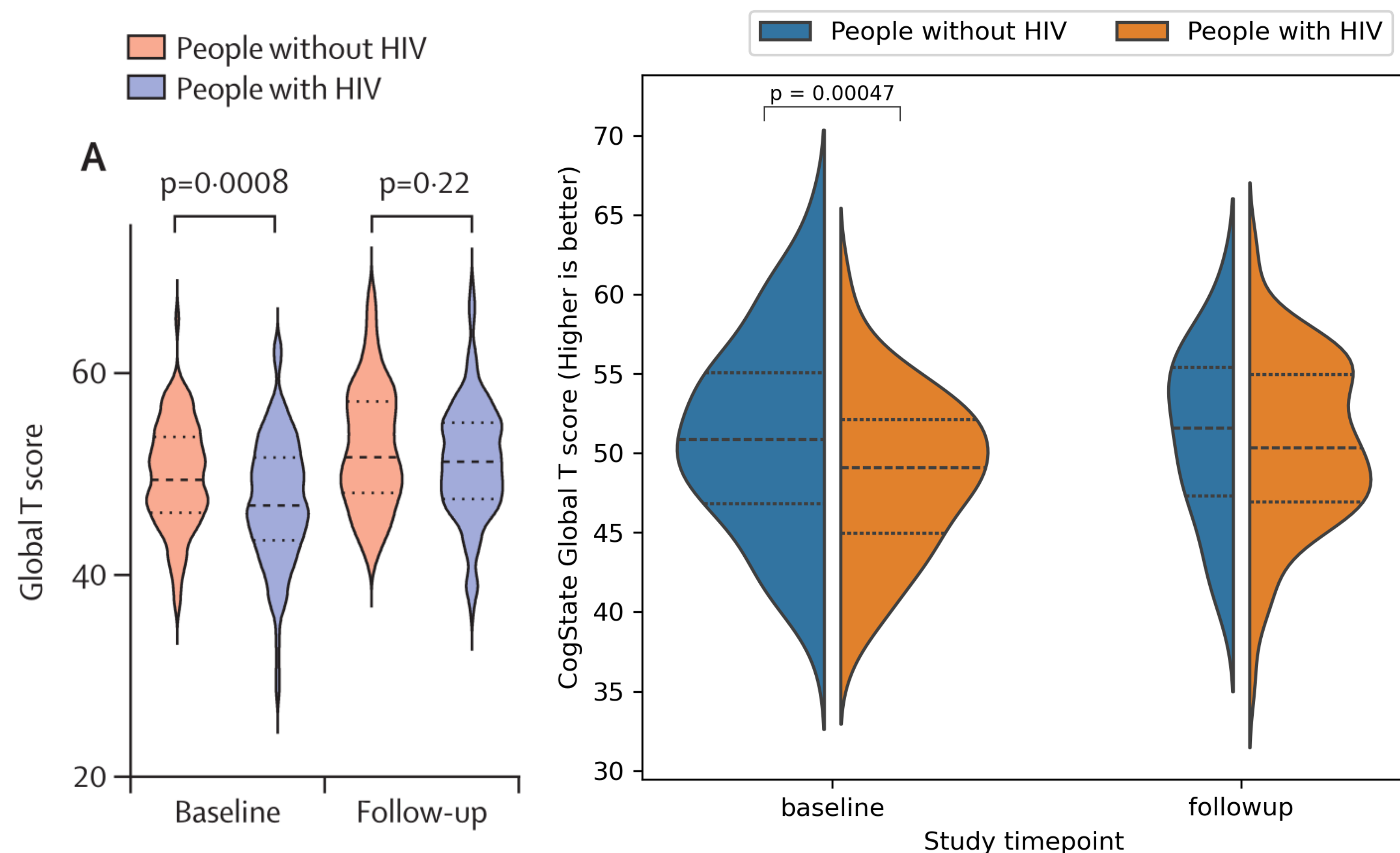
CONNECT study

- 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 healthy controls
- 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 found using conventional testing prior to the ARV switch.

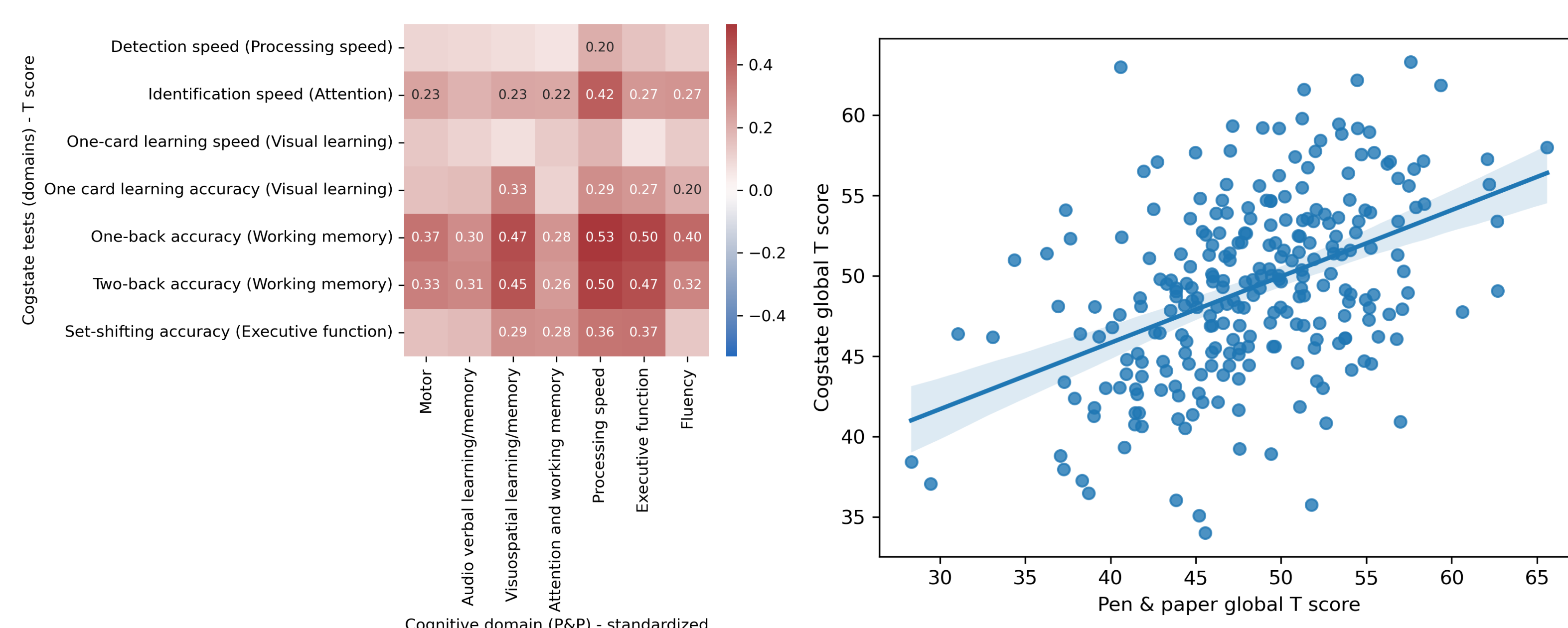


What can individual-level data tell us?

We found low to moderate correlation of individual CogState tests with P&P cognitive domains

Moderate classification performance - ROC AUC 0.7

Global correlation - weak to moderate - $R = 0.45$

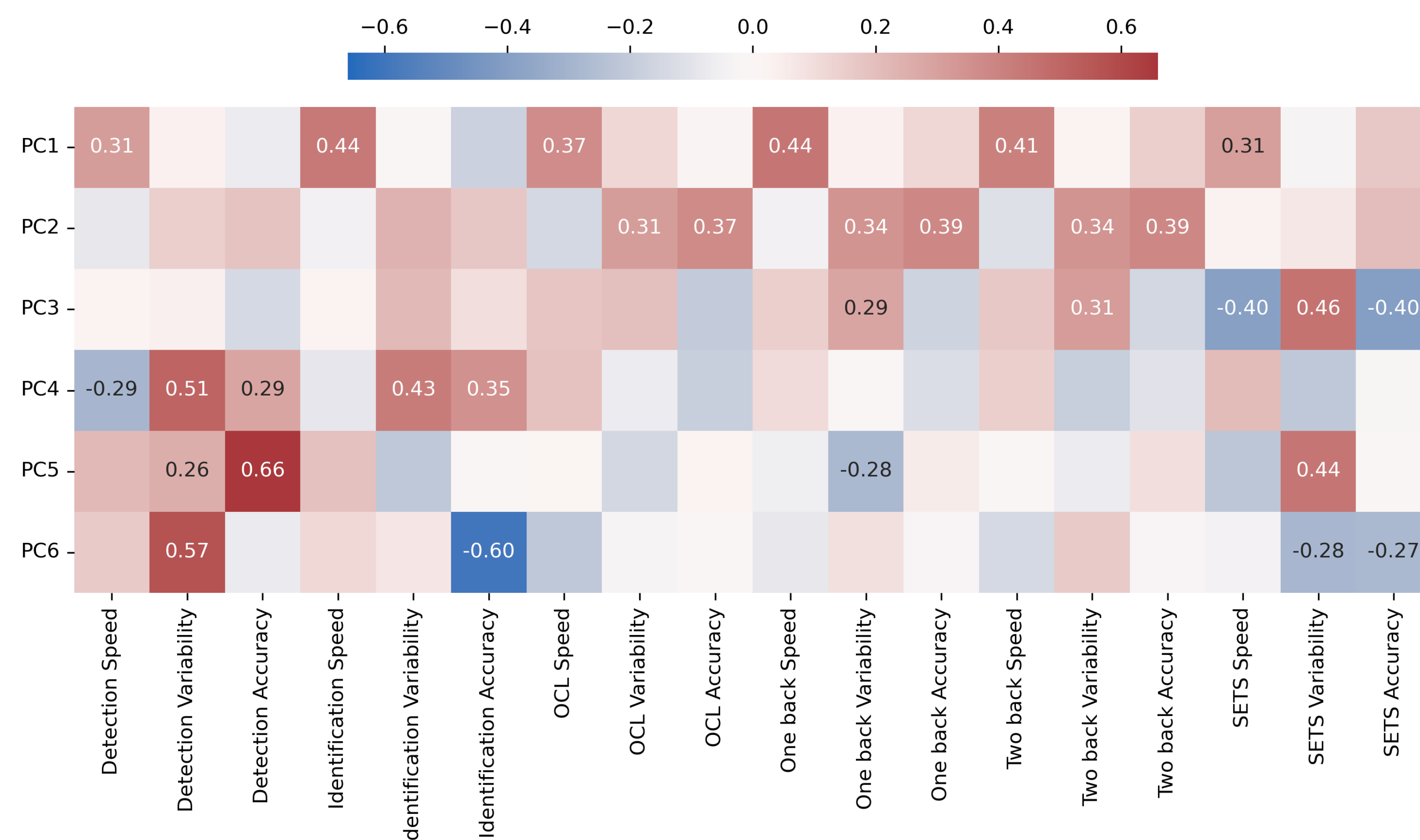


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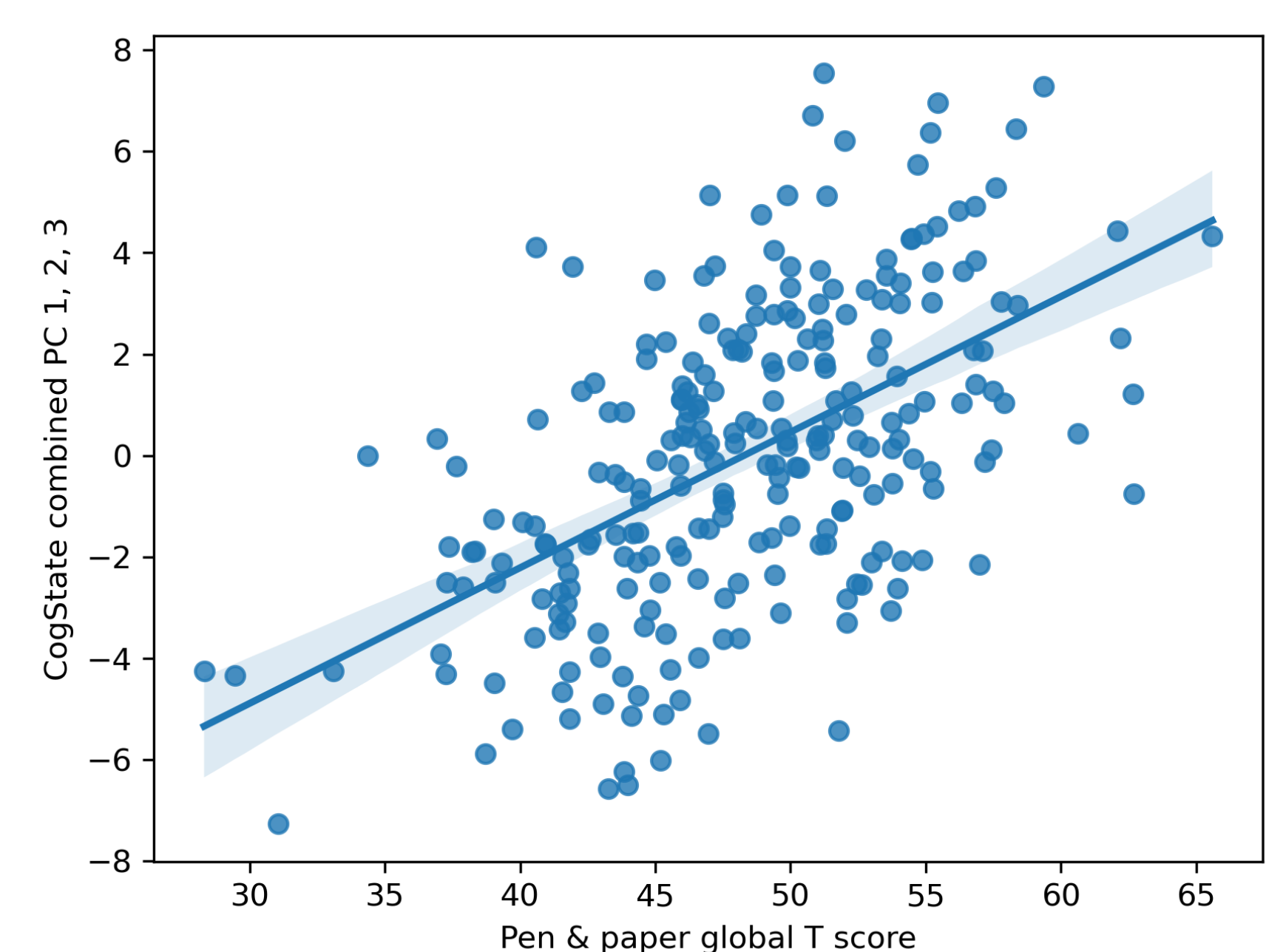
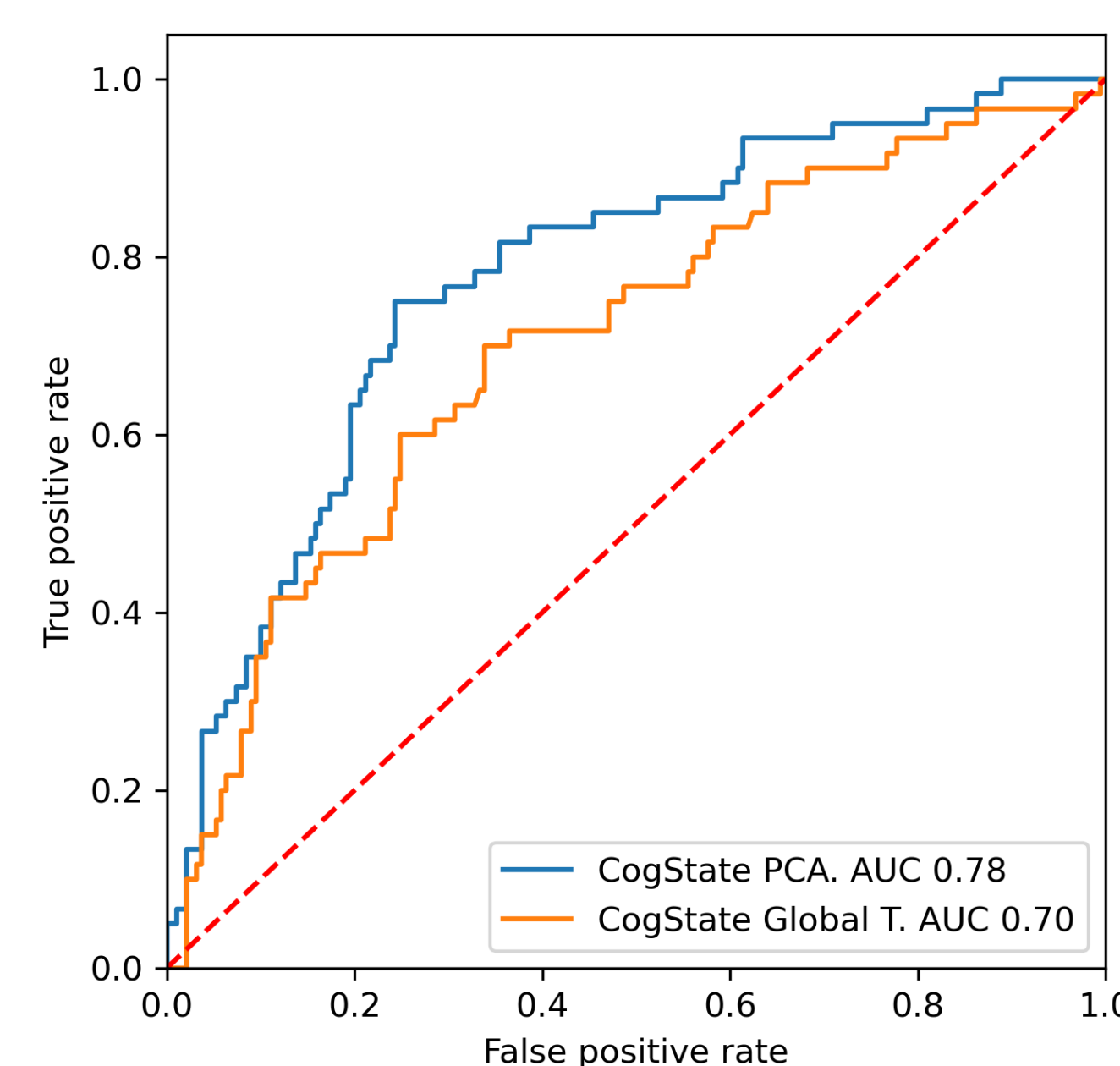
² Cambridge University Hospitals NHS Foundation Trust, UK

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Principal component analysis of CogState data

- PCA can be effective to explore data structure, separate noise, and reduce dimensionality
- We find global measures of processing speed, accuracy, and speed/accuracy tradeoffs
- PCA improves area under curve (AUC 0.78) and correlation with P&P data ($R = 0.55$)



So what?

- Computerised cognitive testing may be applied in resource-constrained clinical settings
- This tool generates global measures that may be applicable to detect both group-level clinical effects and global individual cognitive measures
- Analysis technique may improve weak to moderate correlation with conventional testing