



Long-COVID and [¹¹C]Acetate PET imaging: Preliminary Exploratory Study

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The association patterns between [¹¹C]Acetate uptake and cognitive tasks

INTRODUCTION

Cognitive and behavioral symptoms persisting after COVID-19 infection are recognized under the clinical definition of long-COVID. Evidence suggests this condition is associated with neuroinflammation, potentially serving as a precursor to neurodegenerative disorders. PET imaging with [¹¹C]Acetate is a potential tool for astrocytic reactivity assessment *in vivo*, as acetate is incorporated into astrocytic metabolic pathways. The purpose of this study is to investigate the associations between long-COVID cognitive-behavioral symptoms and [¹¹C]Acetate uptake in the brain.

METHODS

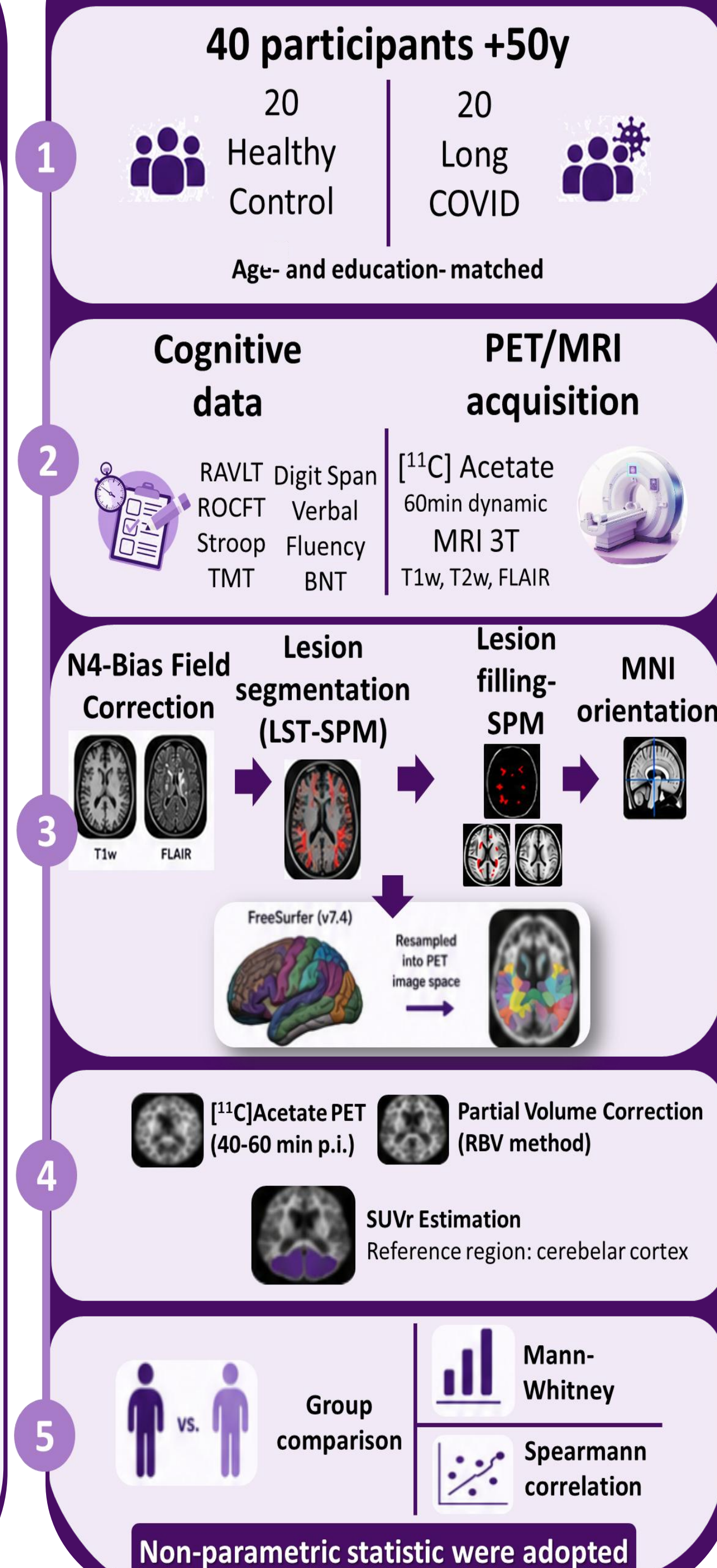


Figure 1. Cognitive performance

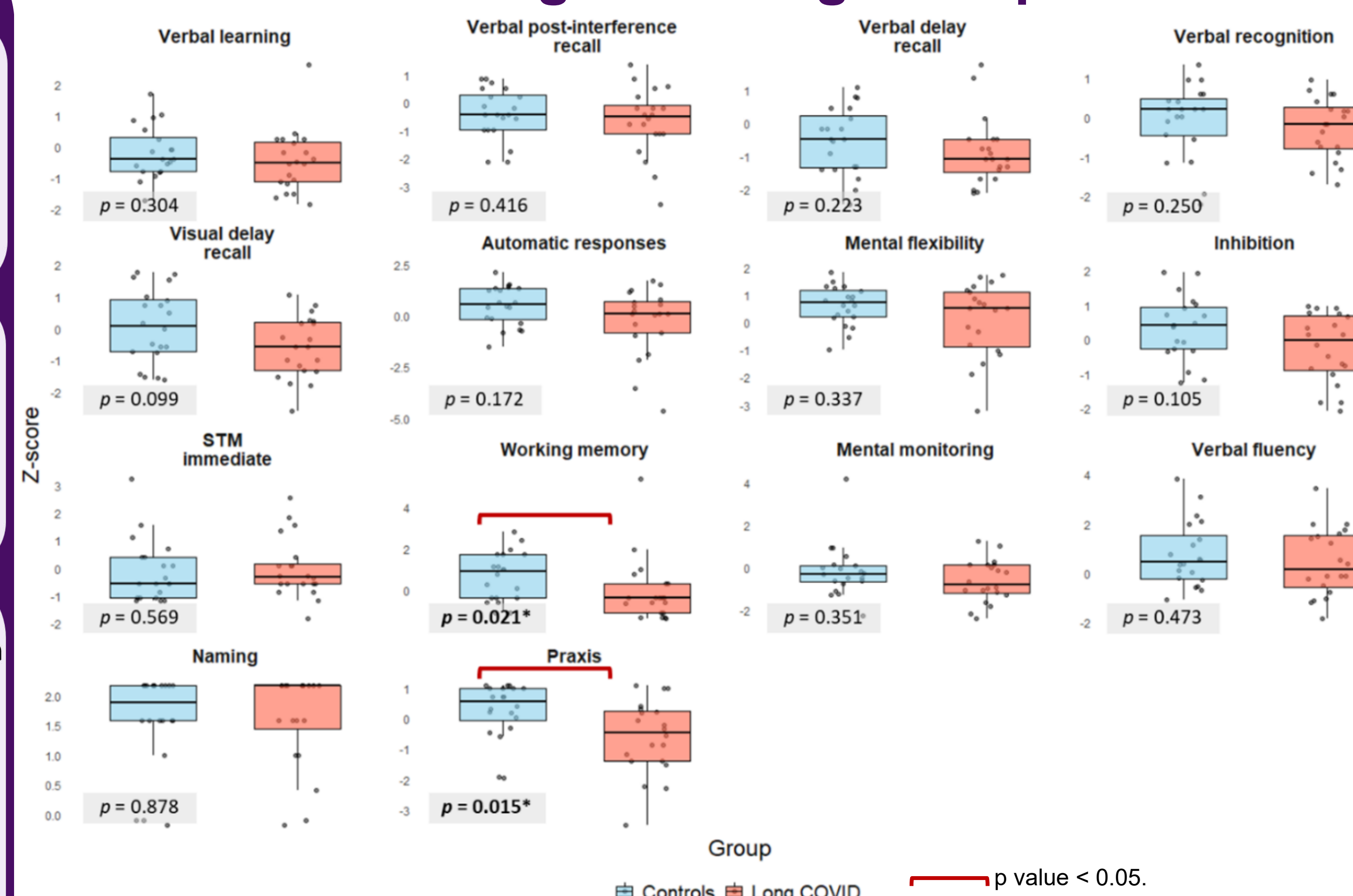
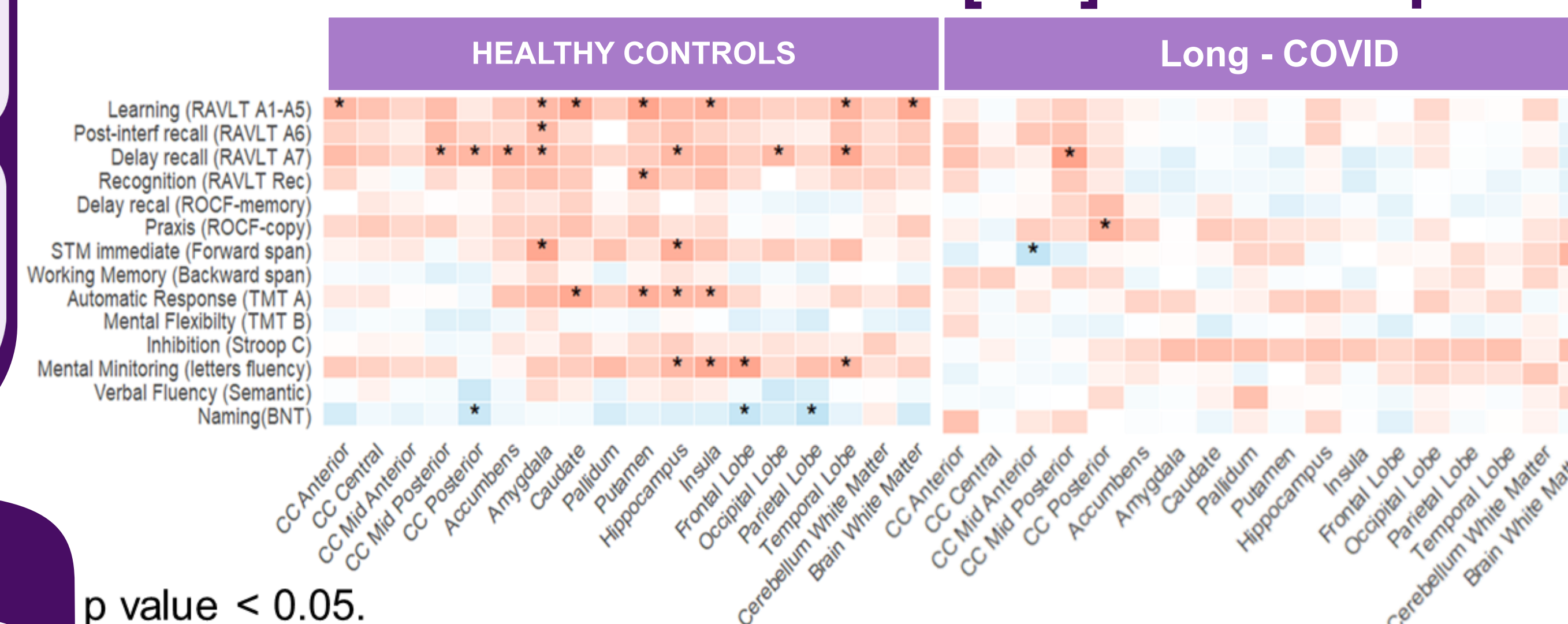


Figure 2. Associations between cognitive tasks and [¹¹C]Acetate uptake



RESULTS

No differences were observed between groups regarding age (p=0.616), education (p=0.512) and sex (p=0.730). Compared to controls, long-COVID participants showed significant impairment in Working Memory (p=0.021) and Praxis (p=0.015) (Fig.1). Although group-wise comparisons of [¹¹C]Acetate SUVr values (Fig 2) revealed no significant differences, correlation analysis showed distinct patterns between the groups. While the control group exhibited multiple significant associations (mostly positive), the long-COVID group presented just few.

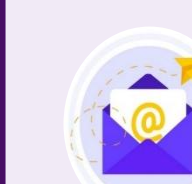
Verbal episodic-memory - Rey Verbal Learning Test (RAVLT), Praxis and Visual episodic-memory - Rey Complex Figure (ROCF); Automatic responses and Mental flexibility - Trial Making Test (TMT); Inhibition - Stroop Test Card C; Short Term Memory immediate and Working Memory - Digit Span; Mental monitoring - letters and semantic verbal fluency tasks; Naming by Boston Naming Test-short form.

CONCLUSIONS

The cognitive profile observed in long-COVID participants, particularly regarding impairments in working memory. The association patterns between [¹¹C]Acetate uptake and cognitive tasks observed in controls were not sustained in the long-COVID group, suggesting a potential link to cognitive impairment.

REFERENCES

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