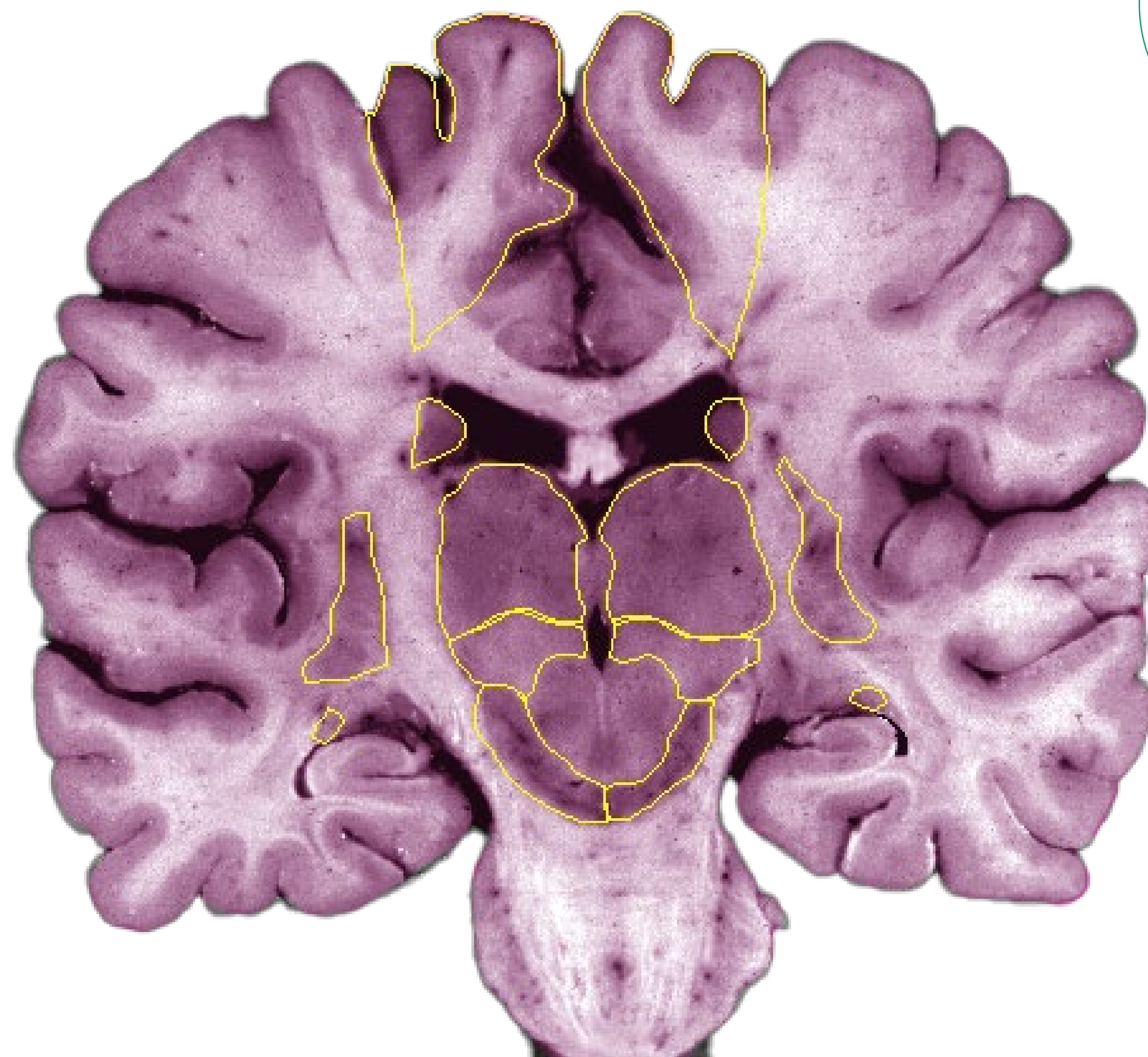


Individual Differences in Inhibitory Control: The Associations Between the “Automatic Pilot,” Executive Function, and Executive Attention

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Introduction

Fronto-Basal-Ganglia Networks



Background

The dorsal stream of the visuomotor system can automatically correct ongoing movements following abrupt changes in a target’s location [1-4].

Study’s Purpose

Investigate whether unintended corrections in the Automatic Pilot Task (APT) are related to other measures of executive attention and function.

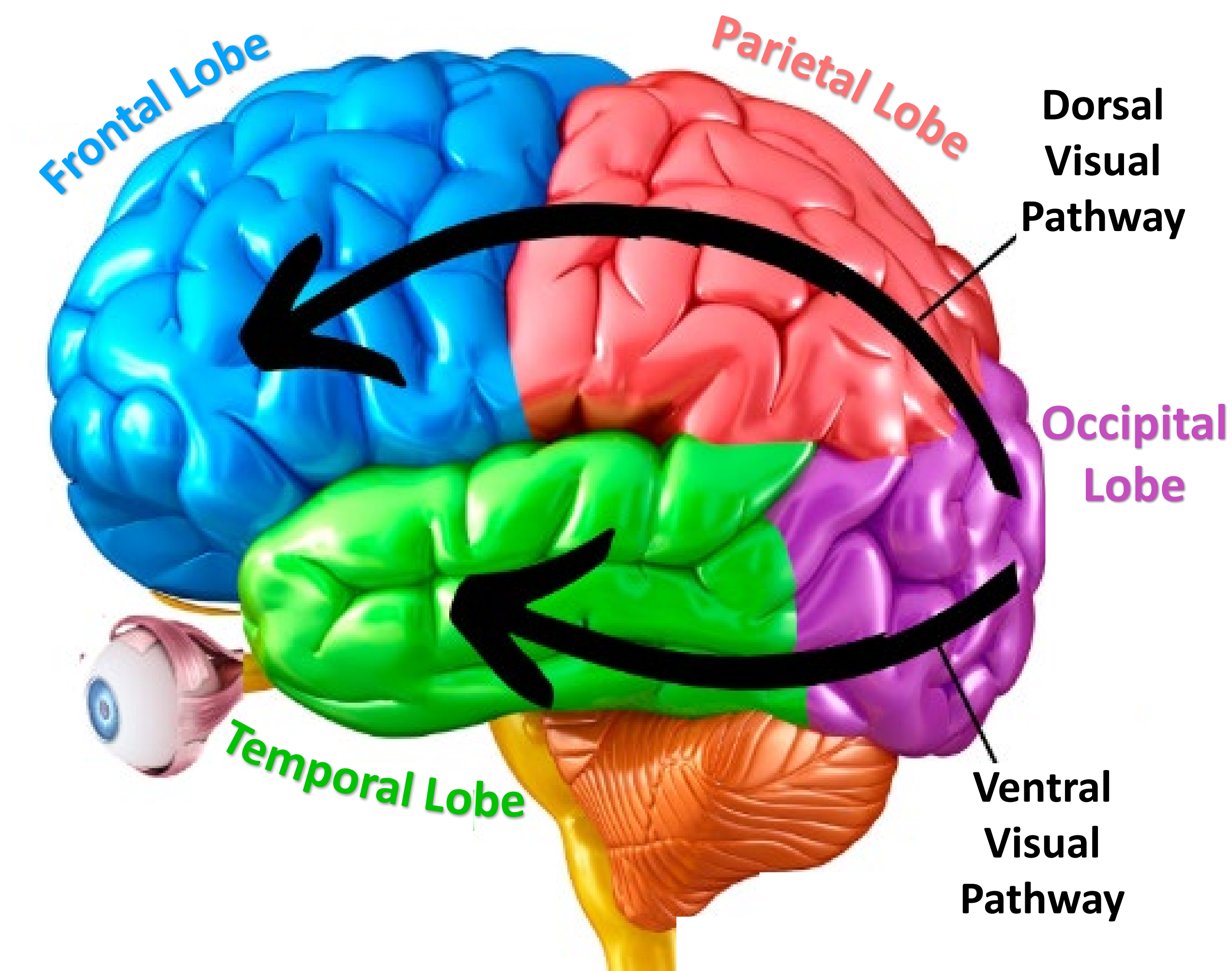
Research Question

Do mechanisms inhibiting automatic movement corrections in the dorsal stream [4, 5] share common substrates with other aspects of executive attention or function?

Predictions

Unintended corrections in the Automatic Pilot Task (APT) will be associated with increased errors on the Sustained Attention to Response Task (SART), and poorer scores on the Adult ADHD Self-Report Scale (ASRS), Cognitive Failures Questionnaire (CFQ), the Behaviour Rating Inventory of Executive Function for Adults (BRIEF-A).

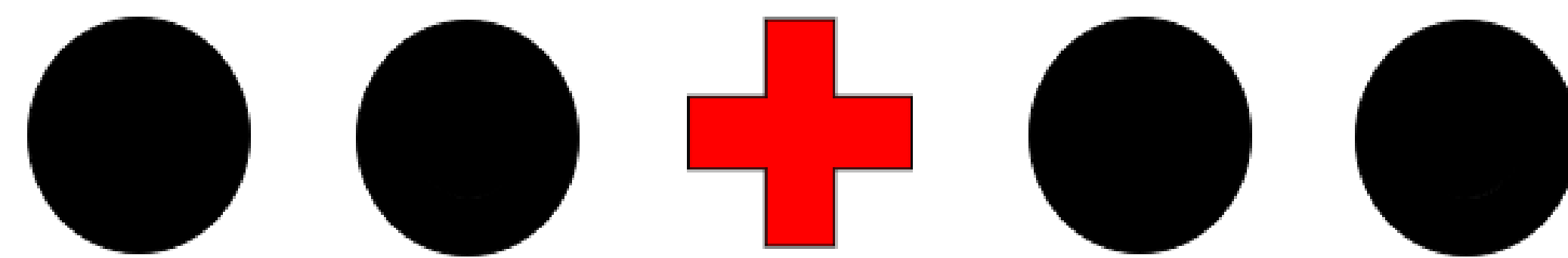
Visual Processing Streams



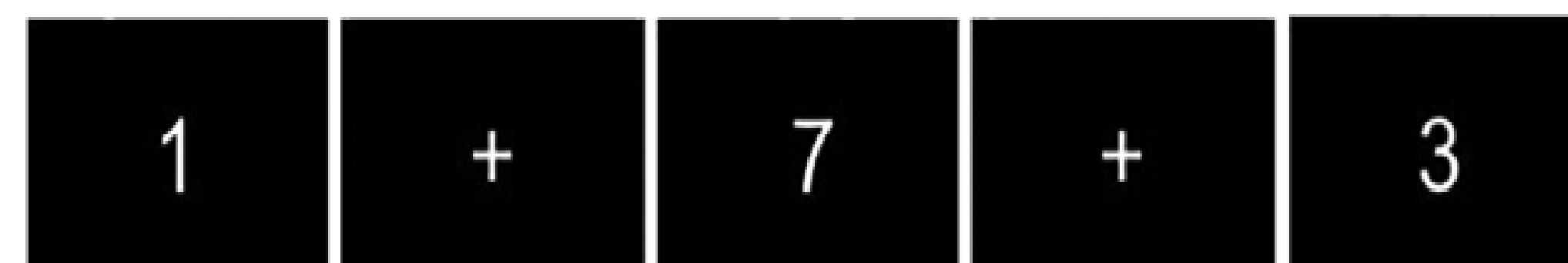
Method

- In a within-subjects design, participants (N = 80) will first perform two blocks (Correct vs. Ignore) of 100 trials of the APT [4, 6] before completing one block of 46 trials of the SART [8].
- During Correct trials in the APT, participants must point to a visual target as fast as possible even if the target moves. During Ignore trials, participants must point to the target’s initial location as fast as possible, while ignoring the target jump [4, 6].
- During the SART, participants must respond to a presented series of digits (“1 – 9”) but must withhold a response when an occasional ‘NOGO’ digit appears (“3”) [8].

Automatic Pilot Task



Sustained Attention to Response Task



- Participants will then complete the CFQ [10], ASRS [11], and BRIEF-A [12].

Sample Items:

CFQ: “In the past 6 months, do you daydream when you ought to be listening to something?”

ASRS: “Over the past 6 months, how often are you distracted by activity or noise around you?”

BRIEF-A: “Over the past month, I have trouble doing more than one thing at a time.”

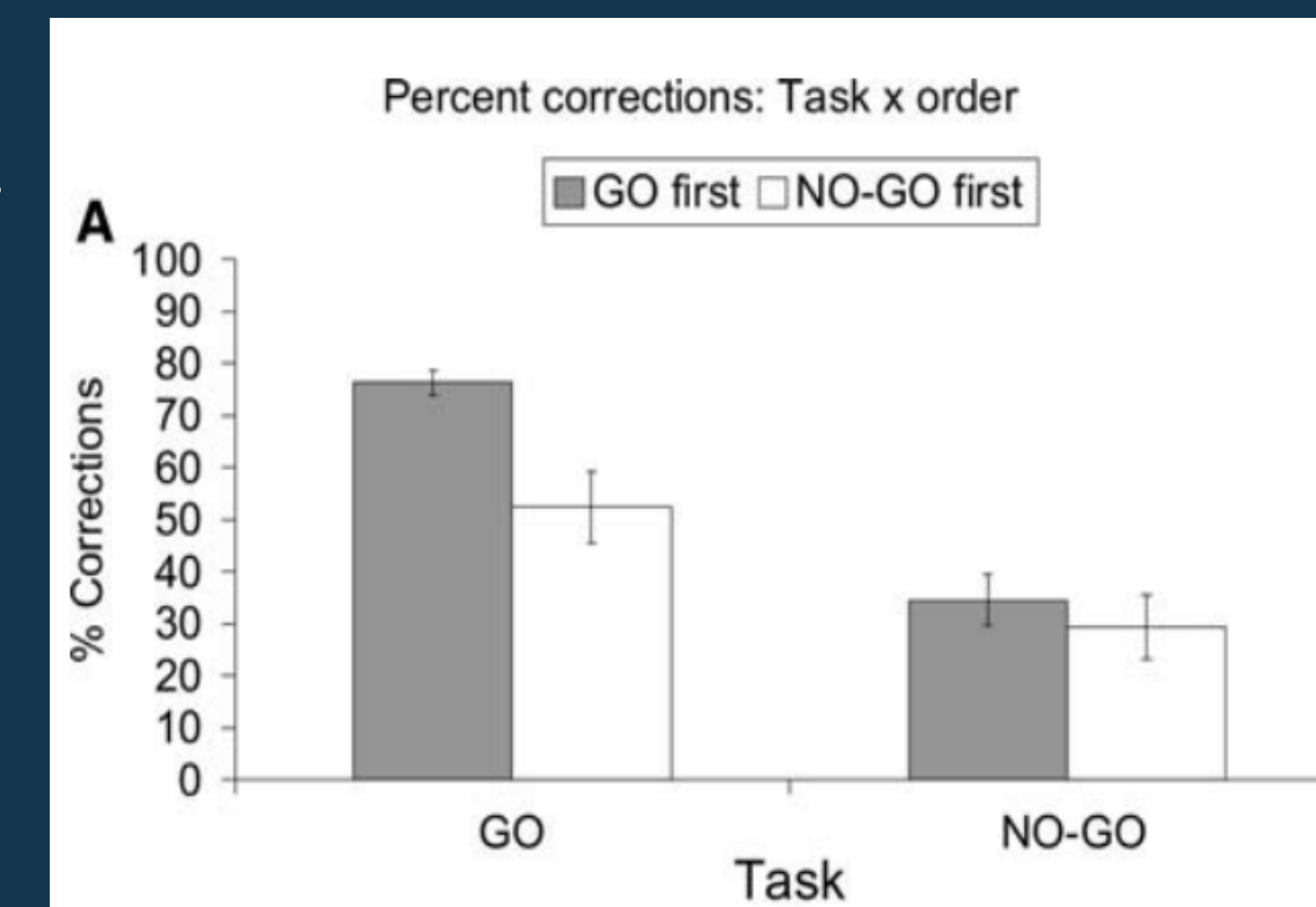
Anticipated Results and Implications

- Based on previous research [4, 6], we predict that participants will make more corrections to target jumps in the Correct condition compared to Ignore condition.
- Participants are predicted to make a significant number of unintended corrections during the Ignore condition [6].
- It is also anticipated that poorer scores on the BRIEF-A, ASRS, and CFQ will correspond with more unintended errors on the APT during Ignore trials.
- We also predict that the frequency of unintended errors on the APT will correspond with the number of commission errors on the SART.
- The results of this study will help us better understand whether the inhibition of ‘automatic’ motor corrections in the dorsal stream share common cognitive and neural substrates with the networks involved in executive function and executive attention more generally.

References and More Information:



Striemer et al. [6] findings for corrections by task x order:



Pisella et al. [4] findings for corrections by task:

