

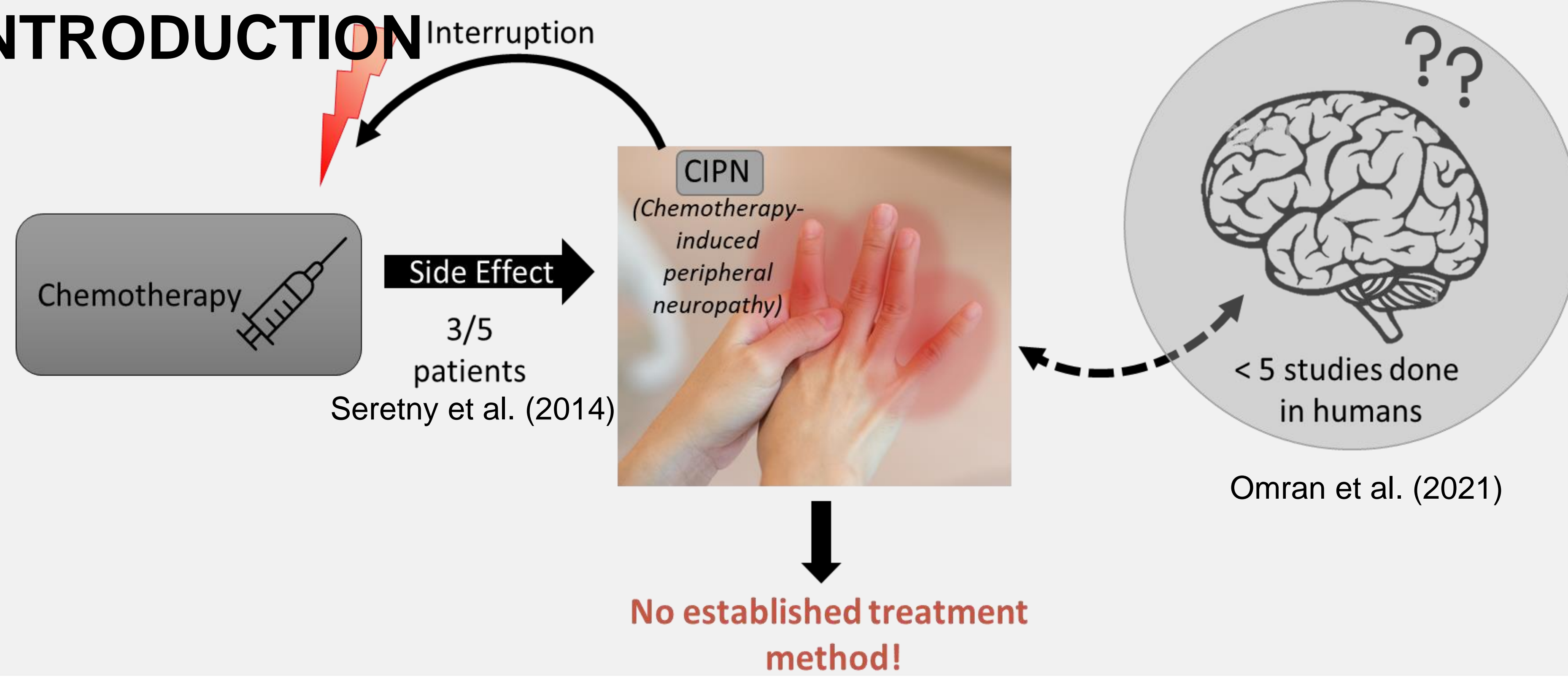


Chemotherapy-induced peripheral neuropathy (CIPN) may be related to altered brain activation during bodily attention



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INTRODUCTION



Goals:

- Assess whether the task is:
- 1. Feasible and reliable
- 2. Sensitive to changes in brain activity
- 3. Suitable for assessing relationships between brain activation and CIPN severity.

PARTICIPANTS

Eleven participants (63±12 years old, 54% women) with breast, gastrointestinal, and multiple myeloma cancers completed an MRI scan and rated CIPN severity (CIPN-20) before and/or 12 weeks after starting taxane, platinum, or bortezomib neurotoxic chemotherapy.

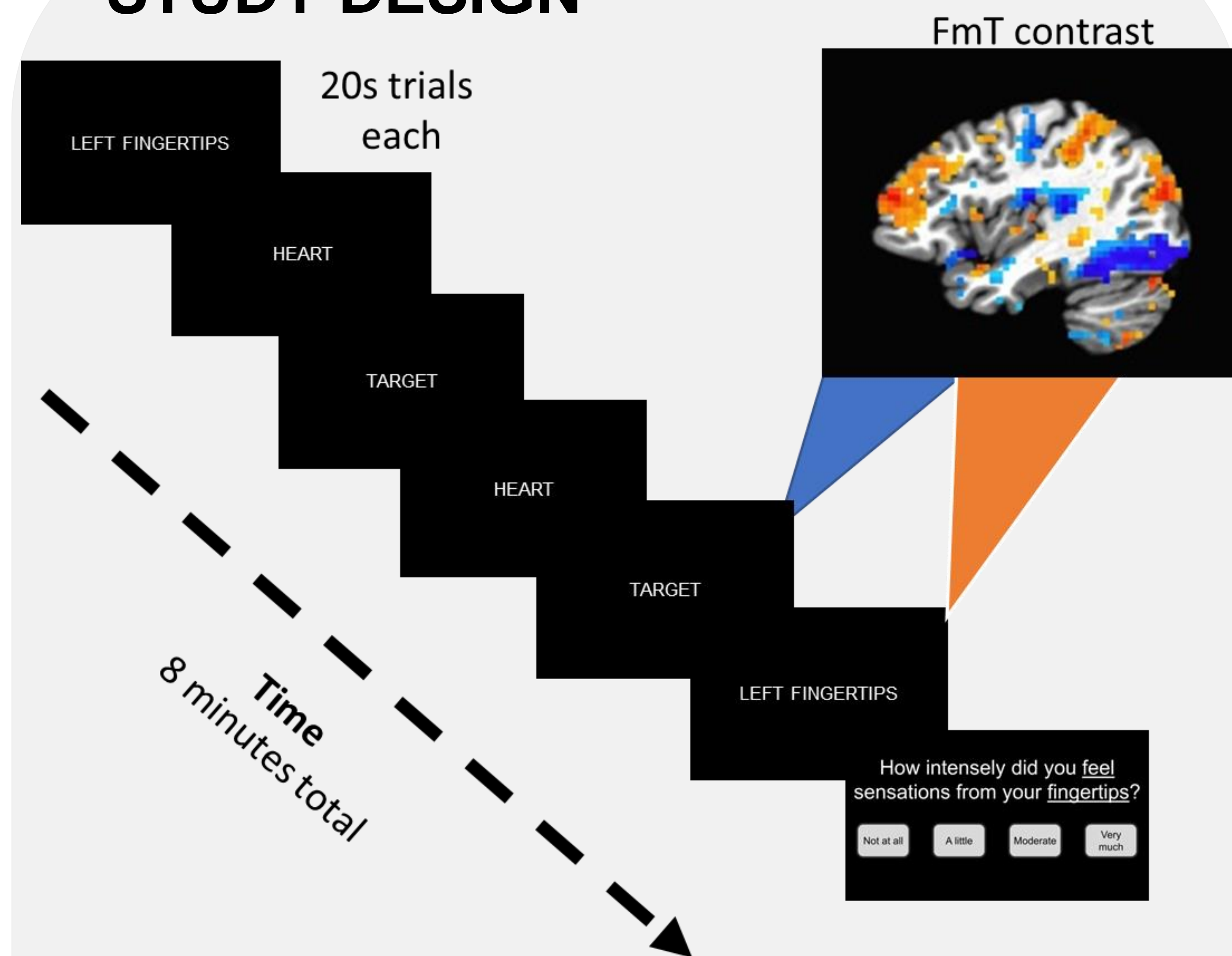
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STUDY DESIGN



Brain Imaging: The BAT is an 8 min fMRI task involving attentional focus on their left fingertips, heart, and a flashing word “target” (visual attention). During half of the trials, participants were asked about their level of attention/sensation.

Behavioral data: CIPN-20 (Postma et al., 2005) scores were collected from each participant within a week of the MRI scanning session.

DATA ANALYSIS

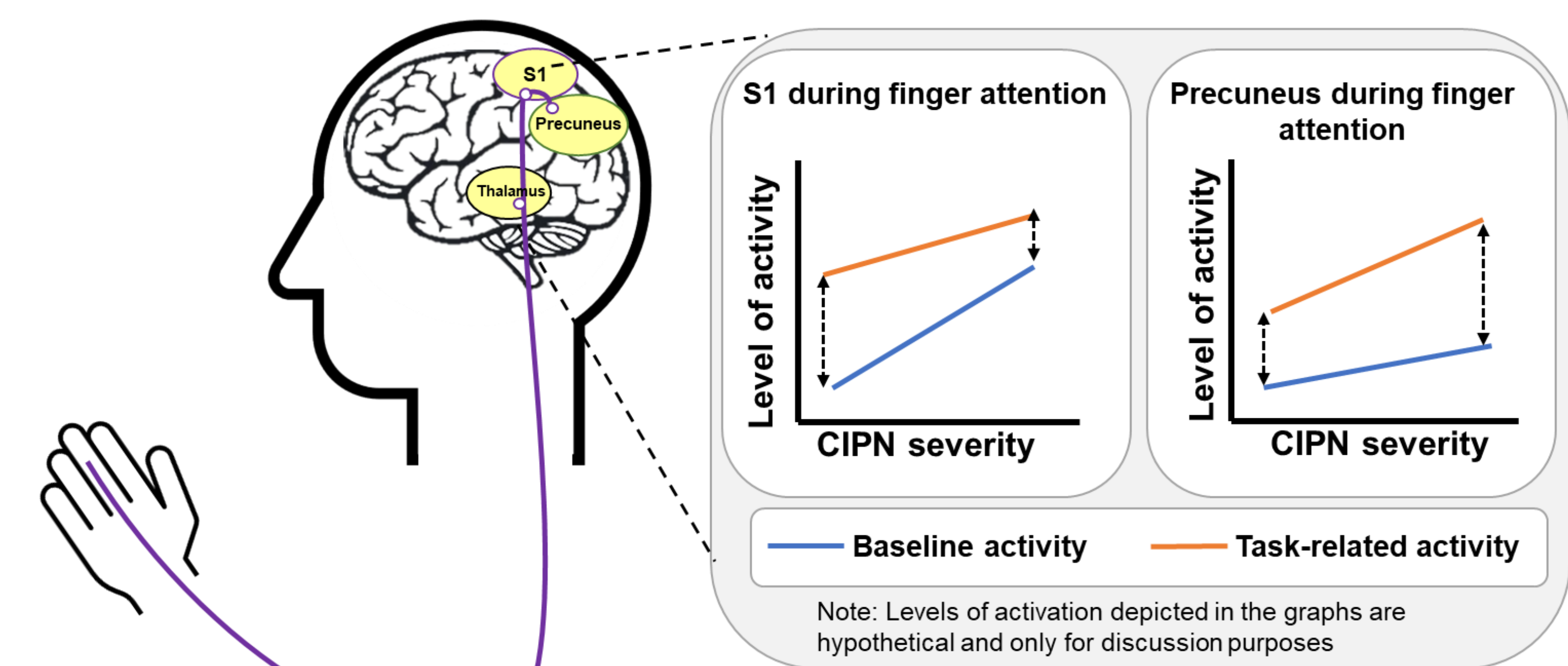
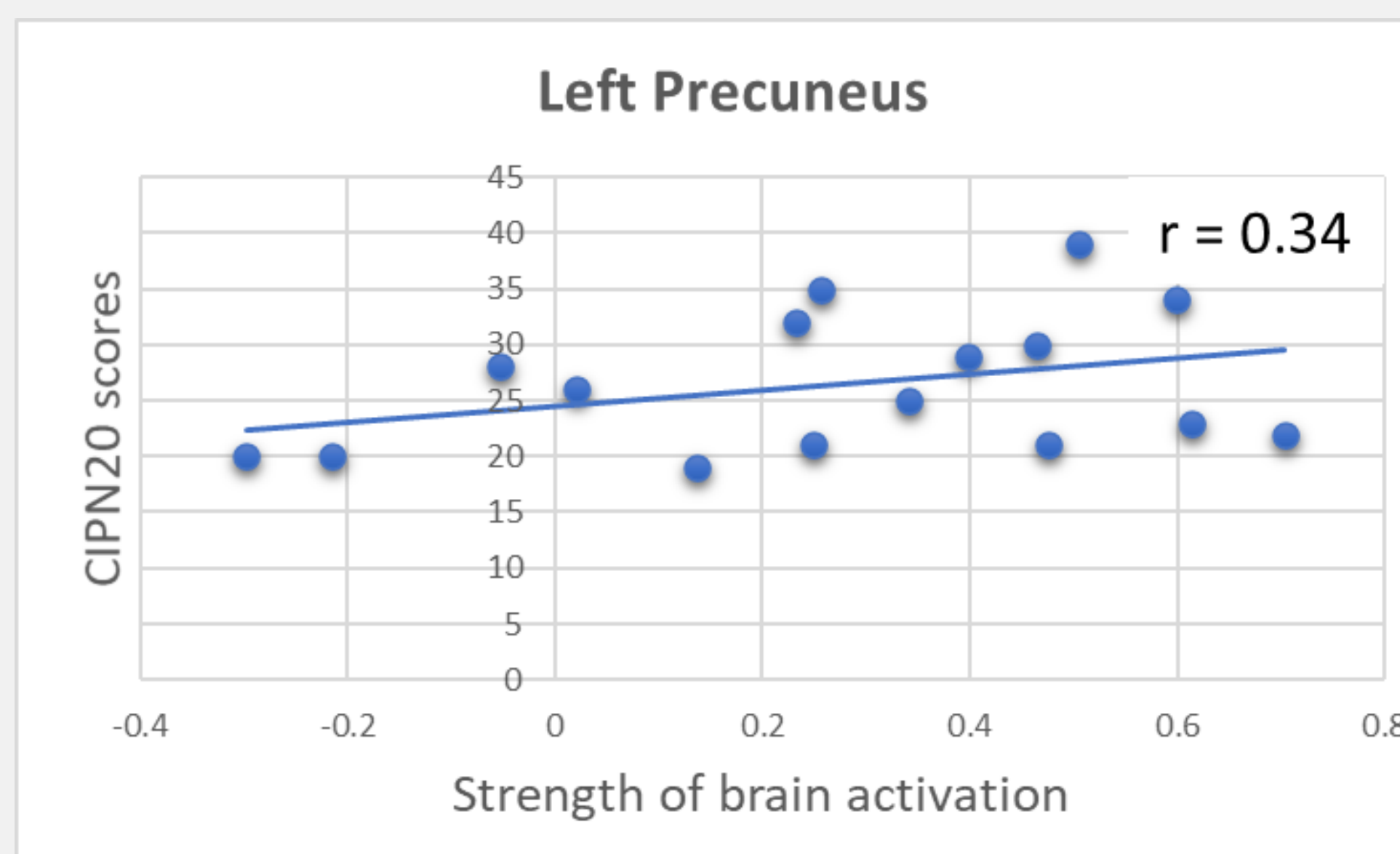
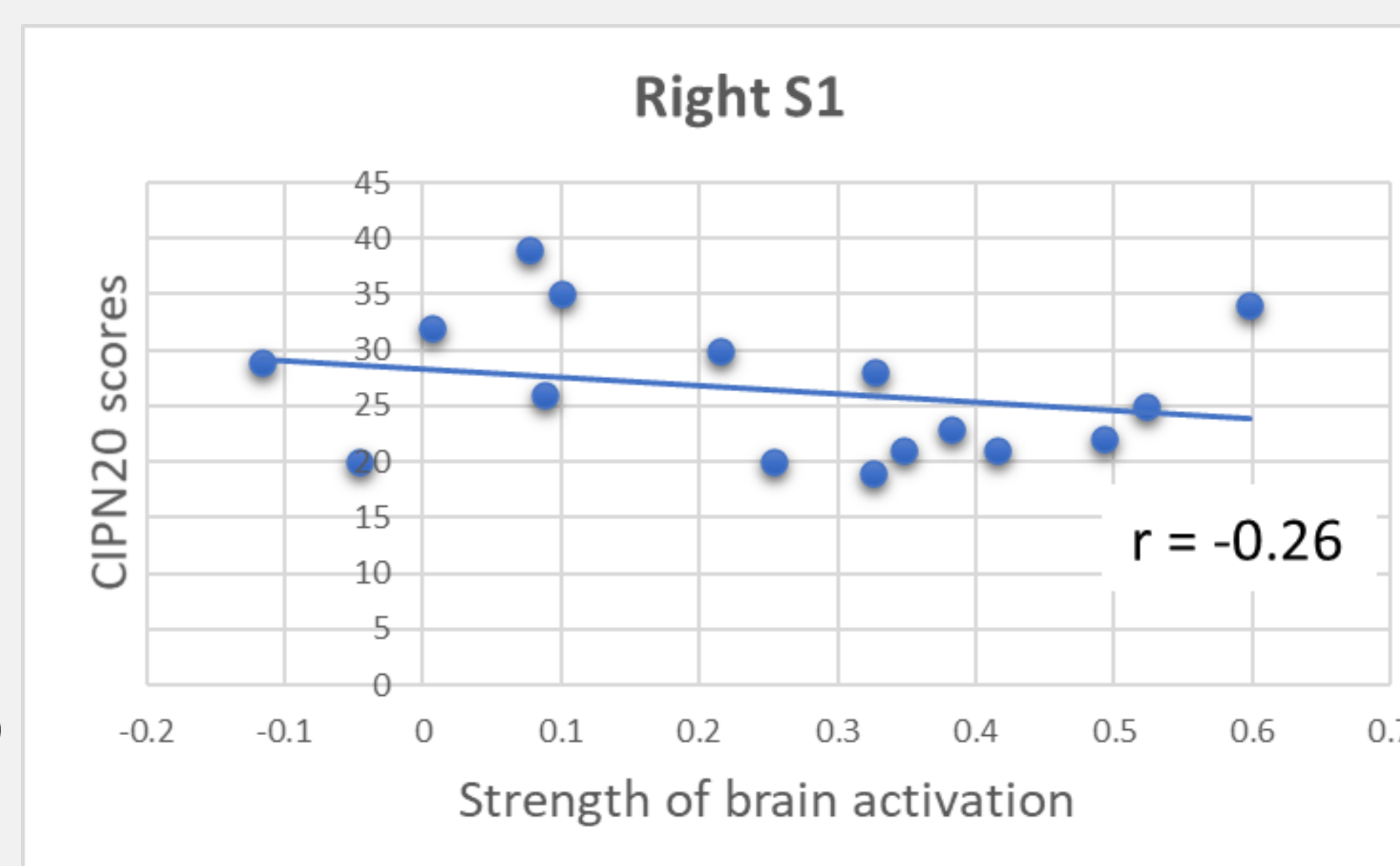
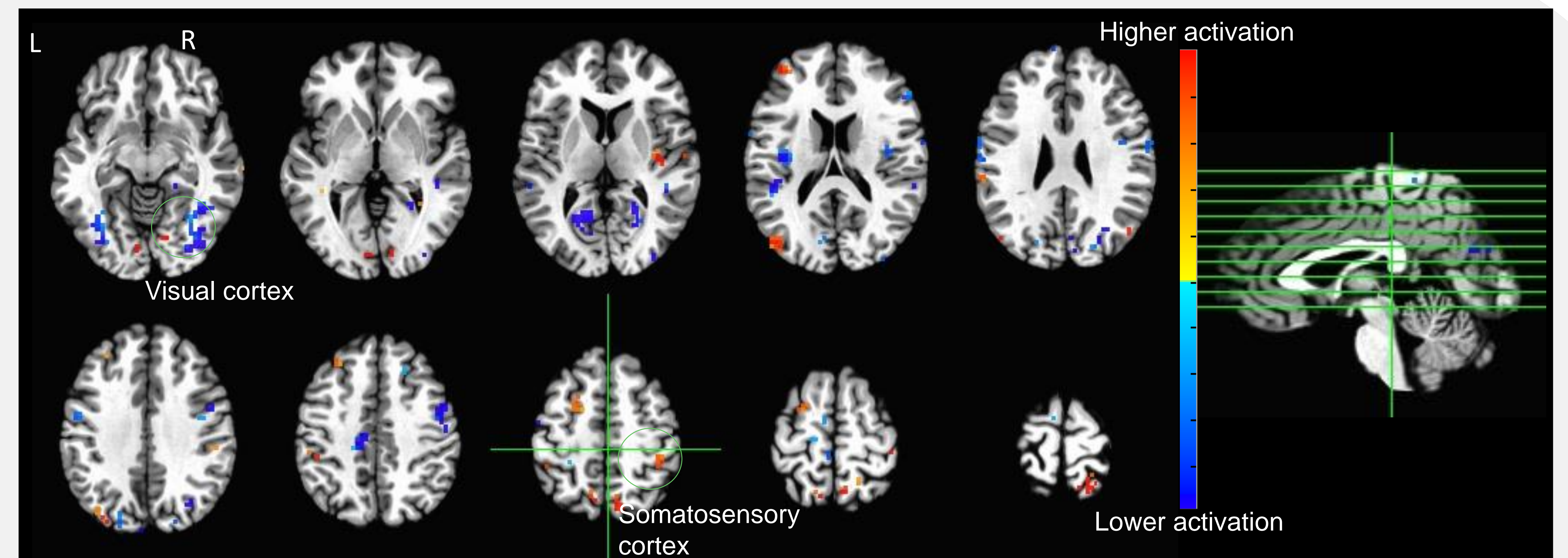
Brain activation comparing left fingertips vs. target (FmT), and its association to CIPN severity were tested using Pearson’s correlation.

RESULTS

Goal 1. 85% of collected data was usable. Participants on average either felt sensations from the left fingers or focused on the target during 75% of all trials.

Goal 2. Somatosensory attention increased activation in the right somatosensory cortex (S1), left dorsolateral prefrontal cortex, precuneus bilaterally, and the left mid-insula

Goal 3. Patients with worse CIPN had smaller increases in S1 ($r = -0.26$) and greater increases in precuneus (left $r = 0.34$ and right $r = 0.29$) activation during somatosensory attention



Working theory

CIPN causes hyperactivity in S1 which may cause hyperactivity in the Precuneus during CIPN related sensory stimuli. The amount of brain activity is greater in patients with severe CIPN symptoms.

IMPLICATIONS

A better understanding of the somatosensory processing of the brain may help improve the prediction, prevention, and treatment of CIPN