Causal neural systems for the comprehension of ambiguous words in sentences

Functional imaging and MEG studies show additional activity in inferior frontal and inferior temporal regions during comprehension of ambiguous words in spoken sentences (e.g. “The steak/stake was rare just as the customer had requested”) compared to matched low ambiguity sentences [1]. Although fronto-temporal activity is consistently associated with ambiguity resolution, this does not show that these regions play a causal or specific role in the interpretation of ambiguous words. Causal evidence can come from studies that assess whether brain lesions or stimulation of inferior frontal and inferior temporal regions causes impaired comprehension of ambiguous sentences. This project will devise behavioural measures of the comprehension of ambiguous words in sentences that can be administered to individuals with fronto-temporal lesions (from the CCNRP cohort) or combined with transcranial magnetic stimulation. These studies can thereby assess the causal role of inferior frontal and inferior temporal regions to comprehension of ambiguous sentences. By considering whether these effects are unique to ambiguity resolution, apply to a range of linguistic or semantic challenges, or overlap with domain general executive functions (e.g. working memory, selection) we can determine whether fronto-temporal brain regions make a specific, causal contribution to ambiguity resolution. Combining brain imaging with lesions or stimulation allows assessment of resilience and plasticity following neural perturbation with implications for rehabilitation of sentence comprehension.

Reference and URL(s)

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