# What we can learn about semantic composition by studying the brain

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Although our brains' ability to build complex meanings from simpler representations is fundamental to all of language, our understanding of the neurobiology of meaning composition is still grossly generic. To characterize the neural bases of semantic composition more mechanistically, a cognitive model is needed to define the space of possibilities; yet the cognitive neuroscience of semantics has not traditionally connected with models of semantic composition in linguistics. Our research departs from the mainstream by taking the results of formal semantics within theoretical linguistics as the model that fundamentally guides the experimentation. In the first half of this talk, I will show magnetoencephalography (MEG) evidence for a shared combinatory network between comprehension and production comprising at least of the left anterior temporal lobe and the ventromedial prefrontal cortex. In the second half, I will present a series of experiments aimed at a deeper understanding of the left anterior temporal cortex in combinatory processing. I show that this activity does not pattern like syntactic or semantic composition in linguistic theories, but rather appears to contribute to a conceptual combinatory operation that doesn't in any obvious way figure in extant cognitive models.