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The Brain's Linguistic Homunculus

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What is the best way to understand the talking brain? Optimally, it is a computational model that has all the known neural properties, from which all known language phenomena are derivable. How close are we to this desideratum? Some argue that we are rather close, and present successes in the field of Natural Language Processing (NLP), as well as in neurolinguistics. I will review some large NLP systems, and show how they display systematic failures; I will then review two recent works that have attempted to fit NLP models to neural data, taken from experiments in sentence processing. Finally, I will present an alternative picture, and show the evidence that supports it: the talking brain is supported by a specialized language homunculus, whose organs align with the brain's cytoarchitectonic parcellation, and their functional structure is best described by current linguistic theory. This homunculus, I will argue, is the object that needs computational modeling.

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