

Teaching the Brain to Read

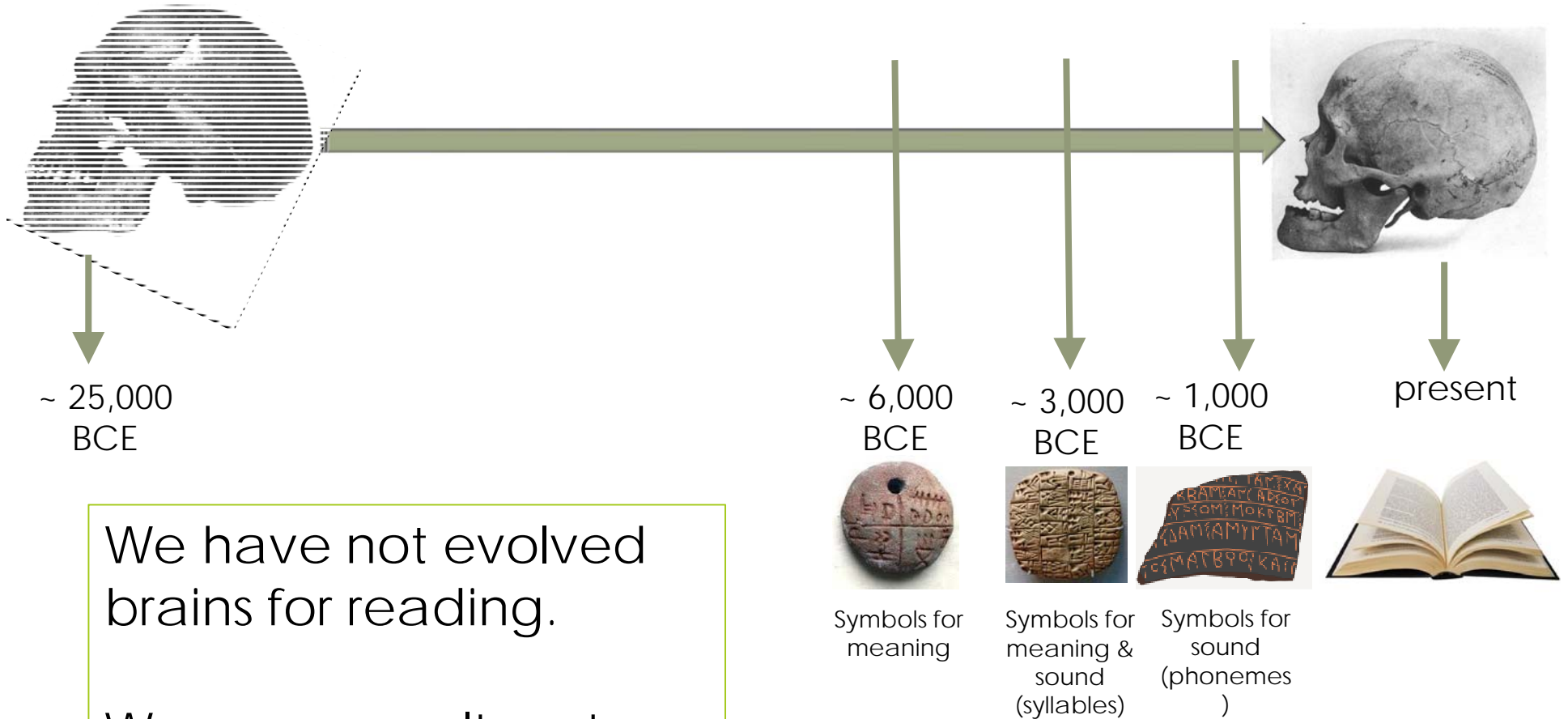
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Development Center

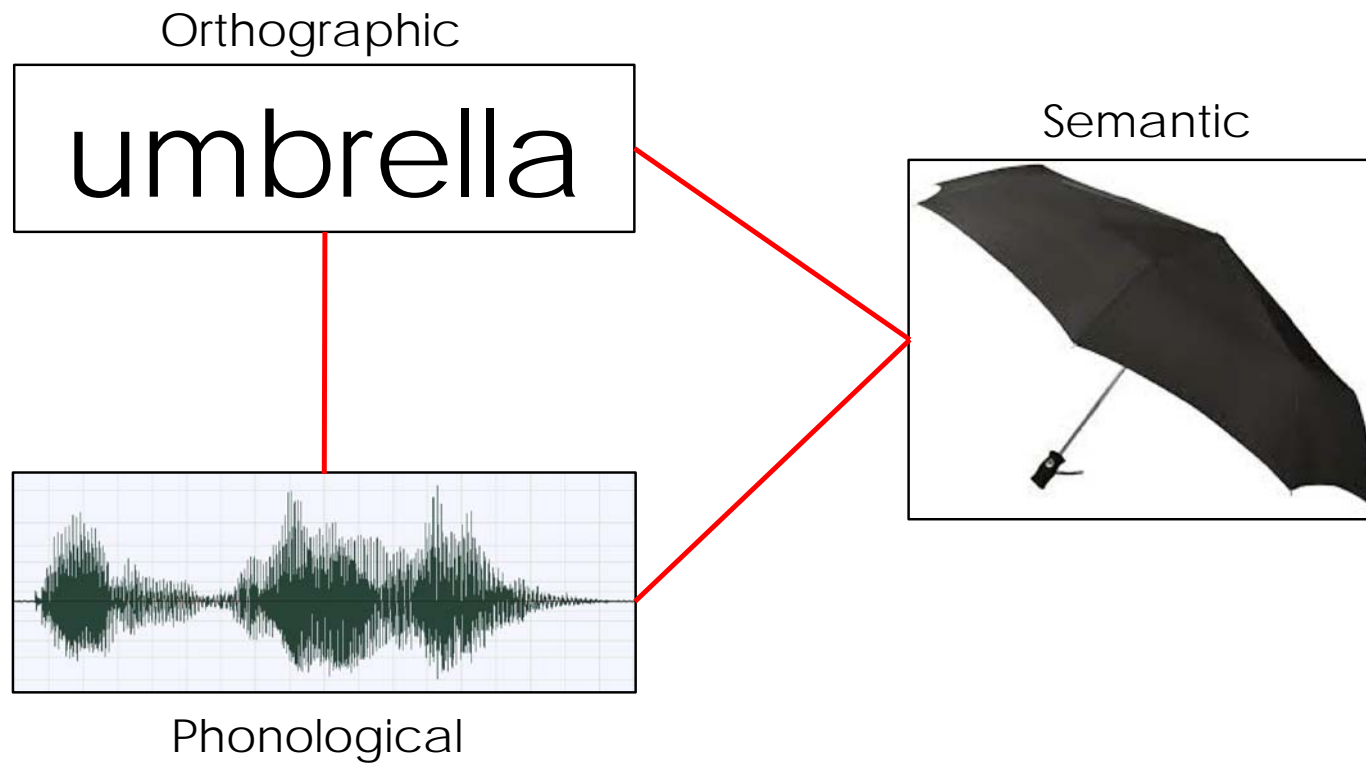
The Neural Challenge



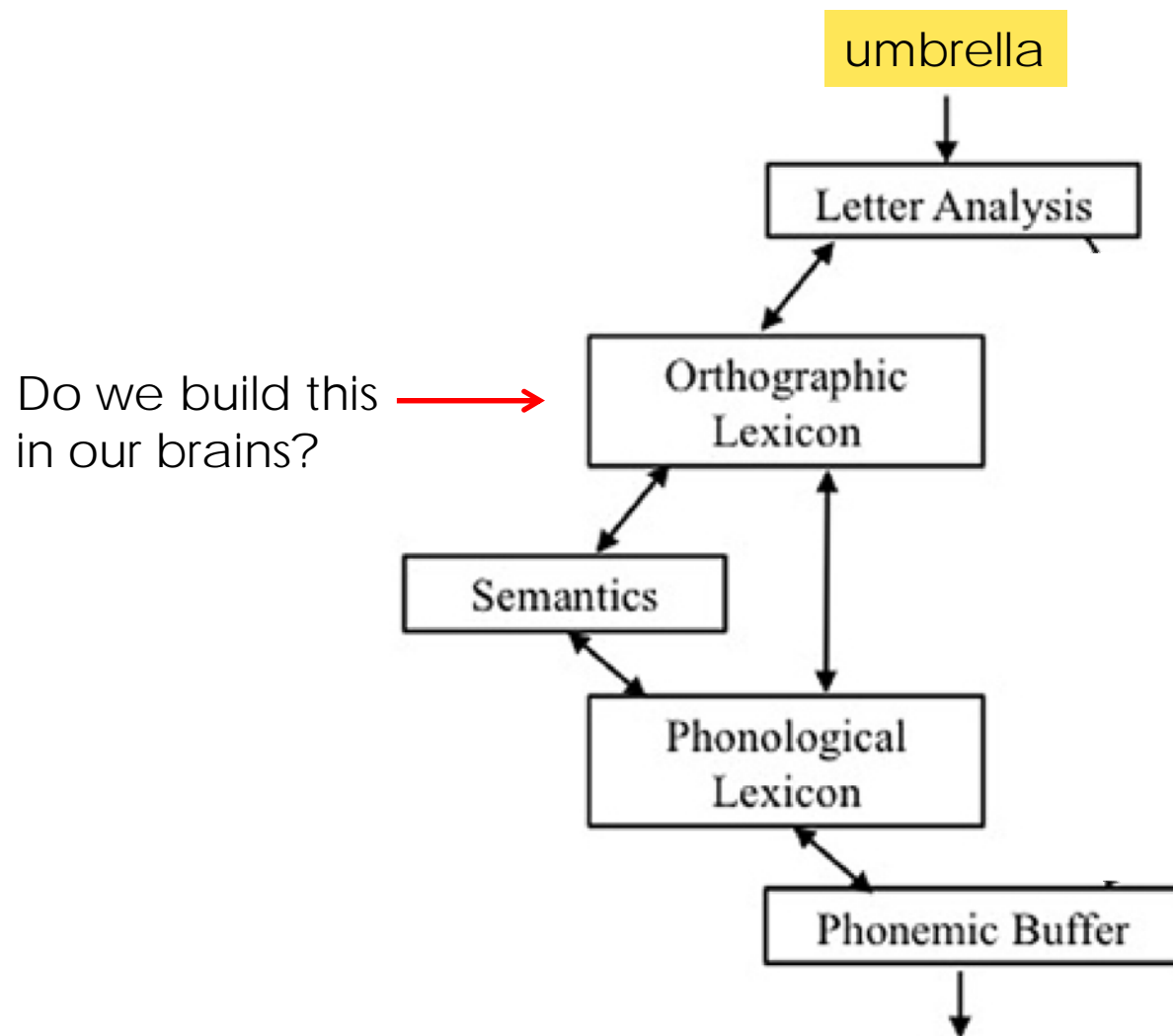
Visual Word Recognition

umbrella

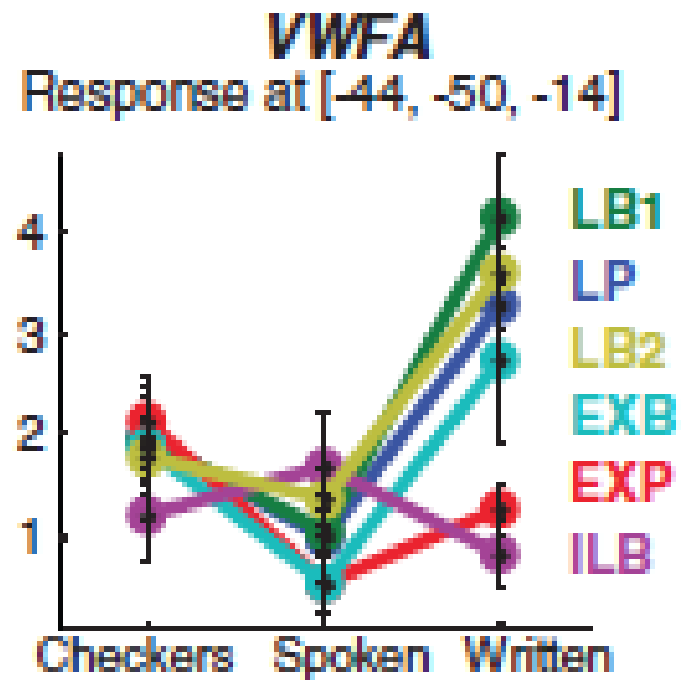
Word Recognition as Integration



The Concept of a Lexical Route

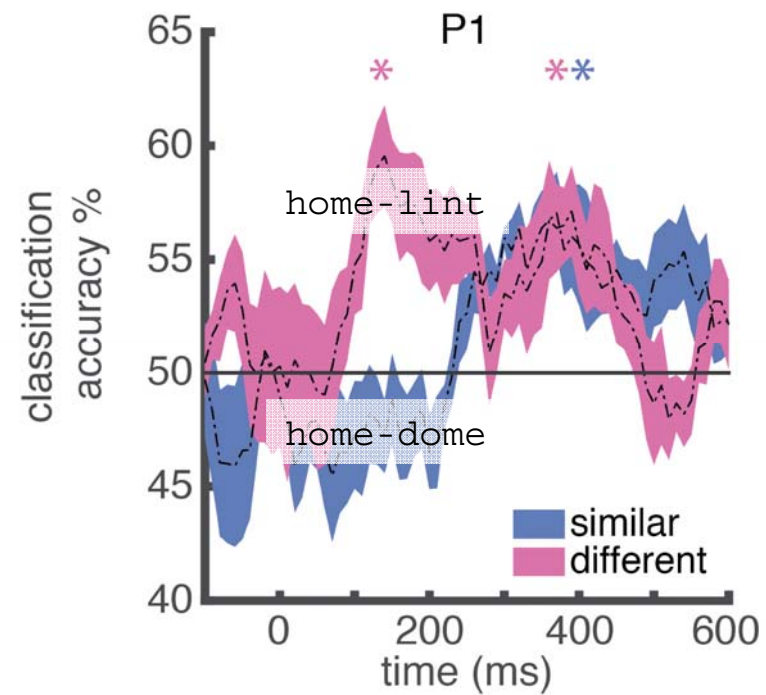
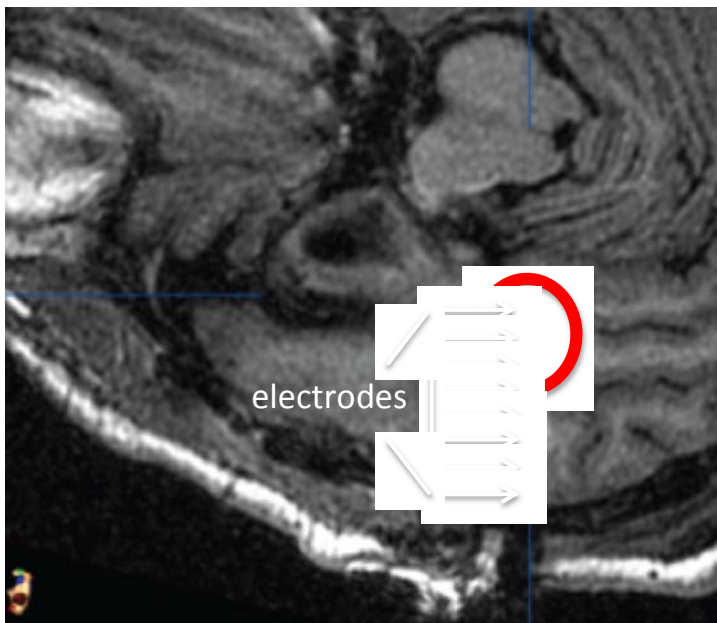


Literacy and the Visual Word Form Area



Cohen et al., (2002) *Brain*, 125:1054-1069 and & Dehaene et al. (2010) *Science*, 330:1359-1364

VWFA neurons code distinct word forms

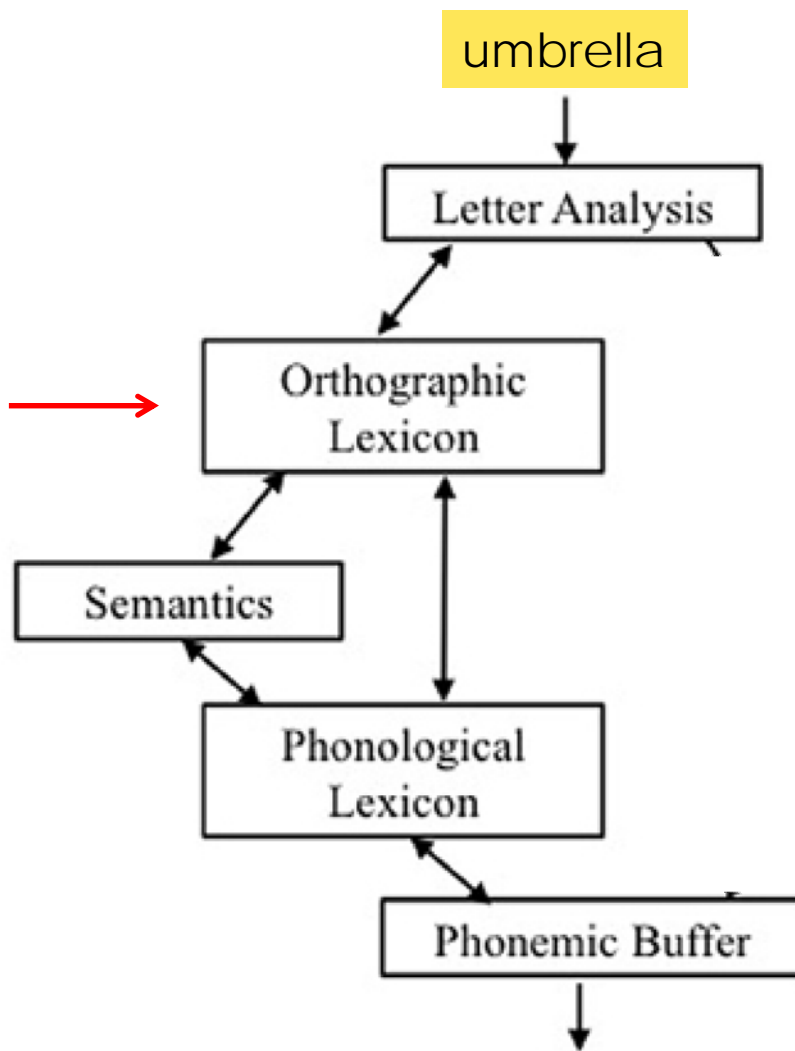


Disrupting the VWFA disrupts word recognition

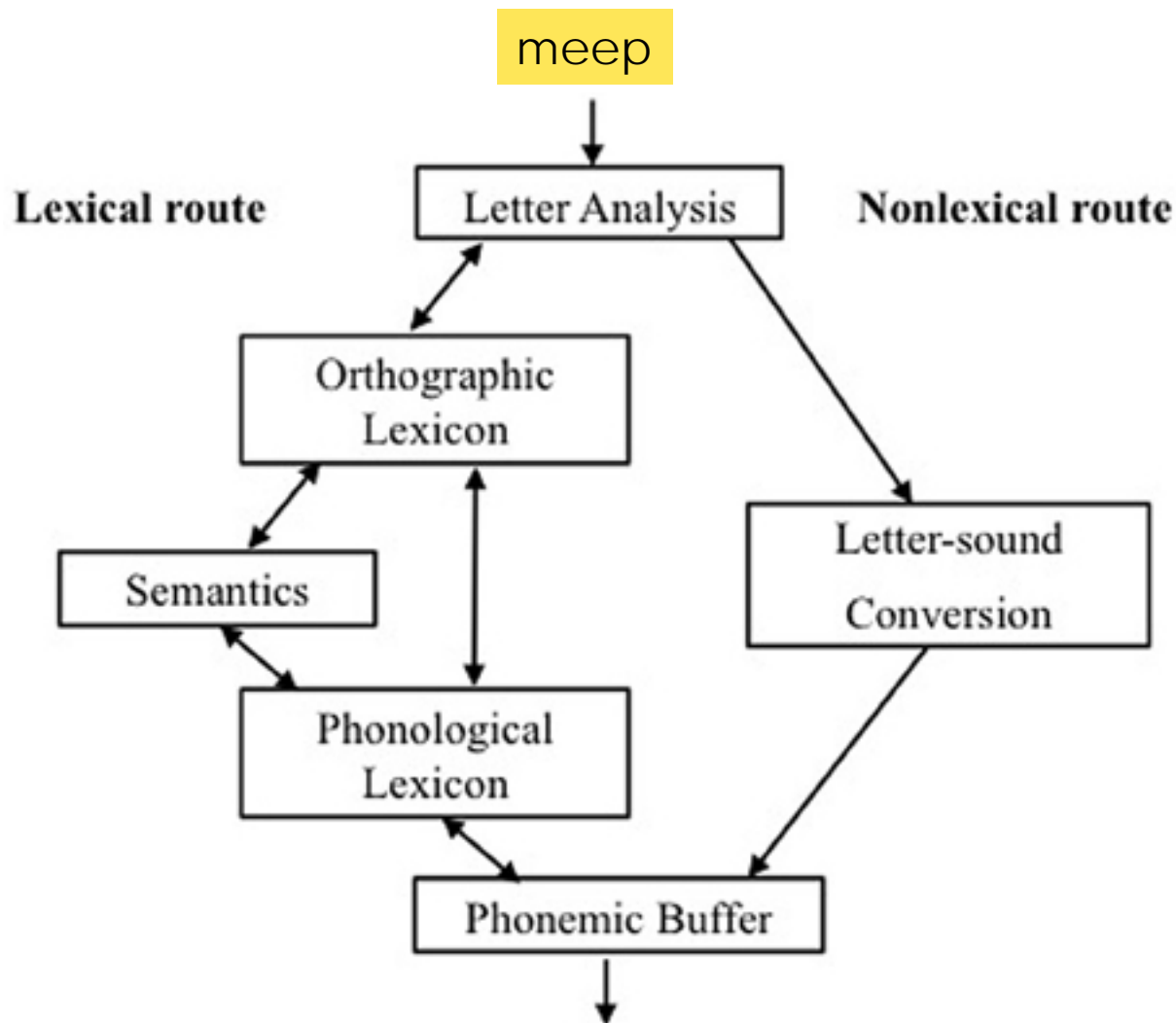


The Concept of a Lexical Route

Do we build this
in our brains?
-- YES



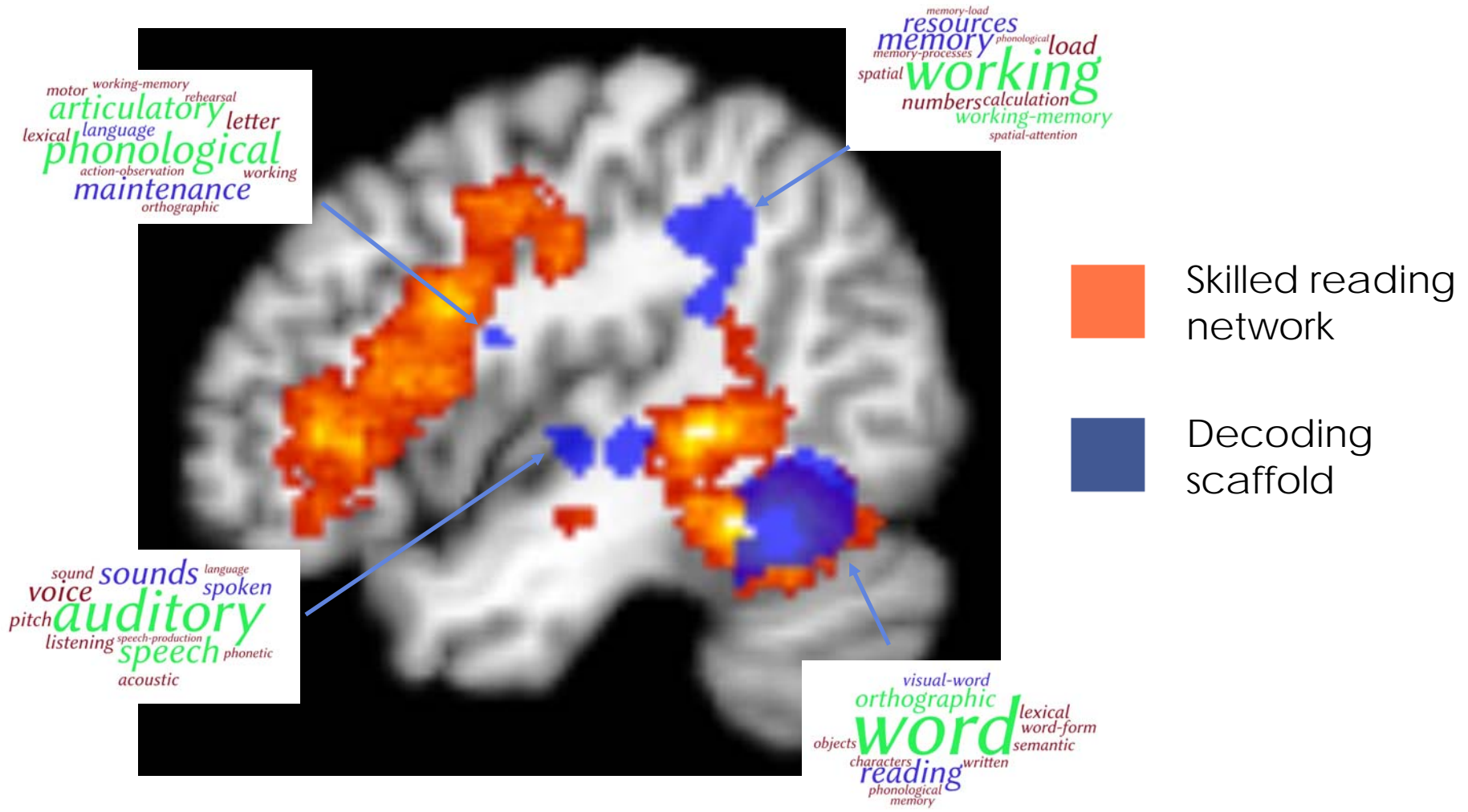
What if the printed word is unfamiliar?



Decoding in action

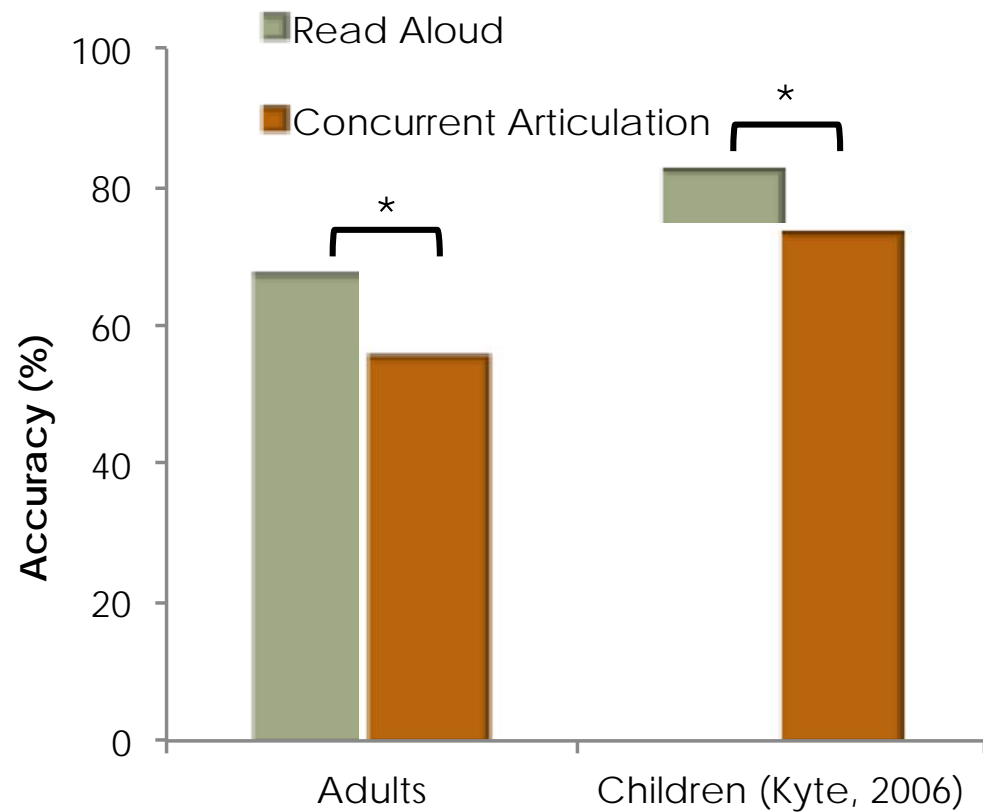


What is the neural scaffold?

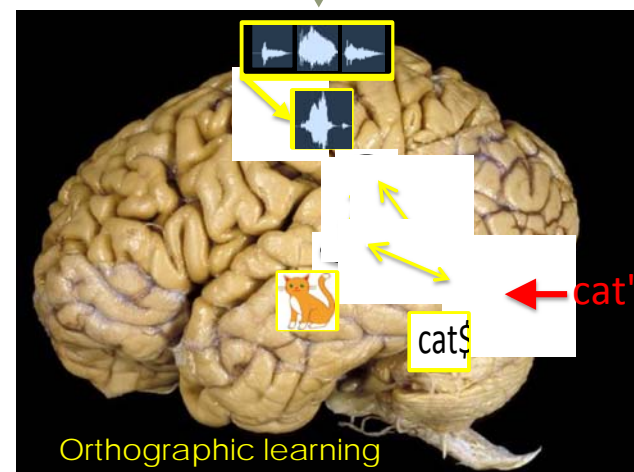
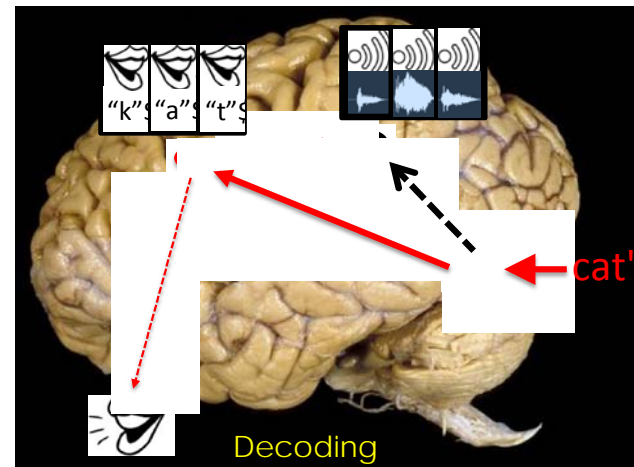
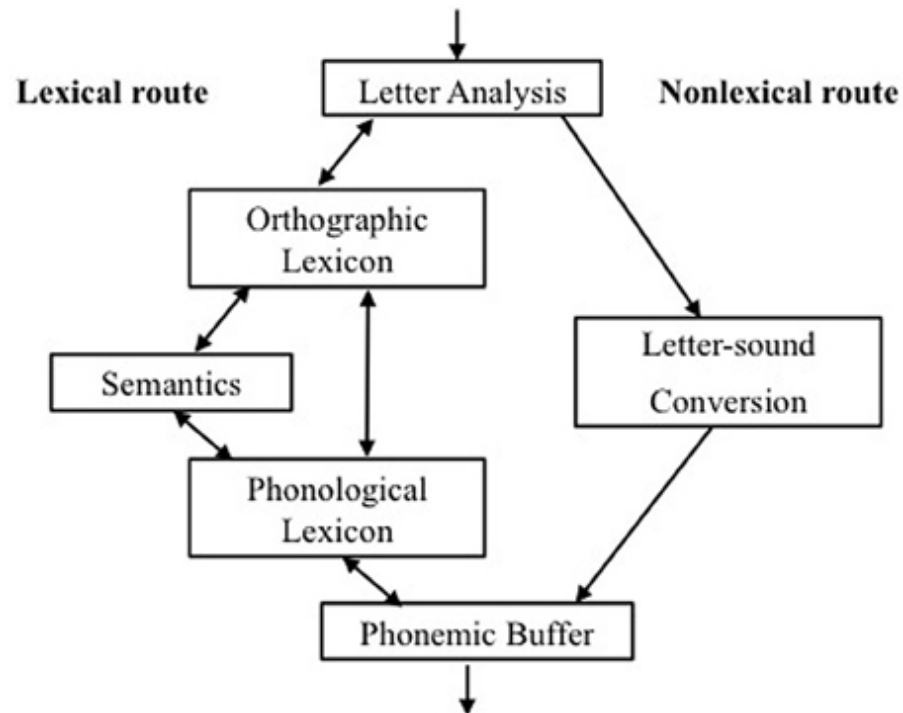


Decoding builds orthographic knowledge

meap
meep
meab
meeb



Putting the Ideas Together



Many thanks



Avniel Ghuman
Neurological Surgery



Mark Richardson
Neurological Surgery



Charles Perfetti
LRDC



Liz Hirshorn
LRDC



Travis Alvarez
Psychology



Michael Ward
Neurological Surgery



Yuanning Li
BioEngineering