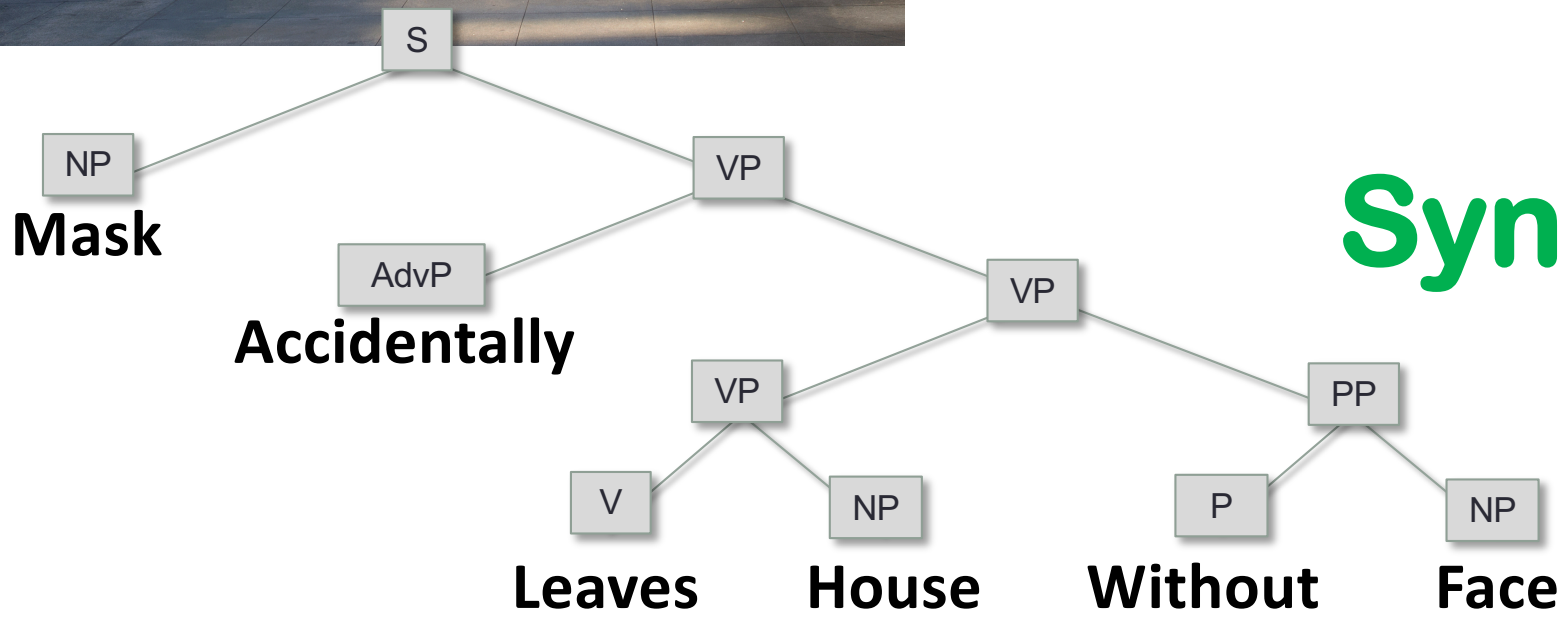
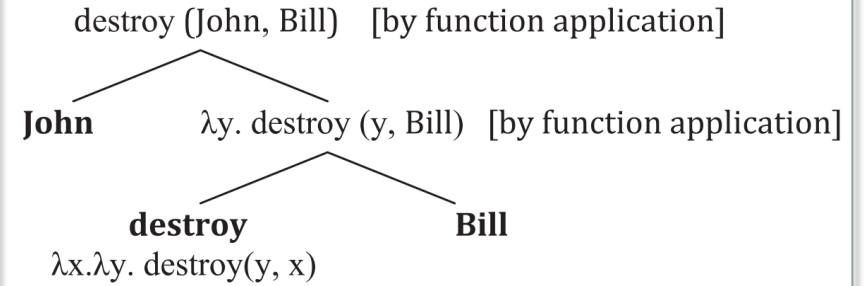




## Compositional interpretation in formal semantics

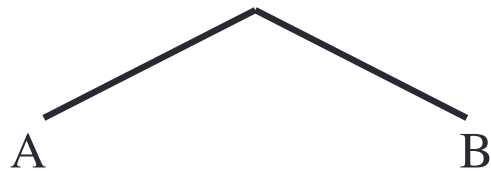


# Syntax

# Basic composition

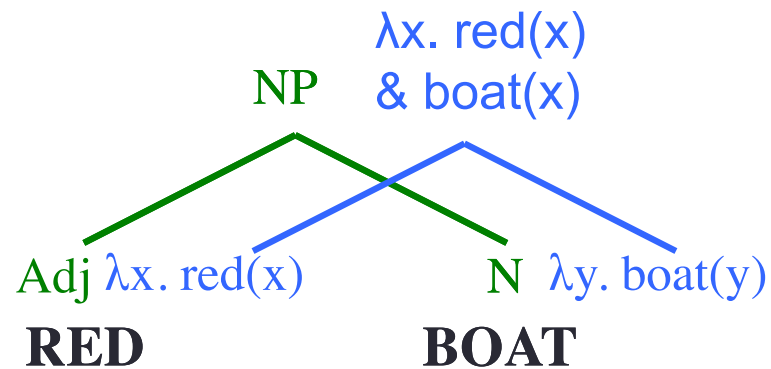
How it started

How it's going



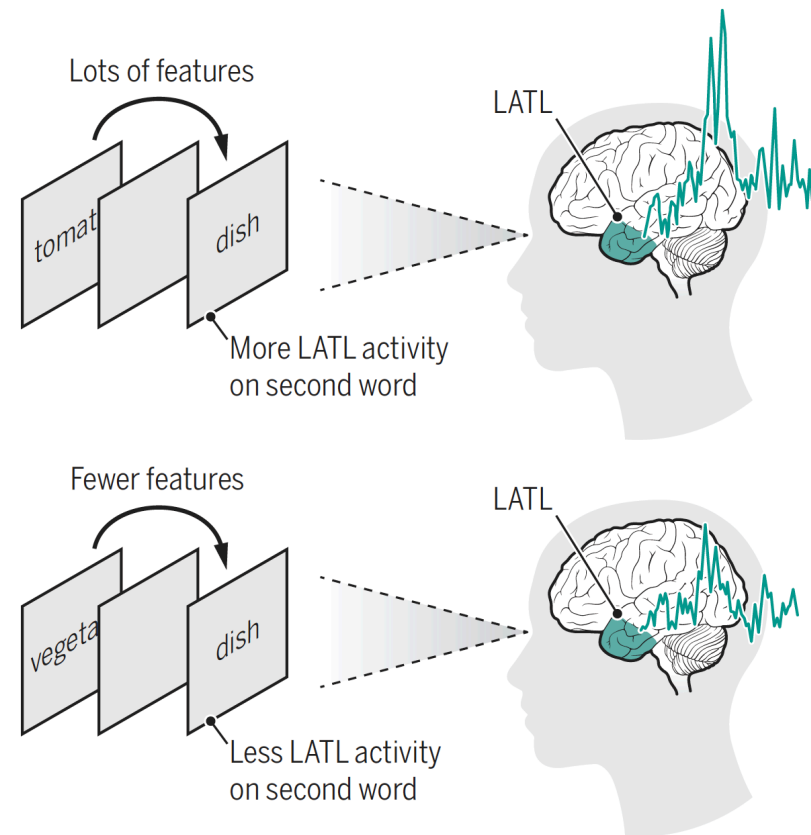
# Basic composition

## How it started

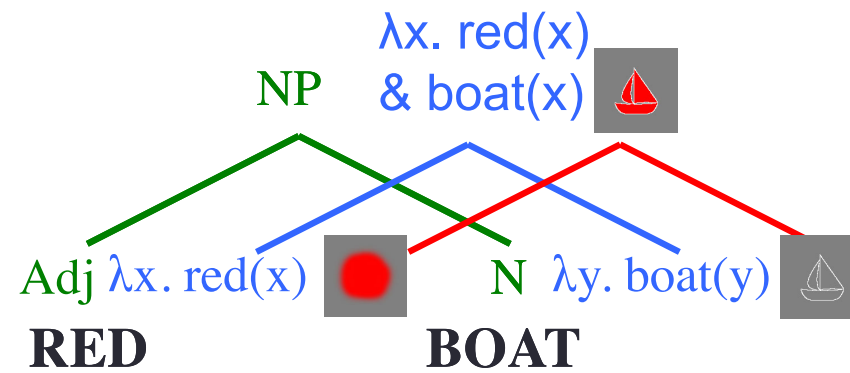


## How it's going

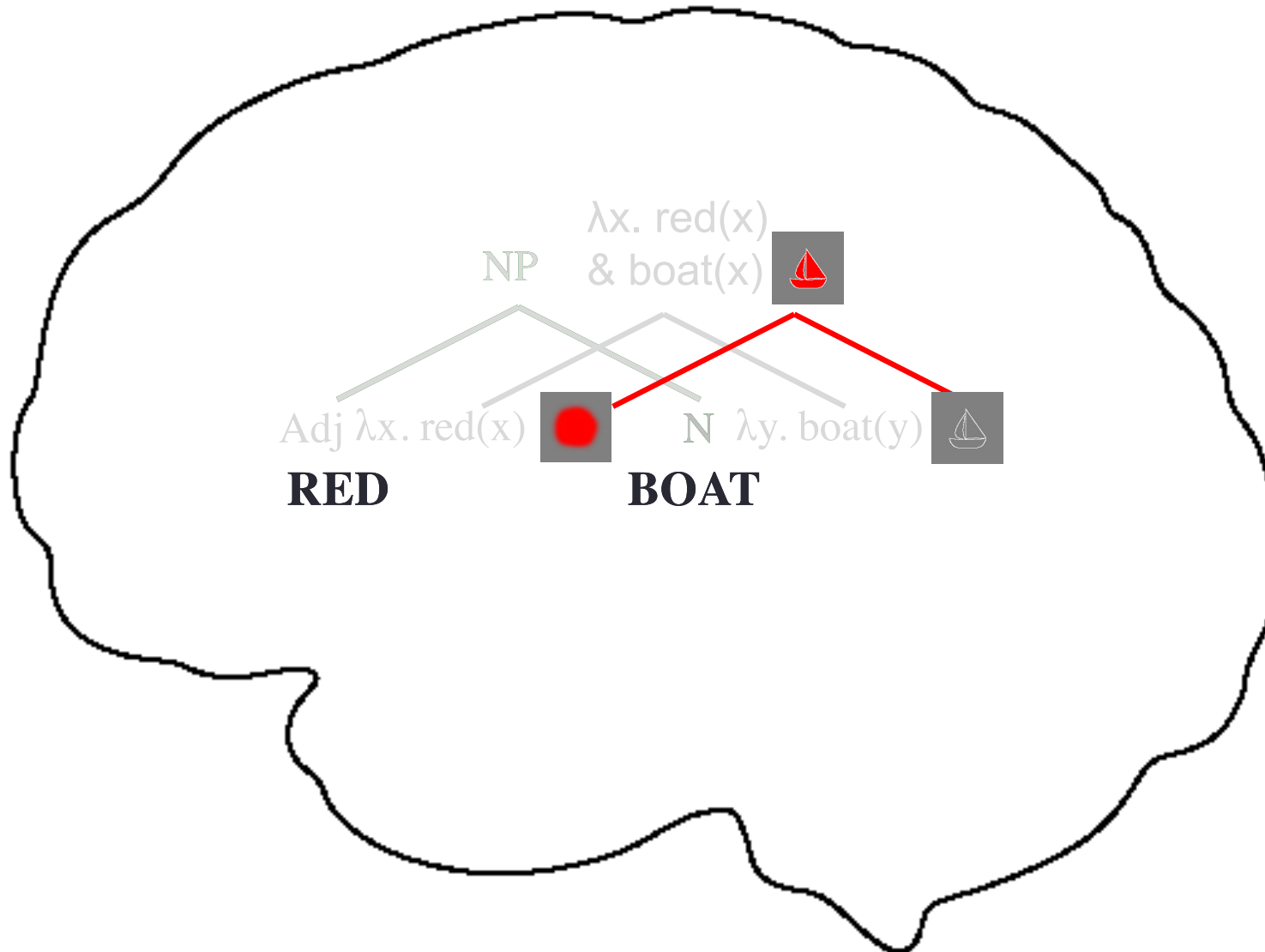
**LATL sensitivity to conceptual specificity**



# Basic composition

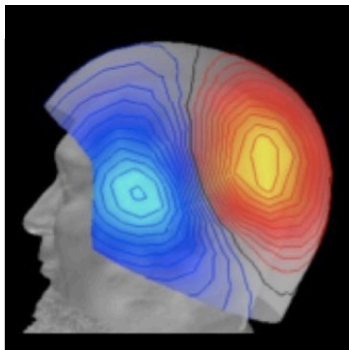


# Basic composition



## 2 questions

1. What happens in the brain when two words compose together?
2. What specific computations do the identified effects reflect?



**MEG**

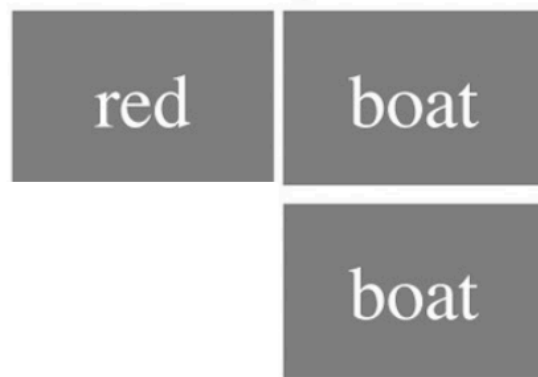


1. What happens in the brain when two words compose together?

red

boat

1. What happens in the brain when two words compose together?





# 1. What happens in the brain when two words compose together?

## The Jabberwocky By Lewis Carrol

'Twas brillig, and the slithy toves  
Did gyre and gimble in the wabe:  
All mimsy were the borogoves,  
And the mome raths outgrabe.

"Beware the Jabberwock, my son!  
The jaws that bite, the claws that catch!  
Beware the Jubjub bird, and shun  
The frumious Bandersnatch!"

He took his vorpal sword in hand:  
Long time the manxome foe he sought—  
So rested he by the Tumtum tree,  
And stood awhile in thought.

red	boat
xkq	boat

Could this be a possible word that doesn't have a meaning? Like **mide**? **mide boat**?

- Pronounceable nonwords ("pseudowords") activate the lexicon. The more they sound like real words, the more they activate real words.
- We don't have theories about what our brains do when encountering pseudowords in a combinatory context. Could be complicated!
- Lewis Carroll took advantage of the interesting and intriguing nature of pseudowords...



1. What happens in the brain when two words compose together?

## Task?

red	boat
xkq	boat



1. What happens in the brain when two words compose together?

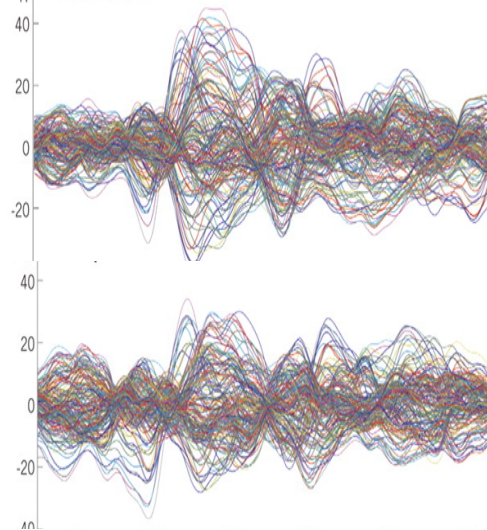
Does the picture match the verbal description?

red	boat	
xkq	boat	

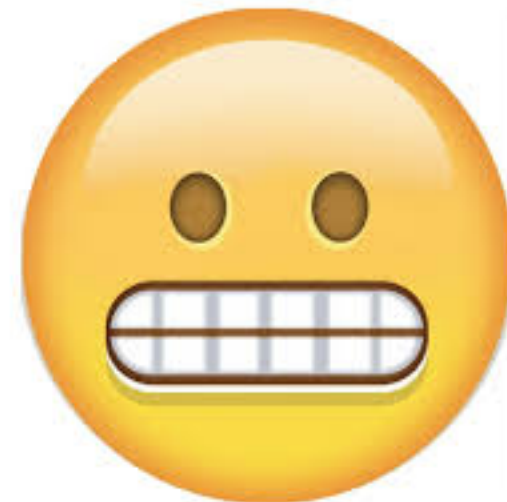
# 1. What happens in the brain when two words compose together?

## Composition Task

Two words	red	boat	
One word	xkq	boat	



Need two words that don't compose with each other

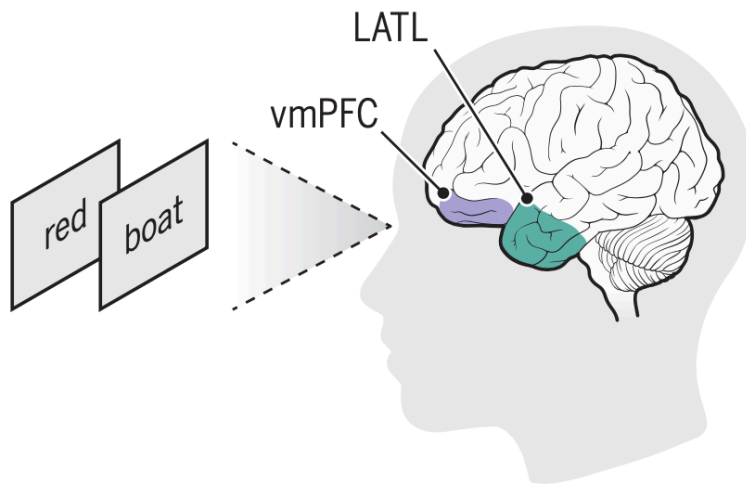


# 1. What happens in the brain when two words compose together?

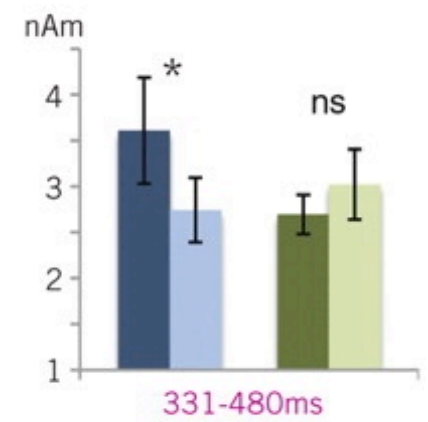
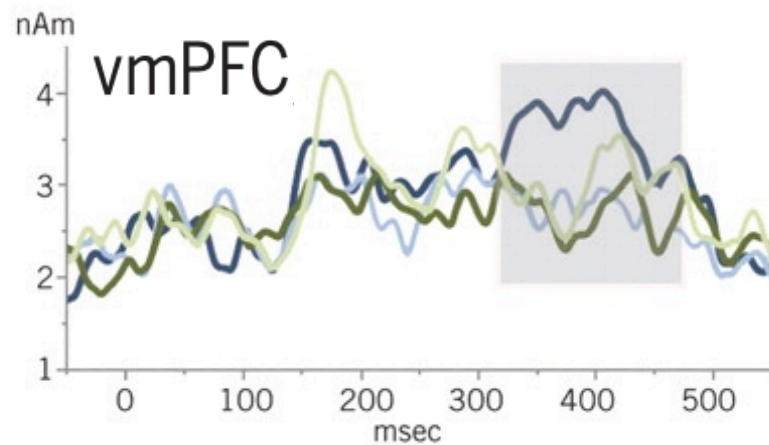
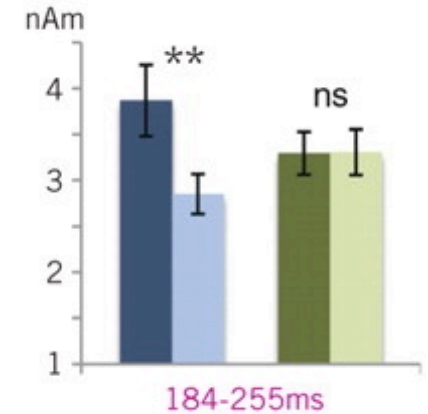
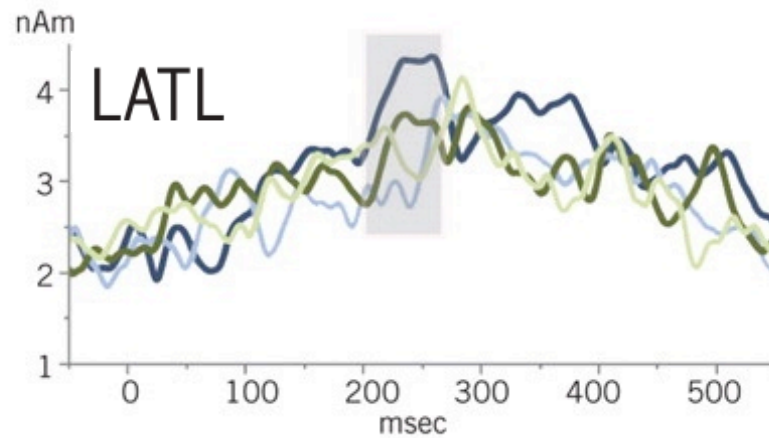
	Composition Task			List Task		
Two words	red	boat		cup	boat	
One word	xkq	boat		xkq	boat	

**Does the picture match any of the words that were presented?**

# 1. What happens in the brain when two words compose together?



Two-word Composition  One-word Composition   
Two-word List  One-word List 

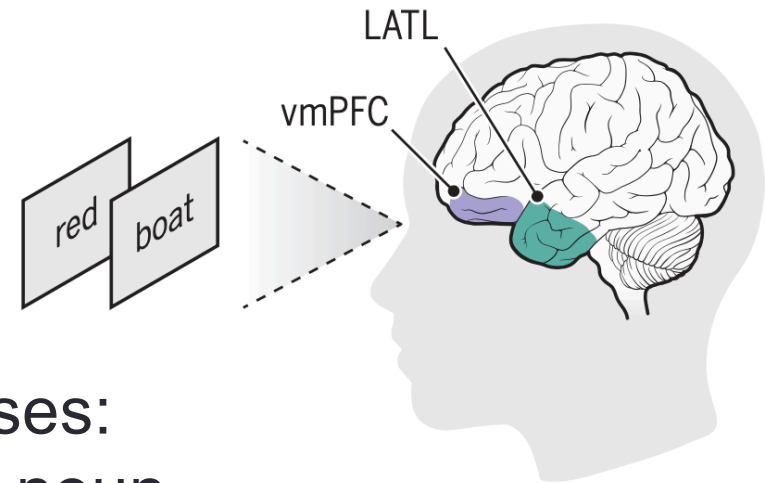


# 1. What happens in the brain when two words compose together?

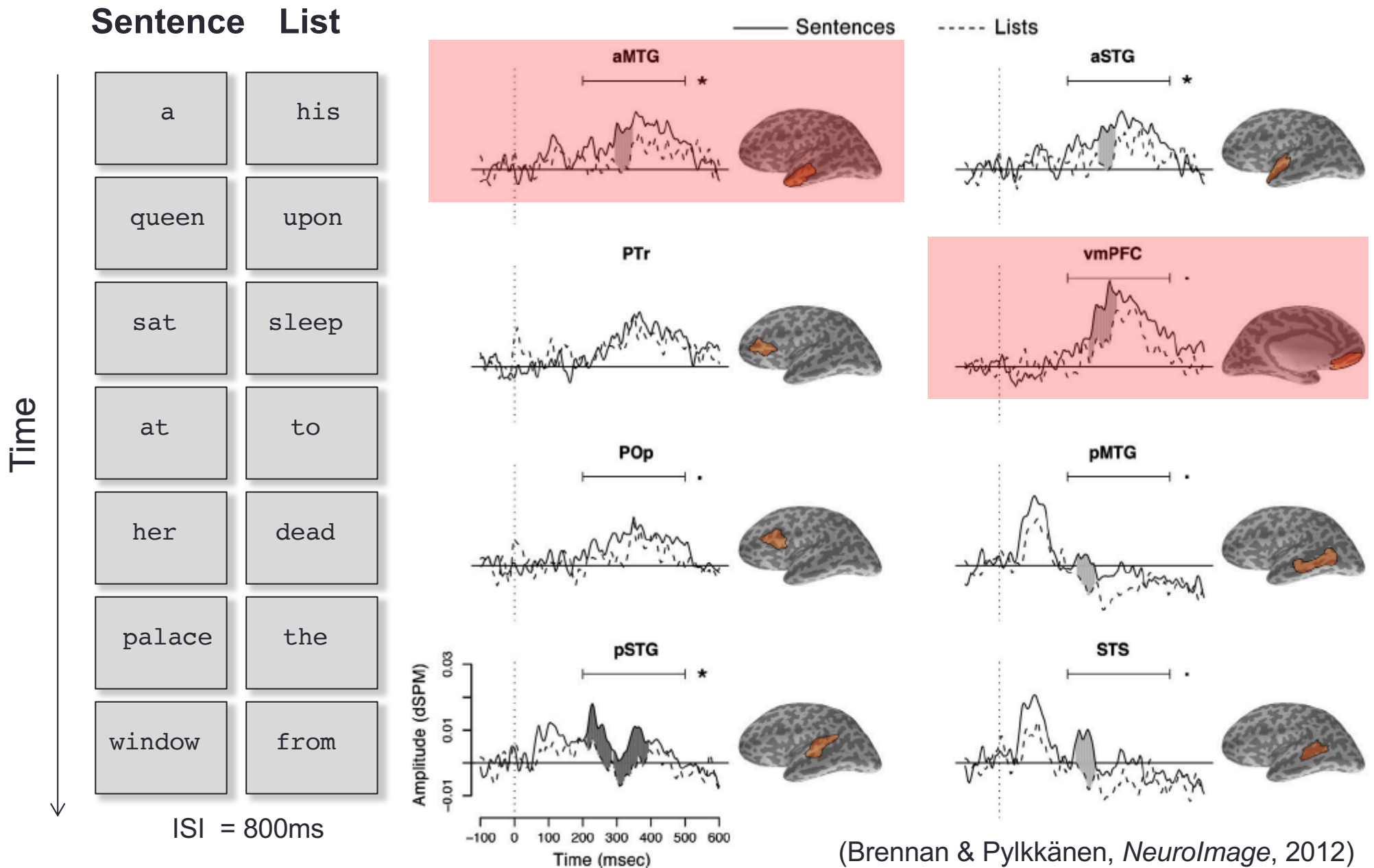
i. Do these effects generalize beyond adjective-noun composition?

- **Yes!** Extend to many other cases: verb-noun, adverb-verb, noun-noun etc..

ii. Do these effects generalize to production?



# Sentence vs. word list design in MEG

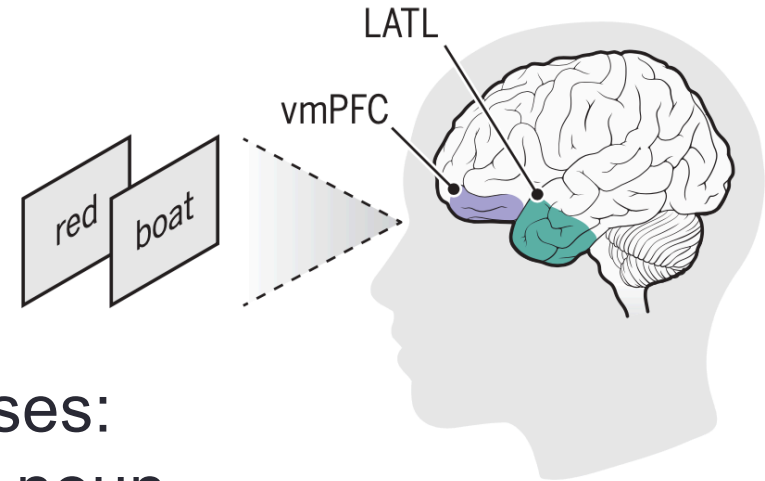




# 1. What happens in the brain when two words compose together?

i. Do these effects generalize beyond adjective-noun composition?

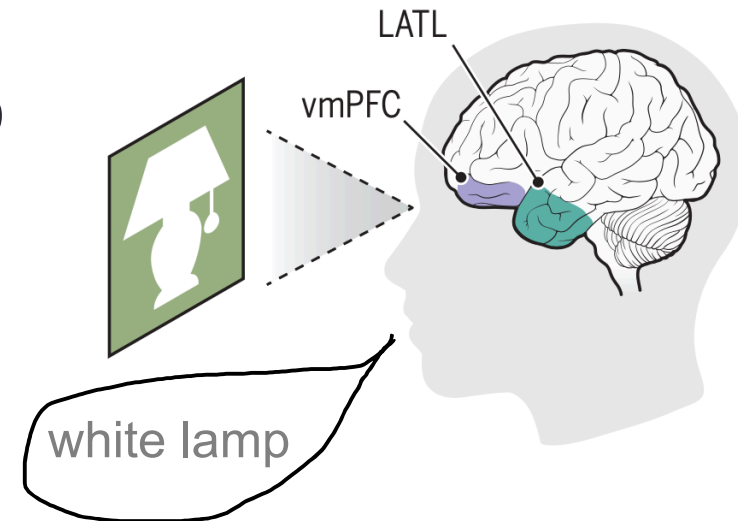
- **Yes!** Extend to many other cases: verb-noun, adverb-verb, noun-noun etc..



ii. Do these effects generalize to production?

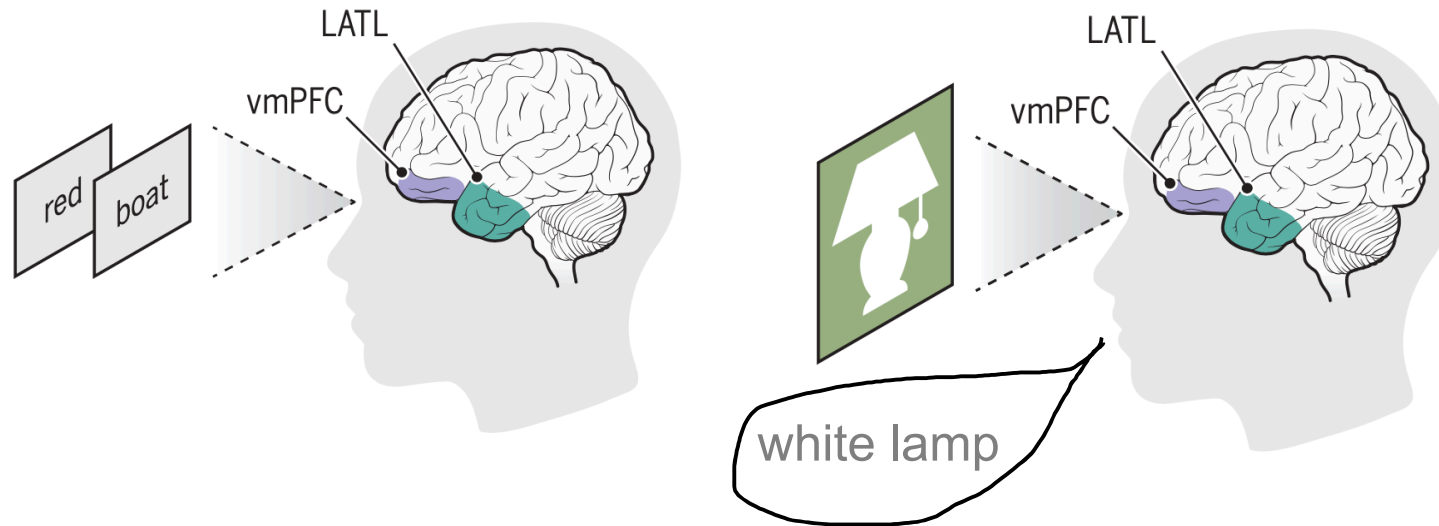
- **Yes!**

[Pylkkänen et al. *Cognition* 2014]  
[Blanco-Elorrieta et al. *Scientific Reports* 2018]  
[Del Prato, P., & Pylkkänen *Front Psych* 2014]  
[Blanco-Elorrieta & Pylkkänen, *NeuroImage* 2016]



## 2 questions

1. What happens in the brain when two words compose together?



2. What specific computations do the identified effects reflect?