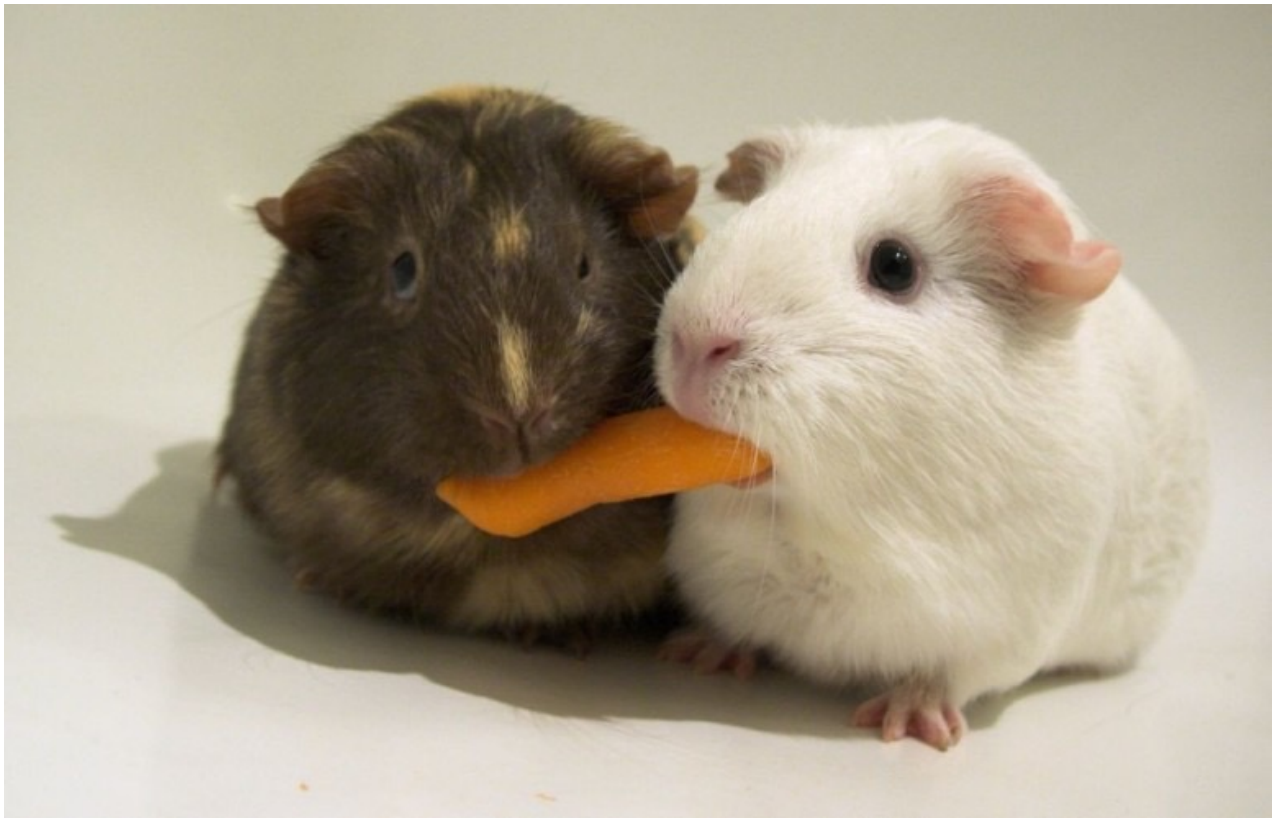
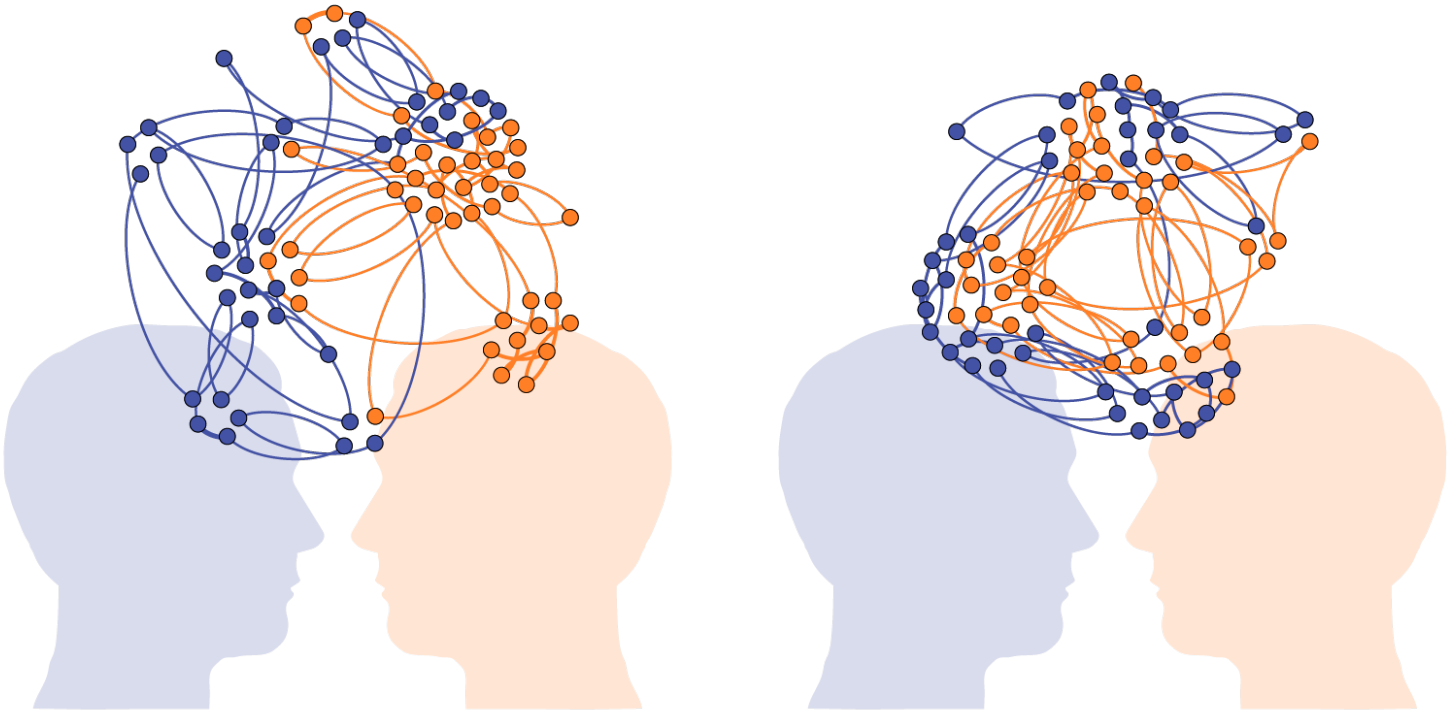
Today's question



What do we share?

Shared Conceptual Spaces I



Today's docket

1. Theoretical framework

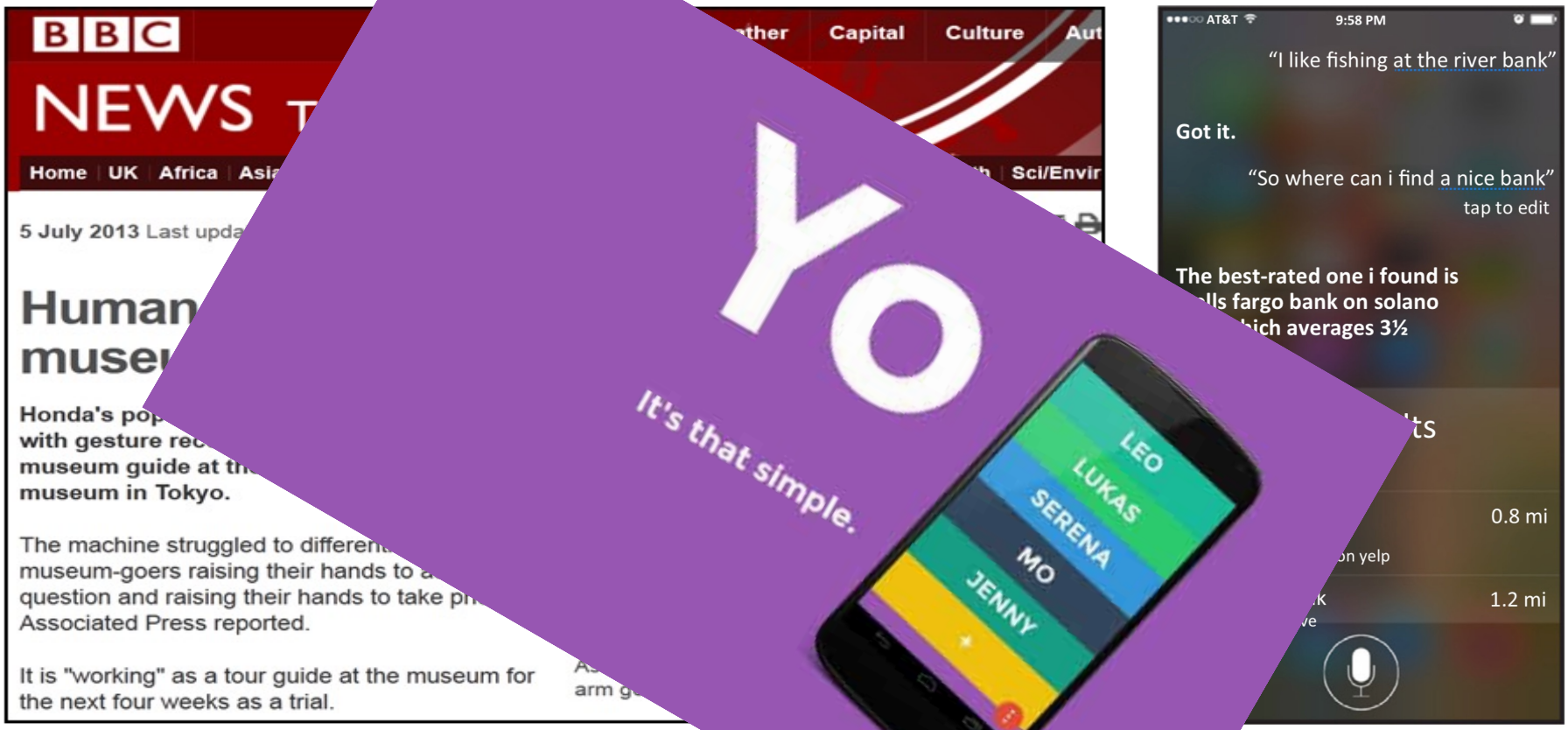
   Building a shared conceptual space

2. Neural predictions

   Neural activity supporting shared conceptual spaces

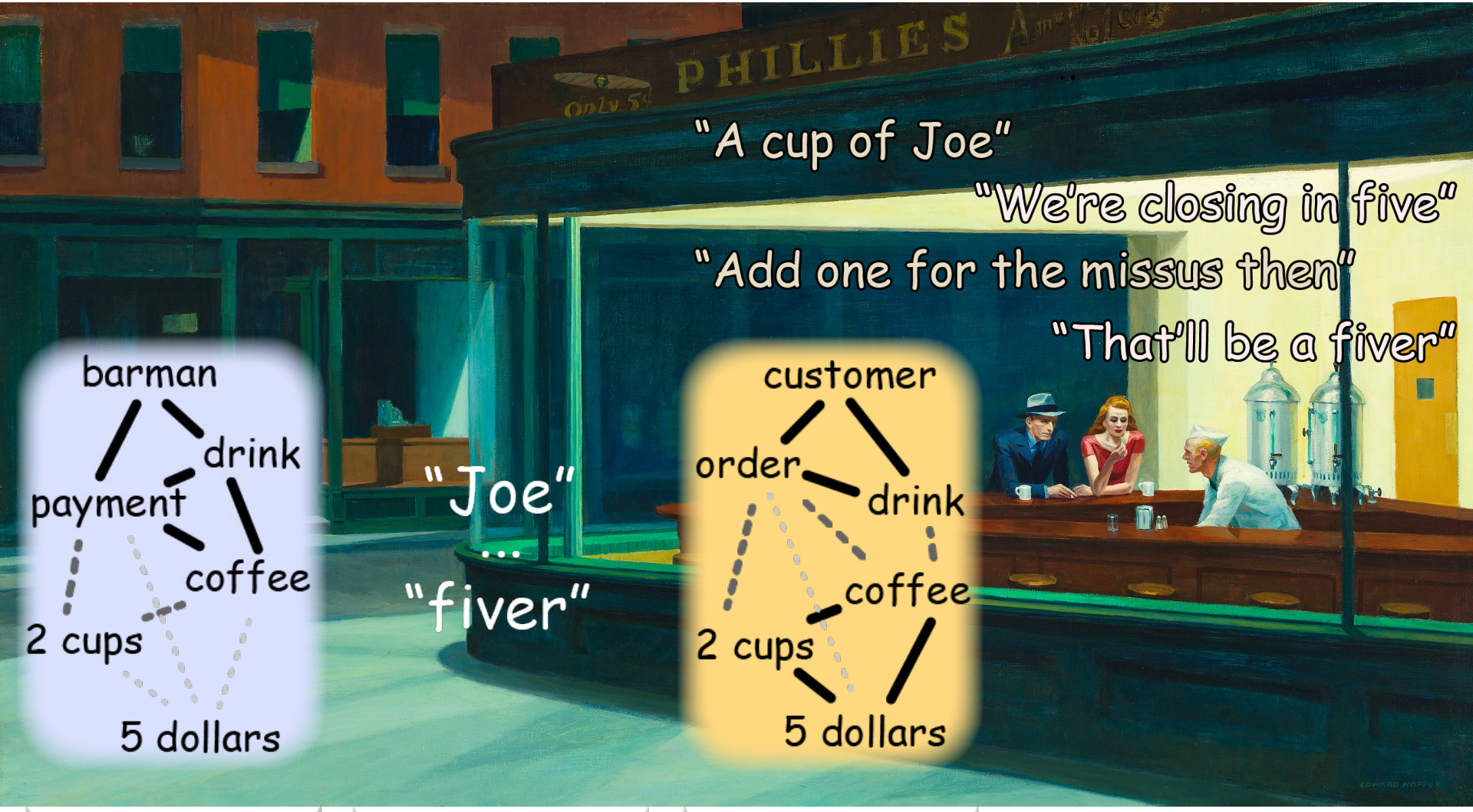
3. Neuroscientific evidence

   MEG, TMS, and lesion studies



Problem: You determine the context?

Solution: We build a shared conceptual space?



Customer concept space

Communicative signal

Barman concept space

Today's docket

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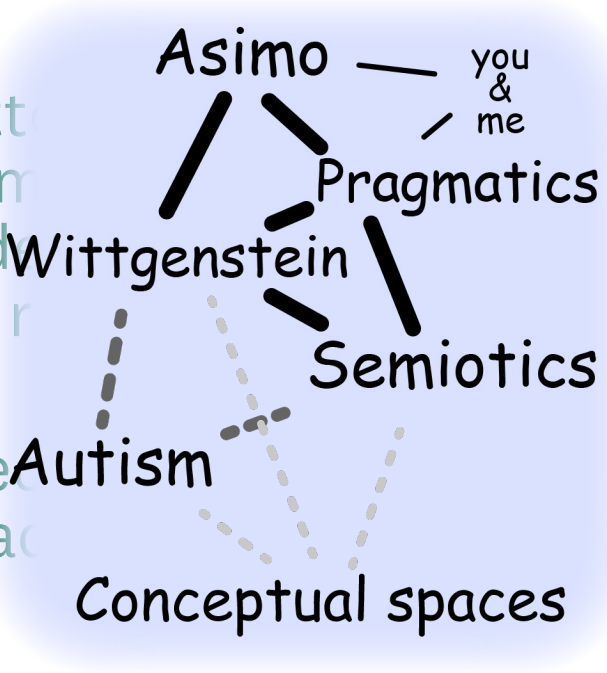

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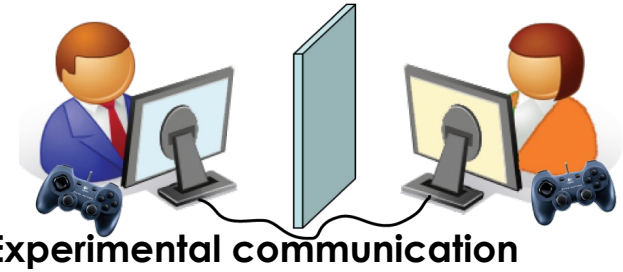


What's different?

Multiple communication channels
(vocalizations, bodily and facial postures/movements, eye contact)

Single communication channel
(movements of a geometric shape: experimental control over communicative environment)

Access to pre-existing conventions
(a common language, body emblems, facial expressions)

Novel communicative signals
(lack of pre-existing shared representations: experimental control over shared cognitive history)

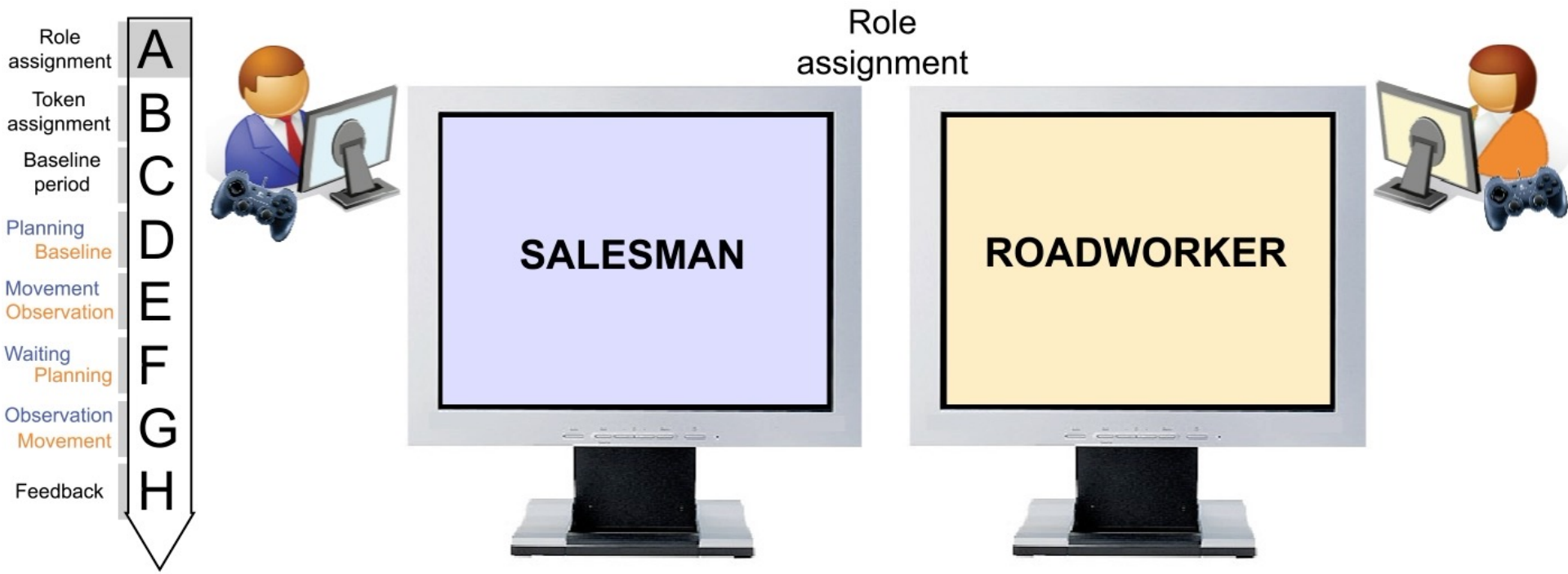
Spontaneous turn-taking

Experimentally-controlled roles
(isolation of production and comprehension)

What's identical?

Dynamic communicative context
(jointly built, updated according to the fleeting idiosyncrasies of an ongoing interaction)

Control interaction task involving the same stimuli, responses, attention and between-subjects dependencies, but no communicative necessities



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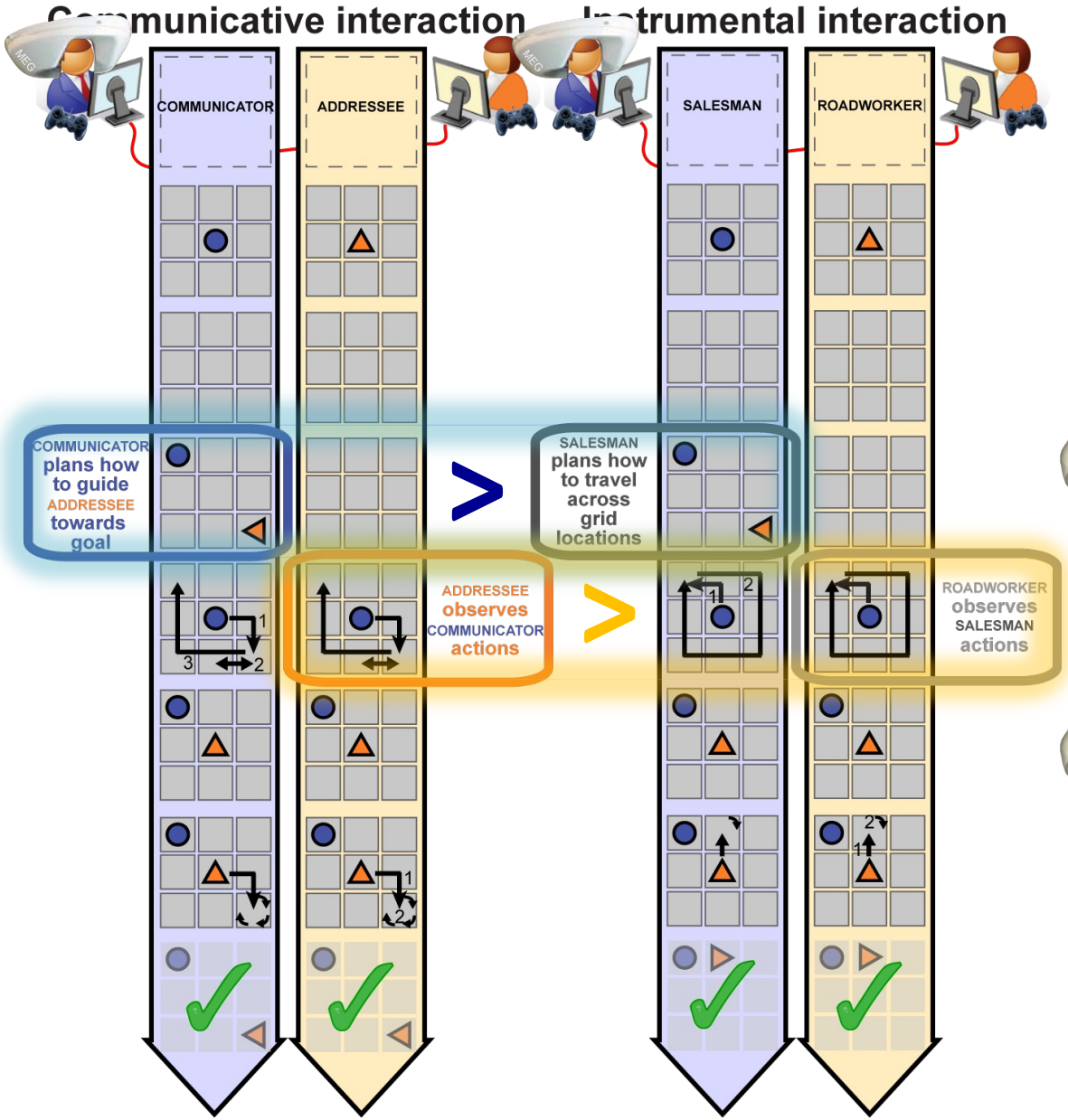
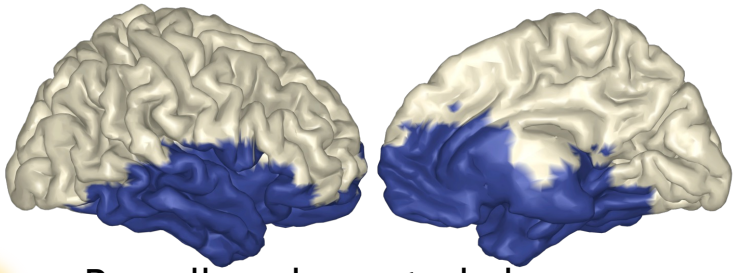
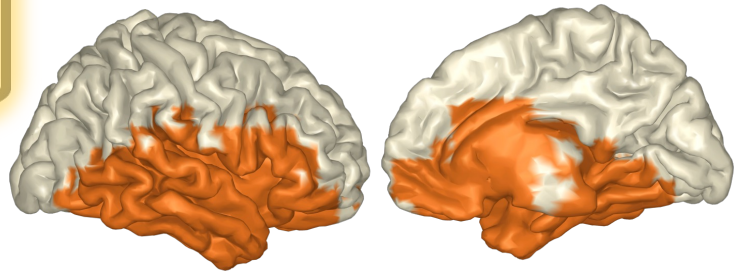


Production of **communicative** actions



Broadband spectral changes



Comprehension of **communicative** actions

Neural mechanisms of communicative innovation

Arjen Stolk[a,1], Lennart Verhagen[a], Jan-Mathijs Schoffelen[a,b], Robert Oostenveld[a], Mark Blokpoel[a], Peter Hagoort[a,b], Iris van Rooij[a], and Ivan Toni[a]

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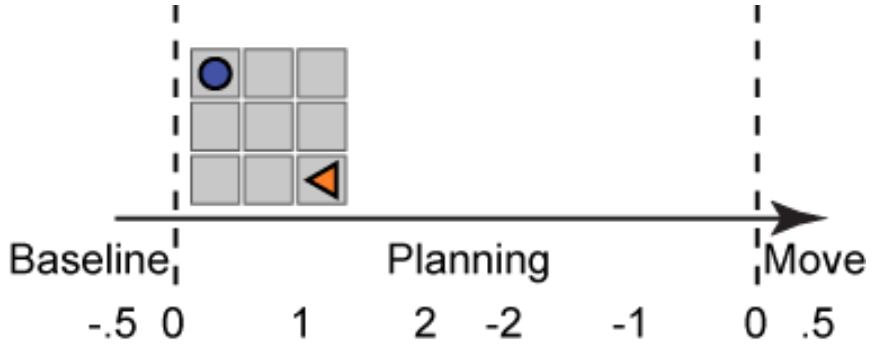

Production of
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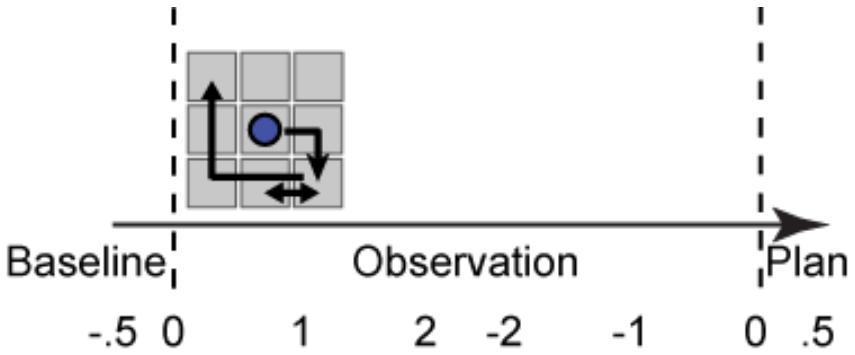

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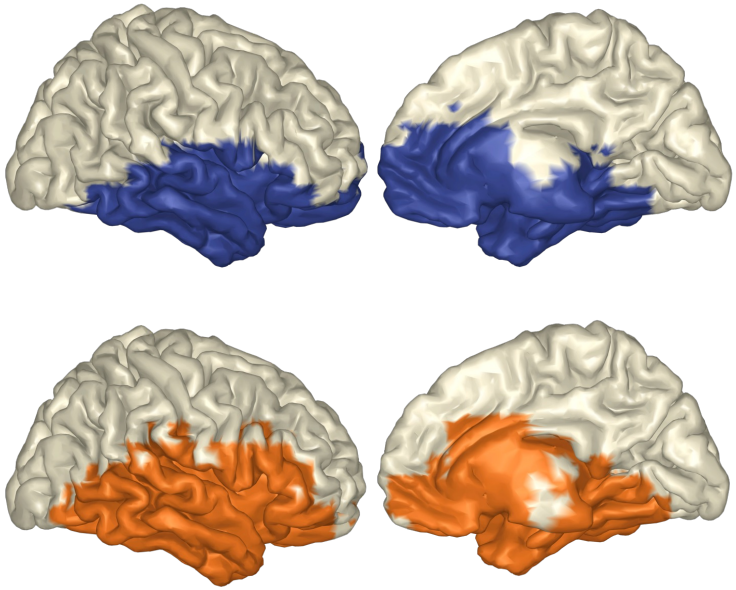

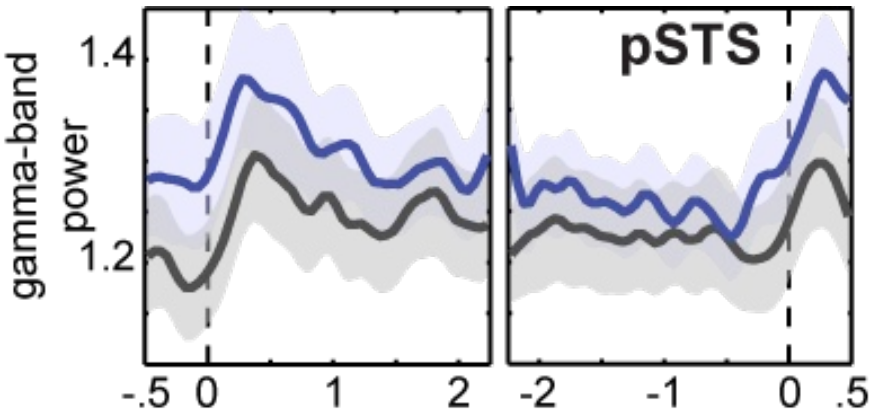

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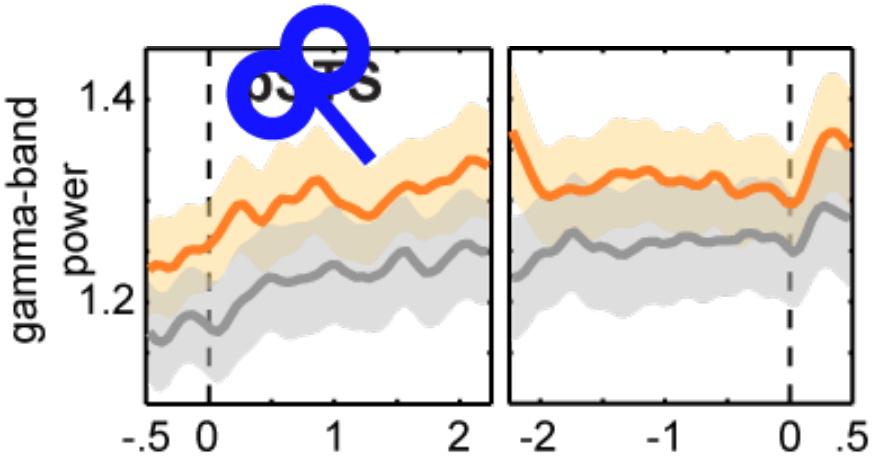

Comprehension of
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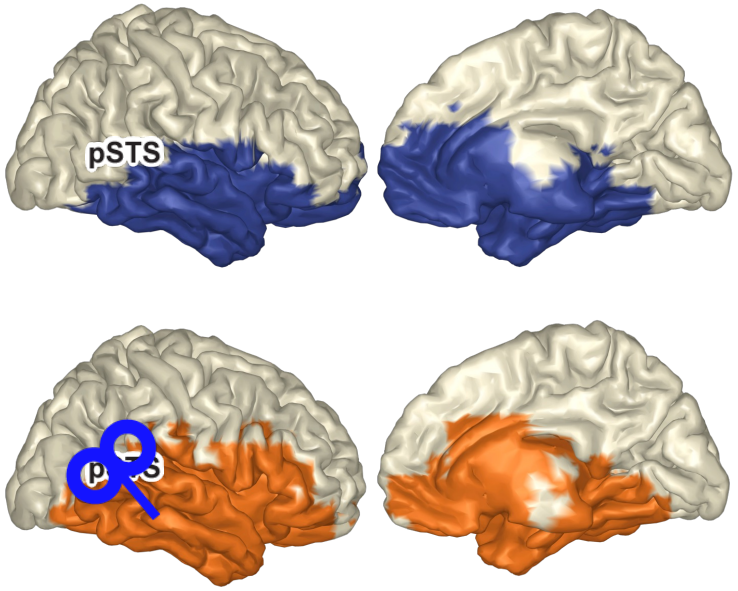
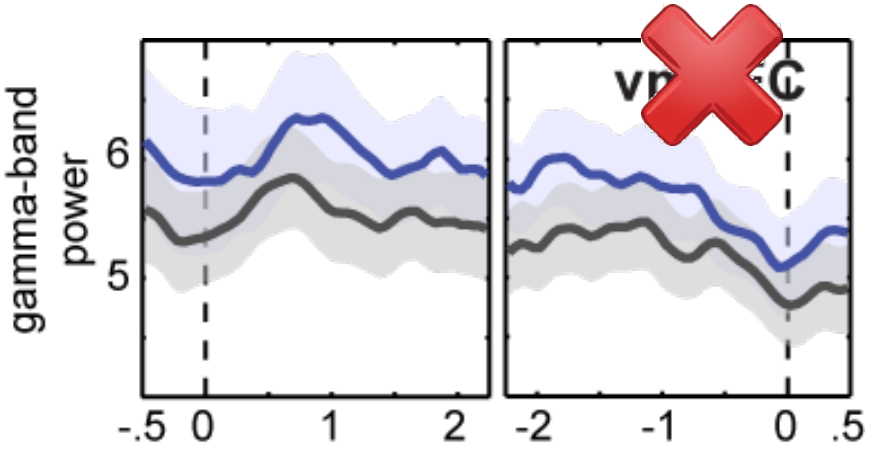
instrumental actions

Understanding communicative actions: A repetitive TMS study

Arjen Stolk [a,], Matthijs L. Noordzij [b], Inge Volman [a,c], Lennart Verhagen [a], Sebastiaan Overeem [d], Gijs van Elswijk [d], Bas Bloem [d], Peter Hagoort [a,e] and Ivan Toni [a]*



Necessary for integrating knowledge of the recent communicative history



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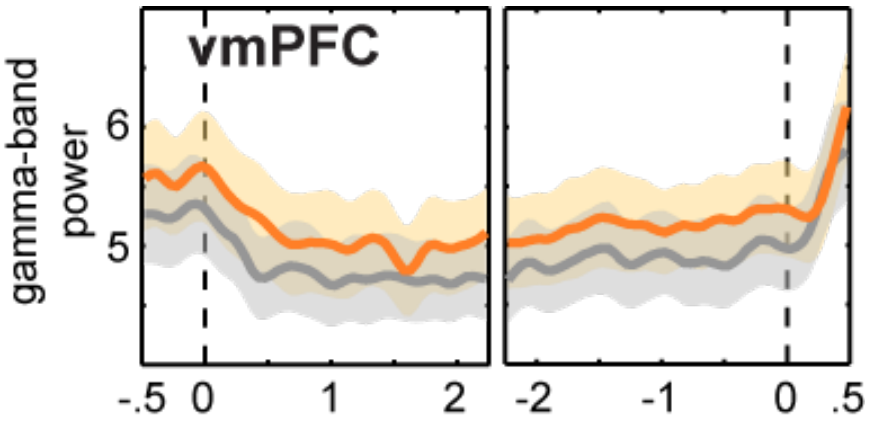

Comprehension of
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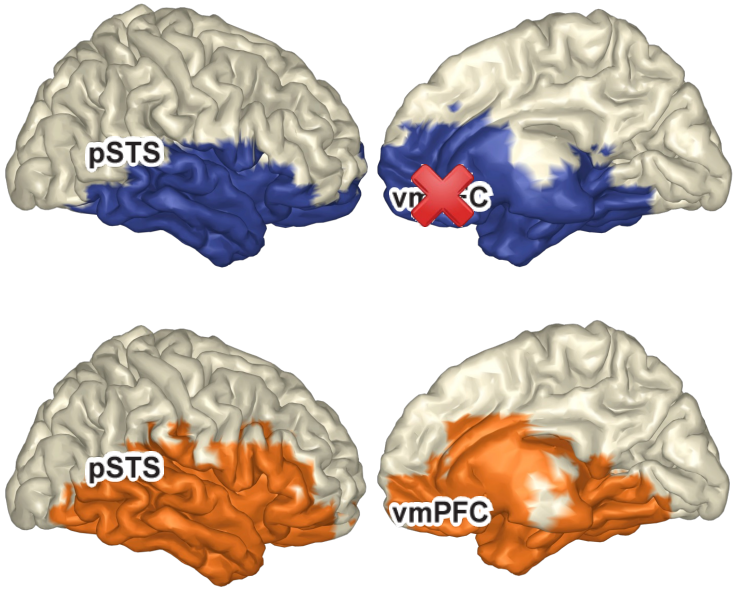
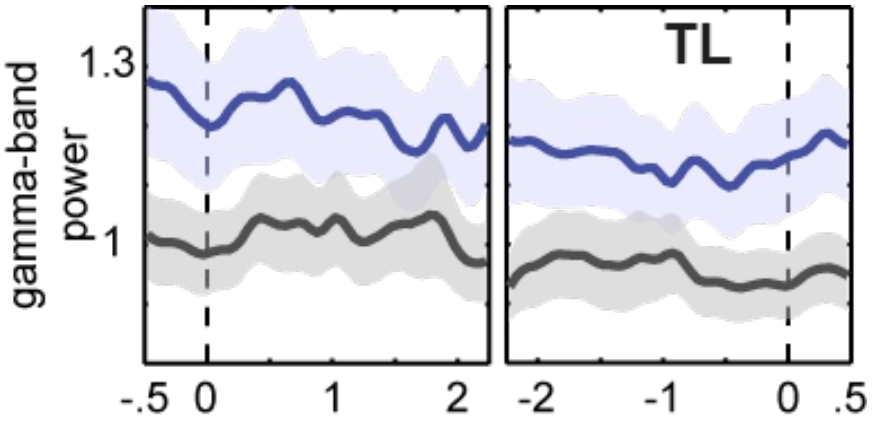
Necessary for tuning decisions with knowledge of a communicative partner



Altered Communicative Decisions following Ventromedial Prefrontal Lesions

Arjen Stolk,[1,*] Daniela D'Imperio,[2,3,4] Giuseppe di Pellegrino,[2,3] and Ivan Toni[1]



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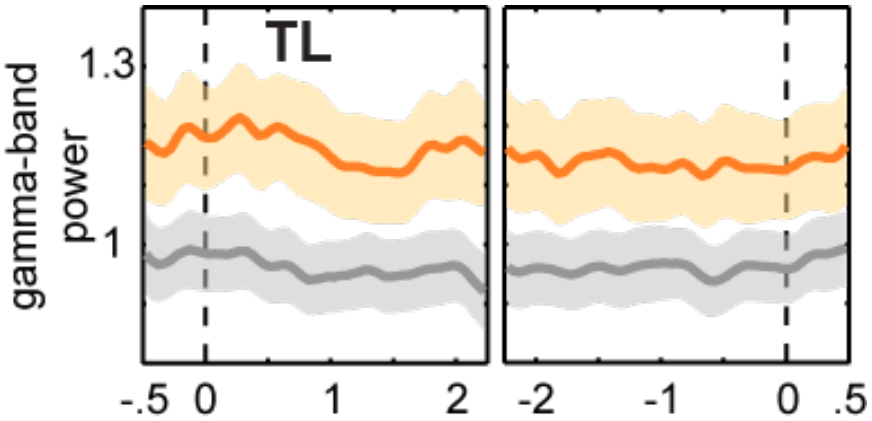

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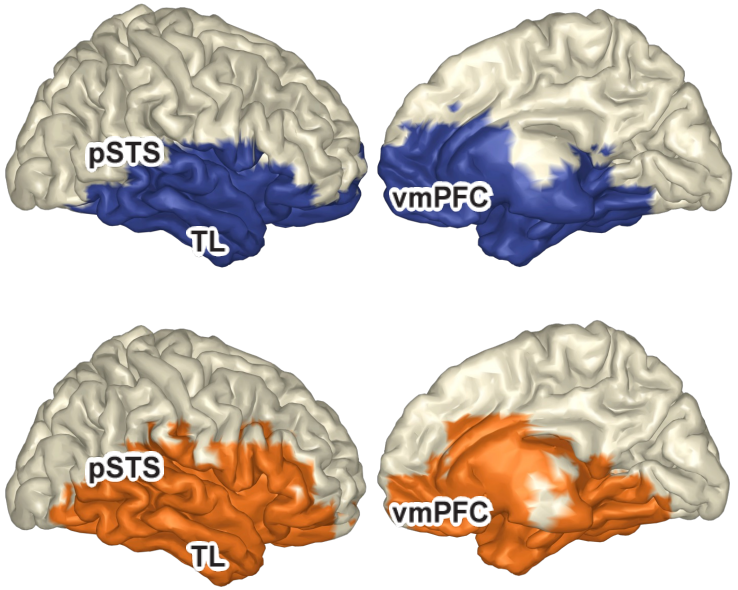
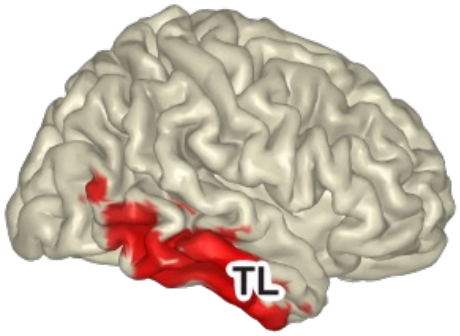
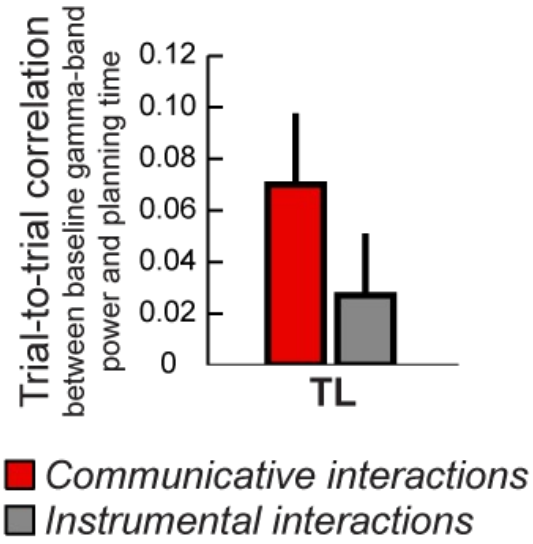
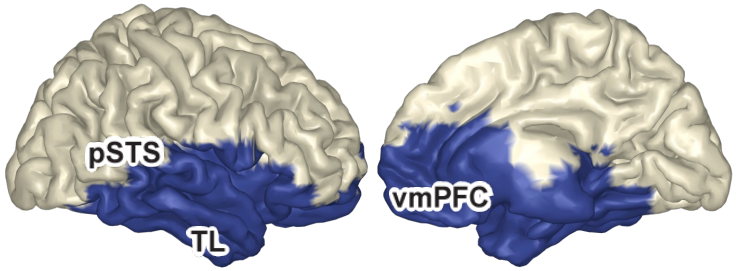
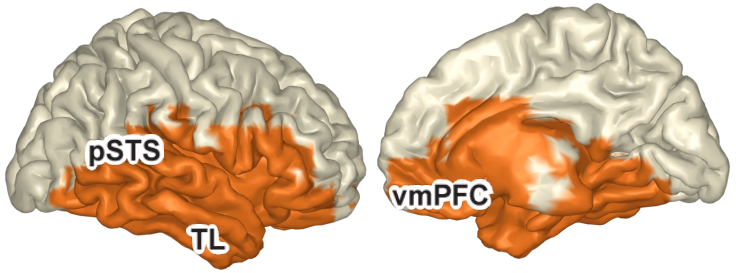


Supports communicative behaviors in a state-dependent manner









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Take-home concepts

- Communicators and addressees achieve mutual understanding by using the same computational procedures and neuronal substrates

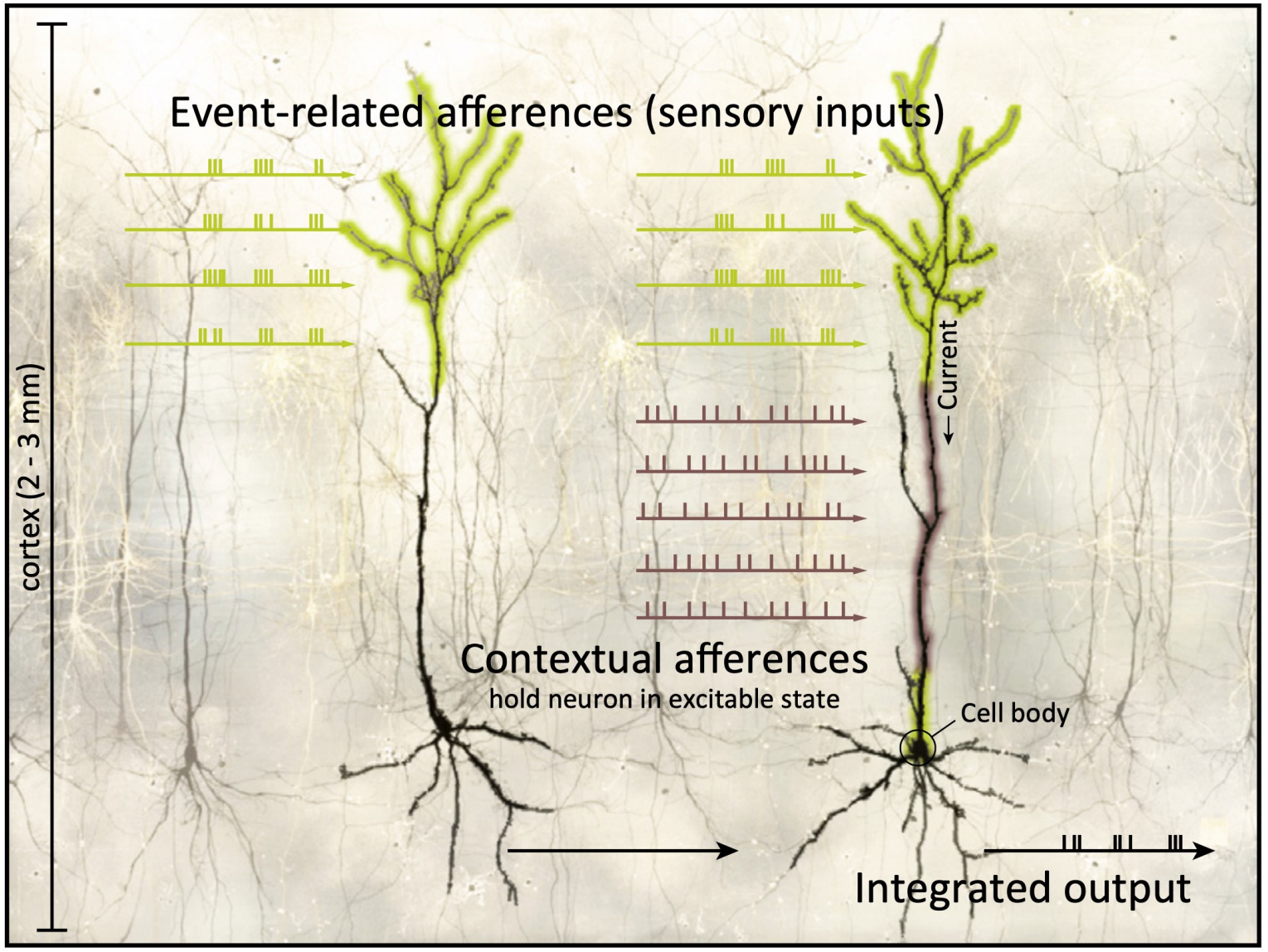
  (implemented in a right-lateralized frontotemporal network)

- Brain regions supporting communication are already upregulated before a communicative utterance is produced or observed

- Shared Conceptual Spaces II

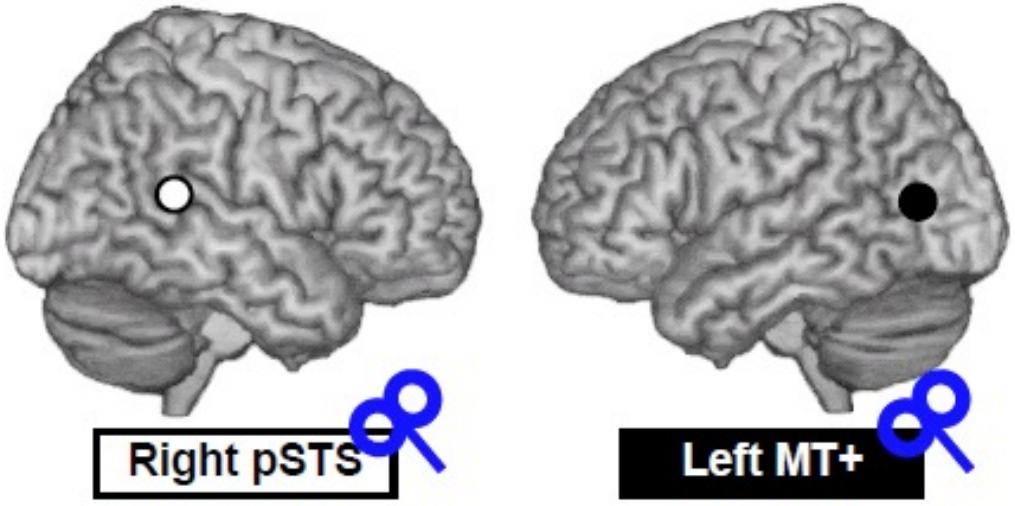
Bonus: A putative neuronal integrative mechanism

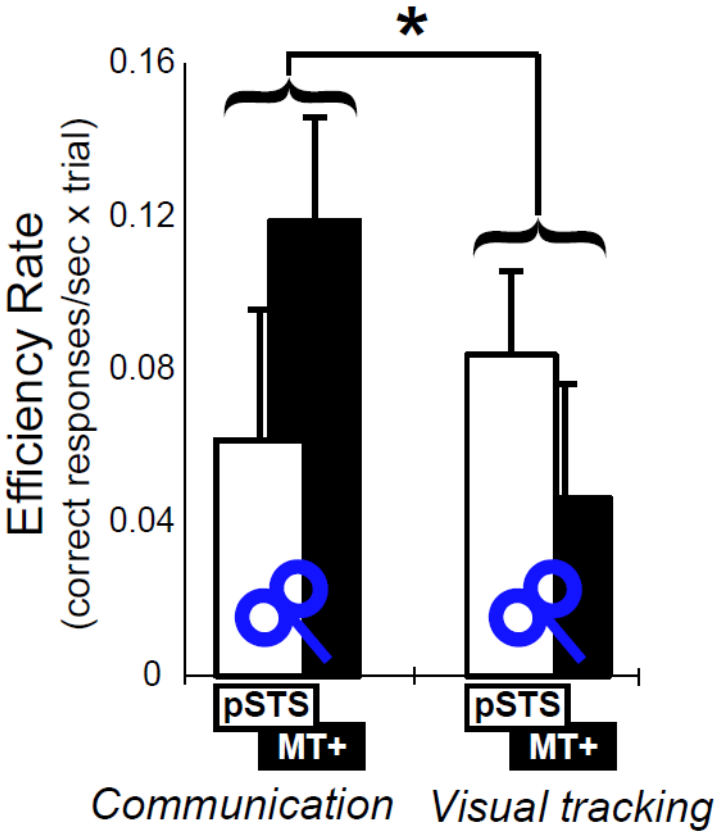
DARTMOUTH



Ongoing contextual inputs can hold neurons near an excitability threshold

Bonus: Perturbing neural integration





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Right pSTS is necessary to benefit from the recent communicative history