

How to disentangle language and consciousness processes?

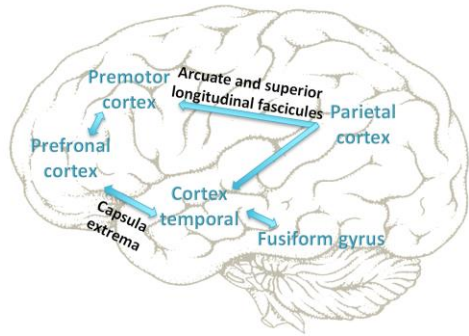
13/12/2023

Charlène AUBINET

FNRS postdoctoral researcher



Aphasia in consciousness diagnosis



Post-comatose language impairment



Altered comprehension of verbal commands



Underestimation of consciousness levels

Brief Evaluation of Receptive Aphasia (BERA)

Look at the two images

Look at me

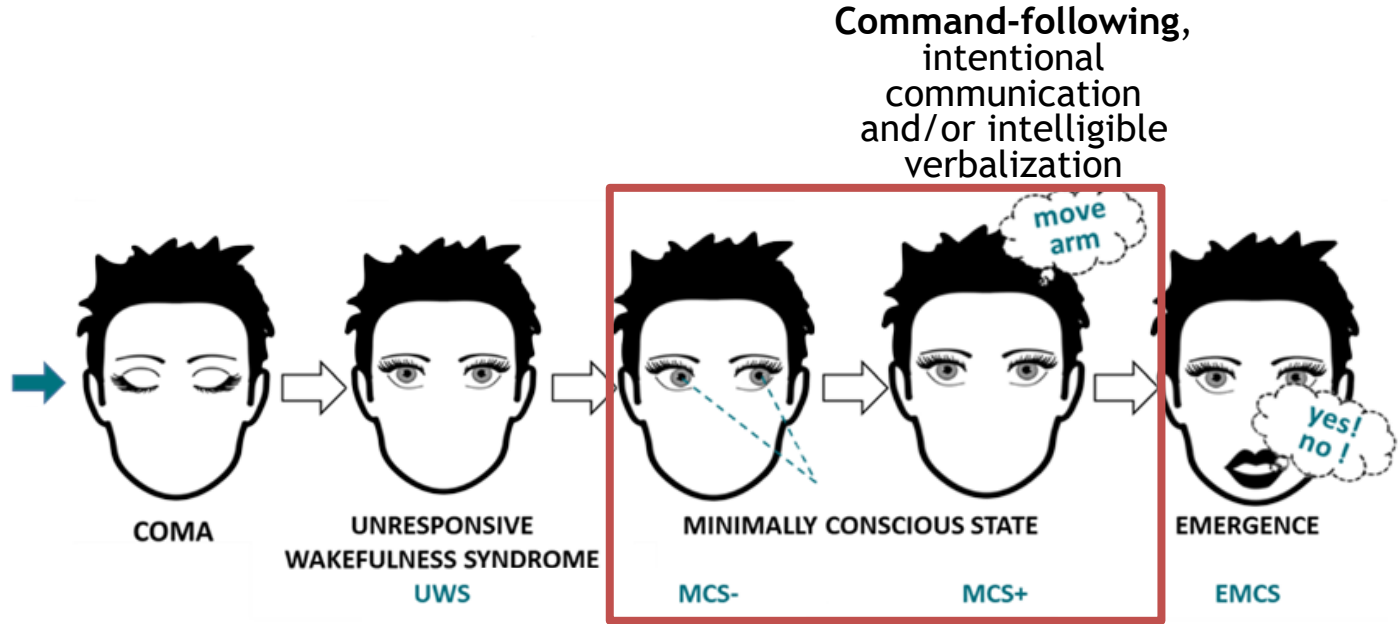
Look at + 'TARGET WORD OR SENTENCE'



From clinical research...

Recovery of language skills after coma

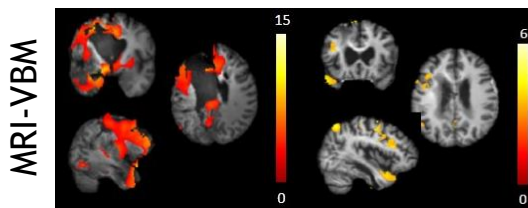
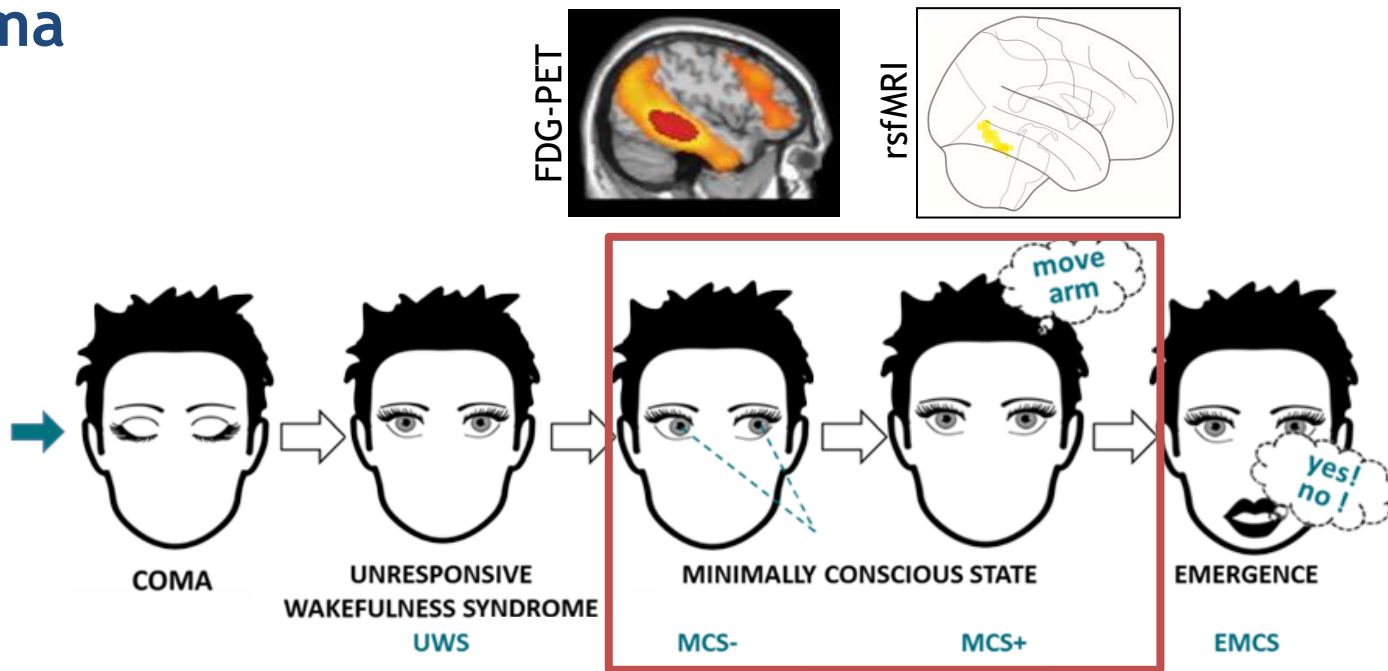
Trauma
Anoxia
Hemorrhage
Metabolic
Infection
Inflammation



Aubinet et al. (2020), *NNR*
Aubinet et al. (2018), *HBM*
Aubinet et al. (2019), *FNSYS*

Recovery of language skills after coma

Trauma
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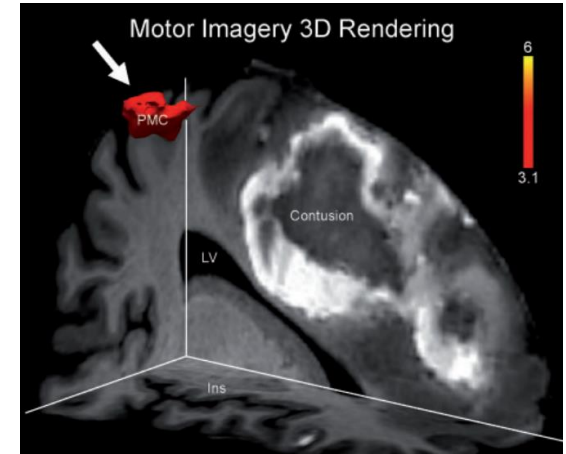
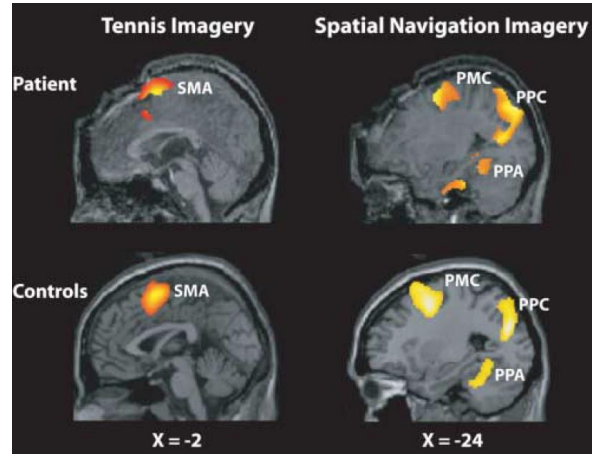
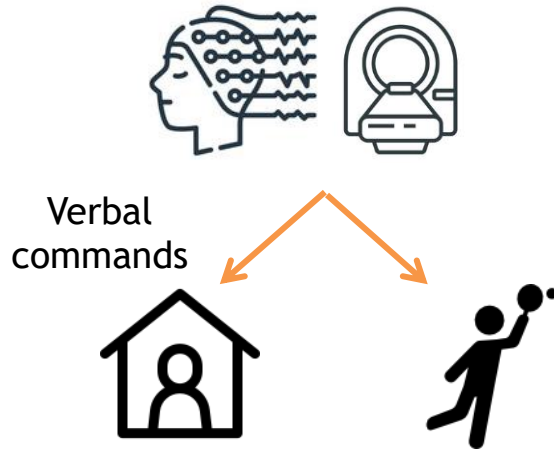
Aubinet et al. (2020), *NNR*
Aubinet et al. (2018), *HBM*
Aubinet et al. (2019), *FNSYS*

From
clinical
research...



Active tasks

→ Explicit language processing



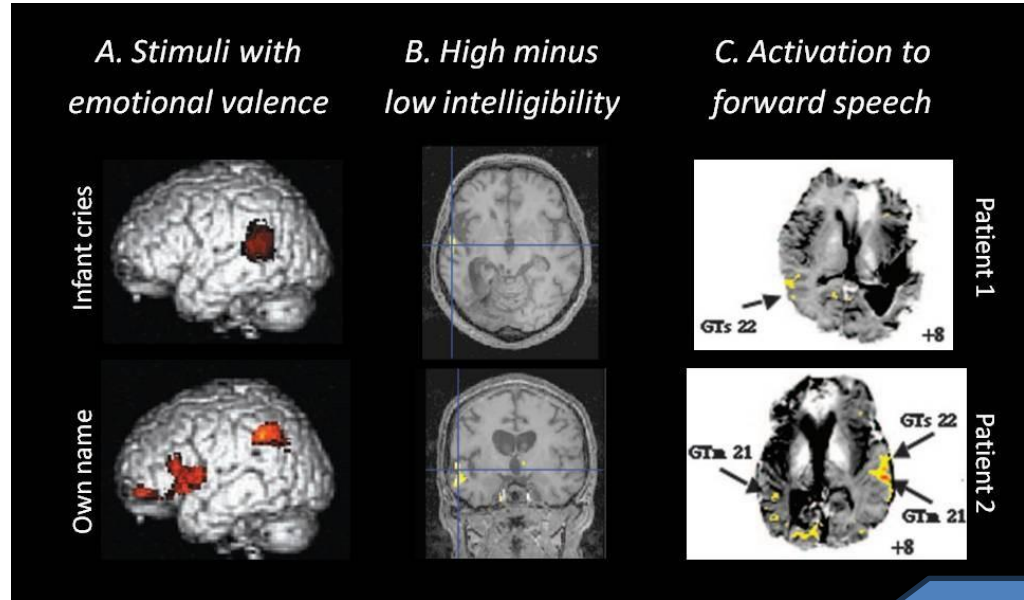
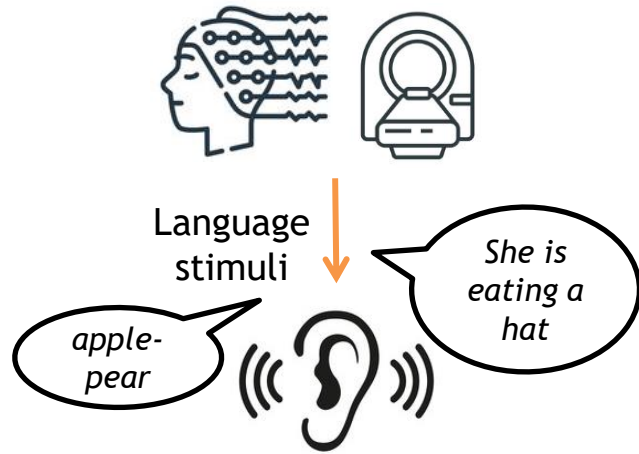
→ *Cognitive-Motor Dissociation*

From
clinical
research...



Passive listening tasks

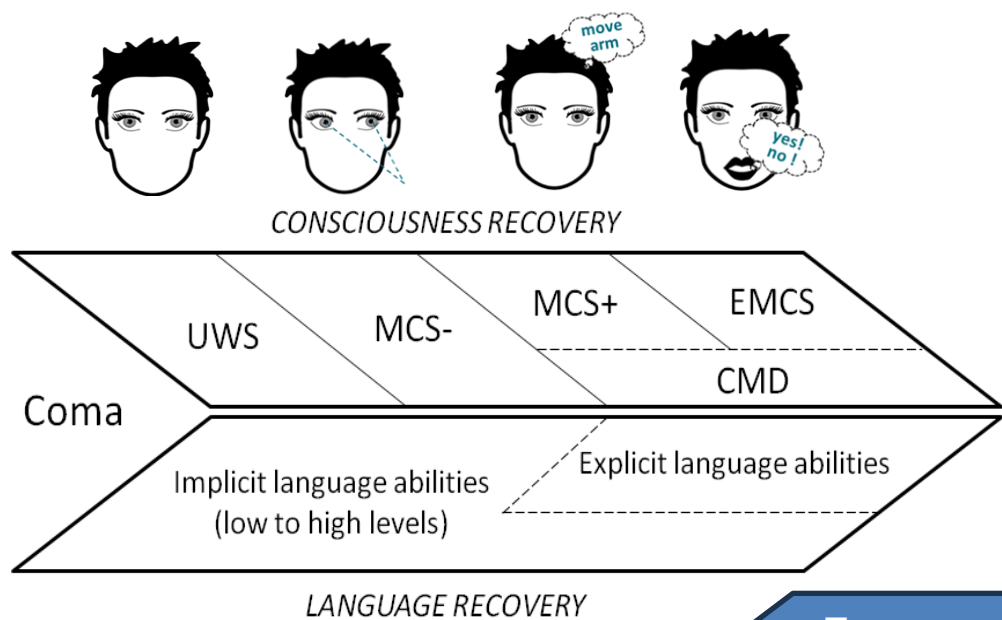
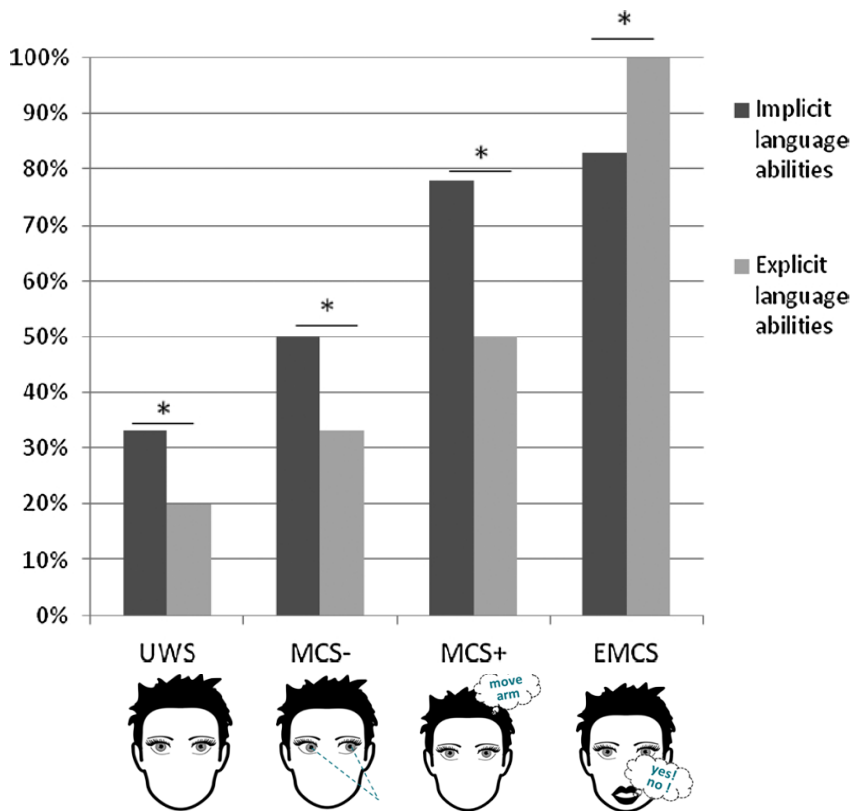
→ Implicit language processing



→ Covert Cortical Processing

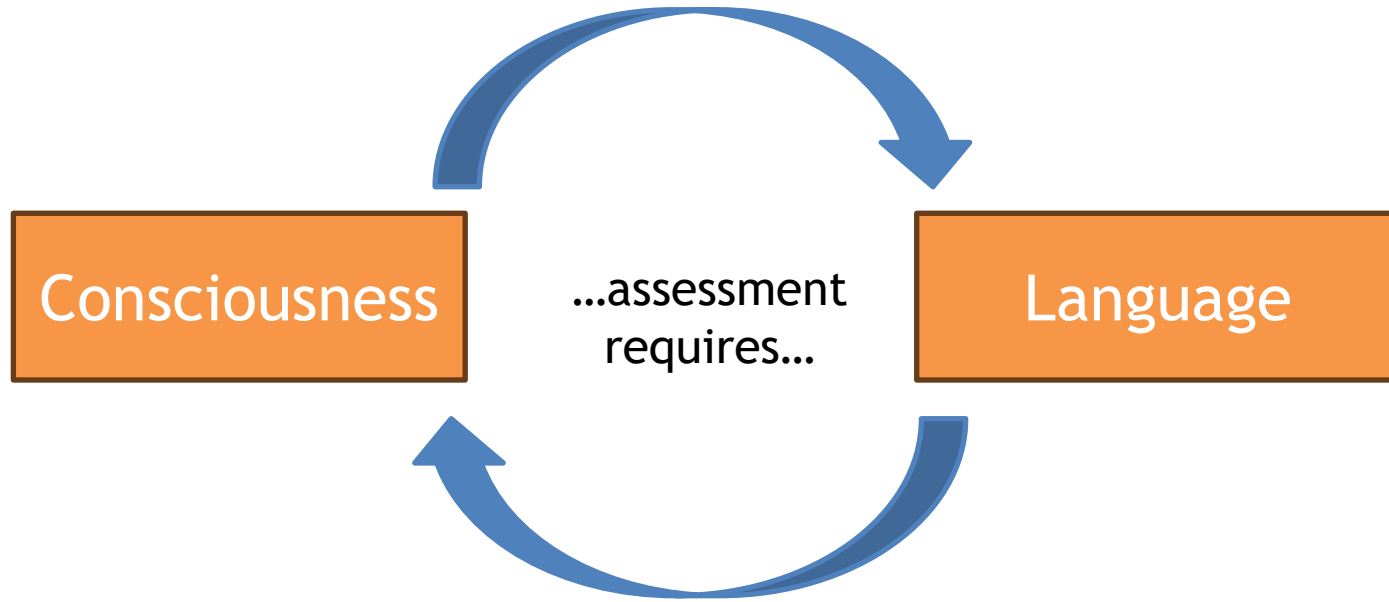
From
clinical
research...

Language // consciousness



From clinical research...

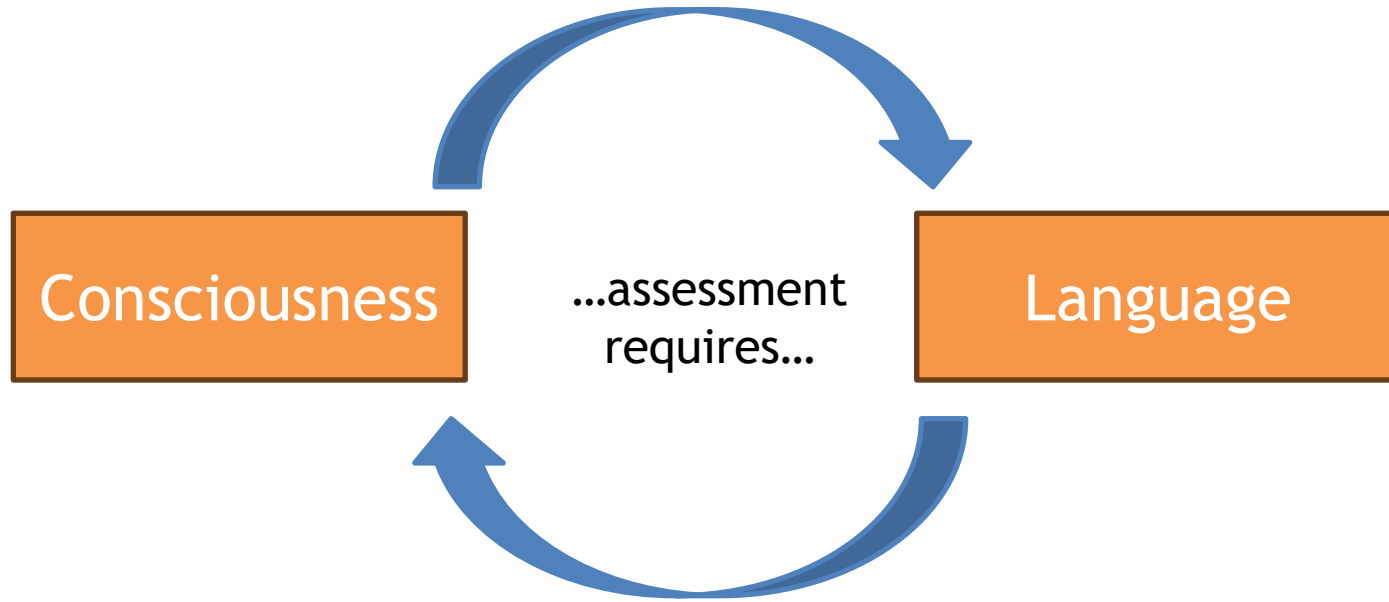
Language and consciousness: the circularity issue



→ *How to disentangle language and consciousness processes?*

... to
theoretical
hypotheses

Language and consciousness: the circularity issue



→ *How to disentangle language and consciousness processes?*

... to
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hypotheses

High-level implicit language processing

Clinical research: UWS patients

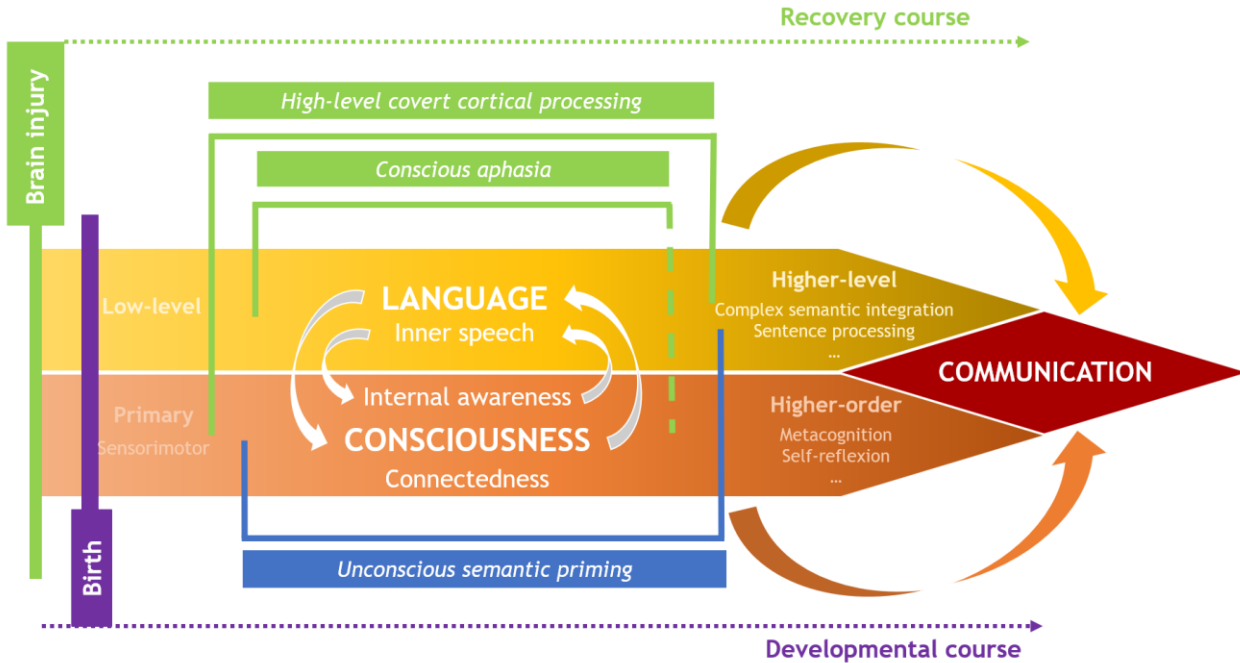
→ Factually

Misdiagnosis

« Automatized process

Experimentation

→ High-level semantic associations require conscious processing but not low-level categorical semantic associations



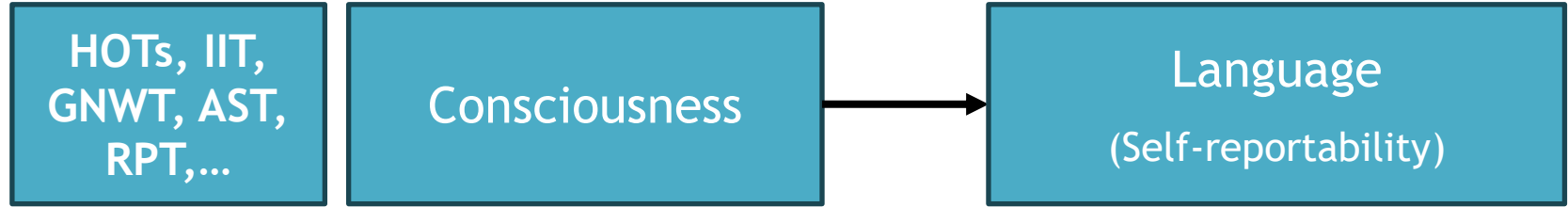
arch follows April)



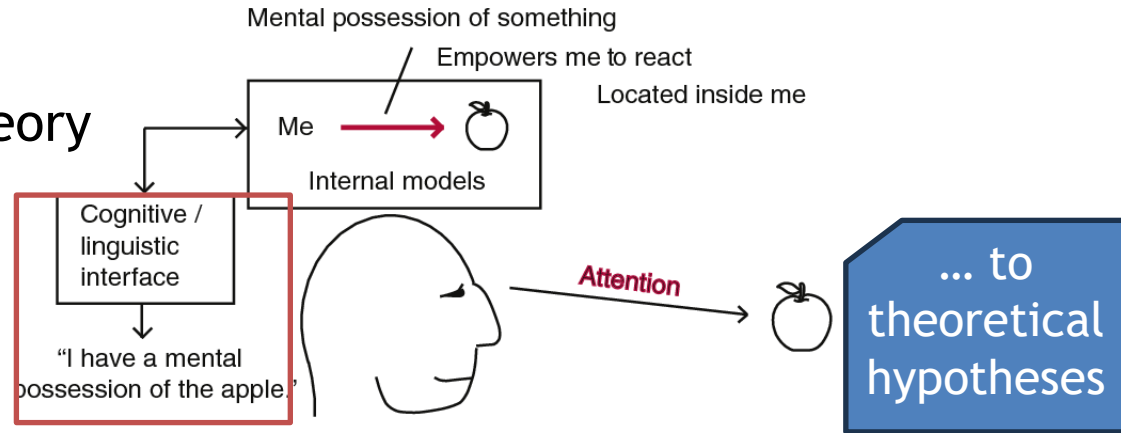
... to theoretical hypotheses

Kotchoubey et al., *Curr. Pharm. Des.*, 2013
Chien et al., *Current Psychol*, 2023

Language processing in current theories of consciousness

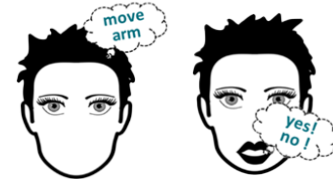
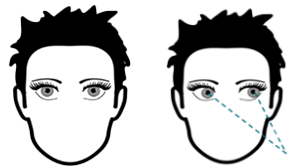
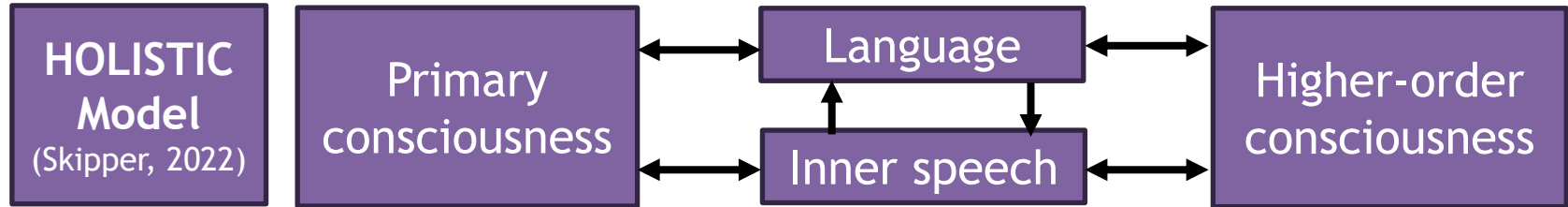


E.g., Attention Schema Theory



Graziano et al. (2017),
Tononi et al. (2014),
Edelman et al. (2009),
...

Language processing in current theories of consciousness



... to theoretical hypotheses

Perspectives

To further examine consciousness and language recovery

- Longitudinal studies comparing consciousness vs. language recovery
- Language vs. consciousness neural networks in healthy subjects → post-comatose patients

To investigate dissociated consciousness and language

- Deeper assessment for unconscious patients with high-level language processing? And in aphasic conscious patients?
- Semantic priming paradigms → specify which language processing requires consciousness?



Questions?

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Aubinet C, Chatelle C, Gosseries O, Carrière M, Laureys S, Majerus S. Residual implicit and explicit language abilities in patients with disorders of consciousness: A systematic review. *Neurosci Biobehav Rev.* 2022 Jan;132:391-409.