

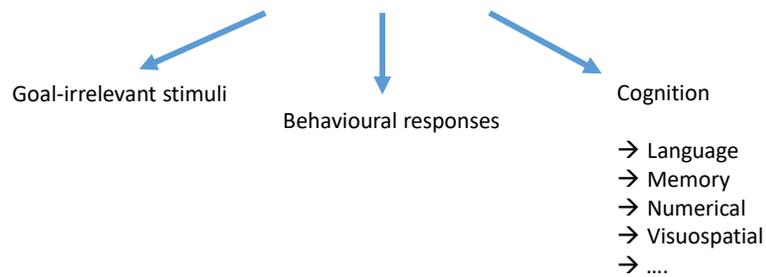
LANGUAGE CONTROL PROCESSES: DOMAIN GENERAL OR DOMAIN-SPECIFIC?

Lucie Attout & Steve Majerus
University of Liège, Belgium

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Introduction

Inhibitory control



(Nigg, 2000; Diamond, 2013)

Introduction

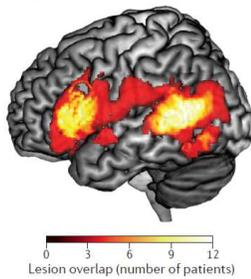
- In language → phonological and semantic inhibitory control



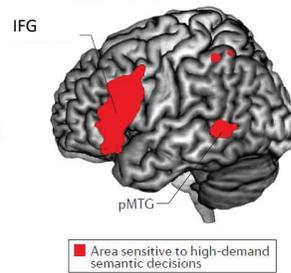
Introduction

- Semantic control

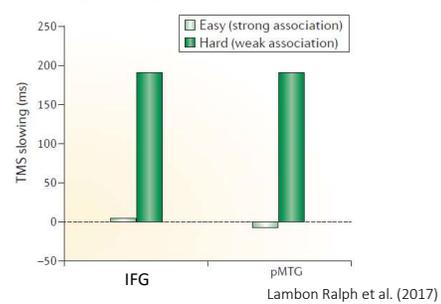
a Lesion overlap in anterior and posterior SA



b fMRI meta-analysis of executively demanding semantic processing



c TMS effect on executively demanding semantic processing

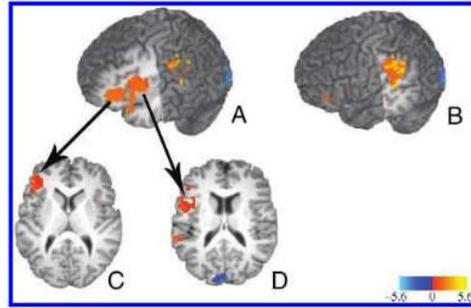
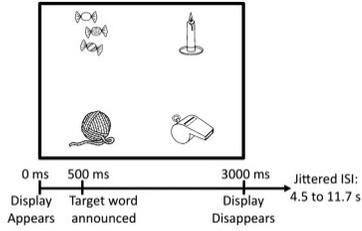


→ Left and right IFG, the MTG, the pre- SMA and the AG

(Lambon Ralph et al. 2017, Hallam et al, 2016; Jefferies & Lambon Ralph, 2006)

Introduction

- Phonological control



Left IFG and SFG, SMG, right AC and left posterior STG

Righi et al. (2009); Marian et al. (2014)

Introduction

General inhibitory account

Semantic and phonological control deficit
(IFG)

vs.

A fractionated inhibitory account

Semantic control deficit
(IFG anterior)

Phonological control deficit
(IFG posterior)



IFG

Hamilton and Martin (2007)
Barde et al. (2006)

Introduction

- Overlap between the IFG for both semantic and phonological control processes
 - Specific regions of the IFG (anterior/posterior parts) will be responsible of each control process
 - No study compared directly both with similar design: Tasks? Patient data?
- **Heterogeneity ++**

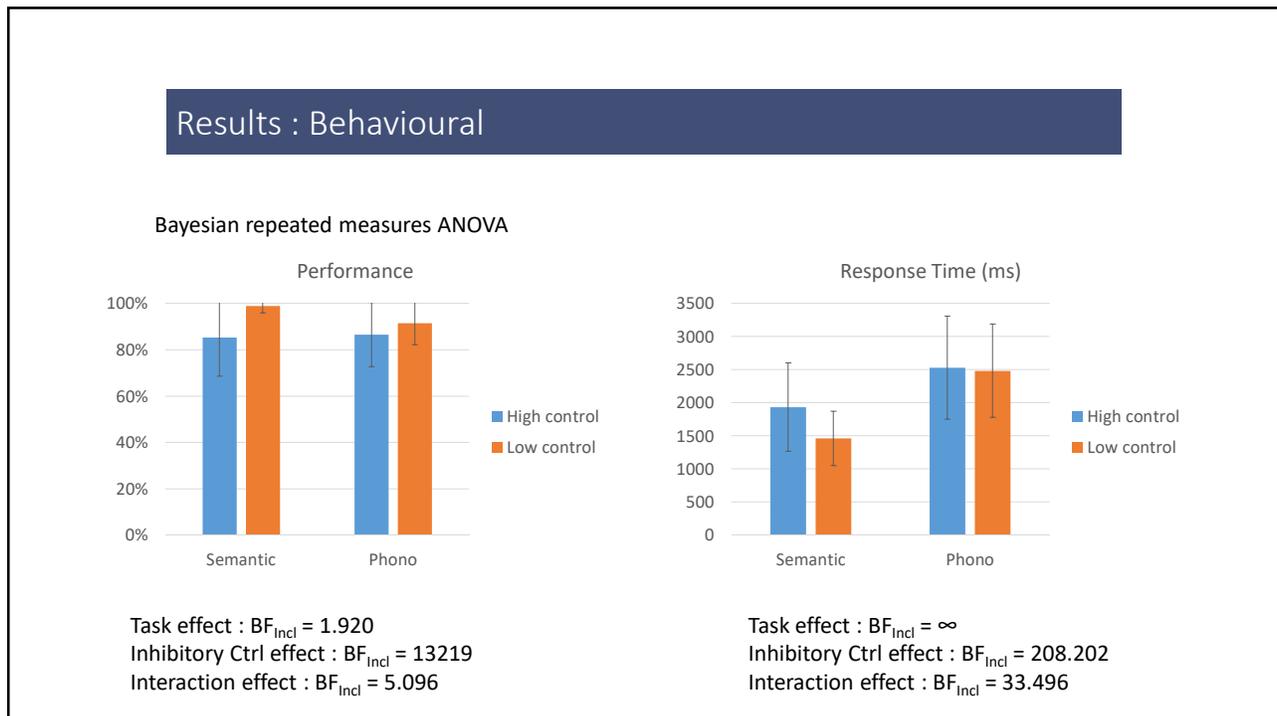
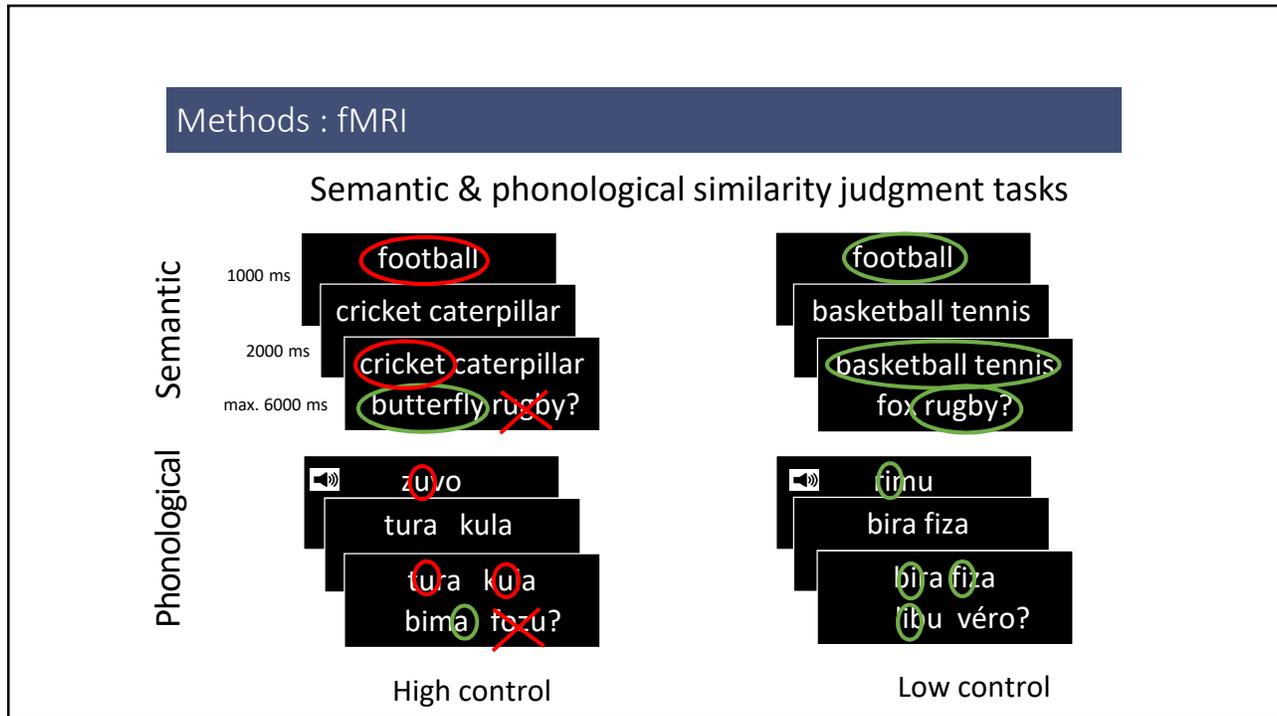
Inhibitory control in language processes: Common or specific?

Methods

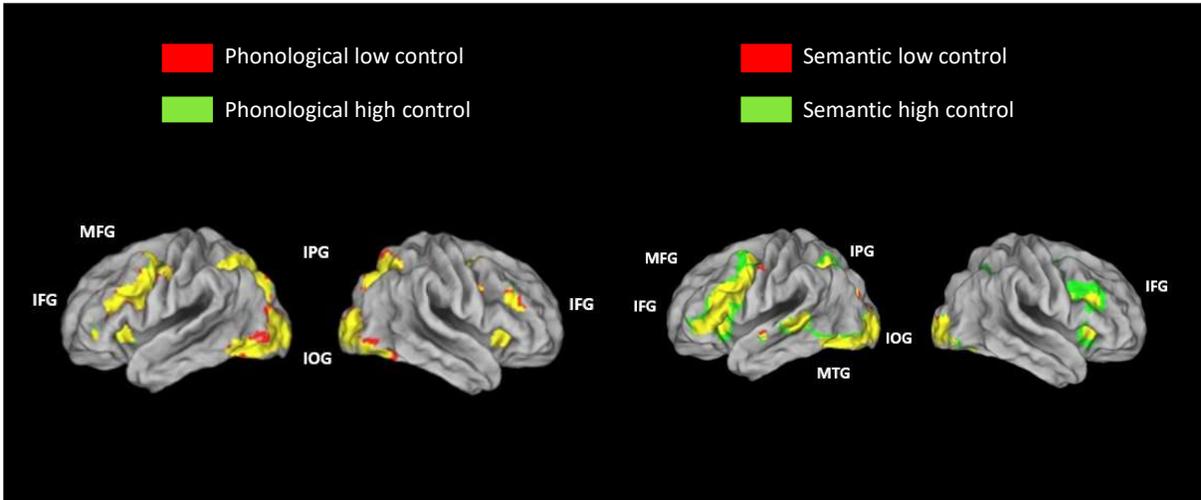
2 similarity judgment tasks in a 3T scanner

- Participants : Thirty-four elderly participants (59.6 ± 6.1 years old)
 - No cognitive complaints + Mattis Dementia Rating Scale (DRS)
 - From a larger study comparing aphasic patients and healthy adults on language control processes

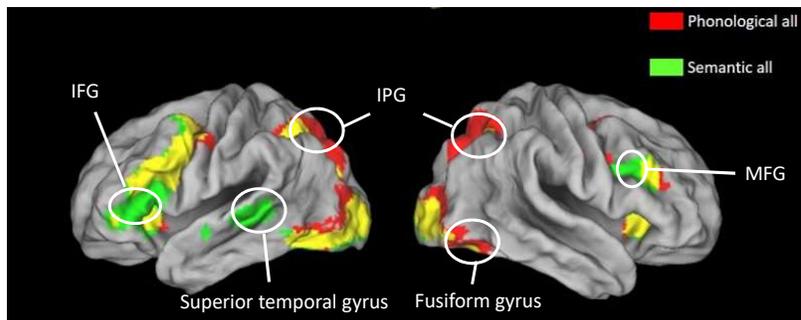




Results : fMRI

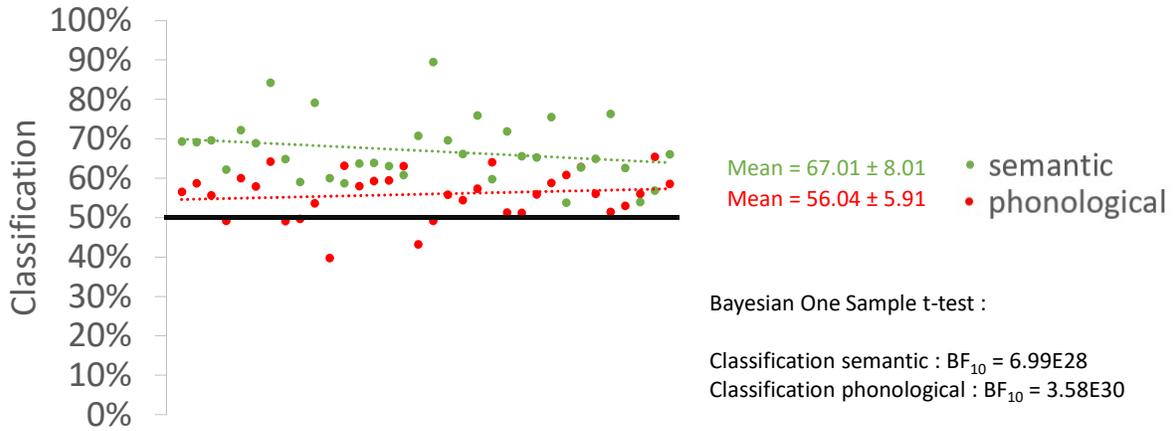


Results : fMRI

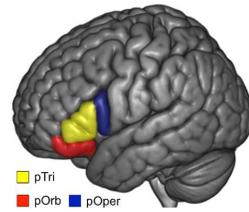


Results : MVPA

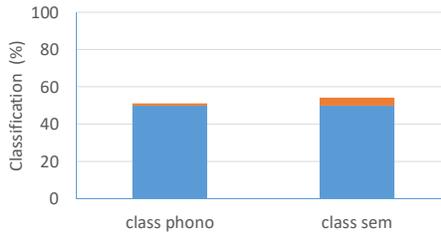
- High vs. low control : whole brain



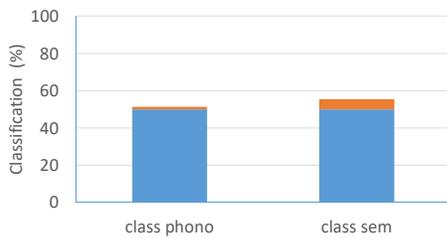
Results : MVPA ROI



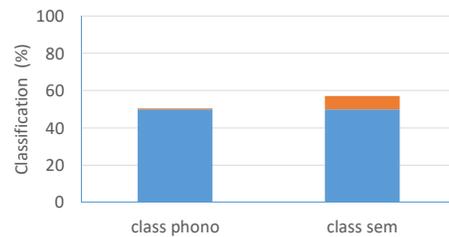
Left Pars Opercular IFG



Left Pars Triangular IFG



Left Pars Orbital IFG



Conclusions

- Semantic control : anterior and posterior IFG
- Phonological control : no specific involvement of IFG
 - Nonwords
 - Two conditions of control?
 - Different strategies?
- Differences observed could be more due to the linguistic material than to the design as such
- Distinct inhibitory control processes for phonological and semantic components?

Thanks for your attention