

Hello from the other side:

a behavioral account of the lexical orthographic abilities of the right hemisphere as revealed by a divided visual field paradigm.

Bonandrini R, Paulesu E, Traficante D, Luzzatti C



Introduction

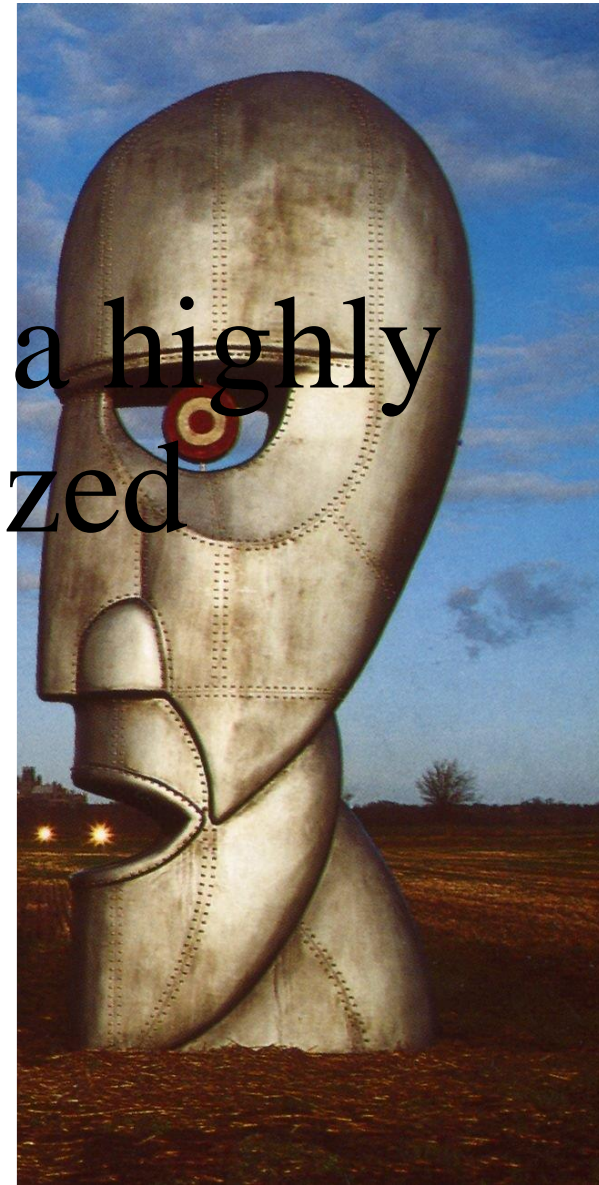
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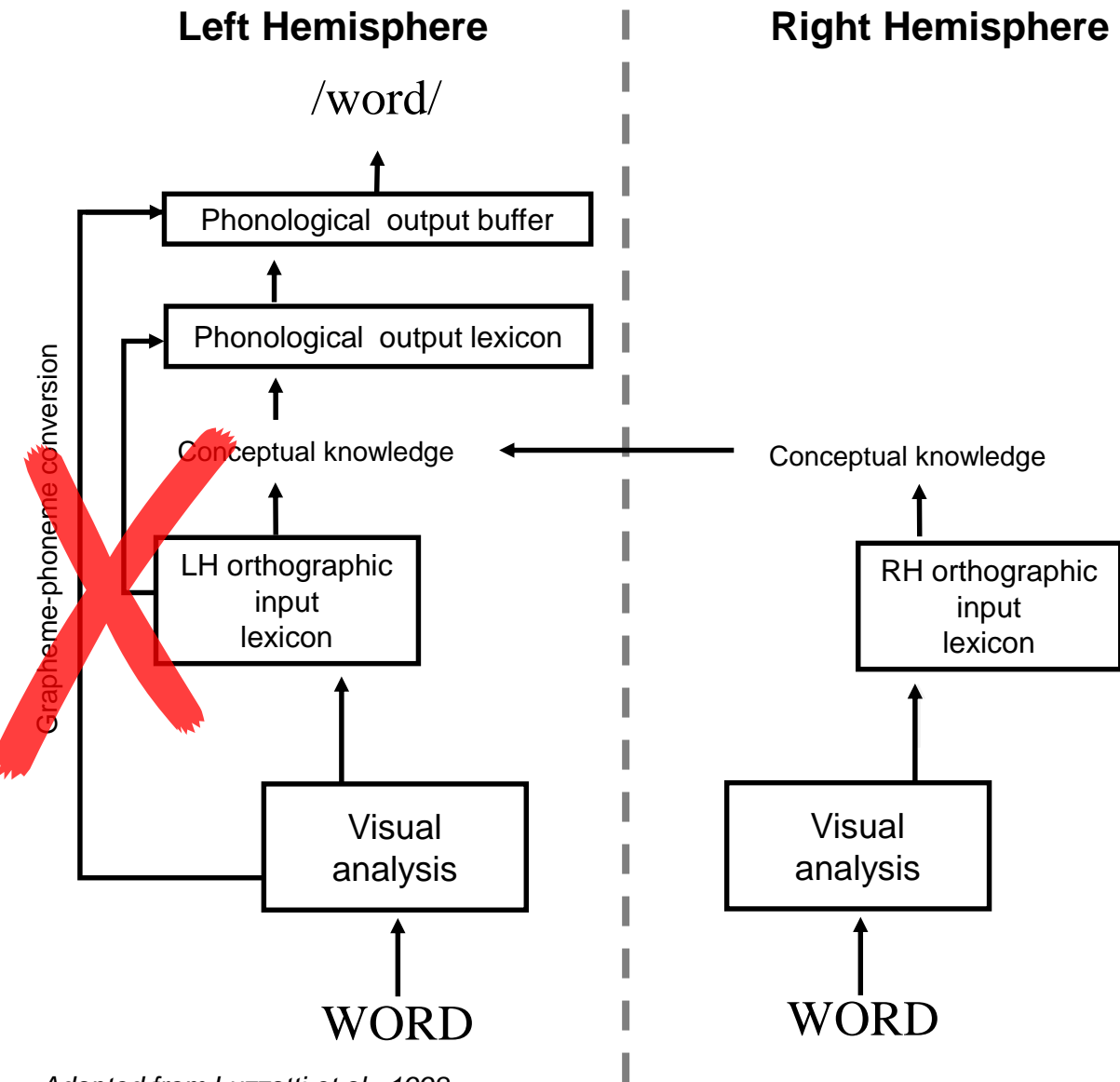
Patient MB, from Ripamonti et al., 2014

Joseph Jules Dejerine

Reading is a highly
left-lateralized
function



Introduction



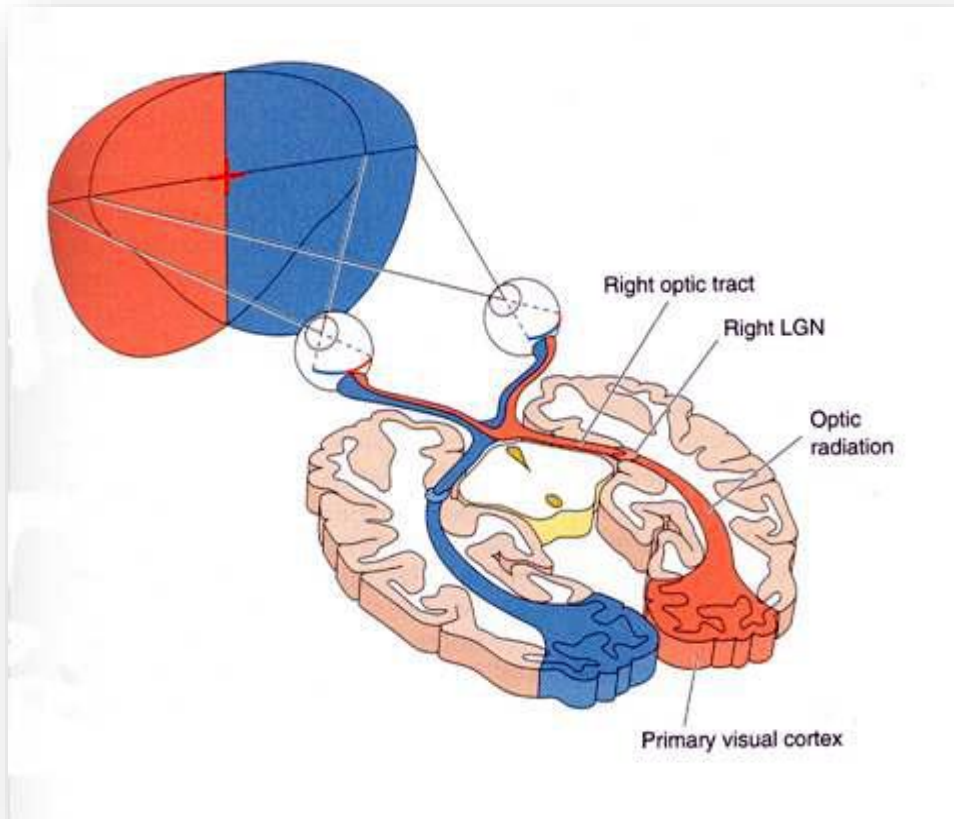
Adapted from Luzzatti et al., 1998

Cognitive neurolinguistic perspective

There are two separate (and different) “visual word stores” (Orthographic input Lexicons).

The RH lexicon is only composed by frequent words (Coltheart, 2000).

It emerges only in case of severe disruption of the dominant LH one.



Divided visual field studies

The RH does not have a proper lexicon (Ellis, 2004).

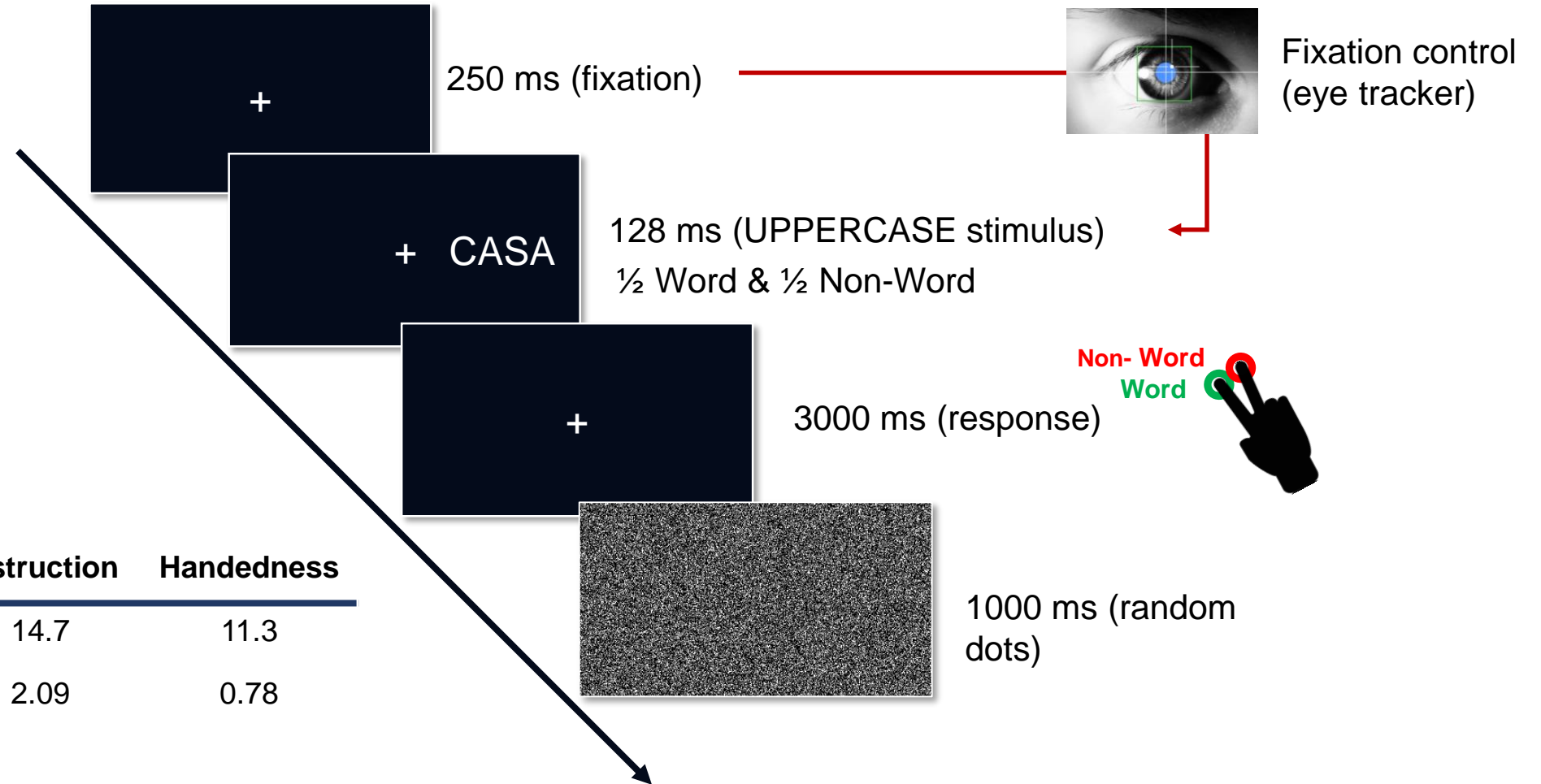
Both hemispheres would access the LH lexicon. Performance differences should be linked to access paths.

Introduction



- Does the RH have lexical abilities?
- Do the two hemispheres process words in a similar way?
- How is lexical knowledge represented in the two hemispheres?

Lateralized lexical decision task



		Age	Instruction	Handedness
N = 60	m	23.06	14.7	11.3
(30 female)	sd	2.79	2.09	0.78

Manipulated variables:

- Word frequency
- Word length (4 and 5-letters)
- Imageability
- Orthographic Similarity
(Neighborhood)

Data analysis

R environment

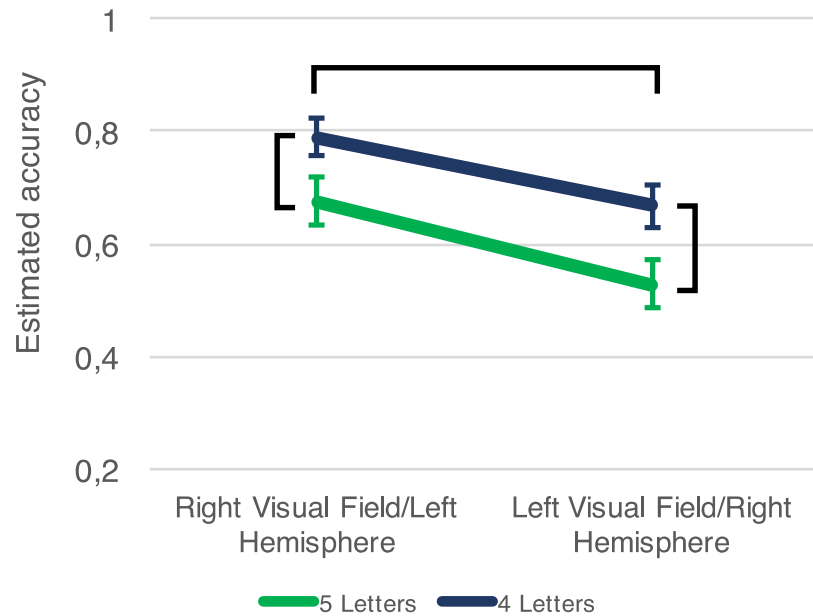
Generalized mixed model

(subjects and stimuli as random intercepts)

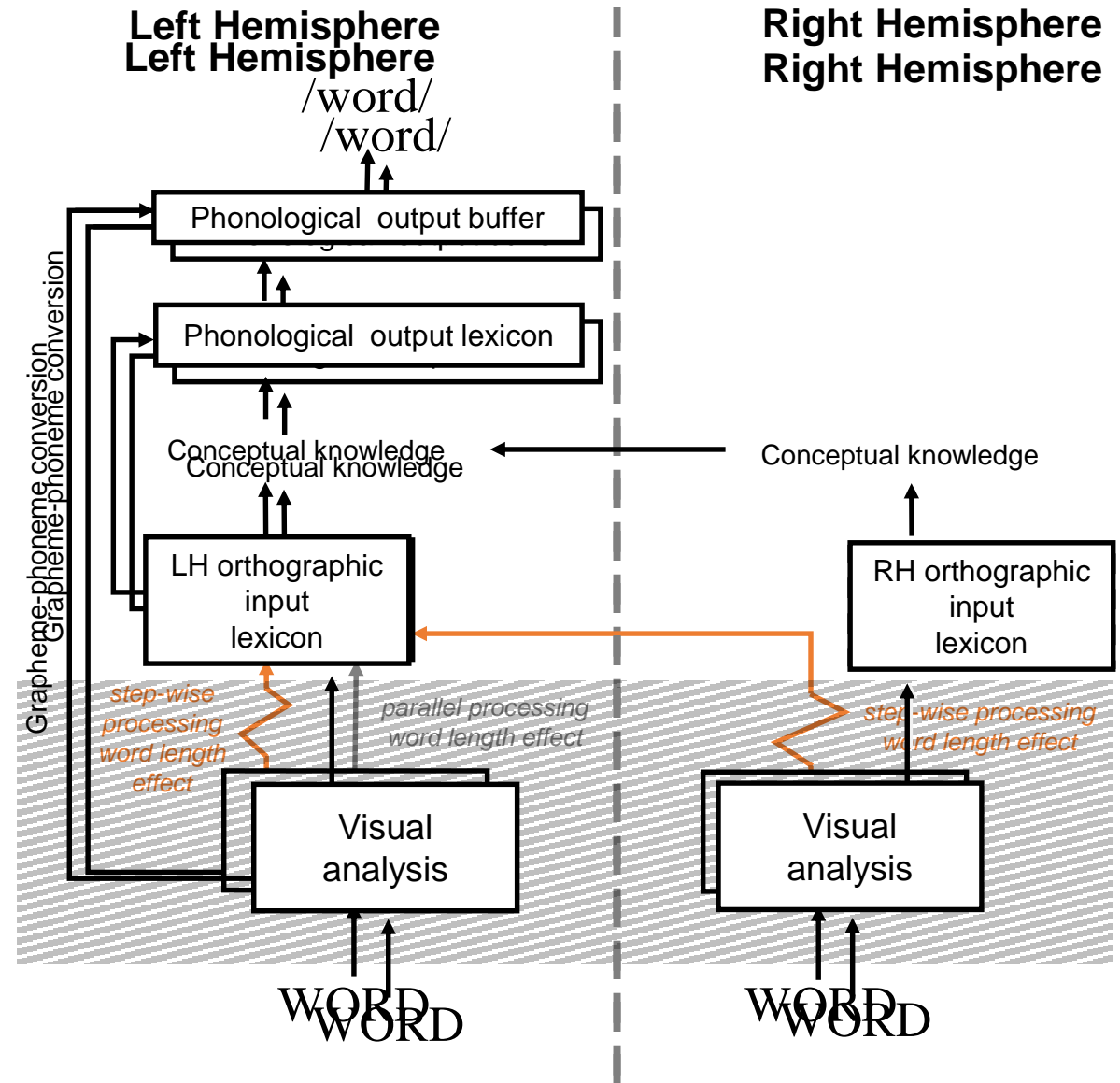
Backward model selection

Results and Discussion

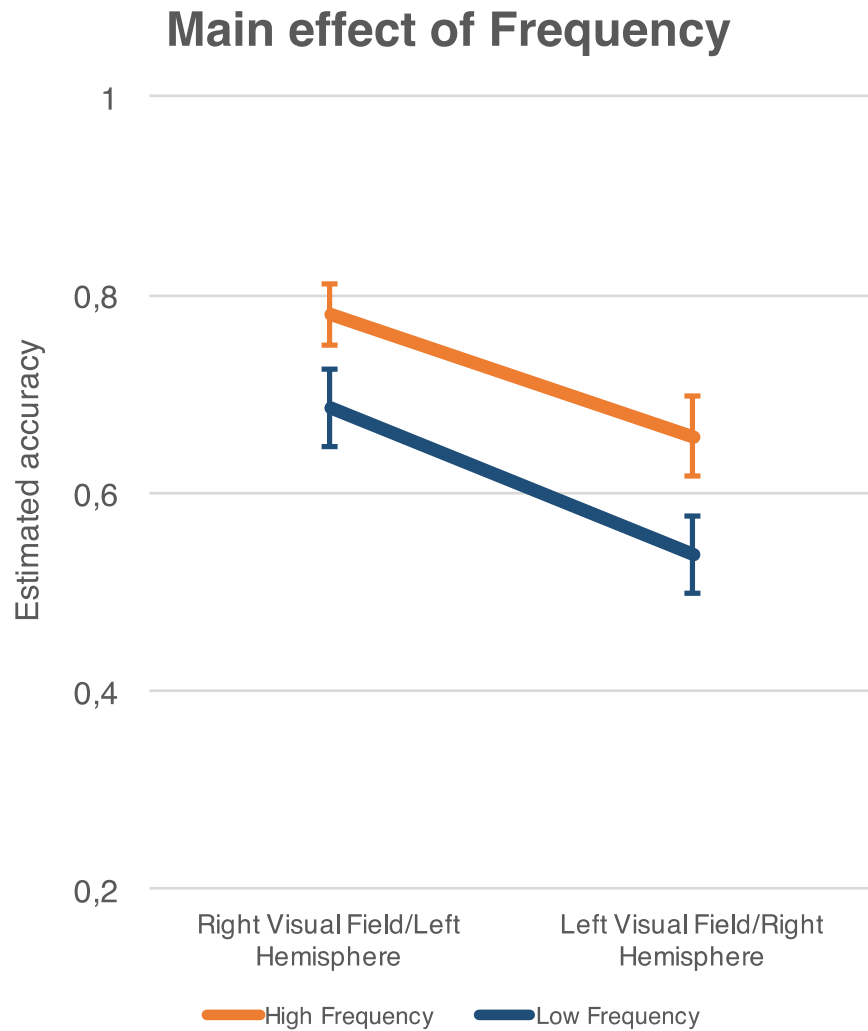
Main effect of Word Length



The "unique lexical storage" interpretation does not fit our data. These results could be better explained by the existence of two different lexicons



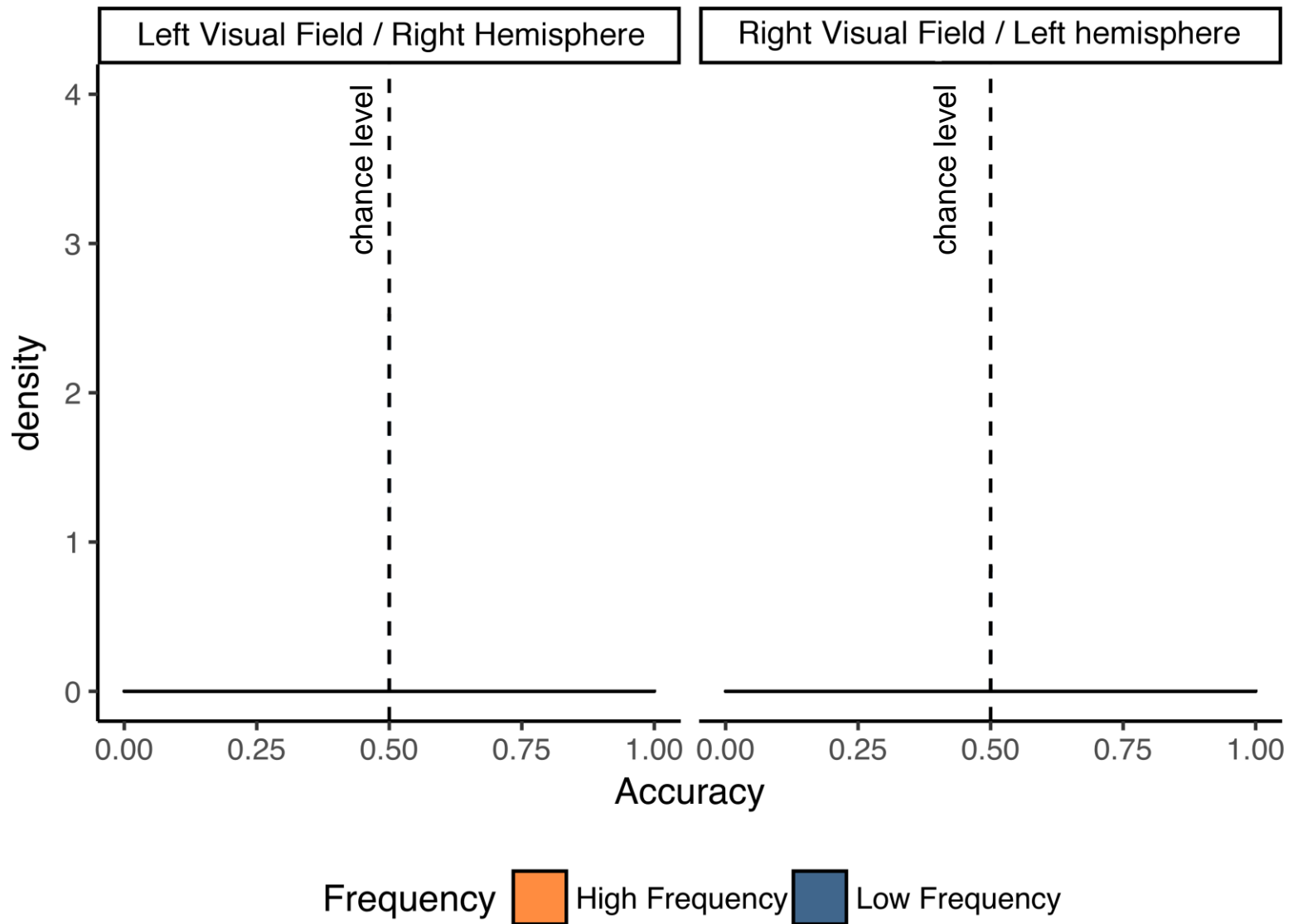
Results and Discussion



Do the two hemispheres process words in a similar way?

The two hemispheres are both sensitive to word frequency

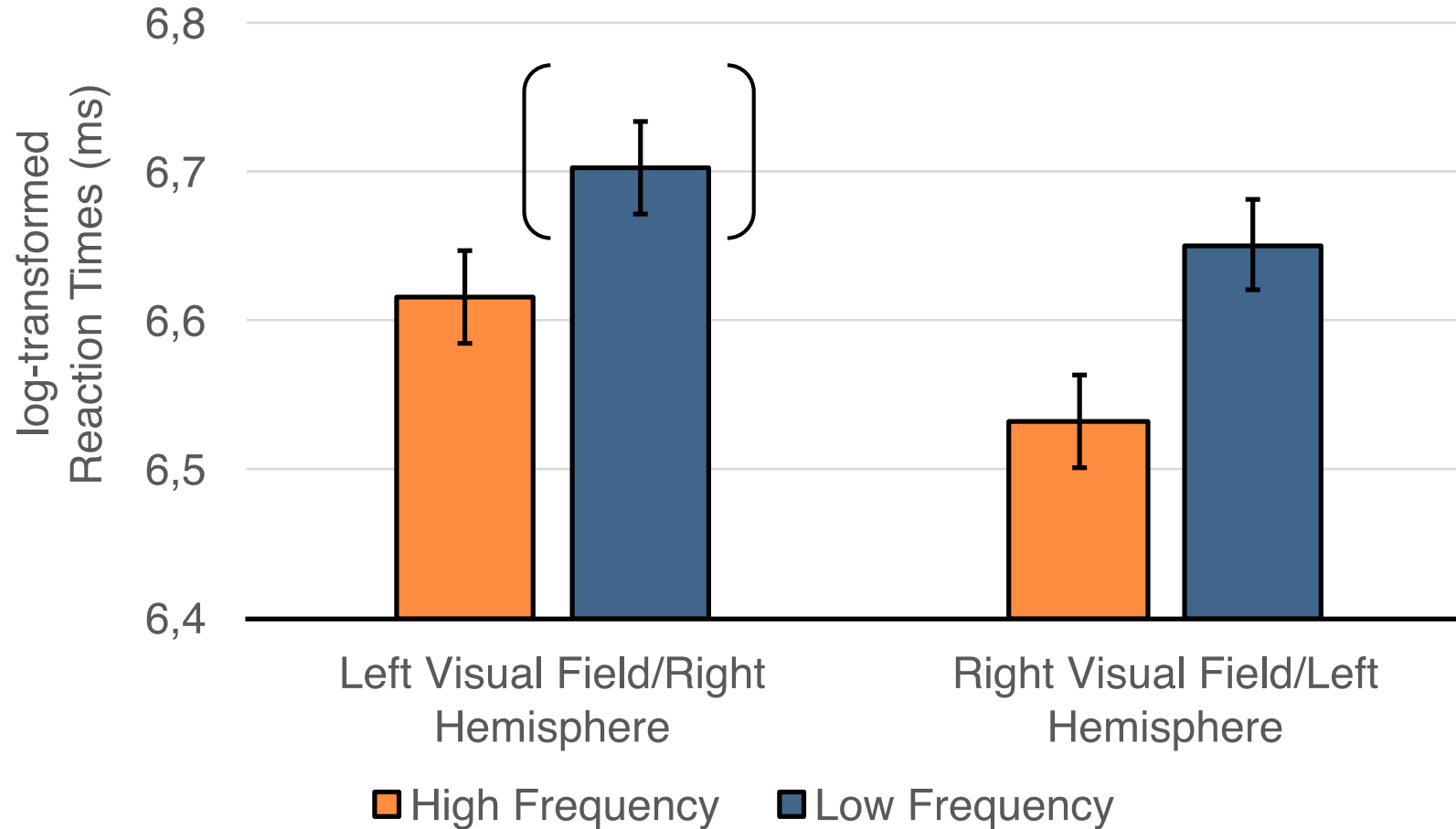
Results and Discussion



The right hemisphere does not process low-frequency words significantly better than chance level.

Results and Discussion

Visual Field by Frequency



The right hemisphere has a particular disadvantage for low-frequency words.

(tentative) conclusions



- The RH also has lexical abilities;
- The two hemispheres are both sensitive to word frequency;
- Low frequency words are particularly difficult to be processed by the RH.
- There are two separate (and different) input Orthographic Lexicons in the brain.

Thank you for your
attention

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