

# Vertical presentation effects to lexical access and predictability in the cerebral hemispheres



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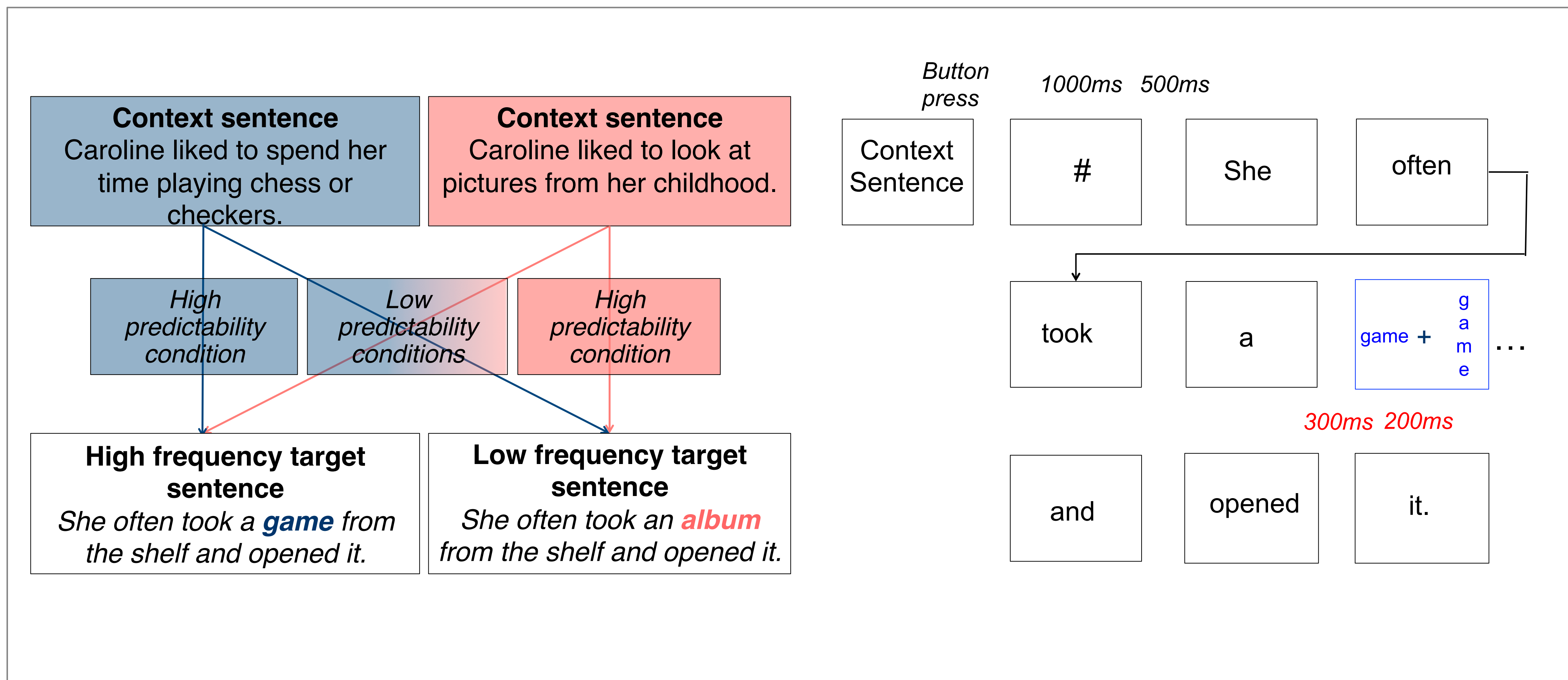
## Introduction

- What are the continuous hemispheric contributions to **lexical access** (word frequency effects) as a function of varying **sentential context** (predictability effects) and word presentation type (vertical vs. horizontal)?
- **N400**: both hemispheres are sensitive to context predictability (Federmeier et al. 2005), LH employs higher-level predictive processing, RH uses lower-level integrative mechanisms (Wlotko and Federmeier, 2007; 2013).
- **P2**: LH involvement in word form preactivation depending on constraint (Federmeier et al., 2005; Wlotko and Federmeier, 2007)
- **Vertical** (Exp. 1) vs. **horizontal** (Exp. 2) presentation rationale: potentially lower visual acuity to horizontal LVF words = higher level effect disadvantage to RH (Bourne, 2006).
- **Exp. 1**: larger effects of predictability in LH (P2 and N400) and frequency in RH (N400)
- **Exp. 2**: if above hypothesis true -> higher predictability sensitivity for RH; else equally taxing for LH & RH

## Methods

- **Predictability** of target word (provided by context sentence) – high vs. low
- **Frequency** of target word – high vs. low
- **Visual field of presentation** – LVF vs. RVF
- 144 pairs of sentences in German, read by 19 (Exp.1) and 23 (Exp. 2) native speakers
- Target words presented laterally **horizontally** (Exp. 1) or **vertically** (Exp. 2)
- 500ms SOA: 200ms word presentation + 300ms ISI

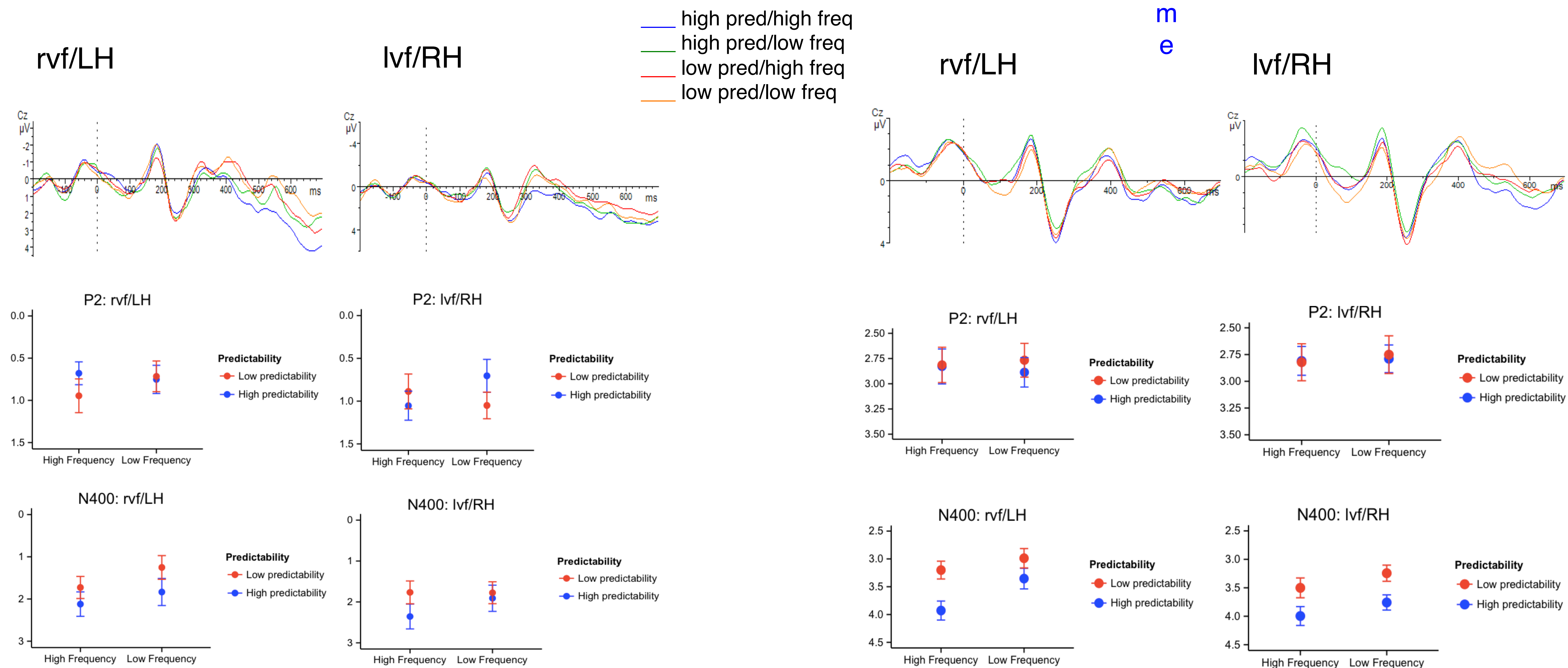
## Design and Procedure



## Results

She often took a **game** from the shelf and opened it.

She often took a **g  
a  
m  
e** from the shelf and opened it.



## Conclusions

- Horizontal presentation:
  - **P2**: both hemispheres sensitive to context predictability with differential specialization for high (LH) and low (RH) frequency conditions
  - **N400**: LH showed further context reprocessing for both frequency conditions; RH sequential selective context effects for high frequency words
- Vertical presentation:
  - **P2**: no P2 effects (delayed early processing)
  - **N400**:
    - delayed lexical access, coinciding with later context effects
    - larger impact of context predictability in LH & RH across frequency conditions
- Context continuously influences word frequency effects in both hemispheres
- Uncustomary vertical word presentation seems to change word processing strategies more drastically, than it prevents potential reading-direction artifacts.

## References

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