GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

WortSchatzInsel
Göttinger Zentrum für Spracherwerb

DAAD
Deutscher Akademischer Austauschdienst
German Academic Exchange Service

primate cognition
Leibniz-WissenschaftsCampus

HOW INTEREST SHAPES EARLY VOCABULARIES

Lena Ackermann
lackerm2@gwdg.de – @masterwahnsinn
University of Göttingen

FLaDD Lab Meeting
November 18, 2019

ACKNOWLEDGEMENTS

I would like to thank

- you for having me
- my supervisor Nivi Mani
- my collaborators and colleagues at WortSchatzInsel Göttingen and beyond
- the families who took part in our studies
- DAAD and Leibniz ScienceCampus for funding

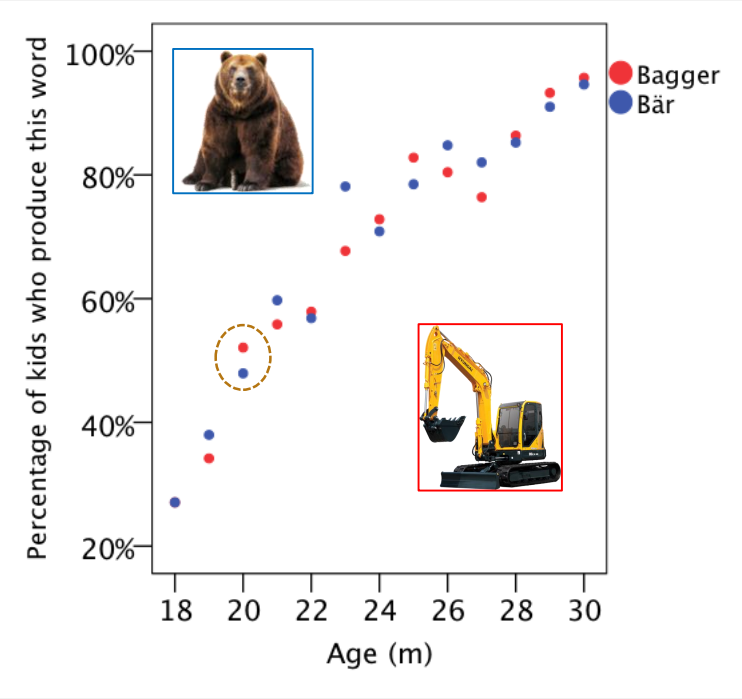
ROADMAP

- What do we want to know?
- How do we approach this questions?
- What have we found so far?
- What are the next steps?

WHAT DO WE WANT TO KNOW?

WHAT DO WE WANT TO KNOW?

- Considerable differences in early vocabularies
- Historically explained in terms of input
- Children with similar input still differ with regard to the words they know
- What determines whether a child is a *Bagger* baby or a *Bär* baby?

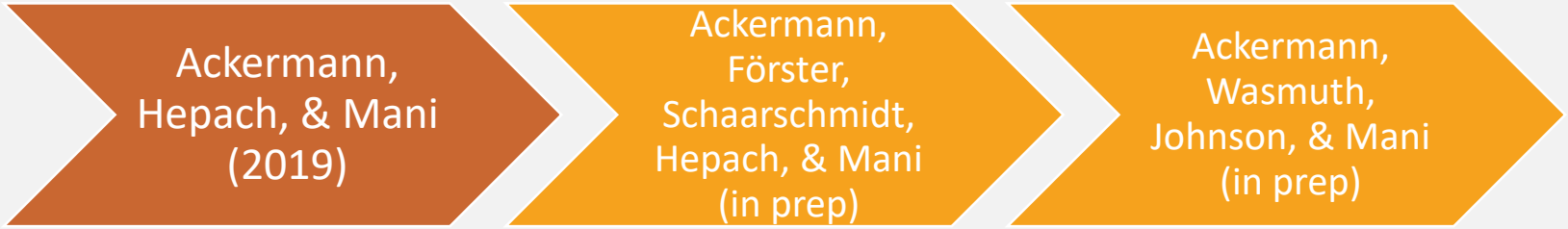


WHAT DO WE WANT TO KNOW?

- Children aren‘t merely passive recipients of information
- Children shape their learning environment according to their interests
- Information provided at the child‘s request is retained best (Begus, Gliga, & Southgate, 2014; Partridge, McGovern, Yung, & Kidd, 2015)
- Children differ in their interests early on (DeLoache, Simcock, & Macari, 2007)
- Can individual interests explain the differences we see in early vocabularies?

HOW DO WE APPROACH THIS QUESTION?

- Three eye-tracking studies



- One touchscreen-based study (Ackermann, Lo, Mayor, & Mani, in revision)
- Large-scale validation study (Malem, Ackermann, & Mani, in prep)

HOW DO WE APPROACH THIS QUESTION?

- Ackermann, Hepach, & Mani (2019): Children **learn** words easier when they are **interested** in the **category** to which the word belongs
  - Categorisation and category size
  - Defining word learning
  - Quantifying infant interest

HOW DO WE APPROACH THIS QUESTION?

Categorisation and category size

- Early lexicon is organized semantically
- Children leverage their existing semantic knowledge to learn new words (Borovsky, Ellis, Evans, & Elman, 2015)
- But why do children have differently-sized categories to begin with?

HOW DO WE APPROACH THIS QUESTION?

Defining word learning

- Immediate recognition of newly-learnt WOAs after 10 labelling events
- Intermodal preferential looking paradigm (Golinkoff, Hirsh-Pasek, Cauley, & Gordon, 1987)
  - Increased proportion of target looking indexes recognition

HOW DO WE APPROACH THIS QUESTION?

Quantifying infant interest

- Pupil dilation as an index of interest (Kang et al., 2009)
  - Change from scrambled baseline to unscrambled picture reflects interest
- Parental questionnaire
  - 7 point Likert scale to rate interest in and familiarity with objects and categories used in the study

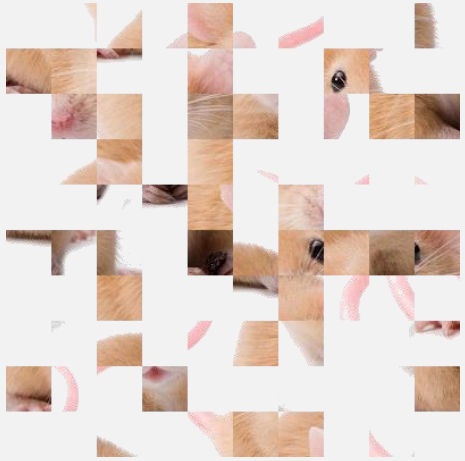
HOW DO WE APPROACH THIS QUESTION?

- Eyetracking study with 30-month-old German learners (N=39)
- Parental questionnaires for overall vocabulary (FRAKIS/CDI) and interest

HOW DO WE APPROACH THIS QUESTION?

Category interest phase

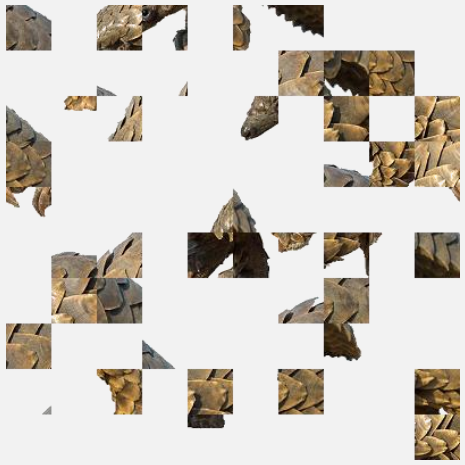
- 16 trials (4 objects from 4 categories)
- 2000 ms scrambled, 3000 ms unscrambled



HOW DO WE APPROACH THIS QUESTION?

Word learning phase

- One novel object from each category
- 2 trials (12.5 s each) per object → 10 naming events



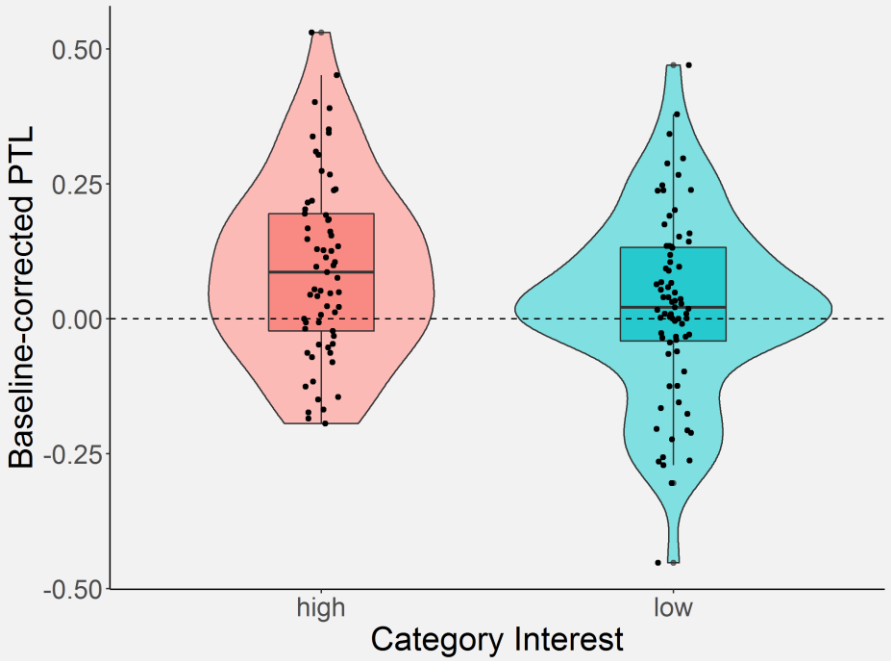
HOW DO WE APPROACH THIS QUESTION?

Word recognition phase

- IPLP → measuring PTL
- 8 familiar and 8 novel trials

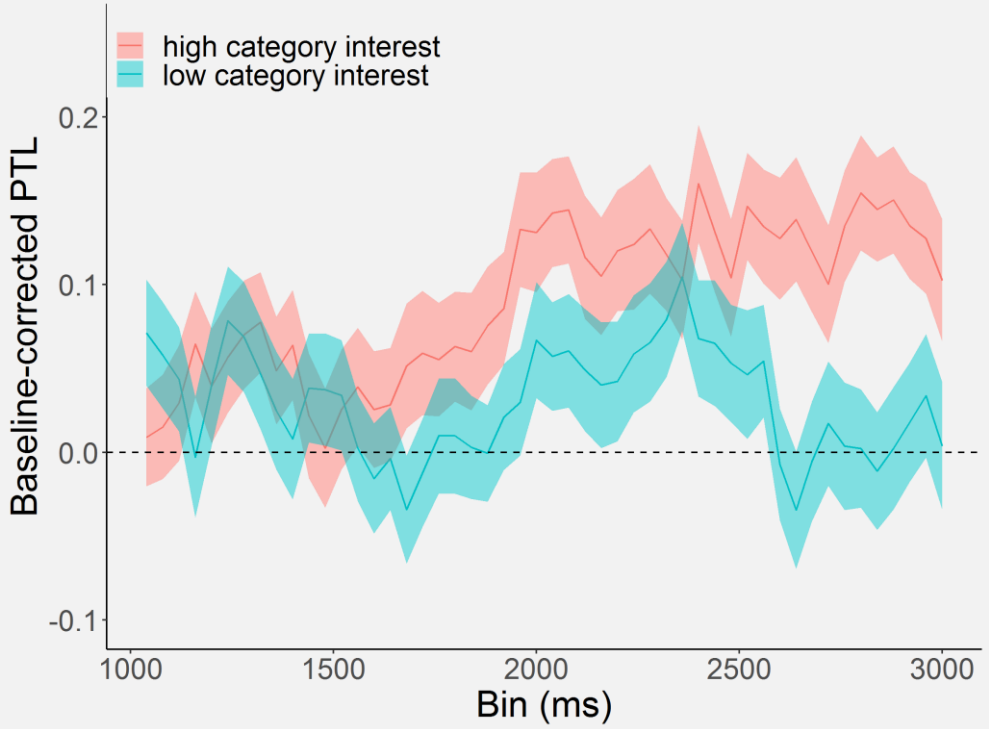
WHAT HAVE WE FOUND SO FAR?

- Pupillary measure allows individual assignment of high and low interest categories for each child
- Children recognize words from high interest categories, but not from low interest categories



WHAT HAVE WE FOUND SO FAR?

- Differences are also reflected in the time course
- Growth curve analyses (Mirman, 2014) reveal that category interest and object interest independently contribute to word recognition

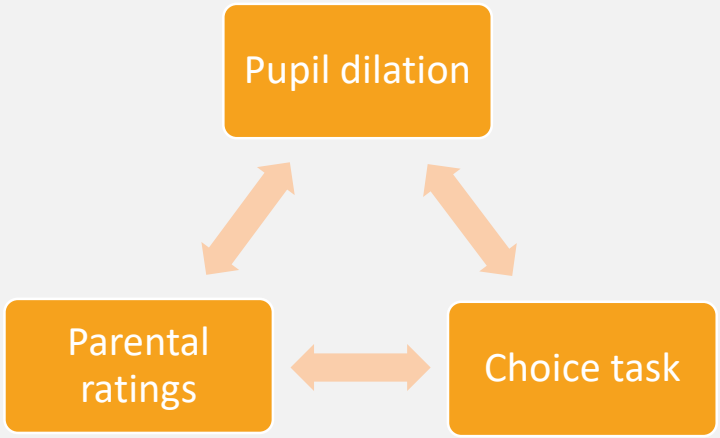


WHAT HAVE WE FOUND SO FAR?

- Growth curve analyses yield similar results with parental data
- No correlation of pupil dilation and parental ratings
- However, parental ratings correlate with category size → both might be reflective of past interests

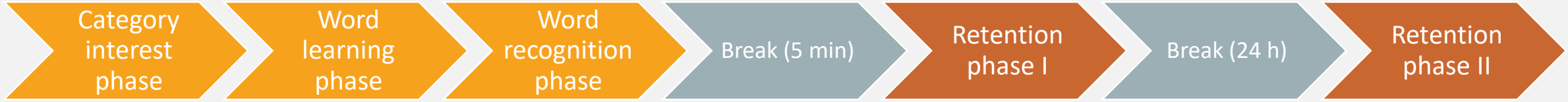
WHAT ARE THE NEXT STEPS?

- Malem, Ackermann, & Mani (in prep): What does the pupillary measure really tap into?
- Large-scale validation study with eyetracking, more detailed parental questionnaire and act-out choice task



WHAT ARE THE NEXT STEPS?

- Ackermann, Förster, Schaarschmidt, Hepach, & Mani (in prep): How does category interest influence retention at 24 and 38 months?
  - Word learning operates on several time scales (Bion, Borovsky, & Fernald, 2013)
  - Ackermann et al. (2019) only tested immediate recognition, but what about retention over a longer period of time?



WHAT ARE THE NEXT STEPS?

- Ackermann, Wasmuth, Johnson, & Mani (in prep): Does interest help children resolve referential ambiguity?

Ackermann et al. (2019)	Real world	Ackermann et al. (in prep)
		

WHAT ARE THE NEXT STEPS?

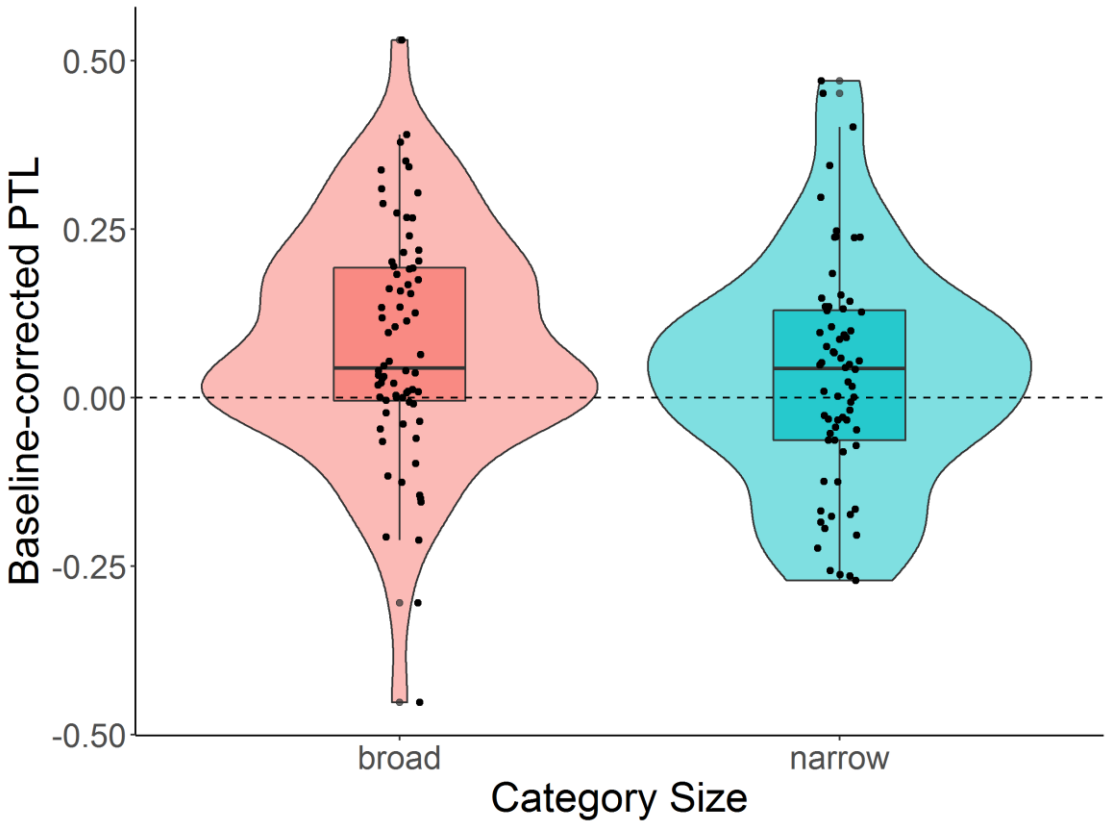
- Influence of interest on familiar word recognition
  - Pool data from all three studies to see how category interest influences speed of processing

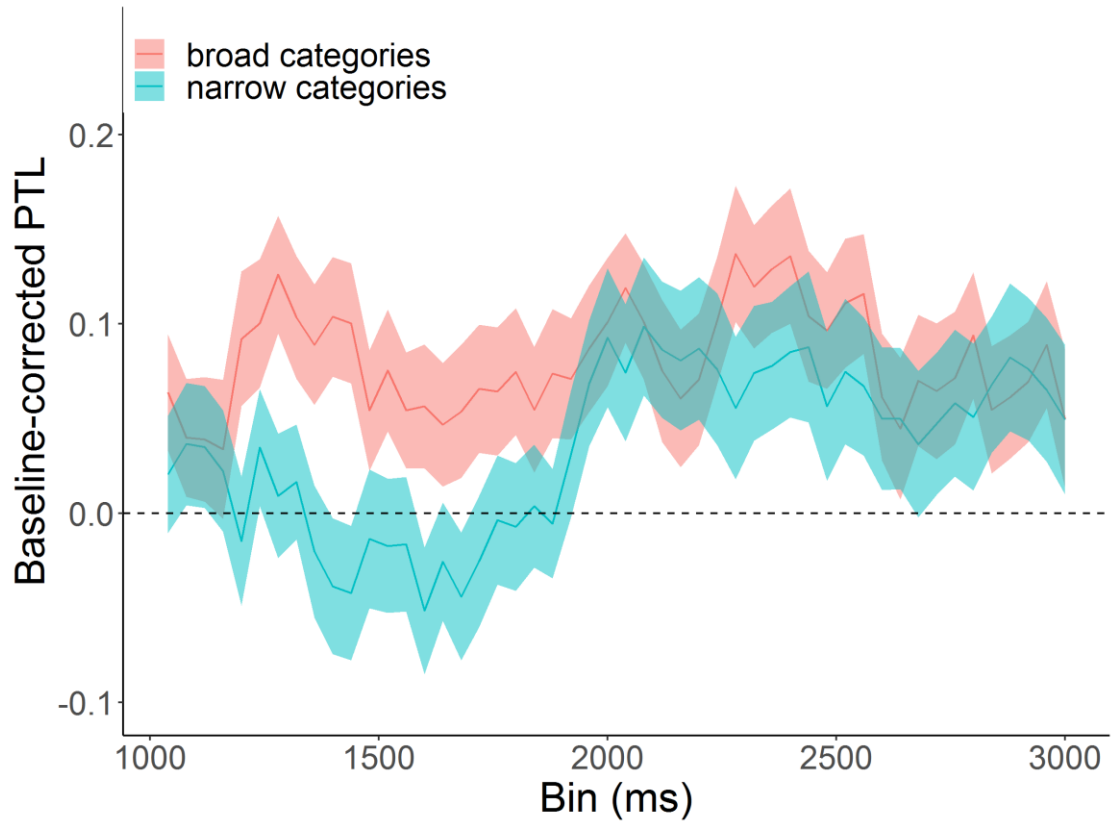
- Computational modelling
  - Better understanding of the underlying processes
  - Allows for controlled manipulation of input

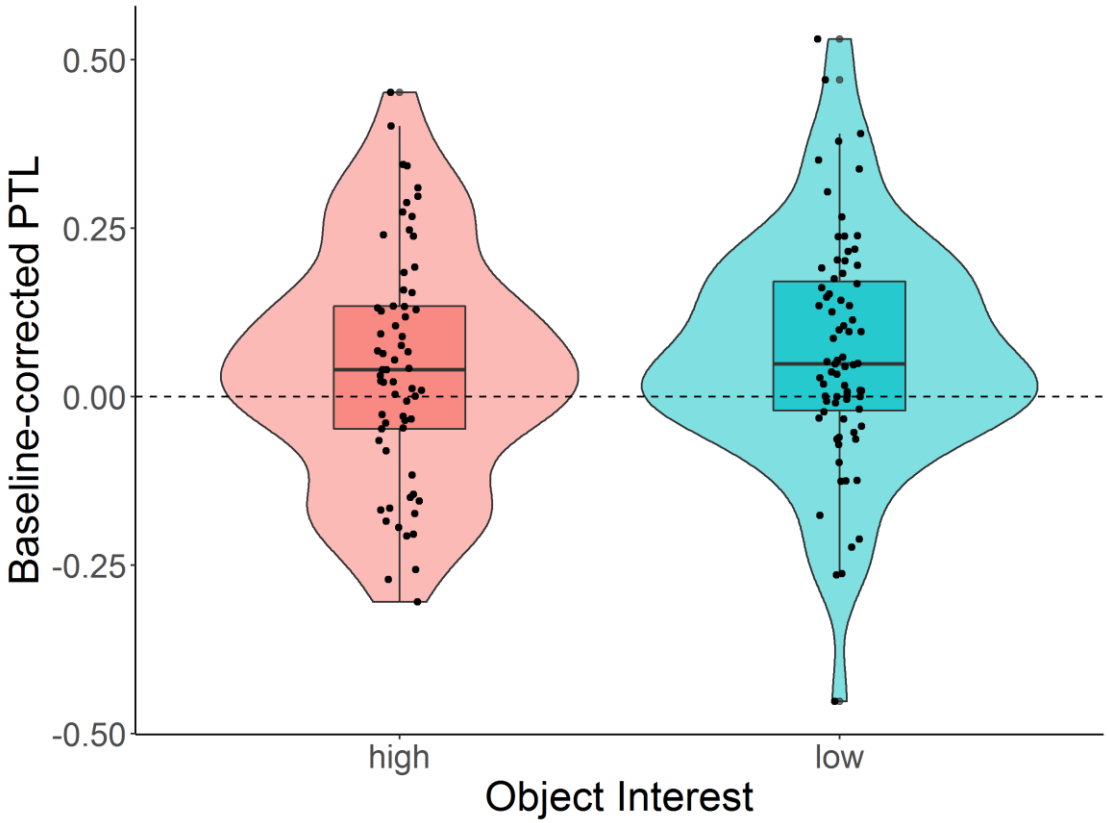
BAGGER OR BÄR?

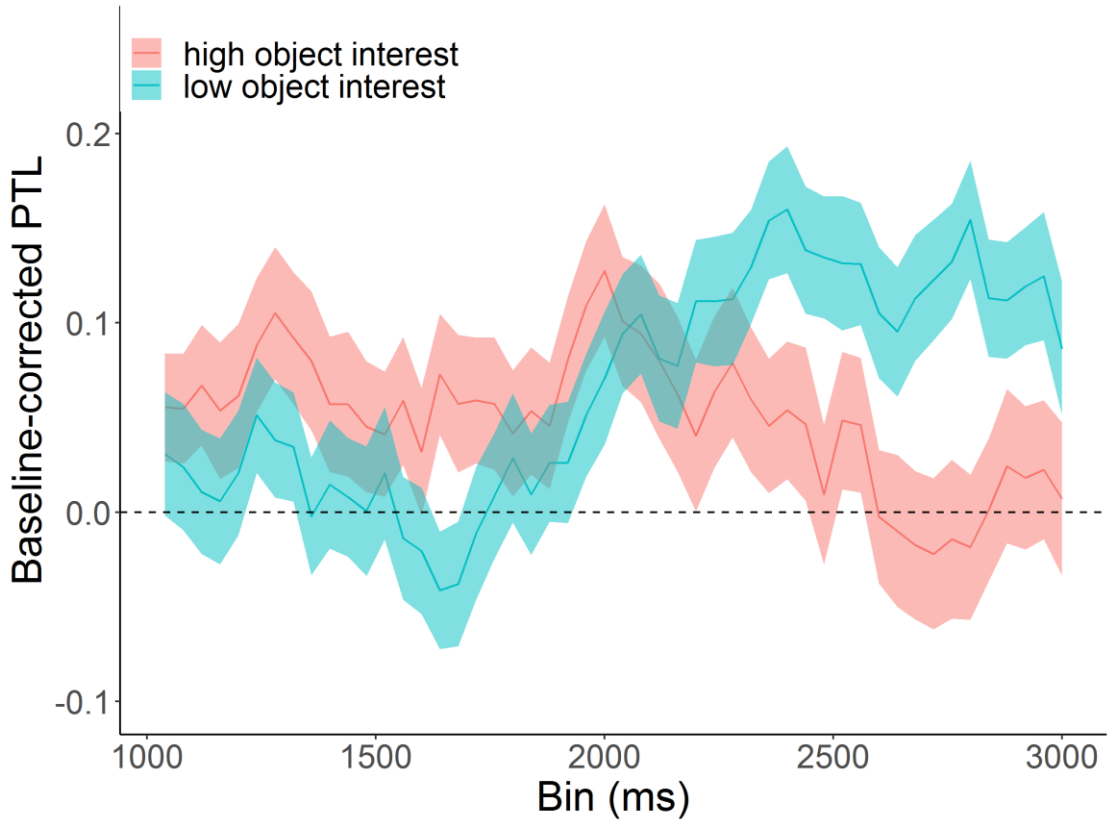
BAGGER OR BÄR? BABY DECIDES!

- Category interest influences novel word recognition and retention in children aged 24 to 36 months
- Parents are aware of their child‘s interests and might alter the input accordingly
- Children shape their learning environment by attending to and encoding what they are interested in
- Differences in early vocabularies can (in part) be explained by individual interests


0.50
0.25
0.00
-0.25
-0.50
Baseline-corrected PTL
broad
narrow
Category Size


broad categories
narrow categories
0.2
0.1
0.0
-0.1
Baseline-corrected PTL
1000
1500
2000
2500
3000
Bin (ms)


0.50
0.25
0.00
-0.25
-0.50
Baseline-corrected PTL
high
low
Object Interest


high object interest
low object interest
0.2
0.1
0.0
-0.1
Baseline-corrected PTL
1000
1500
2000
2500
3000
Bin (ms)