MetaLab: Supporting Power Analysis and Experimental Planning in Developmental Research
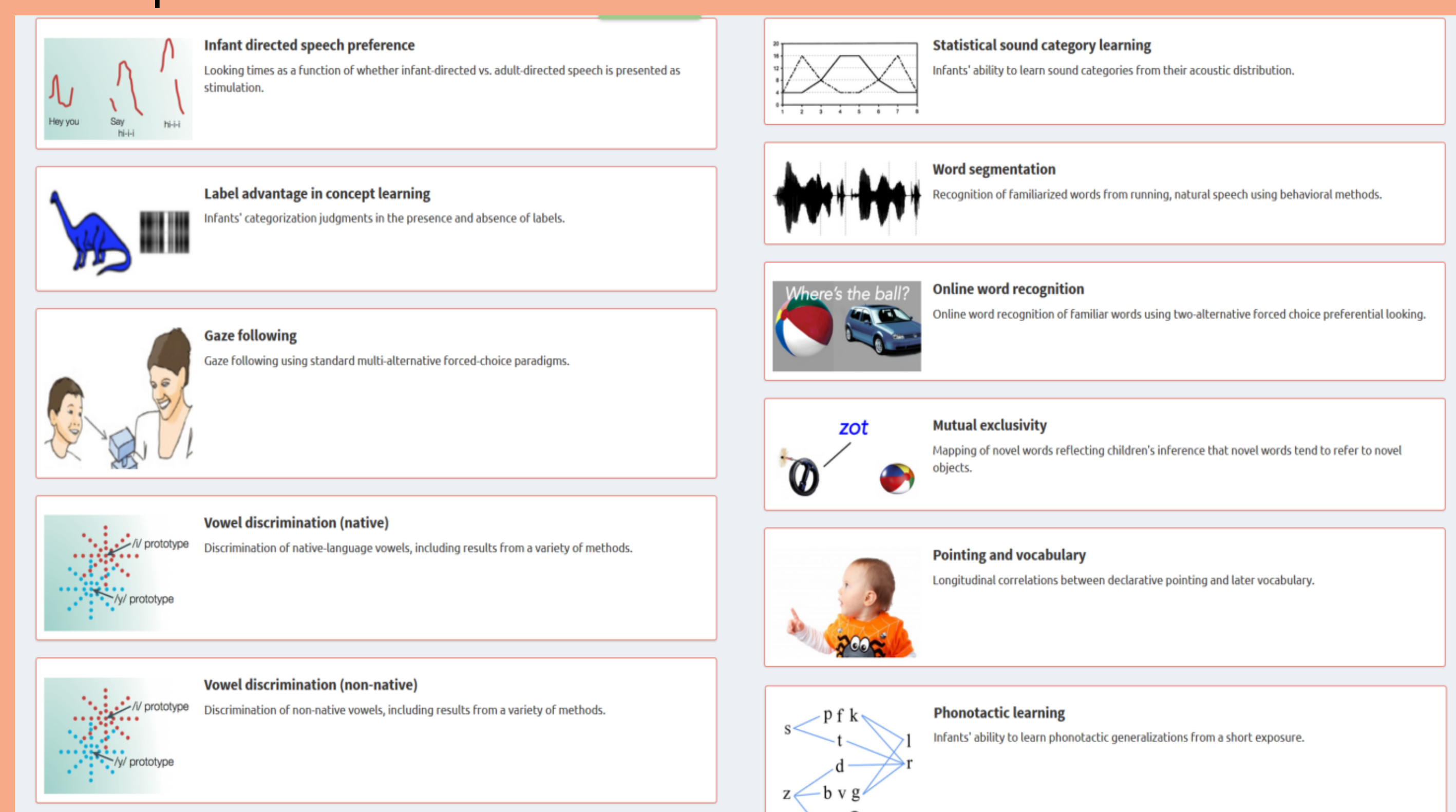
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[1]LSCP (ENS, EHESS, CNRS), Ecole Normale Supérieure, PSL Research University
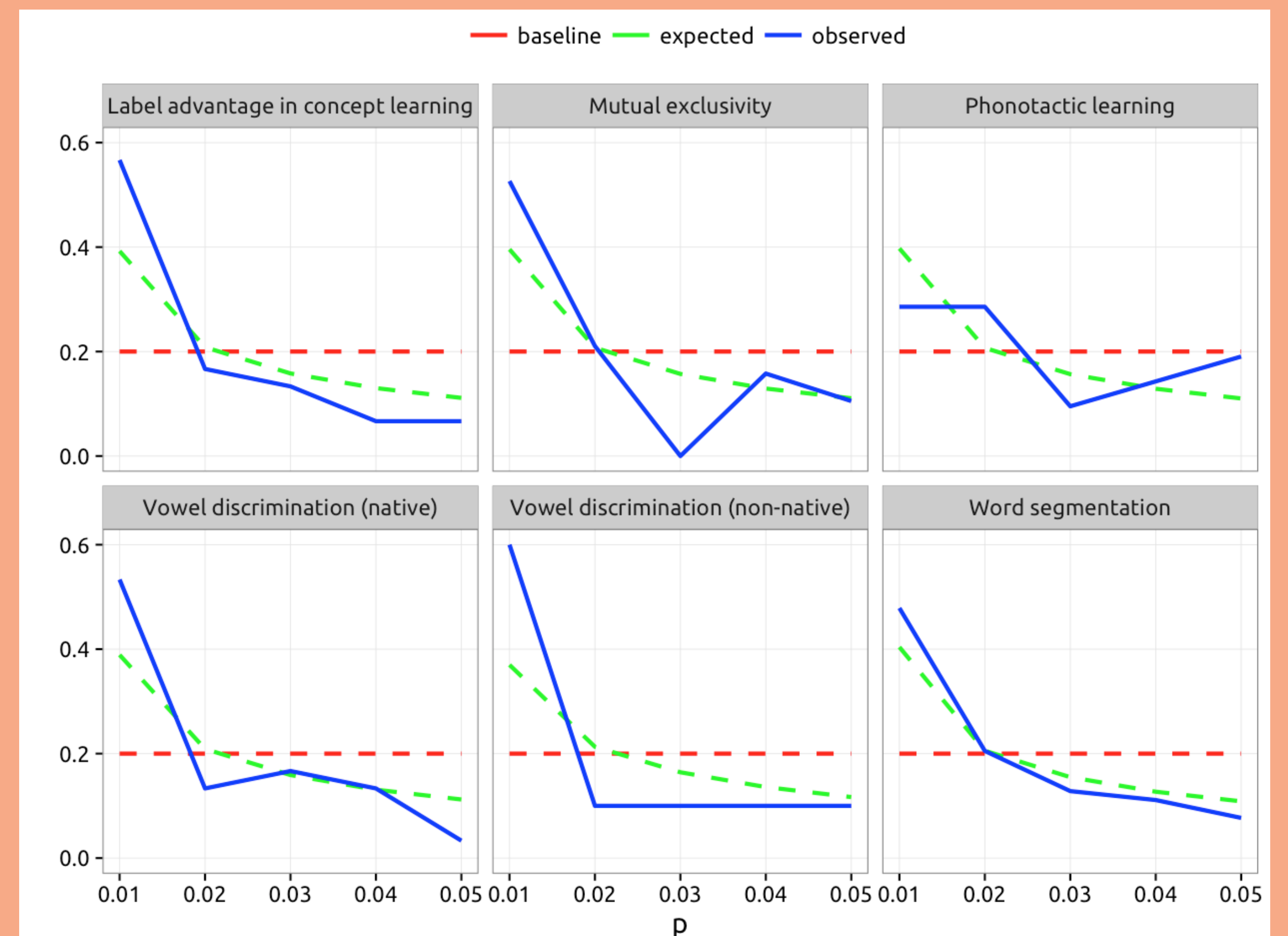[2] Stanford University

What is MetaLab?

- Web-based tool aggregating meta-analyses across different domains in language acquisition
- Includes
  - Data from **11,628** children
  - From **258 papers**
  - Resulting in **938 effect sizes**
- Open for users and contributors

Experimental Planning

Power analysis

- Statistical power required for reproducible research
- Infant studies often underpowered
- Prospective sample size estimation relies on knowledge of previous effect sizes
- MetaLab power analysis tool:
  - Select phenomenon/age group of interest
  - Calculate required sample size for given effect size with 80% power

Mutual exclusivity

Required N = 8
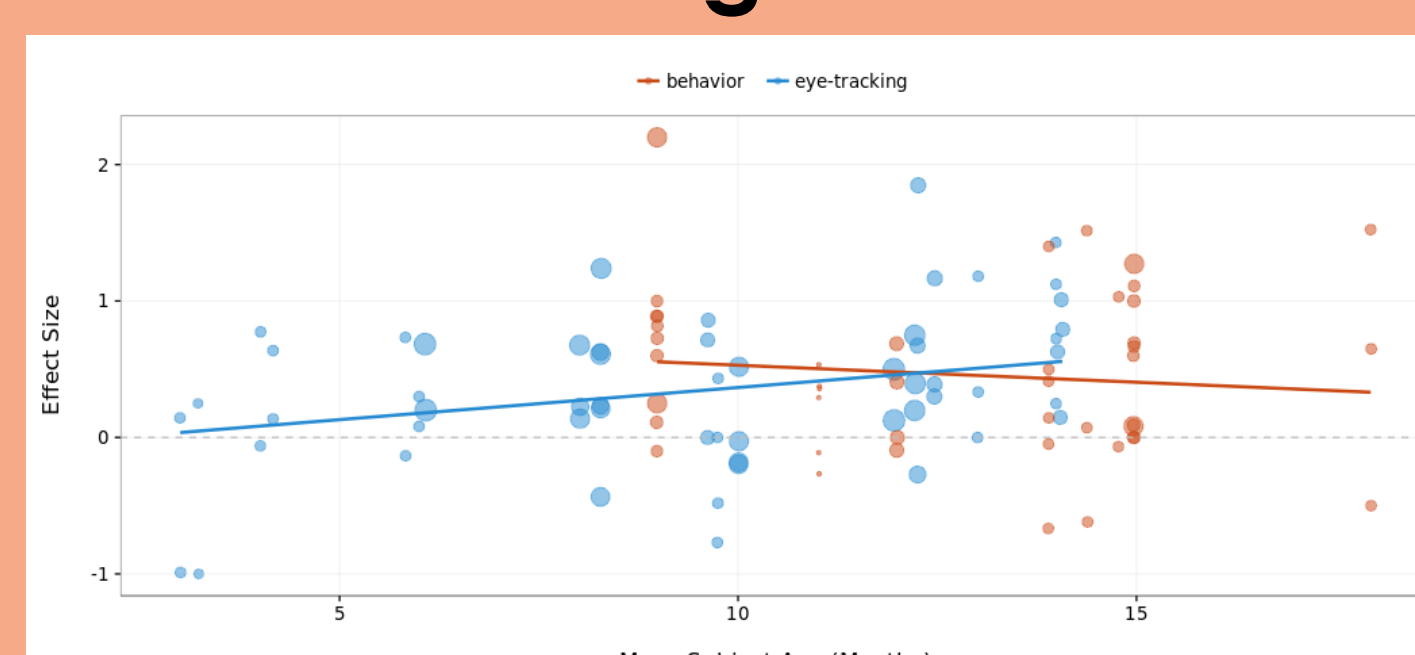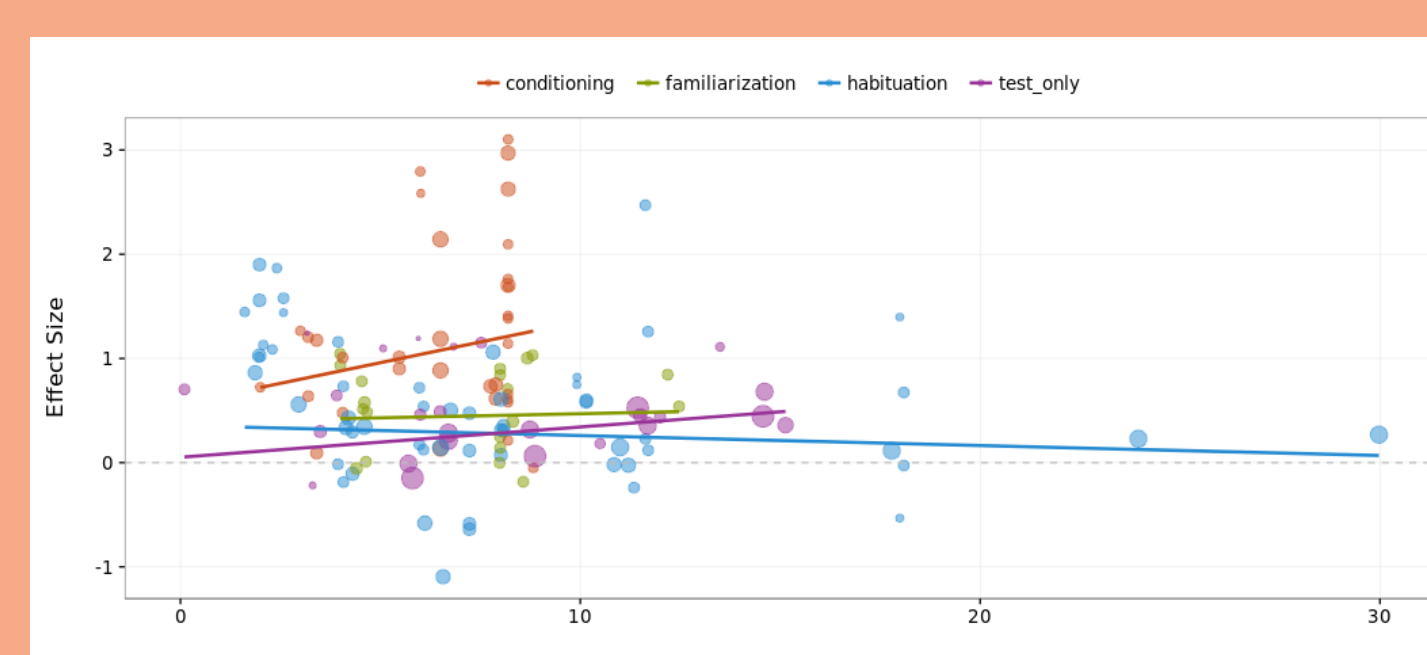
Word segmentation

Required N > 200
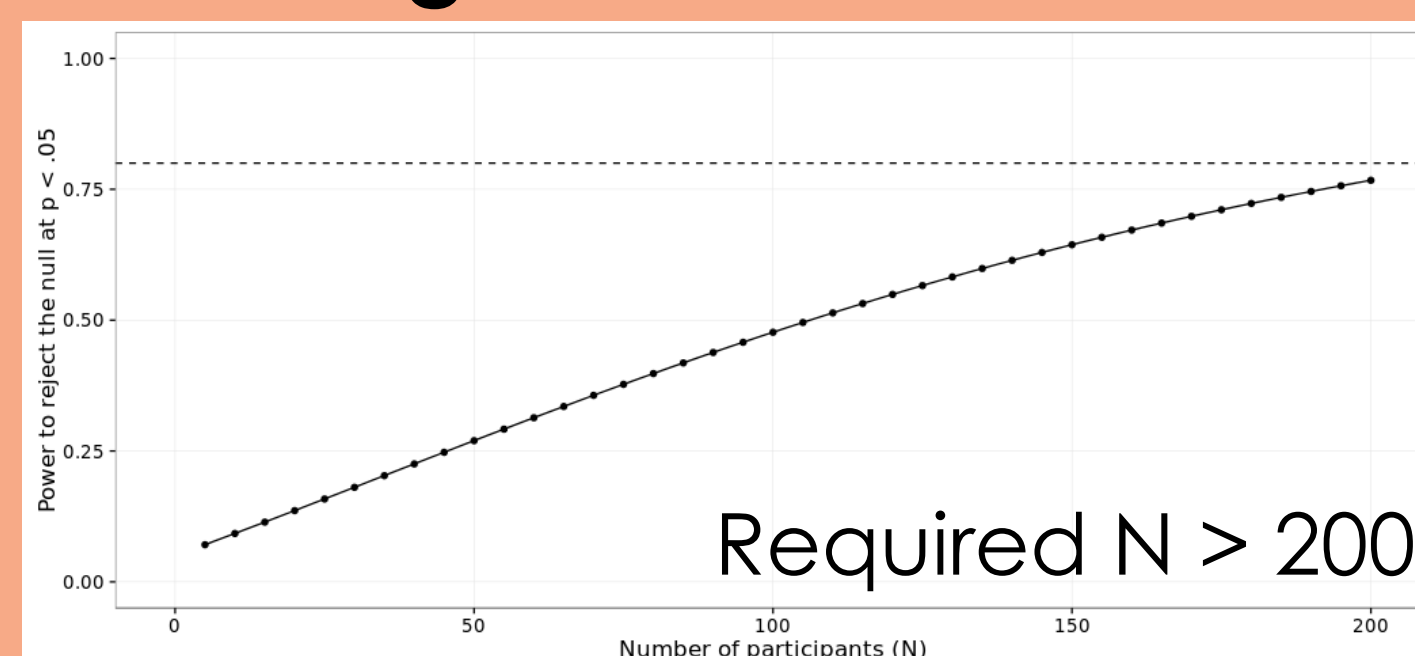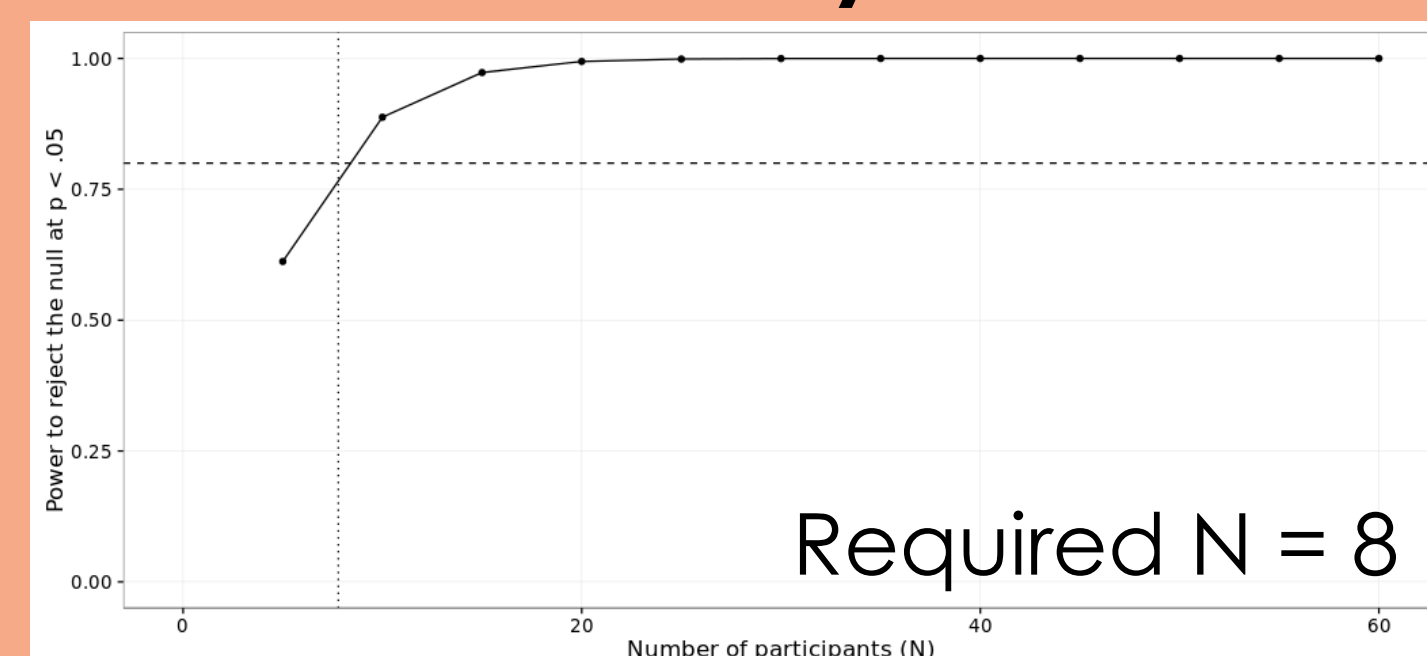
Experiment Design Parameters

- Decide on appropriate method/age group/stimuli based on customized query of previous studies

Native vowel discrimination

Conditioning leads to highest effect sizes

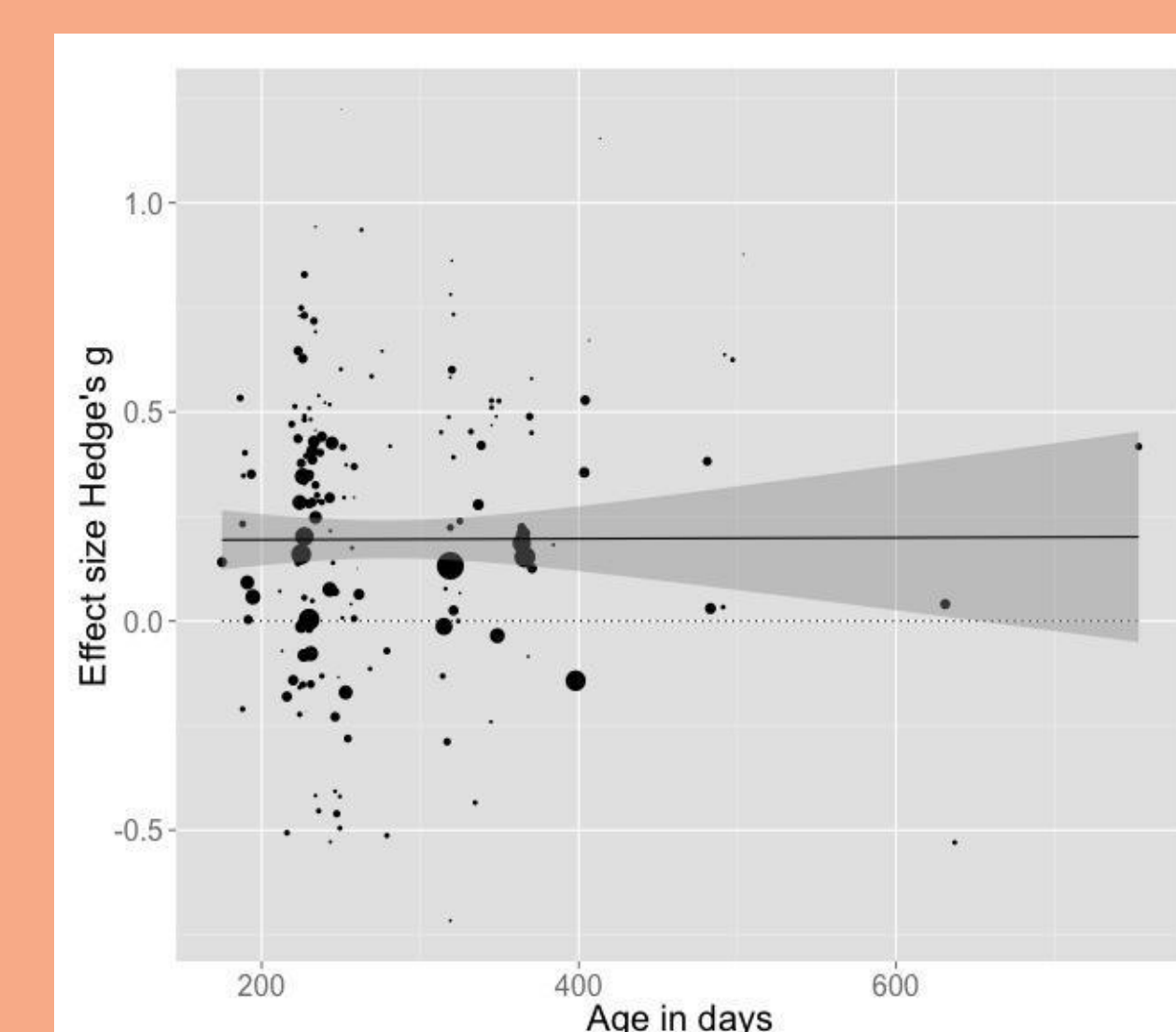**Label advantage**

Choice of method depends on age

Get in Touch

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Assessing the State of the Literature

Exploring publication bias with p-curve

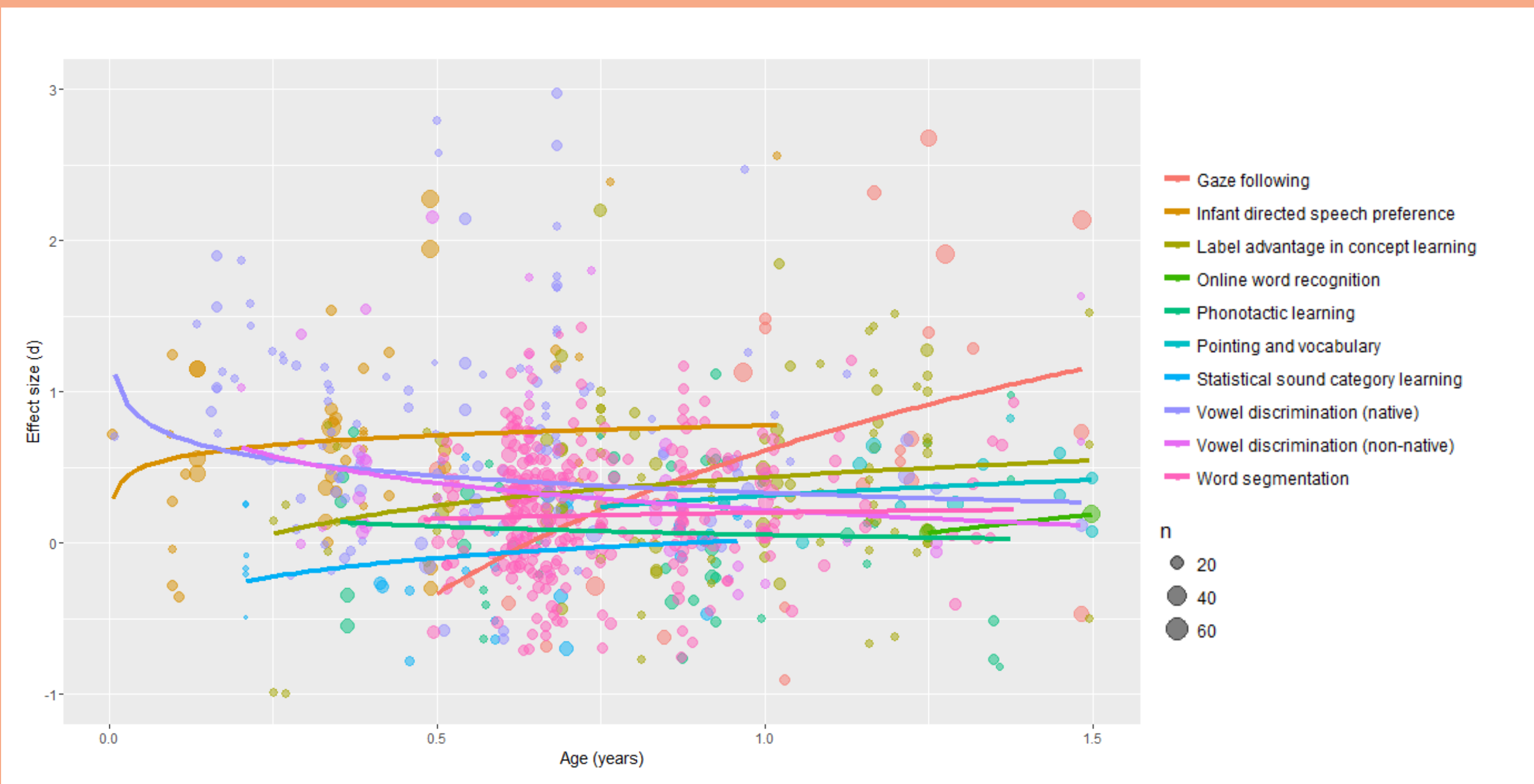No strong bias in language acquisition literature

MetaLab for Theory Development

Test theoretical predictions based on cumulated dataset

Word segmentation: No quantitative evidence that infants switch from familiarity to novelty preference with age.

Synthesize across meta-analyses to create quantitative developmental curve

Outlook

Increase number of contributors and users

- Development of instruction material
- User-friendly web interface
- In-class education & data contribution