

Vocabulary Development in Blind Infants and Toddlers:

The influence of vision on early vocabulary

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Conflicting Prior Studies

- Little is known about blind children's early vocabulary development – conflicting data
 - Blind children experience vocabulary delays (Brambring, 2007) – N=4
 - Blind children do not show vocabulary delays (Landau & Gleitman, 1985) – N=3
 - Composition of vocabulary also poorly understood
 - Potential differences in part of speech (challenges with pronouns), semantic content – also based on small N studies

To what extent does vision (or lack thereof) influence early vocabulary development?

Our Research Question:

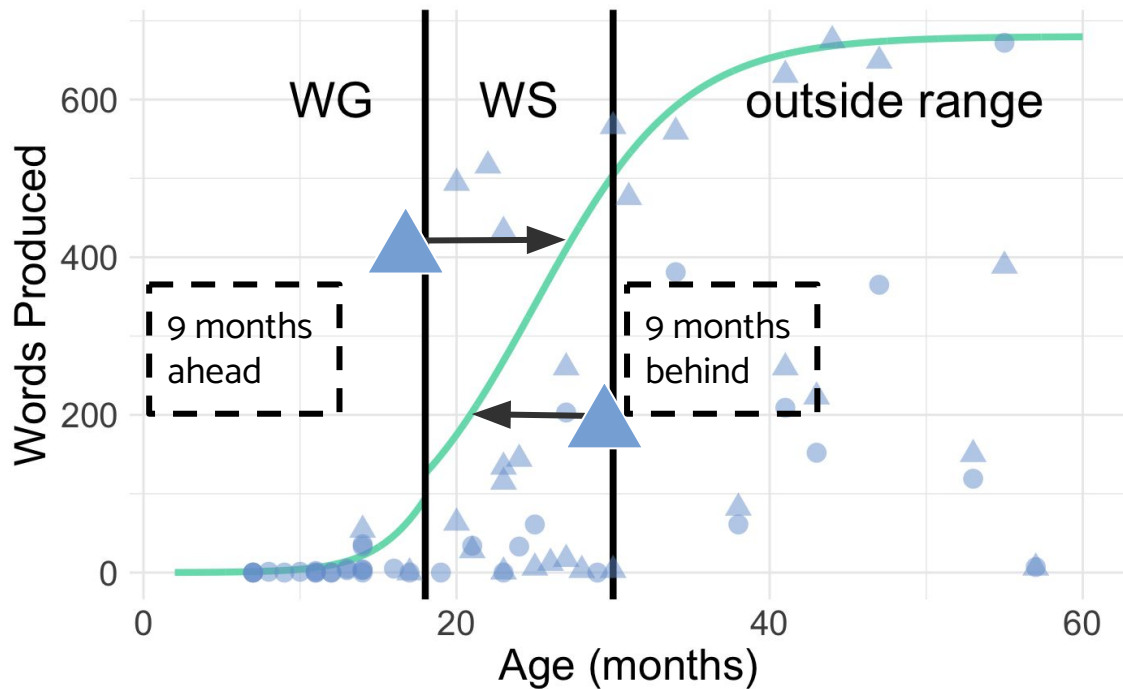
To what extent does vision (or lack thereof) influence early vocabulary development?

1. **Word Production:** Do **blind children** and **sighted children** show similar word production trajectories?
2. **Vocabulary Composition:** Do **blind children** and **sighted children** have a similar vocabulary composition?

Approach

- MacArthur Bates **Communicative Development Inventory** (CDI; American English) (Fenson et al., 1994)
 - Parent-report checklist of words child understands / produces (Words & Gestures) or just produces (Words & Sentences)
 - We focus on **word production measure** from both versions
- **Vocabulary data from 37 blind children**
 - No more than minimal light perception
 - Monolingual (>75% English input)
 - No cognitive comorbidities
 - Age range: 7–57 months
- **Comparison group:** normative vocabulary data from **sighted children** (Frank et al., 2017)
 - N = 1,804 children (Words & Gestures), 4,867 children (Words & Sentences)

Q1: Do **blind** children and **sighted** children
show similar word production trajectories?

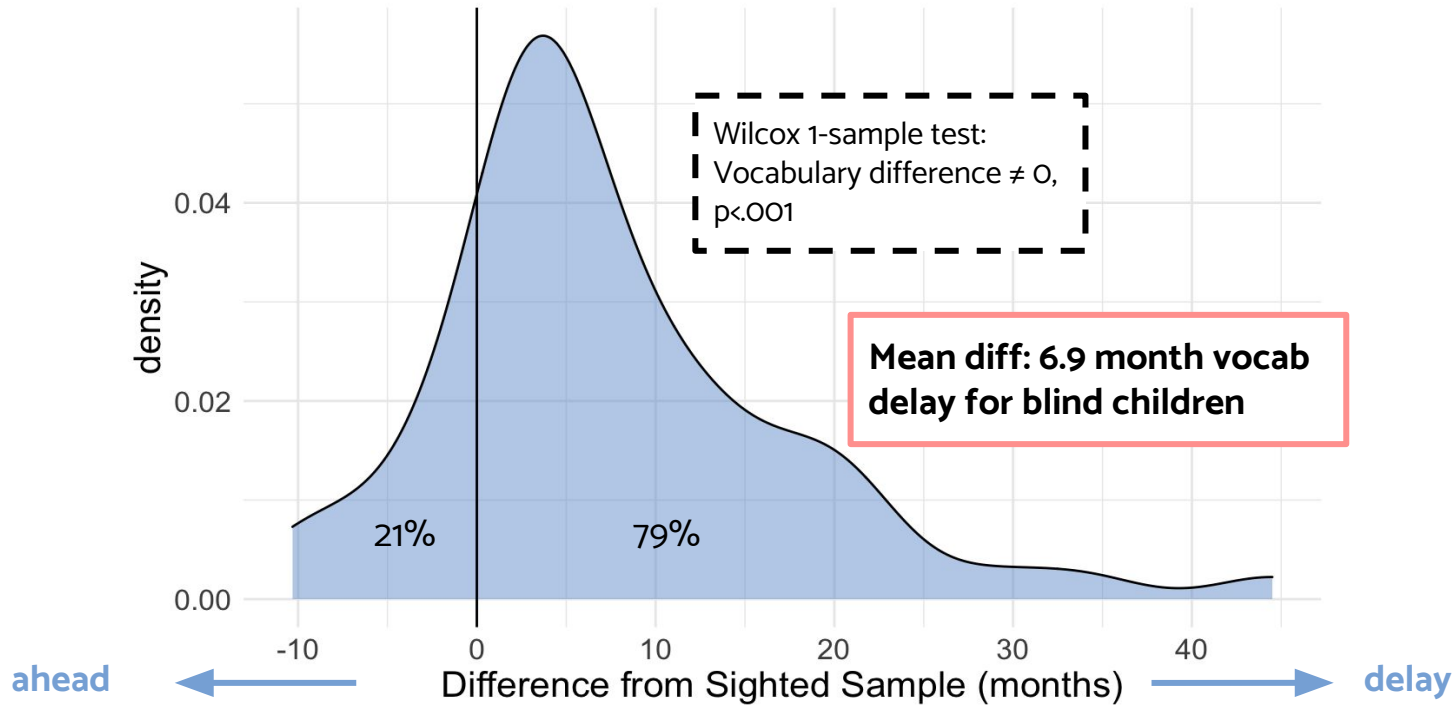


Version

- Words & Gestures
- ▲ Words & Sentences

We compare **blind children's** word production to **50th percentile** logistic growth curves.

Wide variability, but evidence of delays



Q1: Do **blind** children and **sighted** children show similar word production trajectories?

Not exactly:

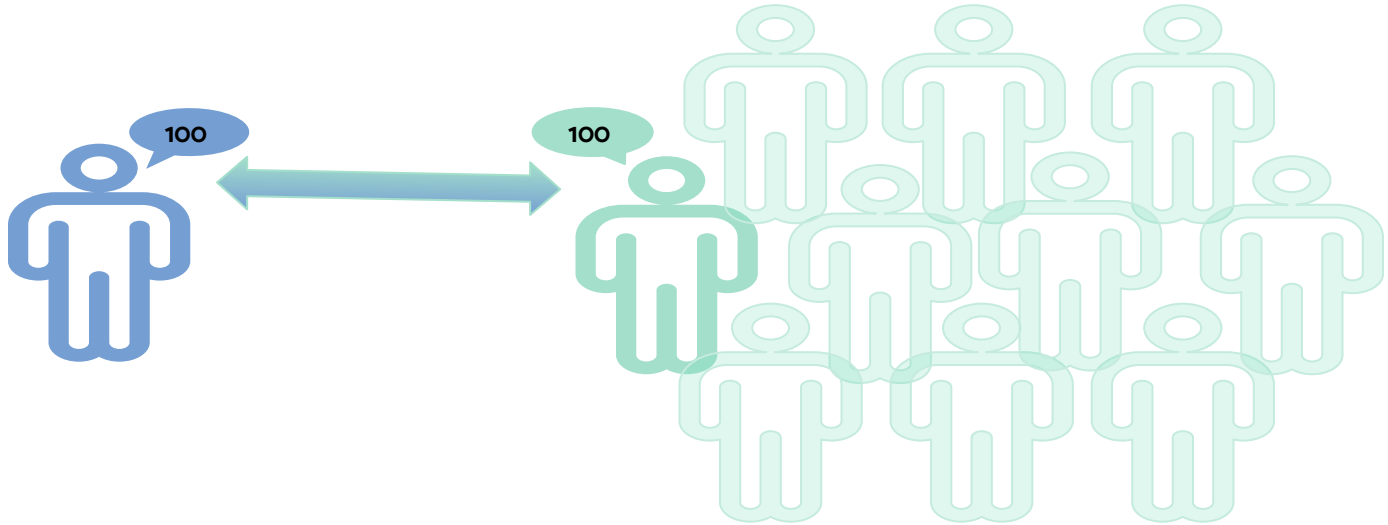
- Overall delay
 - Blind children show ~6.9 month vocabulary delay relative to sighted 50th percentile
- but we find wide variability:
 - 21% of blind children are ahead of 50th percentile

Q2: Do blind children and sighted children have a similar vocabulary composition?

- Semantic categories
- Concreteness
- Sensory modality
- Part of speech
- Word length

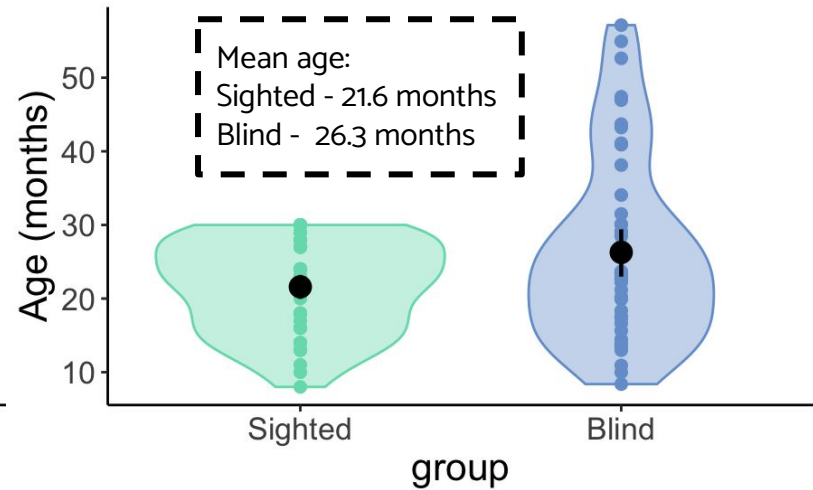
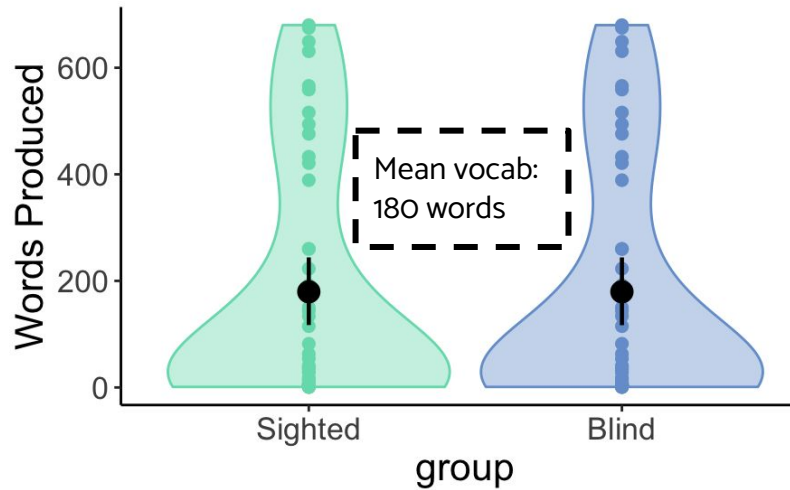
Vocabulary Matches from Wordbank

- Each **blind participant** matched to **sighted participant** from Wordbank
 - Matched based on vocabulary size

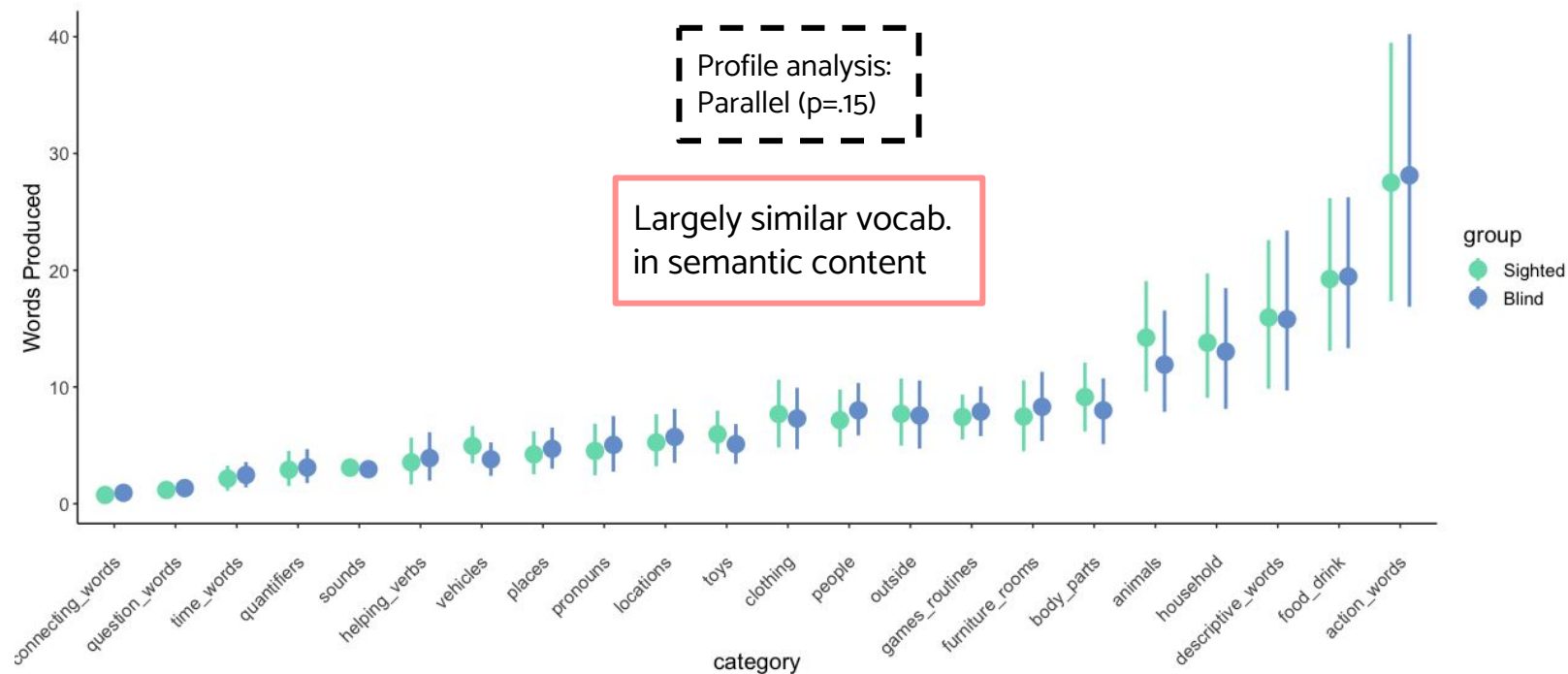


Vocabulary Matches from Wordbank

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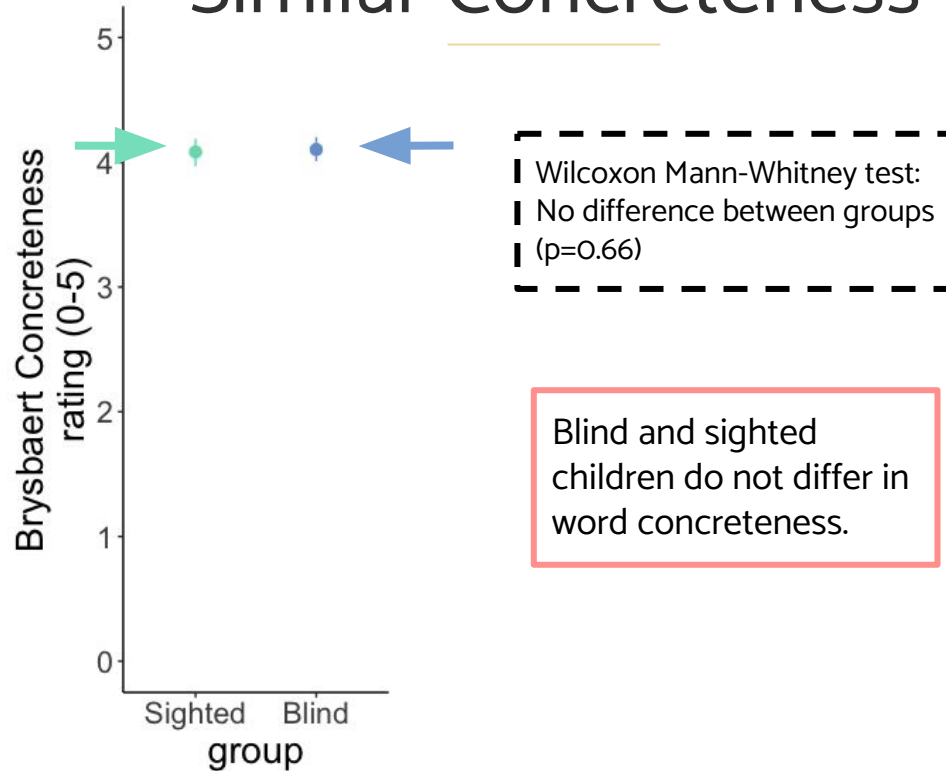
Similar Semantic Content



Q2: Do **blind** children and **sighted** children have a similar vocabulary composition?

- Semantic categories - no differences
- Concreteness
- Sensory modality
- Part of speech
- Word length

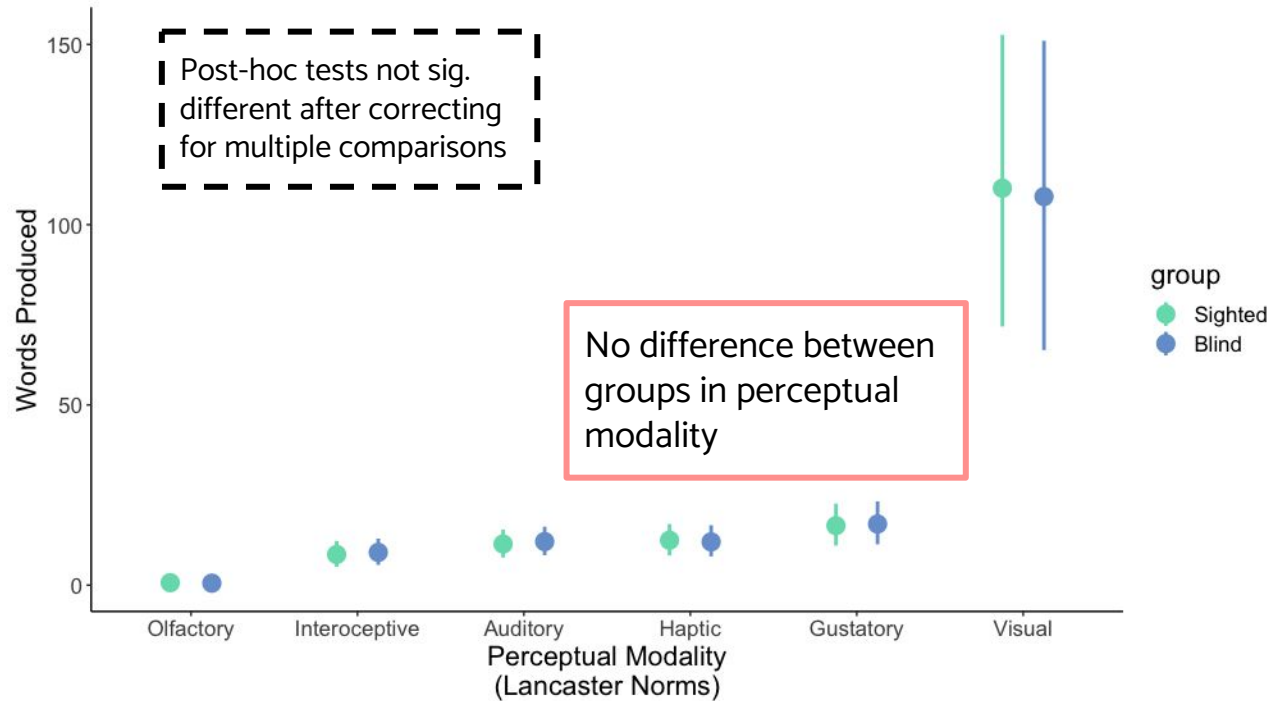
Similar Concreteness



Do **blind** children and **sighted** children have a similar vocabulary composition?

- Semantic categories – no differences
- Concreteness – no differences
- Sensory modality
- Part of speech
- Word length

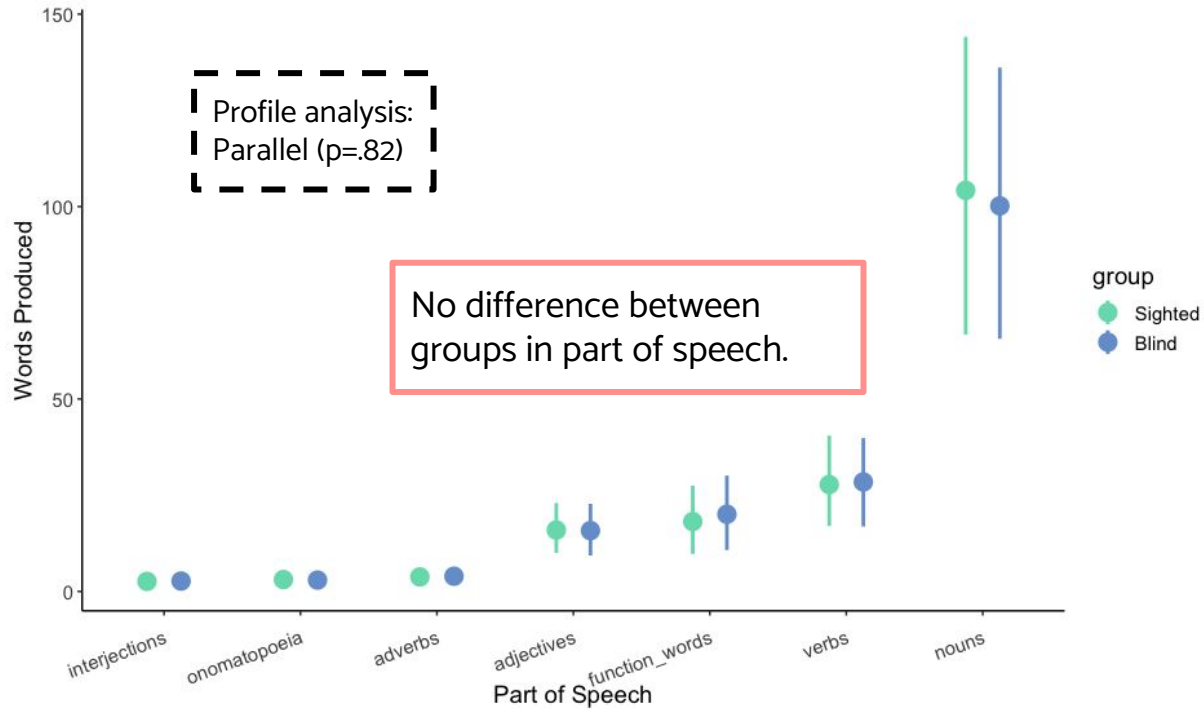
Similar Perceptual Modality



Q2: Do **blind** children and **sighted** children have a similar vocabulary composition?

- Semantic categories – no differences
- Concreteness – no differences
- Sensory modality - no differences
- Part of speech
- Word length

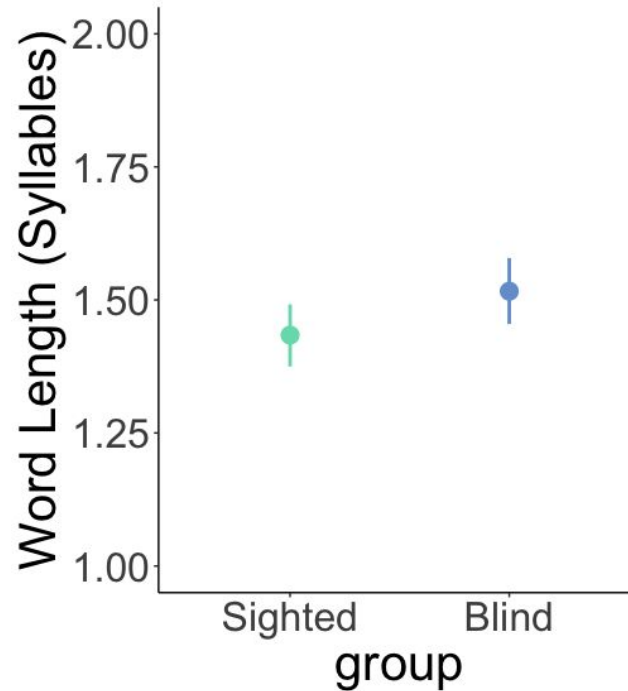
Similar Parts of Speech



Q2: Do **blind** children and **sighted** children have a similar vocabulary composition?

- Semantic categories – no differences
- Concreteness - no differences
- Sensory modality – no differences
- Part of speech – no differences
- Word length

Very Close in Word Length



Wilcoxon Mann-Whitney:
Small difference ($p=.04$)

Blind children say
ever-so-slightly longer words
(1.4 syllables vs. 1.6 syllables)

Q2: Do **blind** children and **sighted** children have a similar vocabulary composition?

- Semantic categories – no differences
- Concreteness – no differences
- Sensory modality – no differences
- Part of speech – no differences
- Word length – one very small difference

Very similar overall compared to sighted children with equivalent vocab size

To what extent does vision (or lack thereof) influence *how many* words and *which* words young children say?

Word Production: Do **blind children** and **sighted children** show similar word production trajectories?

Vocabulary Composition: Do **blind** children and **sighted** children have a similar vocabulary composition?

To what extent does vision (or lack thereof) influence *how many* words and *which* words young children say?

Word Production: Do **blind children** and **sighted children** show similar word production trajectories? → **No!** Blind children show vocab delay

Vocabulary Composition: Do **blind** children and **sighted** children have a similar vocabulary composition? → **Yes!** Vocabulary composition overwhelmingly similar

Discussion

- Teasing apart variability in vocabulary delays
 - How do we identify which children may be in need of vocabulary support?
- Words children learn = fairly robust
 - Is this the same flexible mechanism, or are blind children learning words in a qualitatively different way?
- How does language input interact with sensory experience and influence vocabulary?

Thank you!



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