What's the Story?

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Eye Movements in a Continuous Discourse

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Introduction

Visual world paradigm (VWP): eye movements are monitored while listening to spoken language input → Eye gaze response reflects underlying process involved in online language comprehension

Referring expressions (RE): noun phrases (NPs)('lion') and pronouns ('he'):

- After hearing a RE there is an increase in the proportion of looks to the target referent (e.g., Cooper, 1974; Järvikivi, et al., 2005; Kaiser & Trueswell, 2008)

Limitations:

- Carefully designed tasks
- Series of isolated items
- Limited number of entities in the visual scene

Method

Participants:

15 children(m_{age}= 4.8; 4.2-5.6)
12 adults (m_{age}= 20.0; 18.2-22.0)

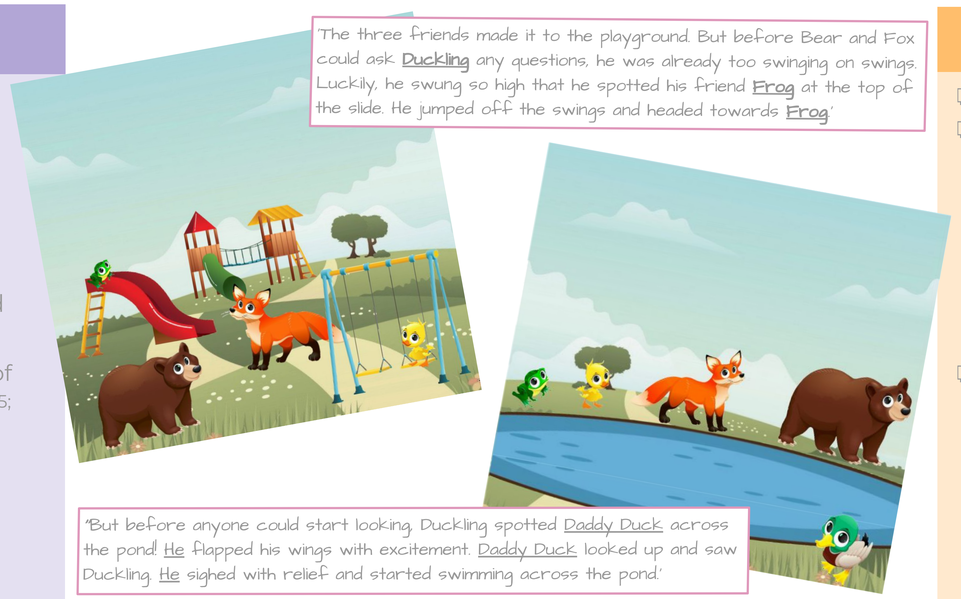
Electronic storybook with ETG:

5-minutes/22-pages
5 animal characters
Multiple referring expressions

Analysis:

Logistic Generalized Additive Mixed Model (looks to target vs. looks elsewhere)

- Time Bin
- Story Position
- Children vs. Adults
- NPs vs. Pronouns



What happens to eye movements during naturalistic storybook listening?

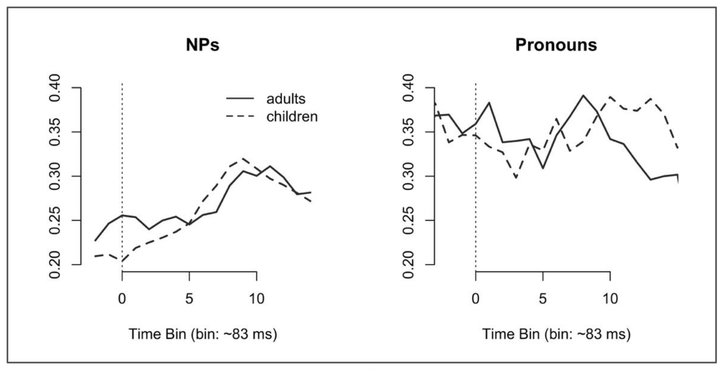


Figure 1. Average proportion of target looks across Time Bin

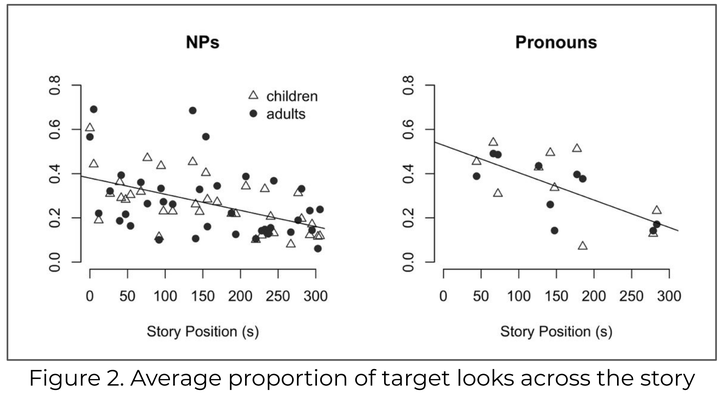


Figure 2. Average proportion of target looks across the story

Results & Discussion

- After a RE looks to the target referent increased (Figure 1)
- Likelihood decreased as the story unfolded (Figure 2)

GAMM model (visualized in Figure 3):

- Nonlinear interaction between Time Bin and Story Position for all 4 experimental conditions
- Differences between NPs and pronouns, as well as children and adults

- The role that the visual scene plays changes as the discourse unfolds over time

Building mental representation	Maintaining mental representation
Trying to figure out who is doing what to whom	Already know who the referents are and generally what is going on
Close time-locking between linguistic input and corresponding eye movements	Eye movements reflect processing for which the timing is not well understood

- Eye gaze is likely influenced by a referent's discourse status

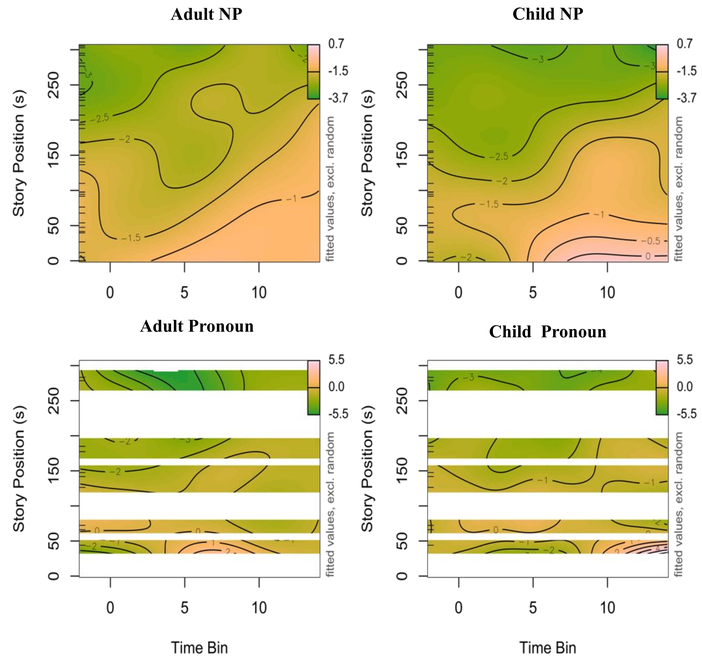


Figure 3. Interaction surface for all 4 experimental conditions

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