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What's the Story?

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)

'Here is a monkey and a tiger. The tiger hit the monkey by the mountain. He wanted to go home'

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

'The three friends made it to the playground. But before Bear and Fox could ask Duckling any questions, he was already too swinging on swings. Luckily, he swung so high that he spotted his friend Frog at the top of the slide. He jumped off the swings and headed towards Frog'

'But before anyone could start looking, Duckling spotted Daddy Duck across the pond! He flapped his wings with excitement. Daddy Duck looked up and saw Duckling. He sighed with relief and started swimming across the pond.'

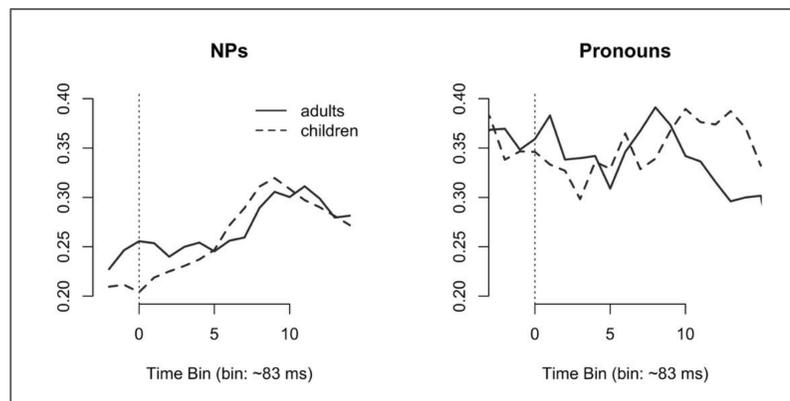## What happens to eye movements during naturalistic storybook listening?

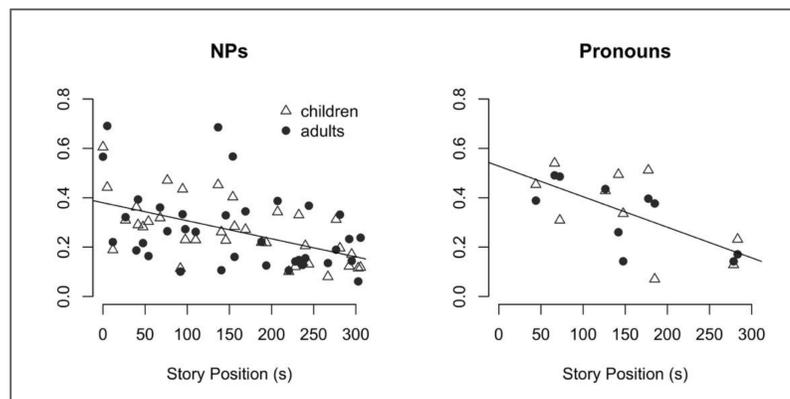Figure 1. Average proportion of target looks across Time Bin

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
↓
Trying to figure out who is doing what to whom
↓
Close time-locking between linguistic input and corresponding eye movements

Maintaining mental representation
↓
Already know who the referents are and generally what is going on
↓
Eye movements reflect processing for which the timing is not well understood
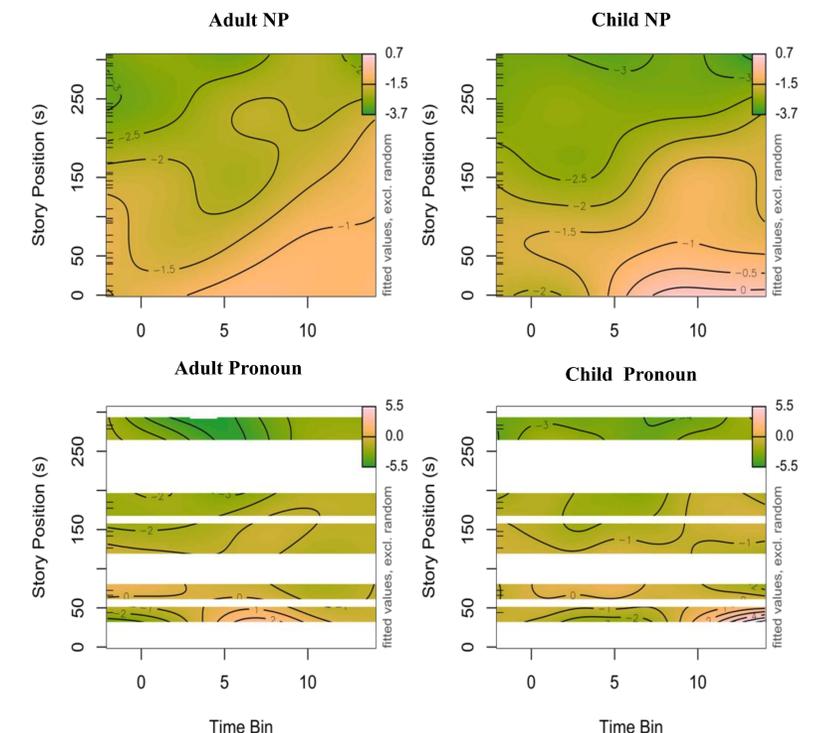
❏ Eye gaze is likely influenced by a referent's discourse status

Figure 3. Interaction surface for all 4 experimental conditions