GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN IN PUBLICA COMMODA SEIT 1737

B3

Curiosity-driven learning in children's reading behaviour and knowledge acquisition

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Motivation

- Children **actively shape** their reading experiences, i.e., how often and what they are reading. However, we do not know **what drives children's reading choices**.
- We propose that **curiosity is a key construct to explain which texts children choose to read** and how their reading preferences change.

Preliminary work:

- We have conducted several longitudinal studies investigating German children's reading development.[1]
- We collected the childLex corpus representing 6-12 year-old's reading environment.[2]
- We explored the development of children's orthographic networks (Fig. 1).[3]

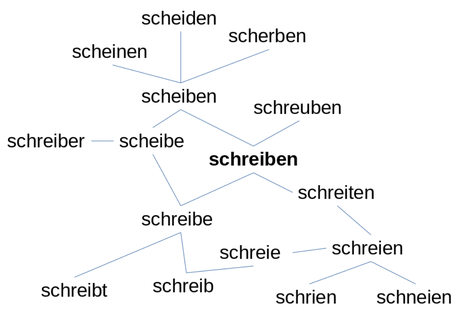

Fig. 1: Development of orthographic networks

Objectives

- Establish whether children's reading choices depend on the semantic **novelty** and **complexity** of the text materials in their learning environment[4].
- Investigate whether children's **past learning experiences** affect whether they select texts about new topics or explore familiar topics.

➢ We will explore the role of curiosity in children's reading choices, thereby answering the question **Why we are curious?**

➢ This project explores the mechanisms underlying curiosity i.e., speaking to the question **How are we curious?**

➢ In examining the factors that drive attention to specific objects, this project asks **When are we curious?**

?

What is the role of curiosity in children's self-initiated reading?

Methods

Step 1: Modelling children's text using topic models

- We will use **topic models** (Fig. 2) to model the **semantic landscape** children navigate.
- This allows us to extract the **semantic fields** covered in popular **children's books** (e.g., horses, vampires).
- Prediction: there will be substantial overlap between topics and children's natural reading choices.

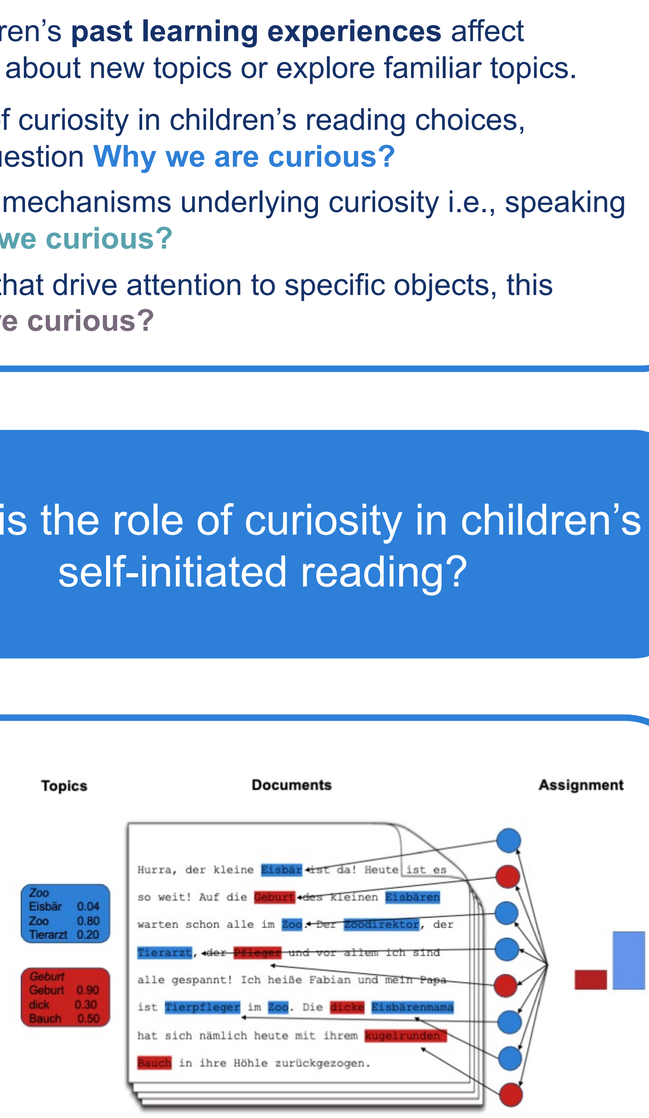

Fig. 2: Analysis of children's books using topic models

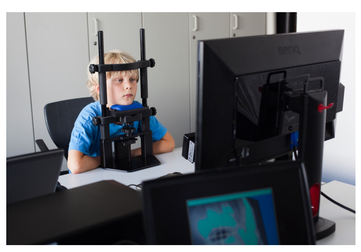

Fig. 3: Eye-tracking

Step 2: Investigating behaviour and neural responses experimentally

- We will create experiments in which children select texts in a simulated reading platform.
- Children's **eye-tracking** and **EEG** responses to new materials will be measured (Fig. 3).
- Prediction: curiosity-consistent materials will be read longer and processed deeper

Step 3: Modelling the development of children's semantic networks

- We will monitor children's reading choices **longitudinally** using tablets.
- **Children's semantic networks** (Fig. 4) and their **development** will be assessed.
- Prediction: children are more likely to integrate concepts with more connections to existing concepts compared to concepts with few connections.

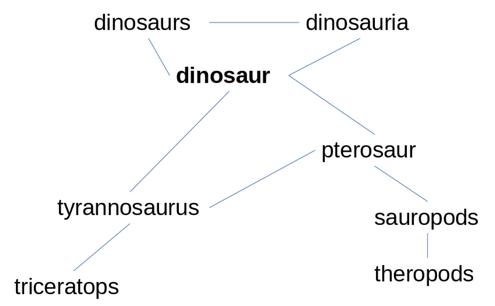

Fig. 4: Growth of the semantic network for "dinosaur"

Cross-project collaborations

- Theoretical collaborations with projects examining early **knowledge acquisition**: **A1**, **B4, C2, C5**
- Supplementing the **modelling** projects **C2**, **C4**, and **C5** with an **applied perspective.**

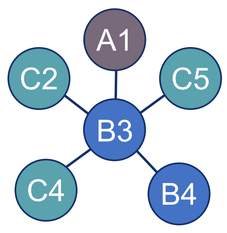

Fig. 5: Key collaboration partners of doctoral researcher working on Project B3

Potential PhD projects

1. Modelling children's curiosity-driven reading choices
2. Effects of curiosity on children's text processing and comprehension
3. Longitudinal effects of curiosity on children's lexical development

References

1. Grolig, L., Cohrdes, C., Tiffin-Richards, S. P., & **Schroeder, S.** (2019). Effects of preschoolers' storybook exposure and literacy environments on lower level and higher level language skills. *Reading & Writing*, 32, 1061-1084.
2. **Schroeder, S.,** Würzner, K.-M., Heister, J., Geyken, A., & Kliegl, R. (2015). ChildLex: A lexical database of German read by children. *Behavior Research Methods*, 47, 1085-1094.
3. Trautwein, J., & **Schroeder, S.** (2018). Orthographic networks in the developing mental lexicon. Insights from graph theory and implications for the study of language processing. *Frontiers in Psychology*, 9, 2252.
4. Dubey, R., & Griffiths, T. (2020). Reconciling novelty and complexity through a rational analysis of curiosity. *Psychological Review*, 127, 455-476.