Taxonomic Organization Scaffolds Young Children's Learning from Storybooks: A Design Experiment

Tanya Kaefer
Ashley M. Pinkham
Susan B. Neuman
Introduction

- Vocabulary development
  - Reading Comprehension
  - Socio-economic differences
  - Long-term outcomes

Therefore, our goal is to improve the vocabulary knowledge of low-income preschoolers
Intervention

- Lower SES
- Beginning in preschool
- Storybook reading
Storybook Reading

- Informative
- Familiar

But...

Storybook reading has a limited impact on outcomes
Learning words implicitly from storybooks has limited success
Storybook Reading

- How it can work
  - Extra-textual comments
  - Dialogic reading

- The book?
Taxonomic Information

- Universal
- Conventional
- Constant

Diagram:

- Animals
  - Cows
  - Horses
  - Sheep
Why Taxonomies may help
- Background knowledge.
- Organization
A Design Experiment

Phase 1
- Do children learn more from taxonomically structured storybooks than traditional storybooks

Phase 2
- Are there socio-economic differences?
- Do children learn from taxonomically structured storybooks with novel categories as well as familiar categories?
Phase 1

- Does providing taxonomic information in a storybook scaffold:
  - Incidental learning of novel words?
  - Learning book content?
A moa builds a nest because it is a bird.
The moa looked in his nest and found his hat.

A moa has a bed and lives in the house.
The moa looked in his bed and found his hat.
<table>
<thead>
<tr>
<th>Category Member</th>
<th>Word</th>
<th>Bird Condition Information</th>
<th>Traditional condition information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moa</td>
<td>Builds a nest</td>
<td>Has a bed</td>
<td></td>
</tr>
<tr>
<td>Faroe</td>
<td>Lays eggs</td>
<td>Has a sofa</td>
<td></td>
</tr>
<tr>
<td>Kona</td>
<td>Eats seeds</td>
<td>Eats candy</td>
<td></td>
</tr>
<tr>
<td>Cupido</td>
<td>Has feathers</td>
<td>Has pockets</td>
<td></td>
</tr>
</tbody>
</table>
Methods – Participants & Procedure

- 70 5-year-olds
- Storybook reading
- Tested on:
  - Story knowledge
  - Vocabulary
Results – Storybook Knowledge
Results – Vocabulary

![Bar chart showing the comparison between Taxonomic and Traditional methods. The Taxonomic method has a higher result than the Traditional method.]
Conclusions

- Taxonomic storybook structure aids in implicit learning of background knowledge and vocabulary.
Phase 2

- Does background knowledge make a difference in learning from taxonomic storybooks?
- Does socio-economic status influence learning from taxonomic storybooks?
What do children know about the taxonomic category?

74 4- and 5-year-olds in Head Start, State funded and University affiliated preschool programs

Tested on Bird knowledge
Pilot results

![Graph showing comparison between Low SES and High SES](image-url)
Phase 2

- Novel vs. Familiar storybooks
- Low vs. High SES
A moa builds a nest because it is a bird.  
The moa looked in his nest and found his hat.

A moa builds a hive because it is a wug.  
The moa looked in his hive and found his hat.
<table>
<thead>
<tr>
<th>Category Member</th>
<th>Word</th>
<th>Familiar (bird) Condition</th>
<th>Novel (wug) Condition</th>
</tr>
</thead>
<tbody>
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<td>Kona</td>
<td>Eats seeds</td>
<td>Eats hay</td>
<td></td>
</tr>
<tr>
<td>Cupido</td>
<td>Has feathers</td>
<td>Has fur</td>
<td></td>
</tr>
</tbody>
</table>
Participants and Procedure

- 155 4- and 5-year-olds in Head Start and state funded preschool programs
- Read taxonomic storybook with familiar or novel taxonomic category
- Tested on:
  - Story Knowledge
  - Vocabulary
  - Category extension (novel only)
Results – Storybook memory

Familiar Category

Novel Category

Low SES  High SES
Results – Vocabulary

![Graph showing vocabulary results for Familiar and Novel Category by Low SES and High SES]
Results – Vocabulary

- Familiar Category
  - Low SES
  - High SES

- Novel Category
  - Low SES
  - High SES
But...

Did children in the novel condition learn the novel category?
Results – Category properties

Low SES

0.6

High SES

0.5
Conclusions

- Learning from taxonomically structured storybooks differs between socio-economic status.
- Background knowledge is a significant factor of learning vocabulary implicitly from storybooks.
- But, children do gain categorical knowledge from taxonomically structured storybooks.
Overall Conclusions

- Potential for storybook based intervention
- However: dependent on establishing background knowledge
  - Scaffolding on background knowledge for lower SES classrooms
Thank You!!

- Children, parents, and schools who participated in this research
- RTL Research Team
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