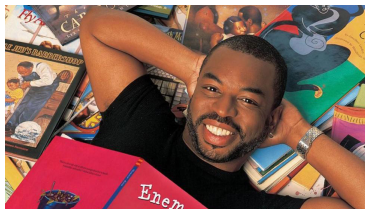# Take a Look!: Investigating the Relative Contributions of Children's Books and Child-Directed Speech

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Perspectives on Computational Research

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How do we learn language?

or, more specifically,

From what sources do children glean language rules/use
and what do they contribute respectively?

Background

- Extensive work on child-directed speech (CDS)
  - Aspects of CDS predict vocabulary skill (Rowe 2008; Rowe 2012)
  - CDS linguistic construction differs markedly from standard speech (Cameron-Faulkner et al., 2001)
- Recent work investigates children's books as important source
  - e.g., Whitehurst et al., 1988; Montag et al., 2015; Montag et al., 2017

Setup / Objective

- Caregiver speech and picture books are two prominent sources of linguistic input for children
- Research has historically neglected the latter
- Important to assess their relative (unique?) contributions

Montag et al.(2015), 2

What language-learning data might early picture books provide that everyday conversations do not?

Question for this project:

What are substantive differences in the content of child-directed speech and age-appropriate children's books?

Procedure

- Content Analysis on Speech and Text Corpora
    1. Relative POS usage across time
    2. Average sentence complexity (using tree parsing)
    3. Lexical diversity through type-token ratio (TTR)
    4. ...etc.

Corpora – Language Development Project (LDP)

- UChicago-based initiative to document parent-child interactions with a socioeconomically-diverse sample ($n = 102$)
- Ecological check-ins between ages 14 - 58 months at four month intervals
- Analysis draws from transcripts of caregiver speech

	subject	age	p_chat
0	22	1	play with Mommy's hand . no . no, no, no . nop...
1	22	2	what are you crawling for ? stand up . what ...
2	22	3	you want to show her how you do a head+stand ?...
3	22	4	how do flowers taste ? yeah . do you eat flow...
4	22	5	what ? you brought it down because you said...
5	22	6	do do do . &xxx get the foot book ? where is ...
6	22	7	right ? are you a mysterious girl ? no on...

Corpora – Books

Montag, J. L., Jones, M. N., & Smith, L. B. (2015). The words children hear: Picture books and the statistics for language learning. Psychological Science, 26, 1489-1496.

Alexander and the Terrible, Horrible, No Good, Very Bad Day by Judith Viorst

Angelina Ice Skates by Katharine Holabird

Are You My Mother? by P. D. Eastman

Arnie the Doughnut by Laurie Keller

Arthur Writes a Story by Marc Brown

A Bad Case of Stripes by David Shannon

Bark, George by Jules Feiffer

Bear Wants More by Karma Wilson

The Berenstain Bears and the Green-Eyed Monster by Stan Berenstain and Jan Berenstain

The Berenstain Bears Forget Their Manners by Stan Berenstain and Jan Berenstain

Blueberries for Sal by Robert McCloskey

Bread and Jam for Frances by Russell Hoban

Brown Bear, Brown Bear, What Do You See? by Bill Martin, Jr.

Bunny Party by Rosemary Wells

Caps for Sale by Esphyr Slobodkina

The Carrot Seed by Ruth Krauss

The Cat in the Hat by Dr. Seuss

Charlie and the New Baby by Ree Drummond

Chicka Chicka 1-2-3 by Bill Martin, Jr., Michael Sampson, and Lois Ehlert

Chicka Chicka Boom Boom by Bill Martin, Jr., and John Archambault

Chrysanthemum by Kevin Henkes

How Do Dinosaurs Say Good Night? by Jane Yolen and Mark Teague

How to Train a Train by Jason Carter Eaton

If You Give a Moose a Muffin by Laura Joffe Numeroff

If You Give a Mouse a Cookie by Laura Joffe Numeroff

I'm a Big Sister by Joanna Cole

The Keeping Quilt by Patricia Polacco

Knuffle Bunny by Mo Willems

Ladybug Girl at the Beach by David Soman and Jacky Davis

Lilly's Purple Plastic Purse by Kevin Henkes

Little Blue Truck Leads the Way by Alice Schertle

The Little Engine That Could by Watty Piper

The Little House by Virginia Lee Burton

Llama Llama Home With Mama by Anna Dewdney

Llama Llama Red Pajama by Anna Dewdney

The Lorax by Dr. Seuss

Love You Forever by Sheila McGraw

Madeline by Ludwig Bemelmans

Maisy Goes Camping by Lucy Cousins

Maisy Goes to the Library by Lucy Cousins

Make Way for Ducklings by Robert McCloskey

Mike Mulligan and His Steam Shovel by Virginia Lee Burton

Miss Rumphius by Barbara Cooney

The Napping House by Audrey Wood

No, David! by David Shannon

Oh, the Places You'll Go by Dr. Seuss

Projections

- Repicate previous work showing that books exhibit higher TTR (with different speech corpus)
- Uncover meaningful distinctions between syntactic make-up of books vs. speech
  - Hopefully uncover specific benefits of children's books (and speech)

Questions?