

# Understanding Children's Learning in Digital Contexts



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# 4 things research has taught us about children's learning in digital contexts

1. **Babies:** people > screens
2. **Toddlers:** screens ≠ reality
3. **Preschoolers:** screens + scaffolding = better learning
4. **“Interactive” digital tech for children can empower parents,** rather than replace them

# Infants

- 12- to 18-month-olds
- Parents given DVD or word list on a piece of paper
- 1 month exposure, 5 times per week
- Control group: no added activities



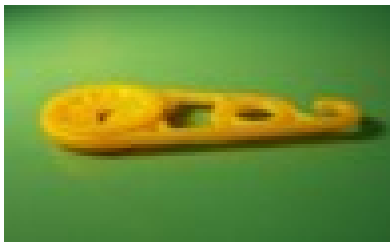
Do babies learn from baby media?  
DeLoache, Chiong, Sherman, Islam,  
Vanderborcht, Troseth, Strouse, &  
O'Doherty (2010, *Psych. Science*)

# Infant Learning Results

- Infants who viewed the DVD did not learn any more words than a control group did.
- Highest level of learning occurred in the no-video **parent-teaching** condition.
- Parents who liked the DVD overestimated how much their children learned from it.

# The “Video Deficit” in Toddler Learning

- Toddlers learn better from a person who is present vs.
  - *Imitating* a person’s novel behavior seen on video
  - *Learning a word* uttered by a person on video



# Video vs. Direct Experience

- 2-year-olds watch a toy be hidden in a room “on TV” or directly through a window, then search for the toy.
- 44% correct search vs. 100% correct search Troseth & DeLoache (1998, Child Development)



# Help toddlers make the connection between screen and reality



- Live video of them (and their parents and pets) “on TV” at home for 2 weeks
- Transferred to use of video and photos for information in the lab
- Troseth (2003, Developmental Psychology)
- Naturalistic experience and the early use of symbolic artifacts
- Troseth, Casey, Lawver, Walker, and Cole (2007, Journal of Cognition and Development)

# What about Video Chat?



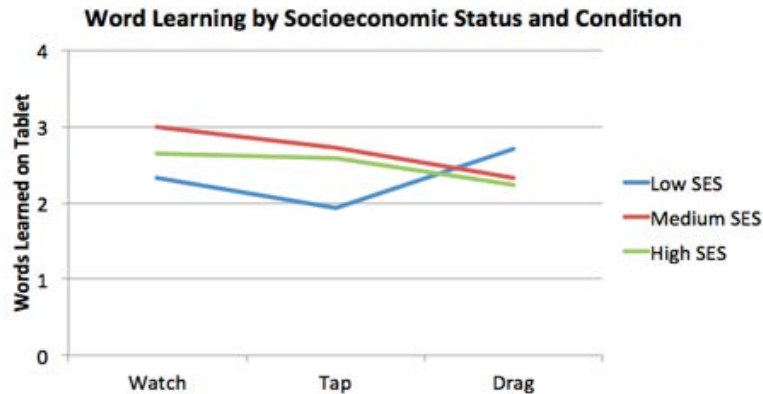
- 5 minutes interacting with a researcher on screen helped children to use information (she told them how to solve a problem).
- Without this socially responsive, contingent 'video chat' prior to the task, children were only a third as likely to succeed.
- Young children's use of video as a source of socially relevant information.  
Troseth, Saylor, and Archer.  
(2006 Child Development)



# Todders & Video: Summary

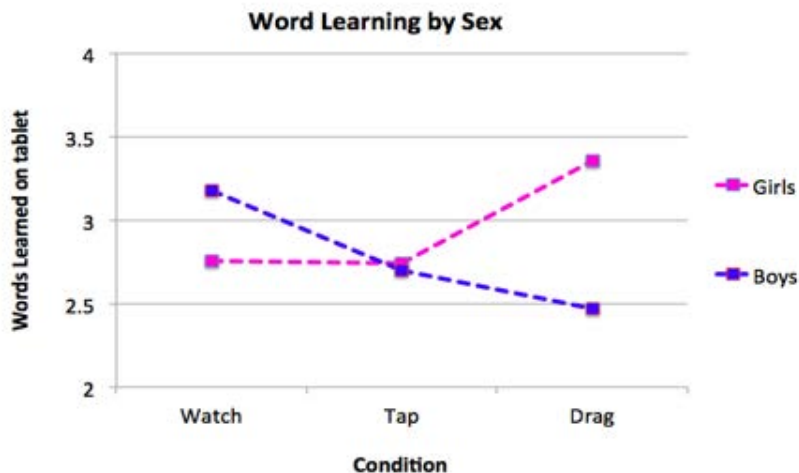
- Children do not expect TV to connect to reality
  - Experience with video that was clearly related to reality helped them to use information from video
- Social cues missing from video impair learning for very young viewers
  - Providing those cues on video (e.g., contingent responsiveness) helped them learn
- What about non-social contingency (e.g., from touch screens?)

# Interaction and learning: Individual differences



- Touch screen use by parent education level:
  - Lower: 1.5 hrs/day
  - Middle: 0.77 hr/day
  - High: 0.61 hr/day

- Russo-Johnson, Troseth, Duncan, & Mesghina (2017, *Frontiers in Psychology*)



# Preschool age



- Preschoolers (3-5 years) do learn from TV
- Enduring educational benefits from watching Sesame Street (Wright & Huston, 1995; Wright et al., 2001; Zill, 2001)
- Also, early evidence that co-viewing helped children learn more (Ball & Bogatz, 1970; Reiser et al., 1984; 1988; Singer & Singer, 1978)

# Parent Co-viewing and Child Learning



Effective coviewing: Preschoolers' learning from video after a dialogic questioning intervention. Strouse, O'Doherty, & Troseth (2013, *Dev. Psy.*)

- 3-year-olds watched storybook videos for a month
- Some parents were trained to use “dialogic questioning” while co-viewing (Whitehurst et al., 1988)
- Some children watched “as usual”
- Another group watched video with an on-screen “dialogic actress” asking questions

# Results

Compared to “Watch as usual” group, Dialogic group improved after a month in:

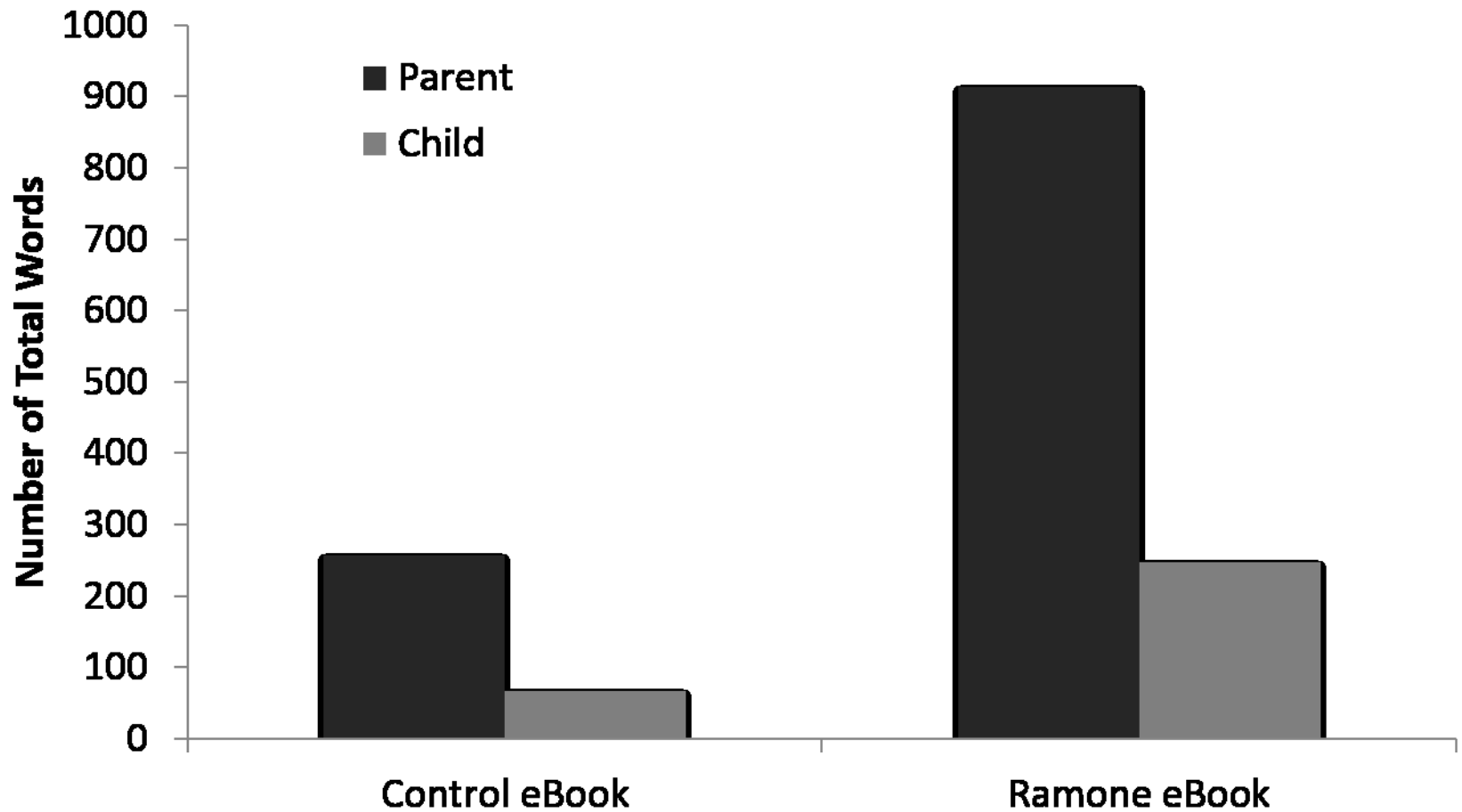
- Standardized Expressive Vocabulary (EOW-PVT)
- Story-Specific Vocabulary
- Story Comprehension
- Dialogic questioner on screen: children learned almost as much about story (vocabulary & comprehension) as with parent questioning

# Dialogic Questioning in an eBook



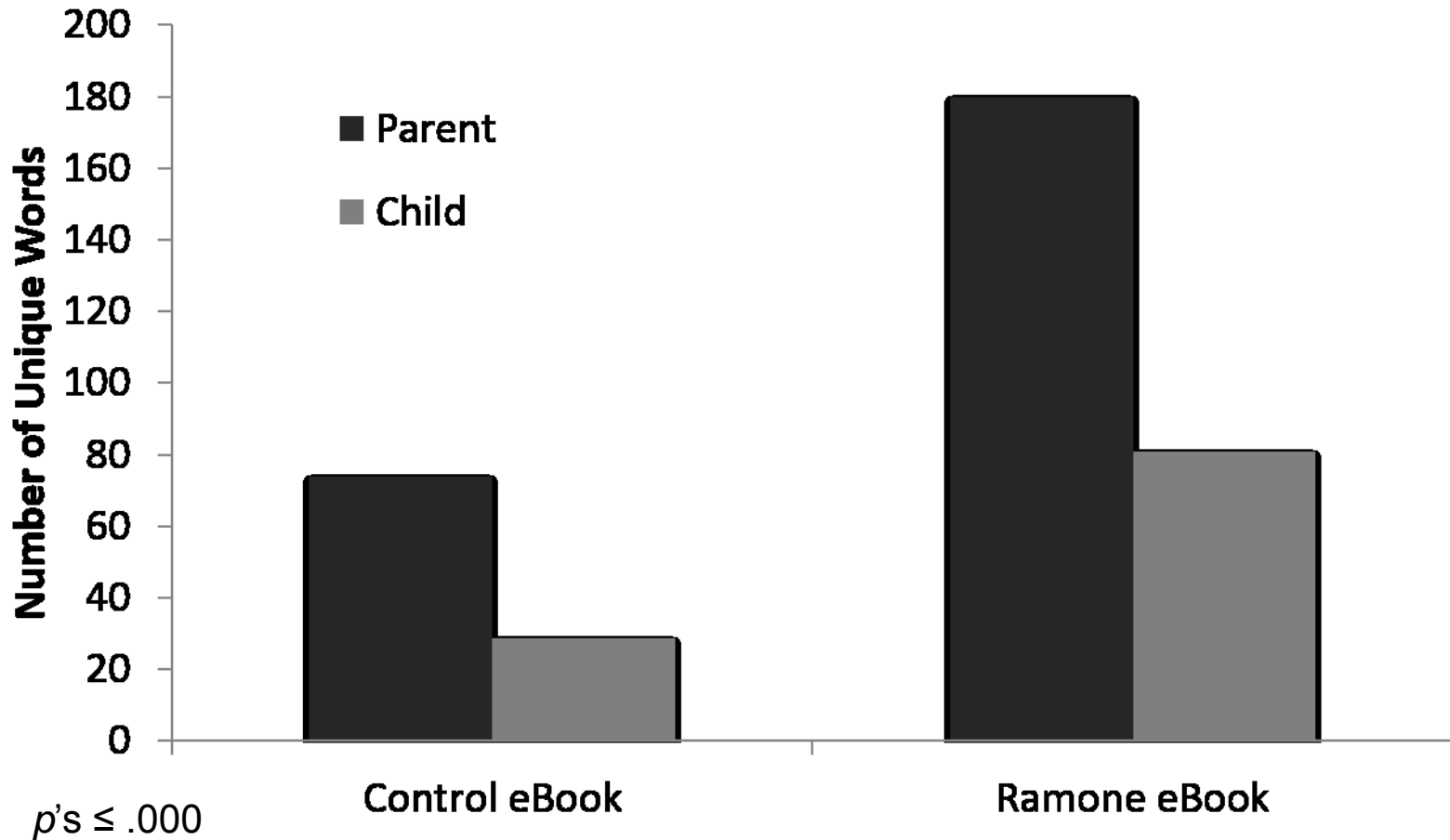
Goal: give all parents the tools to engage in rich conversation around (all kinds of) storybooks

# Parent and Child Talk by Condition



$p$ 's  $\leq .001$

# Parent and Child Unique Words by Condition



Strouse, Troseth, Flores, Stuckelman, & Russo Johnson (In preparation)



# What were they talking about?

- With Ramone's questioning model:
  - More content related talk
  - Less talk to control child behavior
  - Children's topics of talk were similar to parents'
- On the final pages, when Ramone did not automatically appear, parents most often **asked their own questions.**



# What's next?

- Families take e-book/tablet home for 2 weeks
  - Group 1: 2 Ramone versions (easy & harder questions)
  - Group 2: Control (as released) book
  - Group 3: All versions (which will they choose to use?)
- Outcomes
  - Learning (story vocabulary and comprehension)
  - Parent transfer of questioning to other books
- Under development: “Smart” book and questioner that adapt to parent’s and child’s growing skill

# Take-away

- Children's learning in digital contexts depends on age
- Learning can be enhanced by adult support
- Adaptive digital technology holds promise for helping parents to support their children's learning

# Thank you



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Graduate  
Research  
Fellowship  
Program

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