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

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
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

- 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

Effective co-viewing: Preschoolers’ learning from video after a dialogic questioning intervention. Strouse, O’Doherty, & Troseth (2013, Dev. Psy.)
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

Number of Total Words

- Parent
- Child

Control eBook
Ramone eBook

p's ≤ .001
Parent and Child Unique Words by Condition

$p's \leq .000$

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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References


