

Impact of Haptic Feedback on Parent-Child Interaction During Story Time

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Outline

Introduction

- Why is this important?
- What are Haptics and Haptic feedback?

Related Work

Methods

- Individual Understanding & Haptic Feedback
- Influence of Haptic Feedback on Interactivity

Conclusion

Introduction

- Increases in engagement in reading is linked to increases of text comprehension [Kamil et al., 2014]
- Development in literacy at a young age
 - Parental involvement
 - Engage with technology through senses

Haptic & Haptic Feedback

What are haptics?

- Technology interacted with through physical contact [hap, 2018]

What is haptic feedback?

- The response we get from the interaction
- Responses in virtual environments
- Vibration
- Friction

Haptic Vest



Figure: Haptic Vest [Zhao et al., 2015]

FeelSleeve



Figure: FeelSleeve [Yannier et al., 2015]

TPaD Tablet

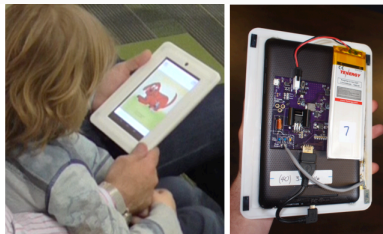


Figure: [Cingel and Piper, 2017]

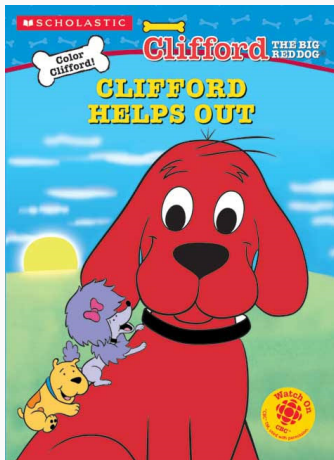
- Glass sheet over screen
- 1st Generation Google Nexus 7™
- Varying friction produces different sensations

Study 1: Individual Understanding & Haptic Feedback

- Examine how parents and children use haptic feedback to show text comprehension individually
- 10 parent-child pairs
- Children age 3-8

Study 1: Individual Understanding & Haptic Feedback

Ebook:
"Clifford
Helps Out"
-Grades
pre-K-3
(recom-
mended
ages 4-9)



Study 1: Individual Understanding & Haptic Feedback

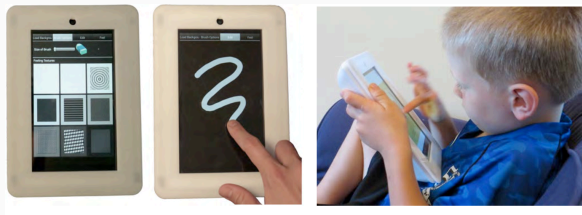


Figure: [Cingel et al., 2015]

Procedure

- Each given a TPaD
- Training period together, read ebook separate
- Haptic palette to "paint"

Study 1: Individual Understanding & Haptic Feedback

-Data

- Interview questions

 - Placement strategies

 - Enjoyment

- Amount of page "painted"

Study 1: Individual Understanding & Haptic Feedback

- Engaging & enjoyable

- Children

 - Placement based on knowledge of the world

 - “can help kids understand if they can't read the words”[Cingel et al., 2015]

Study 1: Individual Understanding & Haptic Feedback

Parents

- Assist child in understanding the text
- Abstract thinking
 - Emotion
 - Crunchy leaves in the Fall
- Two times more haptic feedback than children

Study 2: Influence of Haptic Feedback on Interactivity

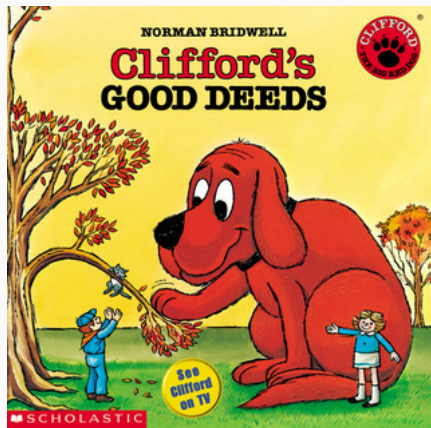
18 parent-children pairs

- 9 pairs in haptic e-book condition
- 9 pairs in non-haptic e-book condition

Children age 4-7

Study 2: Influence of Haptic Feedback on Interactivity

Ebook:
"Clifford's
Good Deeds"
-Grades
pre-K-3
(Recom-
mended
ages 4-9)



Study 2: Influence of Haptic Feedback on Interactivity

-First Level: Type of Utterance

- Statement/Comment
- Directive
- Question
- Answer

Study 2: Influence of Haptic Feedback on Interactivity

-Second Level: Object of Statement

- Story content/Events
- Reading Experience
- Technology

-Third Level: Verbal and Nonverbal Expressiveness

- Expressiveness

Study 2: Influence of Haptic Feedback on Interactivity

Haptic e-book condition group

- More talk about the technology (66%)
- Discussion may help children's short-term comprehension and language skills
- Remembering of events

Study 2: Influence of Haptic Feedback on Interactivity

Non-Haptic e-book condition group

- Technology-related talk was about page turning (93%)
- Four times more expressiveness by parents than other group

Conclusion: The Positive

Haptic feedback may lead child to more individual thought

- Increased Engagement

Discussion of technology and events in the story

- Short term comprehension

- Language skills

Assist remembering events

Conclusion: The Concerns

- No clear positive evidence that proves that haptic feedback ebooks are a "must have"
 - Parents may decrease in expressiveness
 - Level of interest in the feedback by the child
- Limitations of texture provided from haptic feedback versus physical textures in books
 - "I don't think it replicates a fuzzy lion's tail..." [Cingel and Piper, 2017]

References |



(2018).

Techopedia inc. - haptic.



Cingel, D., Blackwell, C., Connell, S., and Piper, A. M. (2015).

Augmenting children's tablet-based reading experiences with variable friction haptic feedback.

In Proceedings of the 14th International Conference on Interaction Design and Children, IDC '15, pages 295–298, New York, NY, USA. ACM.






Cingel, D. and Piper, A. M. (2017).

How parents engage children in tablet-based reading experiences: An exploration of haptic feedback.

In Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing, CSCW '17, pages 505–510, New York, NY, USA. ACM.

References ||

-  Kamil, M., Mosenthal, P., Pearson, P., and Barr, R. (2014). *Handbook of Reading Research*. Number v. 3. Taylor & Francis.
-  Yannier, N., Israr, A., Lehman, J. F., and Klatzky, R. L. (2015). Feelsleeve: Haptic feedback to enhance early reading. *In Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems, CHI '15*, pages 1015–1024, New York, NY, USA. ACM.
-  Zhao, S., Lehman, J., Israr, A., and Klatzky, R. (2015). Using haptic inputs to enrich story listening for young children. *In Proceedings of the 14th International Conference on Interaction Design and Children, IDC '15*, pages 239–242, New York, NY, USA. ACM.