

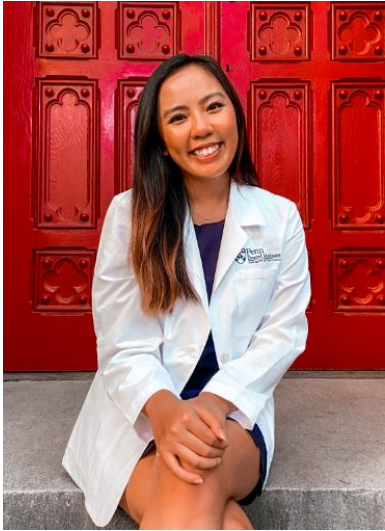


# Literacy Promotion using Automated Hovering to Improve Development in Young, Low-income Children

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# Introduction



Allison Bui



Devin Brown



James Guevara, MD, MPH



## Significance

Low-Income children experience delays in acquiring foundational communication and language development skills.

Early parent-child shared reading interactions can help reverse these disparities.

# The 30 Million Word Gap

"On average, the number of words heard per hour in the welfare group was 616 compared to 1,251 in the working class group and 2,153 in the professional group. "



## Reach Out and Read (ROR)

First developed and implemented at Boston City Hospital

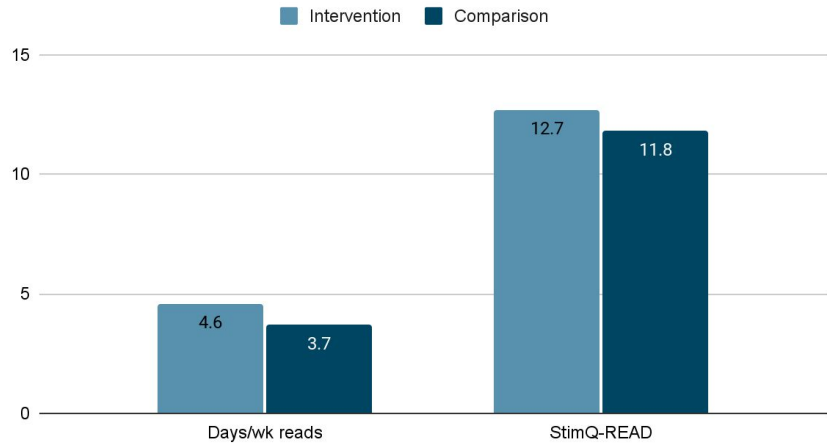
An Intervention program that integrates promotion of parent-child reading activities for children <5 yo

Waiting room program, anticipatory guidance about literacy development, and distribution of age appropriate children's books at each visit

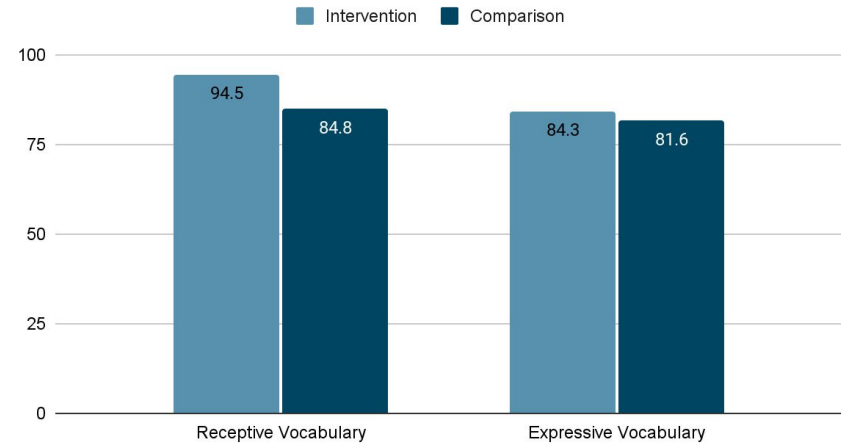
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### Parent-Child Reading



### Language Development

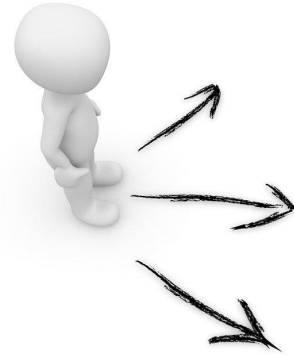


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# Behavioral economics = promising new approach

- Psychology + economics
- Targeting individual behavior
- Past successes
  - physical activity, smoking cessation, sweetened beverage tax



# Automated Hovering

- 5,000 hours
  - Development:
    - Behavioral economics as a field
    - Technology
    - Less resource- & personnel-intensive
  - How it will be used
    - Way 2 Health
- 





## Project Goal:

Incorporate behavioral economics approaches to improve the frequency of early parent-child reading behaviors among low-income families

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# Aims

## Primary:

- Determine the **feasibility and acceptability** of a **behavioral economics** approach of varying degrees to **improve the frequency of parent-child reading** in among low-income families

## Secondary

- To explore differences in **reading frequency, the home reading environment, parenting stress, and child language and socio-emotional development** by the intensity of the behavioral economics approach among low-income families.



# Overall design

- Pilot randomized trial
- Mixed methods
- 8 weeks
- Phase One:
  - Rapid cycle design process (n=10)
- Phase Two:
  - Subjects randomized to 1 of 3 arms utilizing behavioral economics of varying intensity (n=45)
- Study measures at pre- and post-intervention + daily reports
  - Used to determine feasibility, acceptability, and explore outcomes

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# Study Population

- Families from 3-4 urban CHOP-affiliated pediatric practices
  - Reach Out and Read program
- Parents who:
  - Have an infant aged 6-24 months
  - Have Medicaid insurance
  - Have access to a smartphone with text messaging capabilities





# Study Design





# Study Design





## Phase 1: January 2021 - July 2021

- Rapid cycle design (Dr. Buitenheim)
- Interviews (n=10)
  - Open-ended questions to identify specific barriers to more frequent reading with children
  - Audio-recorded & transcribed
- Coding transcripts
- Develop overarching themes

### Purpose:

- Inform text messages and coaching content for phase 2 based on perceived barriers



## Traditional Qualitative Research

- Slow
- 20-30 Interviews
- Purpose:
  - ensure all voices are captured
  - saturation of themes

## Rapid Cycle Design

- Quick
- Fewer Interviews
- Purpose:
  - inform a future intervention
  - “cost-effective and timely results”





## **Rapid Cycle Design**

Pre-developed Codebook

Utilized a team based approach

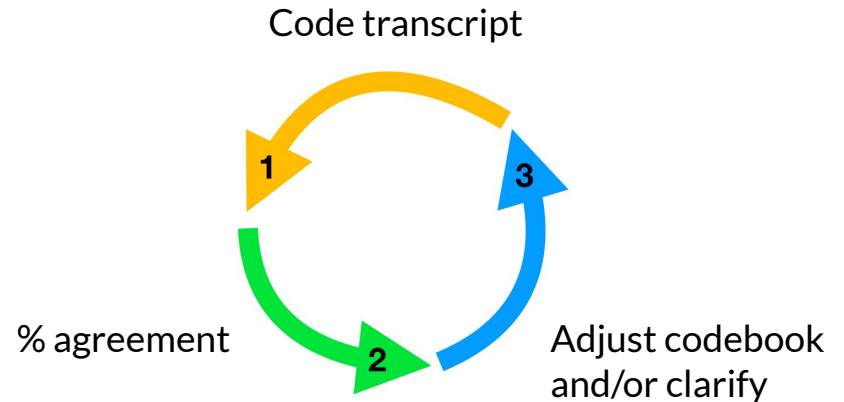
Iterative process of coding

# Rapid Cycle Design

Pre-developed Codebook

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Iterative process of coding



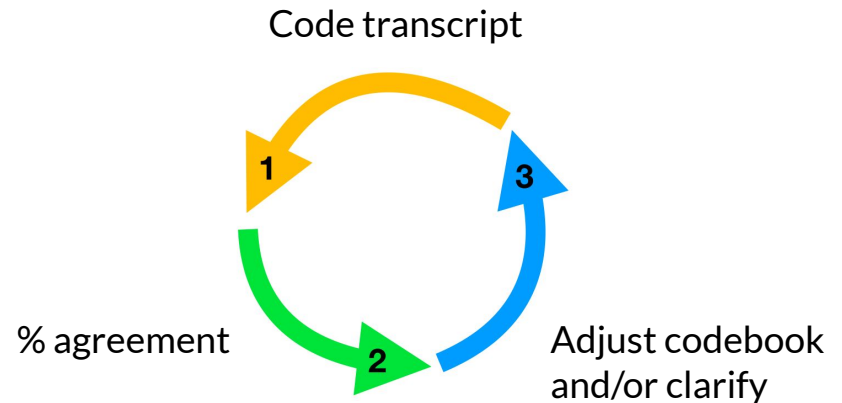
# Rapid Cycle Design

Pre-developed Codebook

Utilized a team based approach

Iterative process of coding

→ consolidated to form themes





## Rapid Analysis Findings

1. Daily Routine
2. Reciprocal Engagement
3. Parent Experience
4. Parent Beliefs
5. Reminder Notifications
6. Reading Environment
7. Time at Home



## Thematic Analysis Example:

Daily Routine	<p>Parents appear to have the easiest time finding time to read if they follow a schedule, often towards the beginning and end of each day, especially close to bedtime.</p> <p>When reading is not part of a daily routine, shared reading time may be forgotten or missed.</p>	<p>“She took her bath. I made her a bottle, gave her the bottle, greased her down and then we just lay in the bed and I just read the book.” (P02-002, line 19)</p> <p>“It could be busy a lot, or it could be I don’t always have the time, or I forget a lot.” (P01-004, line 27)</p>
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## Rapid Analysis Findings

1. Daily Routine
2. Reciprocal Engagement
3. Parent Experience
4. Parent Beliefs
5. Reminder Notifications
6. Reading Environment
7. Time at Home



## Thematic Analysis Example:

Reading Environment	<p>When a room is filled with books, it can serve as a reminder to both the parents and child to start reading time. The environment serves as a facilitator to shared reading.</p> <p>Digital devices can be a distraction for both parent and child that prevents shared reading from occurring. The environment serves as a barrier to shared reading.</p>	<p>“Typically – well, we’re in his room now, and he has like a whole bookshelf here where all his books are. And any time like I’m on the floor he’ll bring books over. And like I think he just assumes it’s like reading time. So I think in his room is when he’s like, okay, let’s do reading.” (P01-003, line 19)</p> <p>“Sometimes when certain things are around, you know, she’s at the age where she likes to get into things. If she sees something else – she’s into remotes and phones. So if she sees something, you know, in her view, she might want to go for it. So when – I’ll reach out, try to move everything out of her way while reading to her so she won’t be distracted.” (P01-008, line 53)</p>
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## Next Steps

Used to identify specific behavioral **barriers** that prevent more frequent reading with children

- One of the most common barriers is simply forgetting to read.
- Digital devices can be a big distraction during shared reading time

Edit **reminder messages** and **develop coaching content** with behaviorally-informed solutions

- Messages encouraging parents to create a reading routine with their child in the morning or before bed.
- Messages to leave phones in a different room or tips on how to create an environment more conducive to reading.





# Next Steps





# Takeaways

Qualitative Analysis

Collaboration

Exposure to Research

# Acknowledgements

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