



# Long Term Effects of a Comprehensive Early Literacy Curriculum on Reading Performance of Students with Intellectual and Developmental Disabilities

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Disability & Developmental Disabilities*

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# Agenda

- Why
- Study
- Intervention
- Immediate Results
- Maintenance Results
- Discussion
- Questions





# Project Intensity Team



# Friends on the Block Research and Development



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# Why



# Literature Review:

## Recent research on comprehensive programs

- Historically, research on reading for students with IDD (intellectual and developmental disabilities) has been limited
- Research in recent years has shown students with IDD respond favorably to more **comprehensive programs** of reading instruction (e.g., Allor, et al., 2014; Allor, et al., 2013; Browder, Mims, Spooner, Ahlgrim-Dezell, & Lee 2008; Connor, Alberto, Compton, & O'Connor, 2014; Lemons, et al., 2015).



## Research with *Friends on the Block* (from IES development grant)

- Allor, J. H., Gifford, D. B., Jones, F. G., Al Otaiba, S., Yovanoff, P., Ortiz, M. B., & Cheatham, J. P. (2018). The effects of a text-centered literacy curriculum for students with intellectual disability. *American Journal for Intellectual and Developmental Disabilities*. [pilot study with 8 students]
- Jones, F. J., Gifford, D. B., Yovanoff, P., Al Otaiba, S., Levy, D., & Allor, J. (2018). Alternate assessment formats for progress monitoring students with intellectual disabilities and below average intellectual quotients: An exploratory study. *Focus on Autism and Developmental Disabilities*. [assessment study]
- Allor, J. H., Yovanoff, P., Al Otaiba, S., Ortiz, M. B., & Conner, C. (2020). Literacy intervention for students with intellectual and developmental disabilities: A meta-analysis. [analysis of all 18 students from pilot studies]





# The Study





# Primary Research Questions

Do **students with disabilities** who experience **intensive literacy needs**, including students with intellectual and developmental disabilities, who participate in FOTB demonstrate greater **reading** and **language outcomes** compared to students who participate in BAU reading instruction?



# Overall Mean Average School Demographics

- *How many schools and districts?*
- Enrollment: 544 (Range: 316-770)
- Minority Enrollment: 76% (6-99%)
- Economically Disadvantaged: 79% (51-91%)
- Student/Teacher Ratio: 15.3:1 (12:1 to 18:1)

# Participants

- *How many children in FOTB and BAU*
- Gender: 61% male, 28% female
- Race: 56% African American, 30% White, 14% Hispanic/other
- Disability labels:
  - 11% Intellectual Disability
  - 46% Developmental Delay
  - 13% Autism (IQ mean=64.4; SD=17.6)
  - 20% Specific Learning Disability
  - 1% Speech/ Language Disorder
  - 1% Other Health Impairment
  - 5% Not Available

# Participant Mean Average IQ

- Composite Kaufman Brief Intelligence Test Second Edition (KBIT-2)
- 73.1 (Range: 40 to 106)

# Dosage

- Weeks of Instruction: 36.9
- Minutes of Instruction: 3150.9
- Average minutes per week: 86.1
- Level Completed: 12 (out of 14 FOTB levels)

*Note: More than half of the students in the treatment group completed the entire program in 42 weeks or less (about 50 hours of instruction).*



# Reading Variables & Measures

- Phonemic Awareness
  - *Comprehensive Test of Phonological Processing, 2<sup>nd</sup> Edition—Blending Words*
- Decoding
  - Non-words
    - *Wechsler Individual Achievement Test, Fourth Edition (WIAT-IV) Pseudoword Decoding*
  - Real words
    - *FOTB Word List*
    - *WIAT-IV Word Reading*
- Fluency
  - *WIAT-III Oral Reading Fluency*



# Language Variables & Measures

- Oral Expression
  - *WIAT-IV Oral Expression*
- Listening
  - *WIAT-IV Listening Comprehension*

# Think, Pair, Share

What is the biggest challenge you face in teaching students with IDD to read?

# Intervention



# What is Friends on the Block?

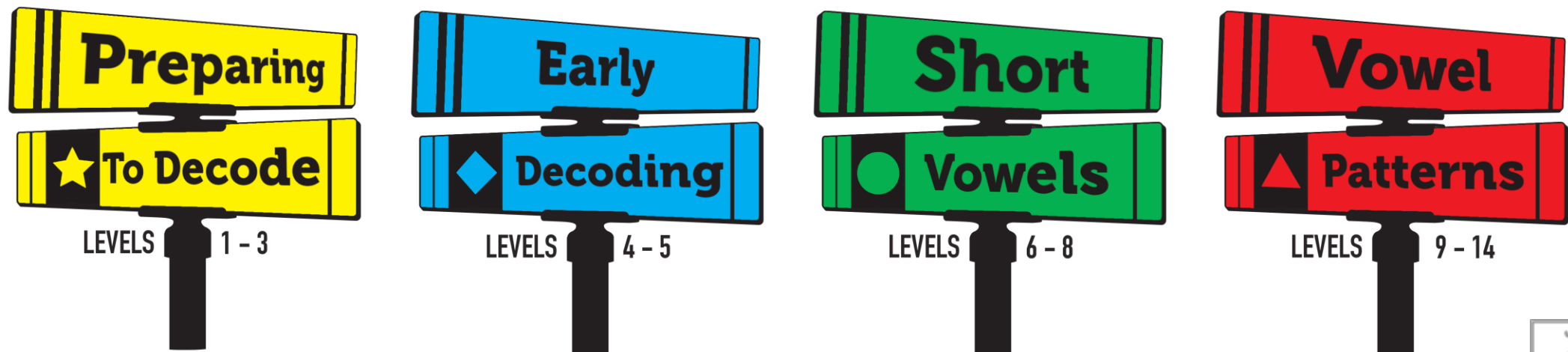
A comprehensive and intensive **early literacy program** (initial instruction or intervention) designed to be **customizable** and provide needed supports and practice so **all students** can attain early literacy skills, particularly those with **intensive needs** such as students with disabilities (e.g., dyslexia, learning disabilities, intellectual and developmental disabilities).





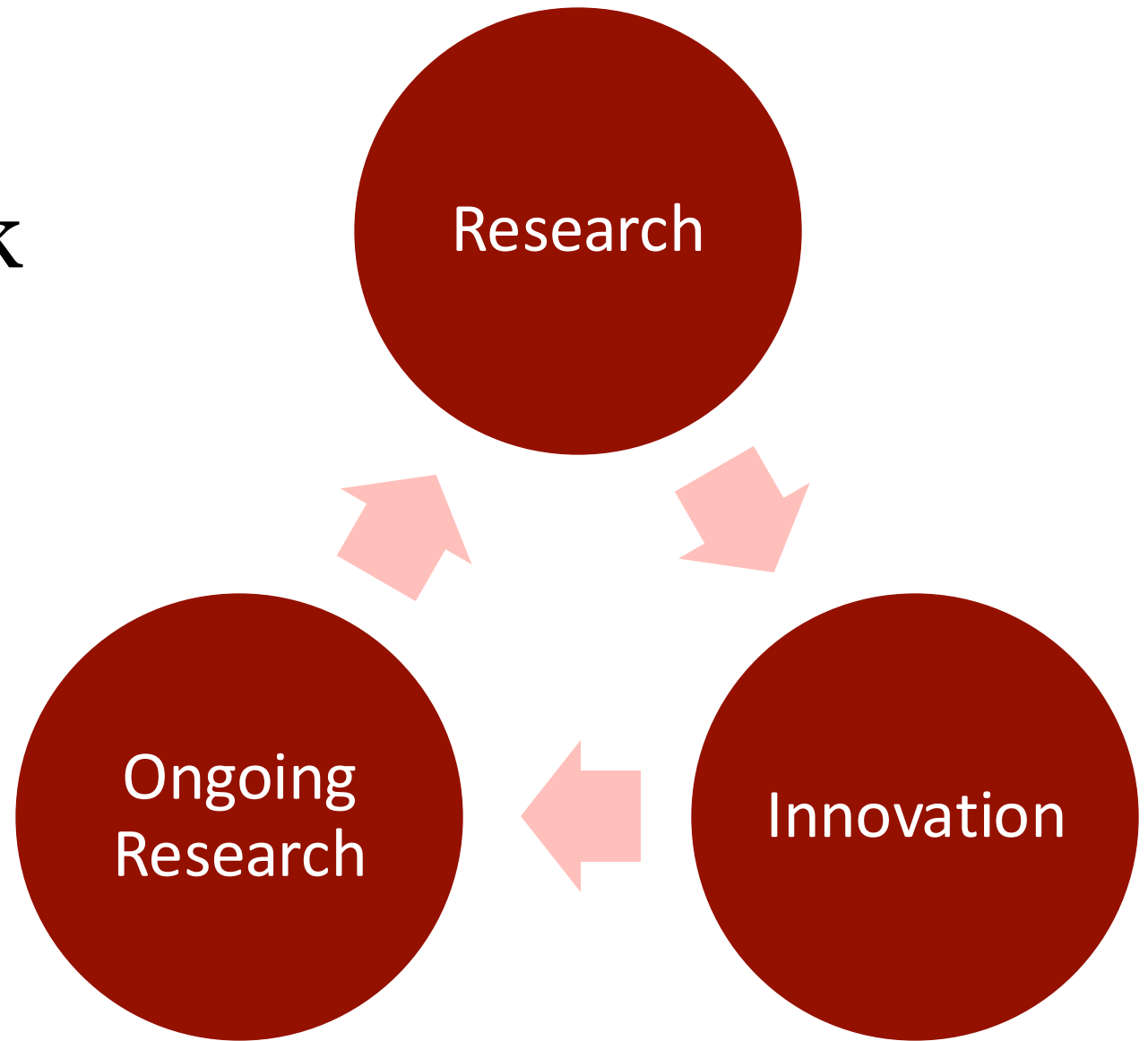
# What are the components of FOTB?

- 60 student books with carefully controlled, decodable text
- Each book has a detailed Teacher's Guide and materials
- Over 100 learning games that provide specific cumulative practice of skills
- Organized into 14 levels that span four stages of skill development



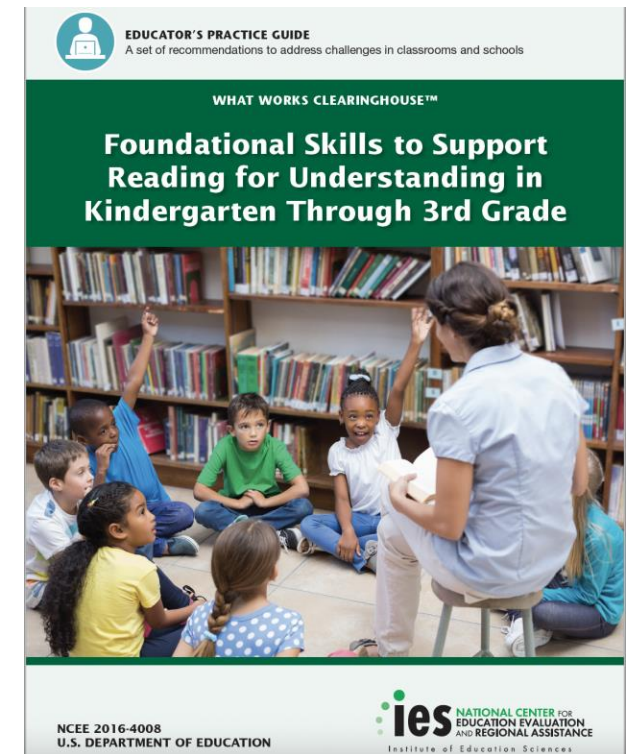
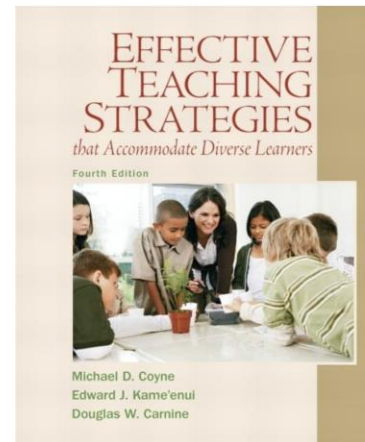
# What makes Friends on the Block special?

- Applies existing research
- Ongoing process of research and innovation

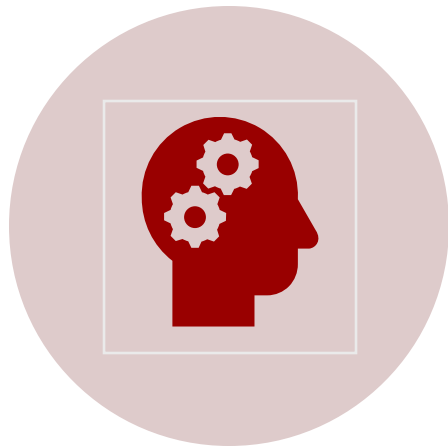


# Research: Evidence-based practices

- National Reading Panel (2000)
- WWC Practice Guide (2016)
- Principles of Effective Instruction (Coyne et al., 2006; Kame'ennui et al., 2002; Coyne et al., 2011)



# Benefits of Friends on the Block



REDUCED COGNITIVE LOAD



EMBEDDED LANGUAGE AND  
COMPREHENSION SUPPORTS



EXTENSIVE USE OF  
CONNECTED TEXT

# Innovation: Features of FOTB

- Multicriteria Student Books
  - Decodable with extensive cumulative review
  - Features enable students to begin reading in a book, with support, in the very first lesson
  - Culturally diverse
  - Natural sounding sentences that reflect spoken language to facilitate comprehension
  - Meaningful stories in common settings (familiar)
  - Fiction and Nonfiction with simple illustrations and photographs that enhance meaning and engagement
- Easily customized and highly engaging (student books and games)





# Innovative Scope and Sequence

- Focuses on key skills within all strands of word recognition and language
- Facilitates integration of skills across strands and apply as they read books

Strand	Objective/Skill	Activity Learning Game	★ 1-3	◇ 4-5	● 6-8	▲ 9-14
Language: Comprehension & Vocabulary	Make oral predictions about a text	Predict				
	Develop language and comprehension	Discuss				
	Discuss and summarize a text using a graphic organizer	Review/ Get the Gist (Level 12+)				
	Develop oral language by sorting words based on meaning	Think and Sort				
Phonemic Awareness	Orally blend the first sound and rime into a spoken word	Say the Word				
		Sounds Bingo				
	Say the first sound of spoken words	Say the First Sound				
		Sounds Bingo				
	Orally blend sounds (phonemes) into a word	Say the Word				
Say the sounds (phonemes) in spoken words	Sounds Bingo					
	Say the Sounds					
Word Recognition	Fluently pronounce taught irregular (or temporarily irregular) words	Read It				
		Amazing Words				
		Word Bingo				
		Word Play				
	Fluently say the most common sound for taught letters	Say the Letter-Sound				
		Climb and Slide				
	Sound out and read short vowel words with taught letters/patterns	Sound It Out				
		I Got It				
	Sound out and fluently read words with taught letters/patterns	Sound It Out				
		Speed Reader				
		I Got It				
	Fluently read target words, including taught irregular words and words with taught letters/patterns	Read through the Seasons				
Word Bingo						
Word Play						
Pronounce words with taught patterns with s, ed, and ing	Read the Groups					
Pronounce words with taught spelling patterns and syllable types	Read the Parts					
Fluency	Read target words and sentences fluently	Super Sentences				
	Read text with increasing fluency	Read				
Writing	Say the sounds in spoken words; spell words with taught letters/patterns	I Got It				
		Say and Write				
	Write sentences fluently	Writing Super Sentences				
Apply	Apply various skills in the context of a book	Scavenger Hunt				

# FOTB Target Word List and Phonics Patterns

Friends on the Block Target Word List and Phonics Patterns

Letter Sounds	★ Preparing to Decode			◆ Early Decoding		● Short Vowels			▲ Vowel Patterns					
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Level 11	Level 12	Level 13	Level 14
	c, f, p, m, s, t	d, j, n	b, g, h, l, r	ck, k, a, z	u	ch, th, w, x, y	i, o, sh, qu, v	e	a-e, i-e, o-e	ai, ay, ol	al, ea, ee	ar, igh, er	oa, or, ow	ir, oo, ur
Sound It Out Words (Decodable)	In Levels 1-3 students are learning phonemic awareness blending and segmenting, letter-sounds, and a small number of irregular words. Students begin in the level in which they miss two or more target words (Levels 1-5) or four or more target words (Levels 6-14). As soon as the students learn most of the words in the starting level, move to the next level. (Note: Sound it Out words in Levels 4-5 are repeated in Level 6.)			am and at can dad mad sad	am and at can dad mad sad	am big bed fine five hold may old plain play rain neat need never night number road short show slow yellow	big did got him in it had mom not on sit stop this will with	bed best end get help let next red step tell them then went when yes	came cold day hold clean each eat hard high goal good hook hurt shirt stood third took turn wood	cold day hold may old plain play rain neat need never night number road short show slow yellow	all call clean chapter door follow forget goal know more morning own road short show slow yellow	after better below door follow forget goal know more morning own road short show slow yellow	before below door follow forget goal know more morning own road short show slow yellow	bird book burn cook disturb girl good hook hurt shirt stood third took turn wood
Read It Words (Irregular)	a do I like not want	dad here is look mom see the where	are at happy in no she yes you	good help play there to was	big have little my please very what	be friend give go he her it me on so thank we who with your	because care come could feel first of how next said should take too why would	again away came clothes cold eat food for from need oh other out push put ready some	about animal been day does down every many one or once room saw their they were	any ball both boy done family girl more most right second soon sure review thought two work	another answer kind know our people question really learn money new probably through usually walk water worry	almost book bought break buy easy four idea often special talk love move only over try world	above alone by eight find house idea often instead live love move only over try world	able along carry color full great heard instead live love move only over try world
	Note: Words in blue are made up of patterns taught in later levels so they are temporarily irregular. They are introduced prior to the pattern to facilitate meaning and may facilitate learning of the phonics pattern.													



# A Typical FOTB Lesson (Flexible: About 20-35 minutes) Level 4 Example

Part 1: Warm-Ups  
5-8 minutes

Part 2: Book Reading  
10-15 minutes

Part 3: Learning Games  
5-10 minutes

Lesson A Warm-Up

**Say the Word** *Sam, dog, mad, Jazz*

1. Teacher: I will say the sounds in a word. Then you will say the word. I'll do the first one. Listen. /s/ /a/ /m/ /d/ /g/ /m/ /a/ /d/. Say the word. Stretch the sounds slowly. Hold continuous sounds 2-3 seconds. Say the stop sounds quickly. Allow think time. Next word is Sam. Say the word.

2. Teacher: Listen. /d/ /o/ /o/ /g/. Say the word.

Students: (Say the word)

Repeat Step 2 with /j/ /e/ /z/ and /a/ /t/ /m/.

**Connective Feedback & Scaffolding**

If students do not respond correctly, go through the steps below, starting with Step 1 and stopping when students are able to respond correctly.

1. Say the word slowly. Stretch continuous sounds 2-3 seconds and connect the sounds.
2. Gradually shorten the length of continuous sounds.
3. Provide the word and have students repeat it.

**Say the Sounds** *mad, dog, Sam, Jazz*

1. Teacher: I will say a word. Then you will say each sound in the word. The first word is mad. Listen to me say the sounds. /m/ /e/ /d/. Stretch the word by connecting the sounds as you say the word. Hold continuous sounds 2-3 seconds. Say continuous sounds 2-3 seconds. Say stop sounds quickly. Say the word.

2. Teacher: Listen. Dog. Say the sounds.

Students: (Say the sounds.)

Repeat Step 2 with Sam and Jazz.

**Connective Feedback & Scaffolding**

If students make an error, follow the 1. We. You feedback procedure. Listen. Say the sounds, holding continuous sounds as you say the word.

1. Teacher: You're going to say the sounds in a word and then say the word. Listen. /s/ /a/ /m/. Say the sounds. Hold continuous sounds for 2-3 seconds. Say the word. Repeat Step 2 with the word.

2. Teacher: (Point to letters of the word.) Students: (Say each sound as you point to the letter, then say the word.) Repeat Step 2 with all of the words.

**Connective Feedback & Scaffolding**

If students make an error, follow the 1. We. You feedback procedure. Listen. /s/ /a/ /m/. Say the sounds. Hold continuous sounds as you say the word. Repeat the row.

Repeat the row.

**Warm-Up**

Say the Letter-Sound

r	a	z	k	l
---	---	---	---	---

Sound It Out

mad	Jazz	can	at	am
-----	------	-----	----	----

Read It

was	to	good	there	are
-----	----	------	-------	-----

Lesson B Book: Read and Discuss

Use this guide to direct discussion and enhance student engagement. Use 1-2 questions per page based on student ability. Questions listed as the question "help" or number's increase with the right of the most difficult.

1. Teacher: Echo Read with the student for the student text.

2. Teacher: Read the title.

3. Read the word list to the student. Know what the pictures are. Optional: Have the students point to the pictures.

4. Read the Story Starter.

5. Why does Sam talk to the girl if she is mad? What are some things that make you mad/sore? Sam says he is... (bored). Why do you think Sam is...? What color is the sky? (blue)

6. The girl looks... (mad/sore). What do you think Sam should do next? Why do you think Sam should do next? What color is the grass? (green) What is Sam wearing? (green shirt and blue shorts)

7. Why do you think Sam thought the girl was angry? Why was the girl sorry she had yelled?

**Sam and Jazz Take a Walk**



Written by Jill Allor, Francesca Jones, and Ashley Sandoval  
Illustrated by Jennifer Cheatham

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**Sam and Jazz Take a Walk Scavenger Hunt**

Materials: Sam and Jazz Take a Walk student book, provided.

Teacher: Make sure your book is closed and is big enough to see. Then you look through your book to look for clues.

Read each clue, one at a time.

- If you have 1 student, encourage them to read the clues together.
- If you have more than 1 student, encourage everyone to read the clues together.

Materials: student chart (sentences), Super Sentences (optional)

Set out the necessary word and picture cards for the chart.

1. Teacher: We will use the word cards to make the chart.

2. Teacher: Let's make the chart to help us find the clues. Encourage student to read the sentences together.

How let's read out sentences together.

**Amazing Words**

finish	there	good	where	like	is	help	there	play	to	you	yes	start
		no	where	like								
	was	help										
	the		is	help	there							
	good	here	do		want	look						
	see		play				where					
	are	to	was	she	not	happy						

**I was not mad at you.**



# Lessons can be easily customized by...

- Selecting the appropriate starting level with our simple placement test
- Deciding when to move from one level to the next
  - Students do not need to read all the books and complete all the lessons in each level
  - They move to the next level as soon as they know most of the target words in that level
  - Students with intensive needs will need to read more of the books and complete more of the lessons before moving to the next level; other students may move through the levels more quickly
- Selecting games to practice specific skills based on student need
- Adjust amount of time spent on book reading and games (we recommend doing ALL 3 parts of every lesson – warmup, book, game)







# Group Huddle

How could Friends on the Block benefit your students?



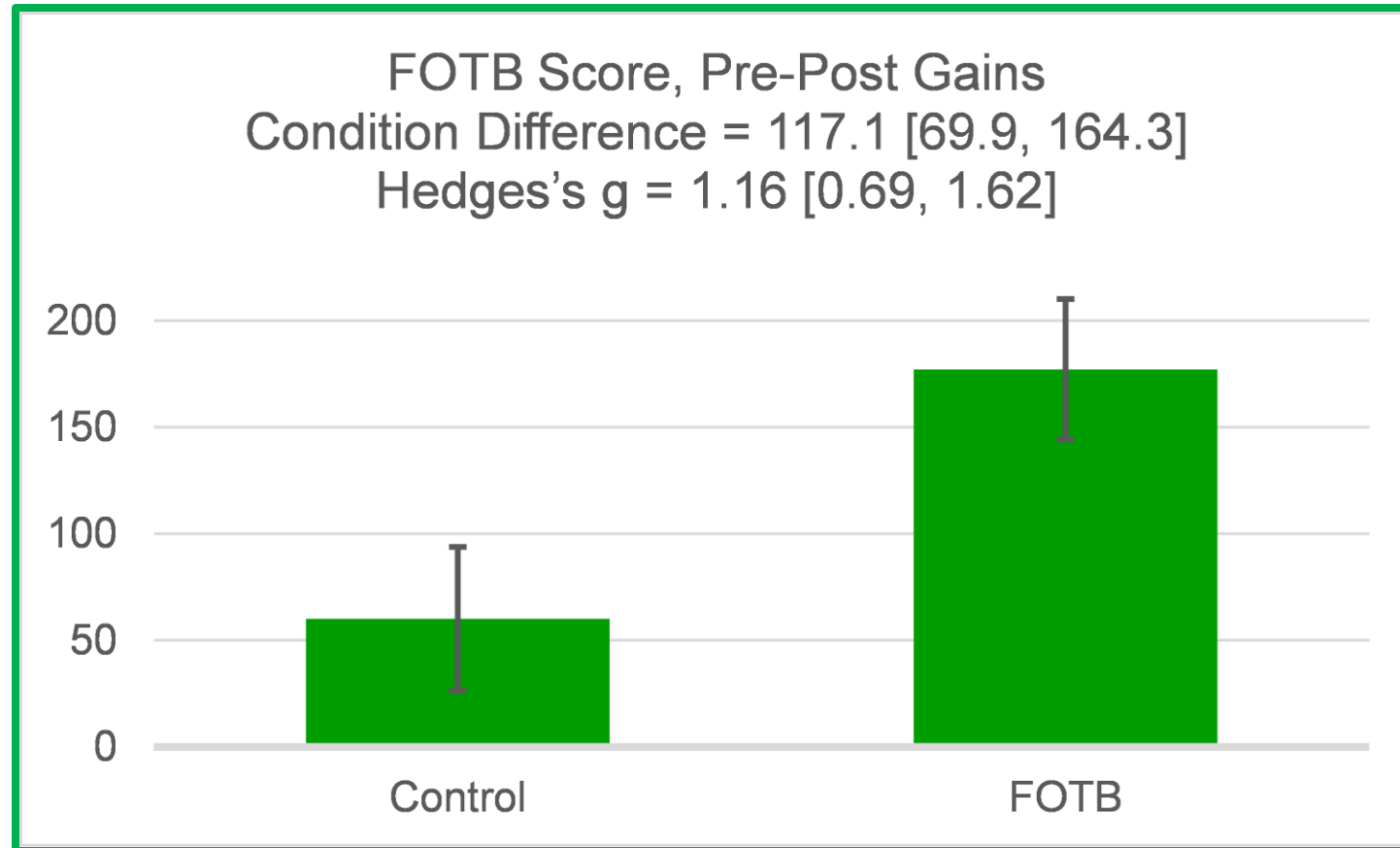
# Immediate Results



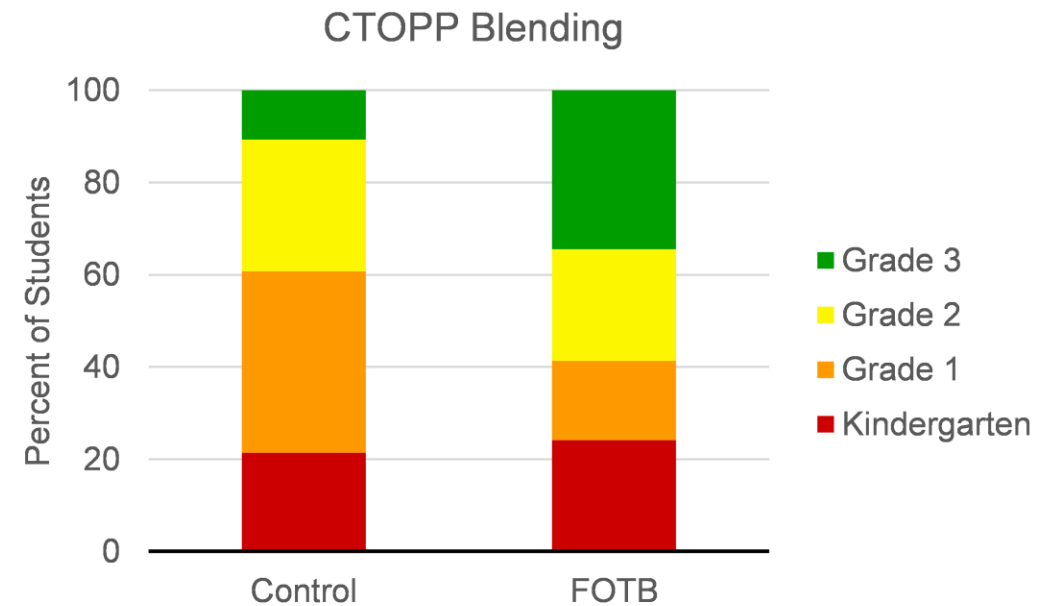
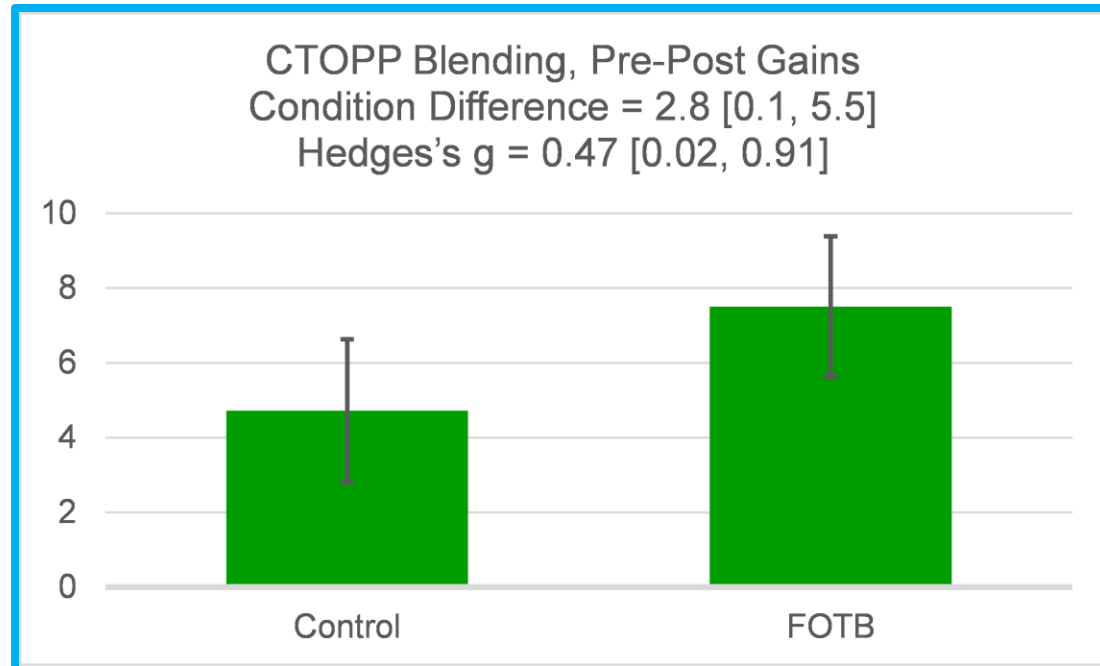
# Results Overview

- Preliminary results—first cohort of two cohorts of students
- Analyzed 22 measures—reported a representative summary
  - Proximal measure for FOTB
  - Phonemic Awareness
  - Pseudoword Decoding
  - Word Reading
  - Reading Fluency
  - Listening Comprehension
  - Oral Expression
  - Reading Comprehension

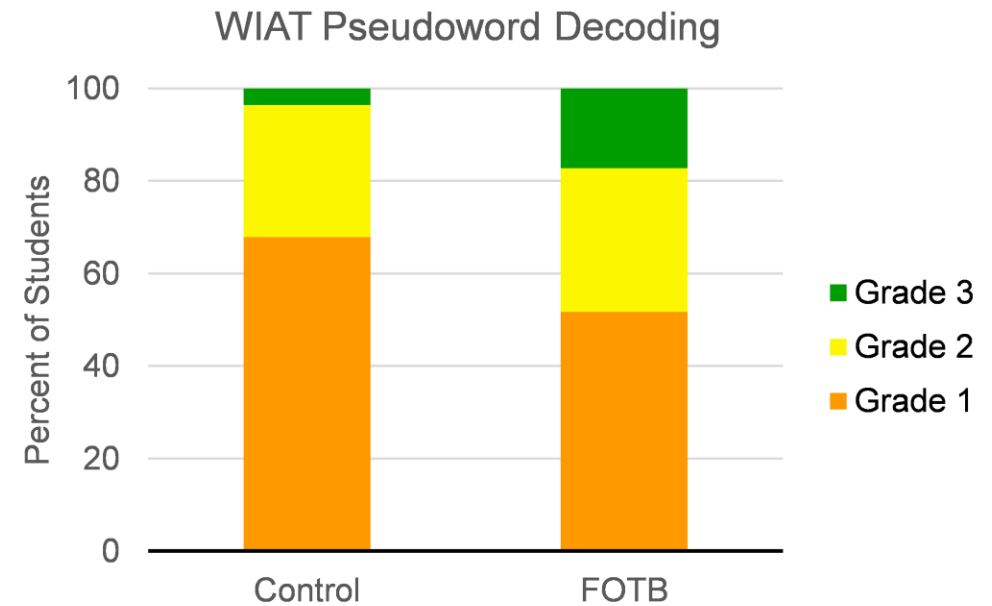
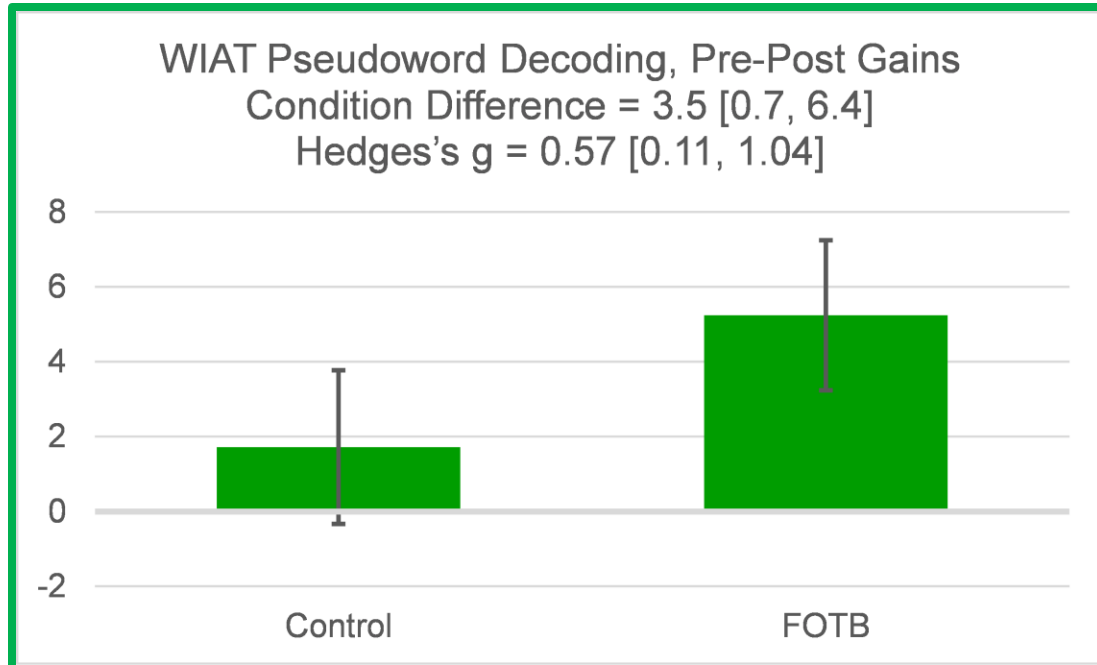
# Proximal measure for FOTB



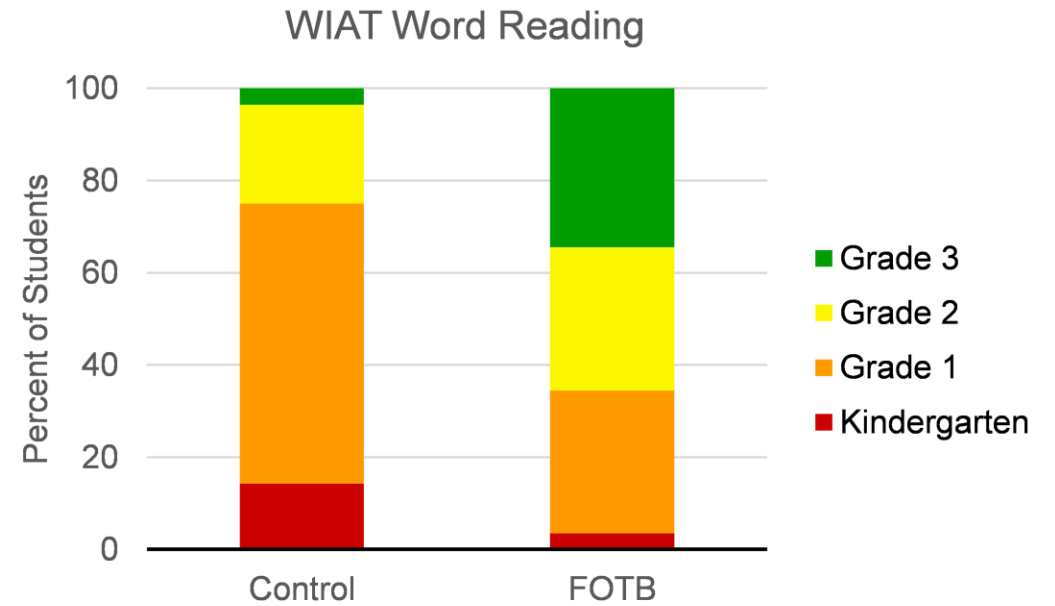
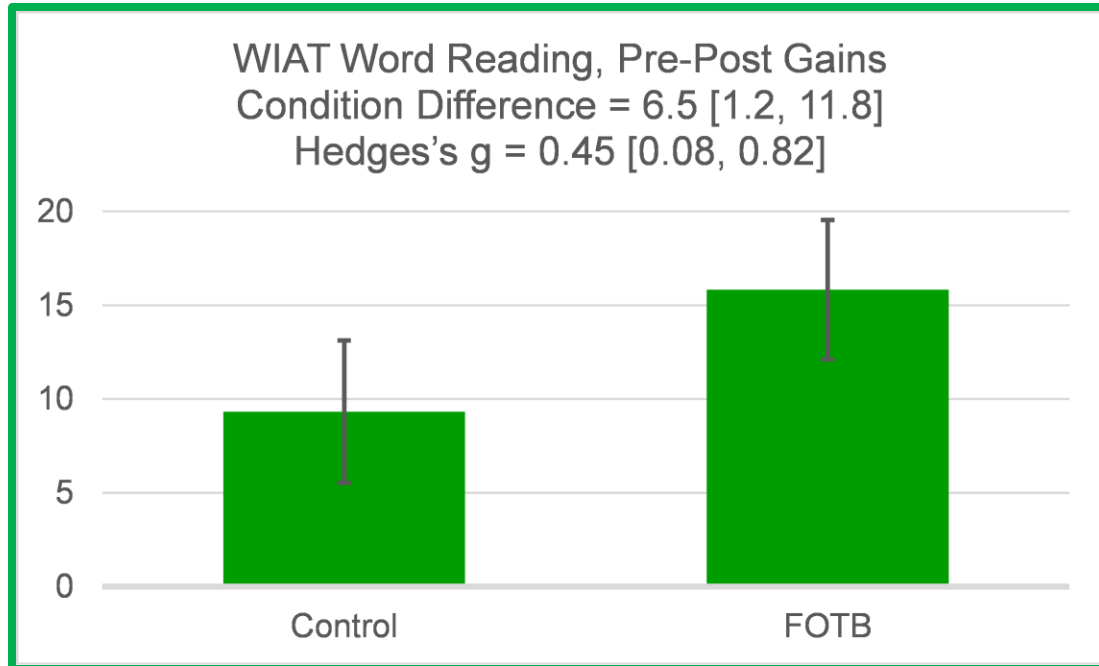
# Phonemic Awareness (Blending)



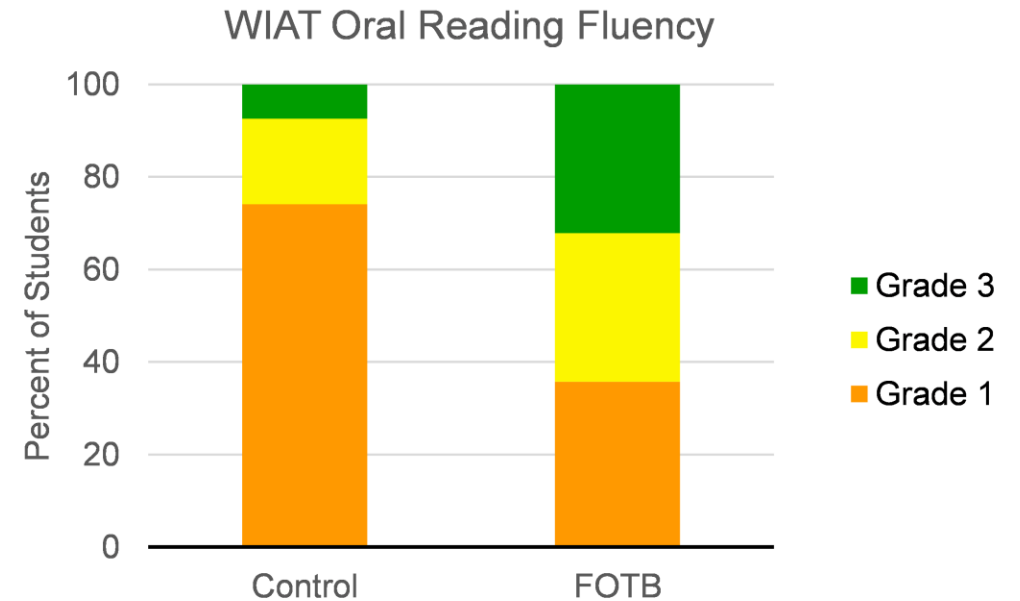
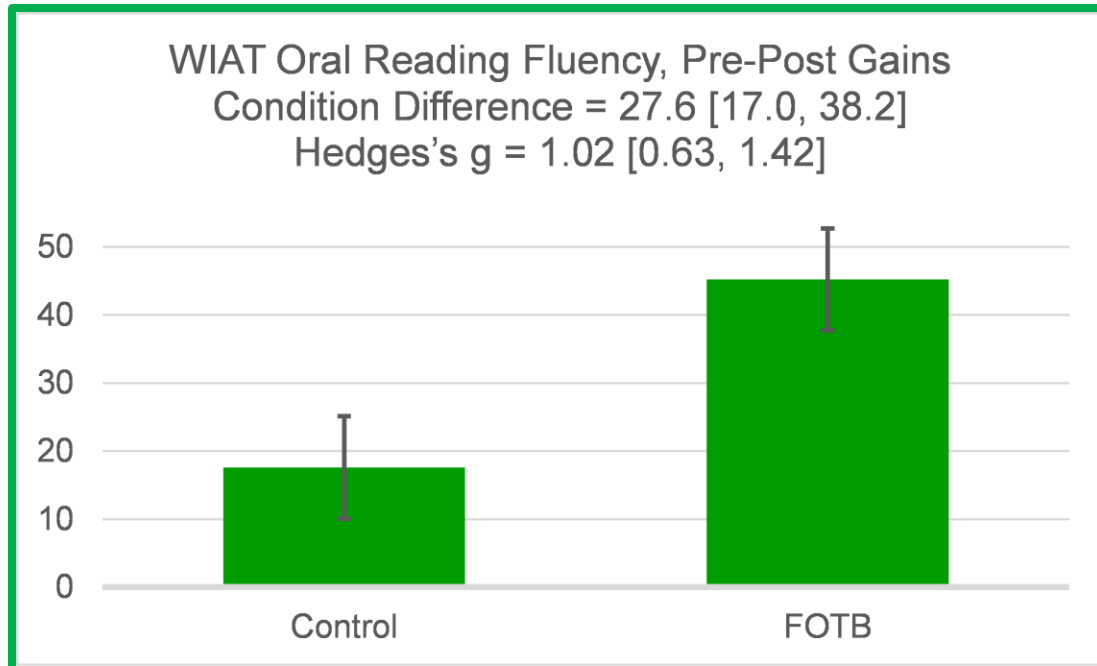
# Pseudoword Decoding



# Word Reading

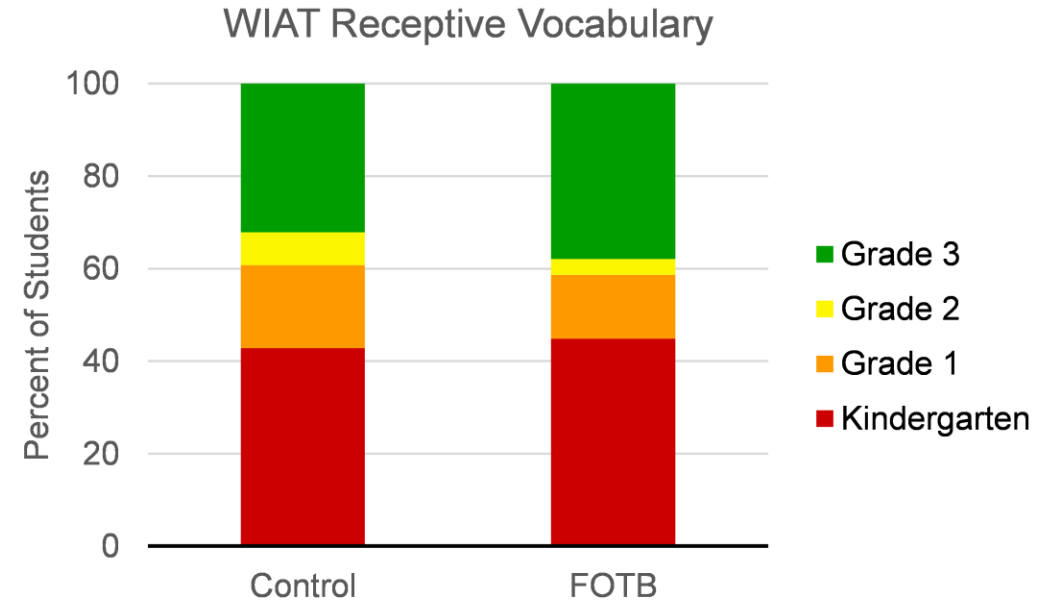
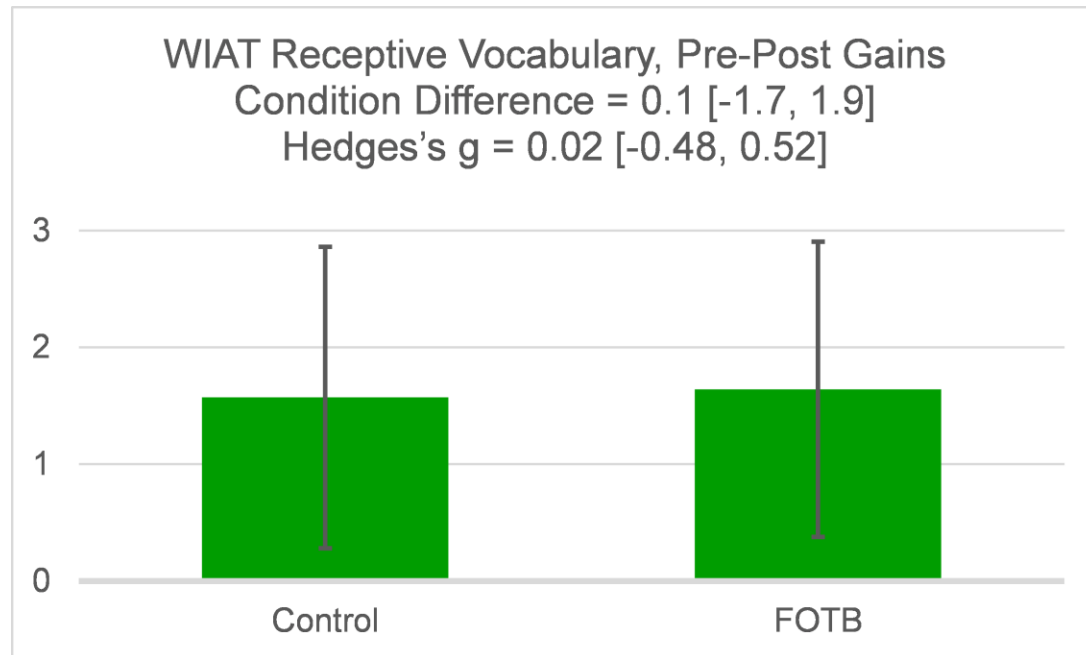


# Oral Reading Fluency

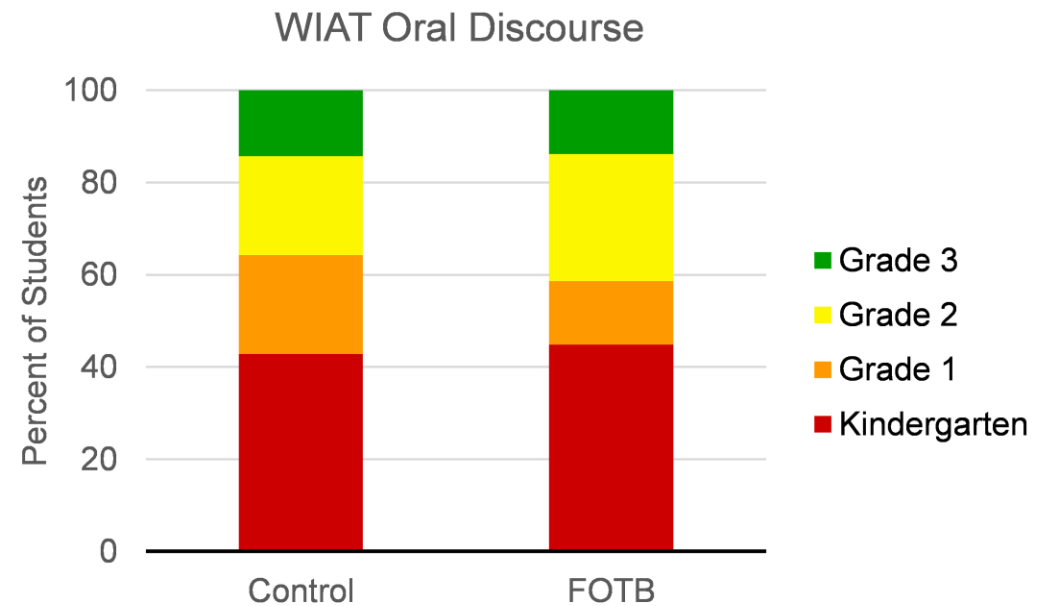
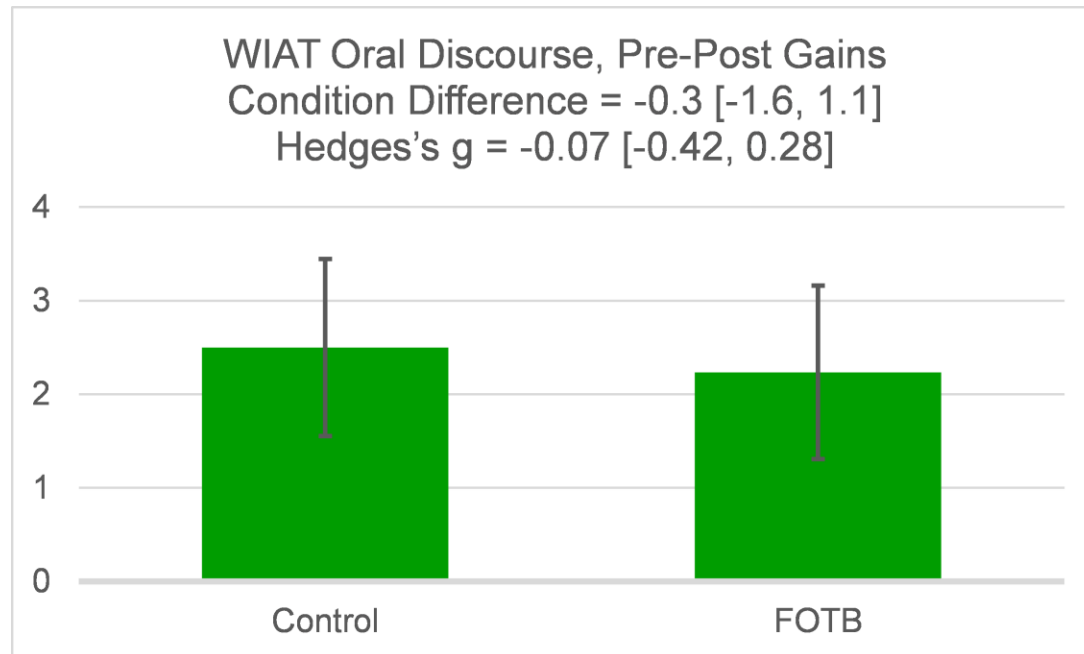




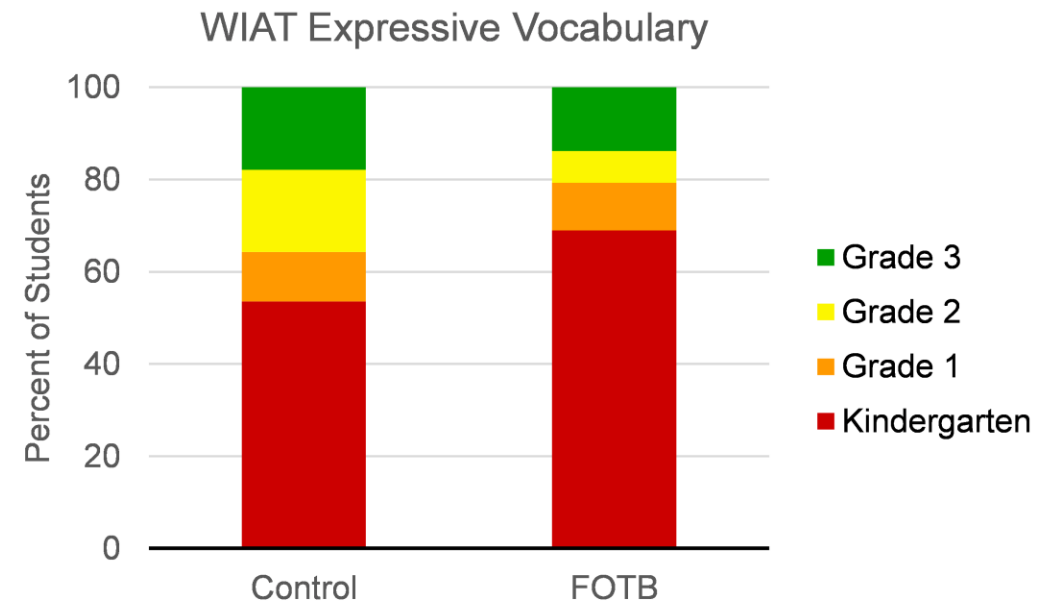
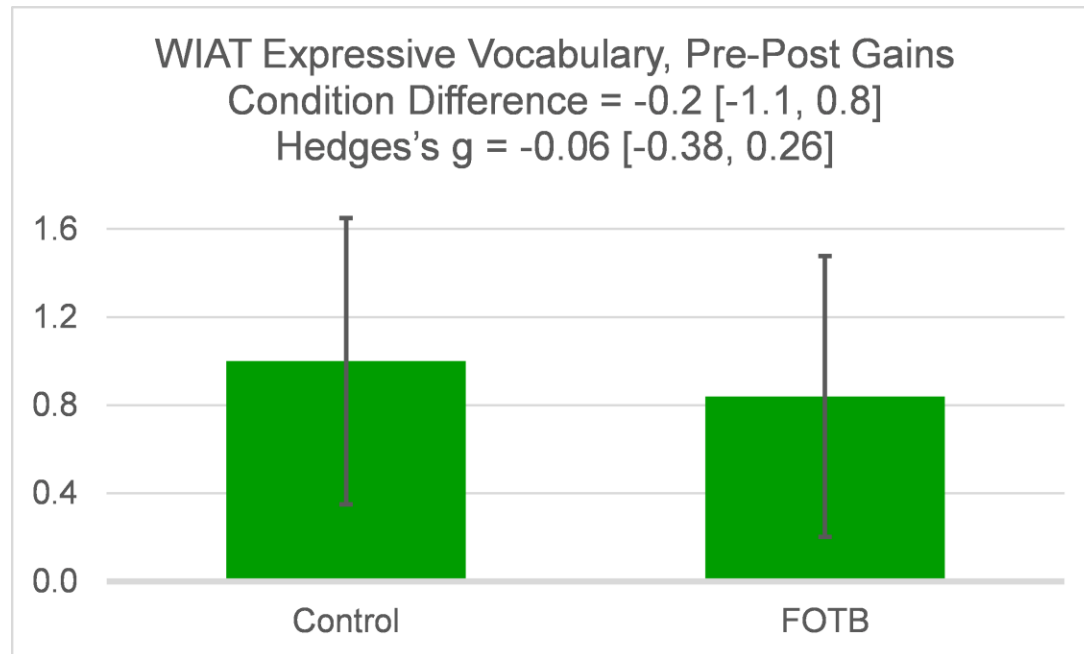
# Listening Comprehension (Receptive Vocabulary)



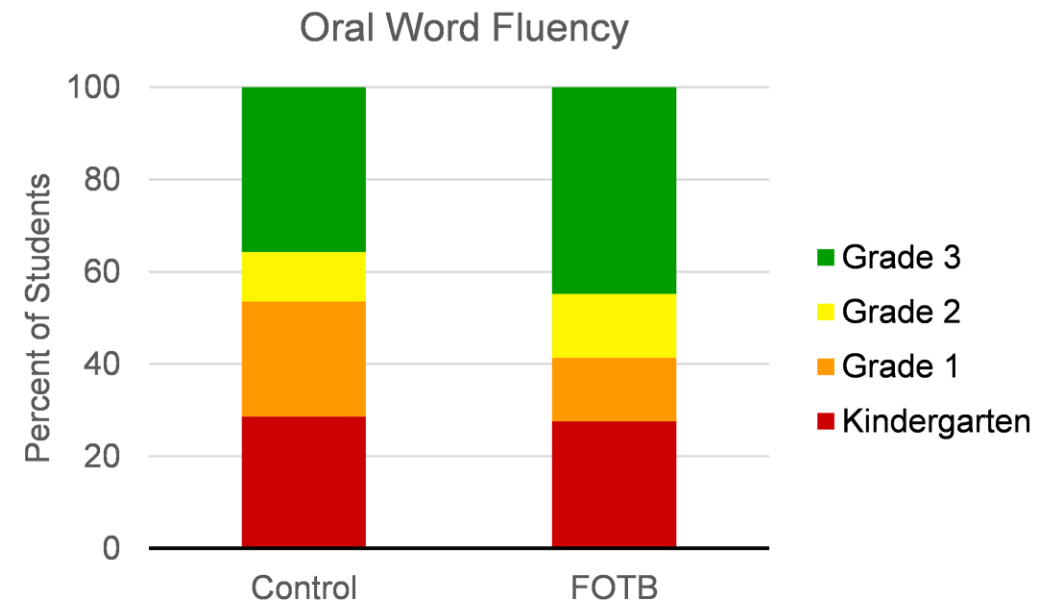
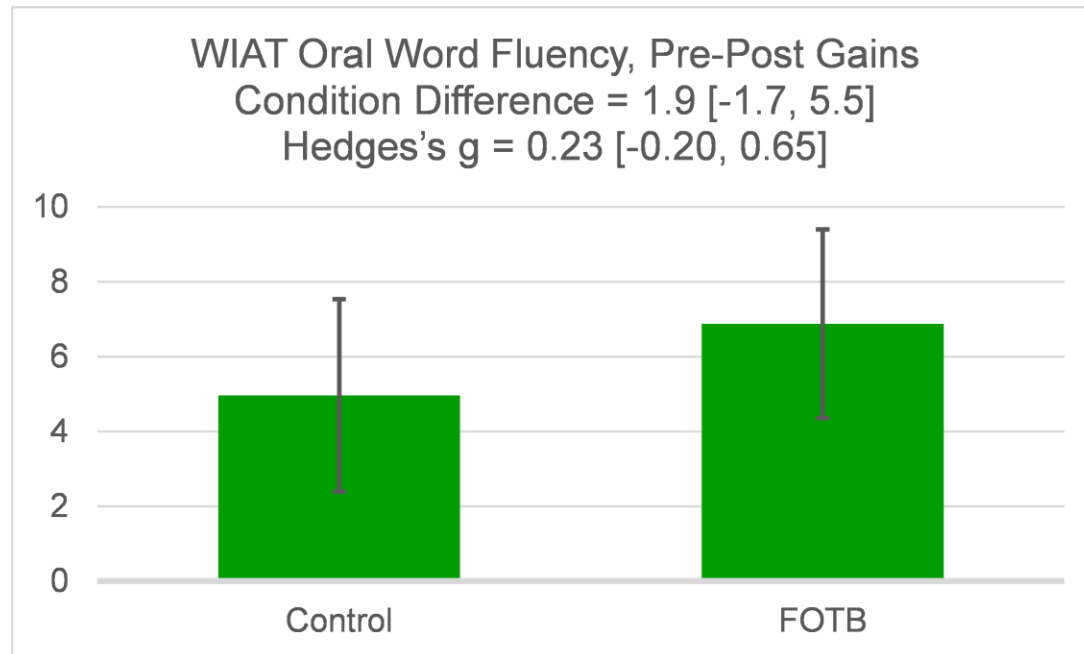
# Listening Comprehension (Oral Discourse)



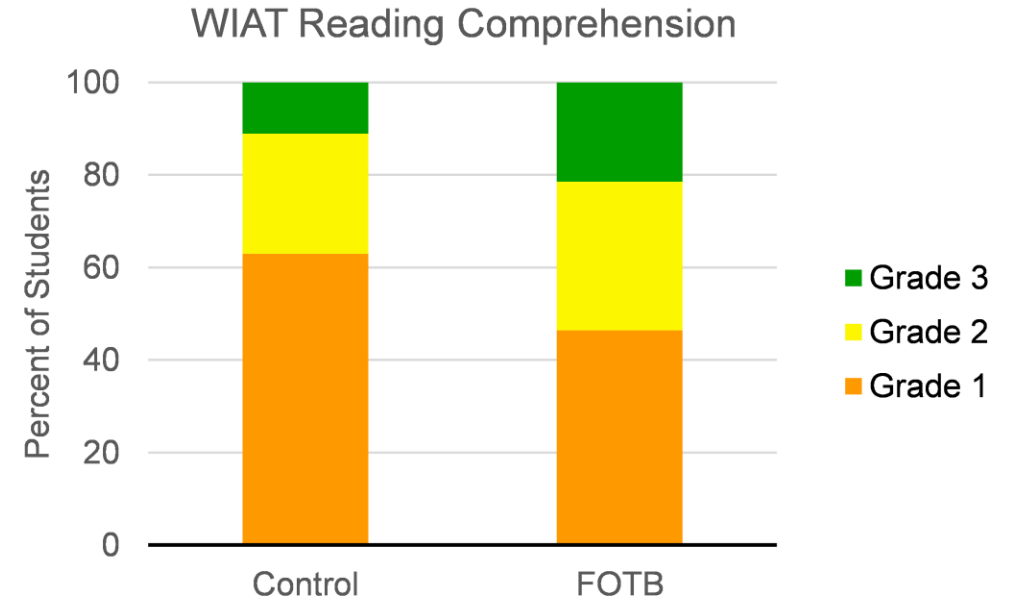
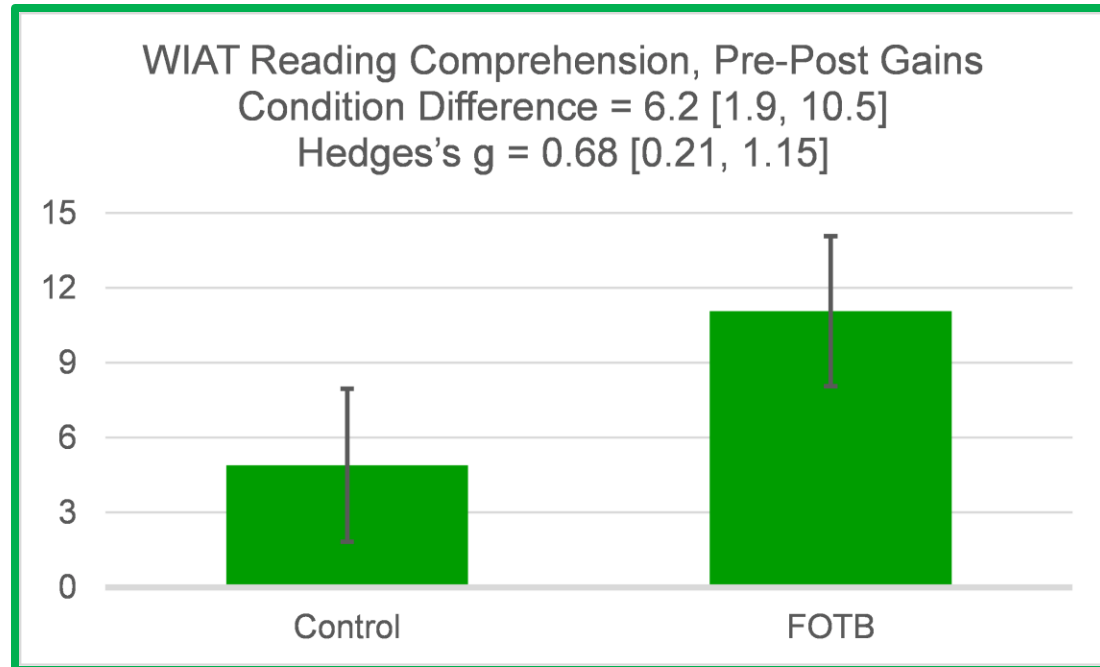
# Oral Expression (Expressive Vocabulary)



# Oral Expression (Oral Word Fluency)



# Reading Comprehension



# Results Summary

Measures Reported Today	<i>p</i>	<i>g</i>
<b>FOTB (proximal measure of target words)</b>	<b>.0006</b>	<b>1.2</b>
CTOPP Blending	.0702	0.5
<b>WIAT Pseudoword Decoding</b>	<b>.0326</b>	<b>0.6</b>
<b>WIAT Word Reading</b>	<b>.0326</b>	<b>0.4</b>
<b>WIAT Oral Reading Fluency</b>	<b>.0006</b>	<b>1.0</b>
WIAT Receptive Vocabulary	.9388	0.0
WIAT Oral Discourse	.7561	-0.1
WIAT Expressive Vocabulary	.7606	-0.1
WIAT Oral Word Fluency	.4026	0.2
<b>WIAT Reading Comprehension</b>	<b>.0176</b>	<b>0.7</b>

Other Measures	<i>p</i>	<i>g</i>
WIAT Sentence Repetition	.5565	0.1
Peabody Picture Vocabulary Test	.5482	-0.1
Expressive Vocabulary	.4658	0.1
CUBED Phonological Awareness	.2208	0.3
<b>CUBED Word ID</b>	<b>.0326</b>	<b>0.6</b>
<b>CUBED Decoding</b>	<b>.0006</b>	<b>0.9</b>
<b>CUBED Narrative Lang. Reading WPM</b>	<b>.0006</b>	<b>0.9</b>
<b>CUBED NL Reading Story Qs</b>	<b>.0310</b>	<b>0.6</b>
<b>CUBED NL Listening Story Qs</b>	<b>.0310</b>	<b>0.7</b>
<b>CTOPP Elision</b>	<b>.0018</b>	<b>0.8</b>
<b>CTOPP Sound Matching</b>	<b>.0136</b>	<b>0.9</b>
CTOPP Phoneme Isolation	.2313	0.4

Note. *p* values adjusted with Benjamini–Hochberg correction for 22 total tests



# Results Summary

## *Measures Reported Today*

- Statistically significant ( $p < .05$ )
  - FOTB
  - WIAT Pseudoword Decoding
  - WIAT Word Reading
  - WIAT Oral Reading Fluency
  - WIAT Reading Comprehension
- Marginally significant ( $p < .10$ )
  - CTOPP Blending
- Our effects for word reading are stronger than prior research, including our own.
- We did not find effects favoring FOTB for language measures.
- Anecdotally, students enjoyed reading the books and engaged with the characters and settings.

*Note.*  $p$  values adjusted with Benjamini–Hochberg correction for 22 total tests



# Follow-Up Results





# Follow-Up Results Summary

Baseline to Post	<i>p</i>	<i>g</i>	Baseline to Follow Up	<i>p</i>	<i>g</i>
FOTB (proximal measure of target words)	.0006	1.2	FOTB (proximal measure of target words)	.0557	0.7
CTOPP Blending	.0702	0.5	CTOPP Blending	.5247	0.2
WIAT Pseudoword Decoding	.0326	0.6	WIAT Pseudoword Decoding	.0622	0.6
WIAT Word Reading	.0326	0.4	WIAT Word Reading	.0745	0.4
WIAT Oral Reading Fluency	.0006	1.0	WIAT Oral Reading Fluency	.0033	0.95
WIAT Receptive Vocabulary	.9388	0.0	WIAT Receptive Vocabulary	.5176	0.2
WIAT Oral Discourse	.7561	-0.1	WIAT Oral Discourse	.7817	-0.1
WIAT Expressive Vocabulary	.7606	-0.1	WIAT Expressive Vocabulary	.2572	0.3
WIAT Oral Word Fluency	.4026	0.2	WIAT Oral Word Fluency	.0801	0.7
WIAT Reading Comprehension	.0176	0.7	WIAT Reading Comprehension	.0303	0.8

Note. *p* values adjusted with Benjamini–Hochberg correction for 22 total tests



# Methods

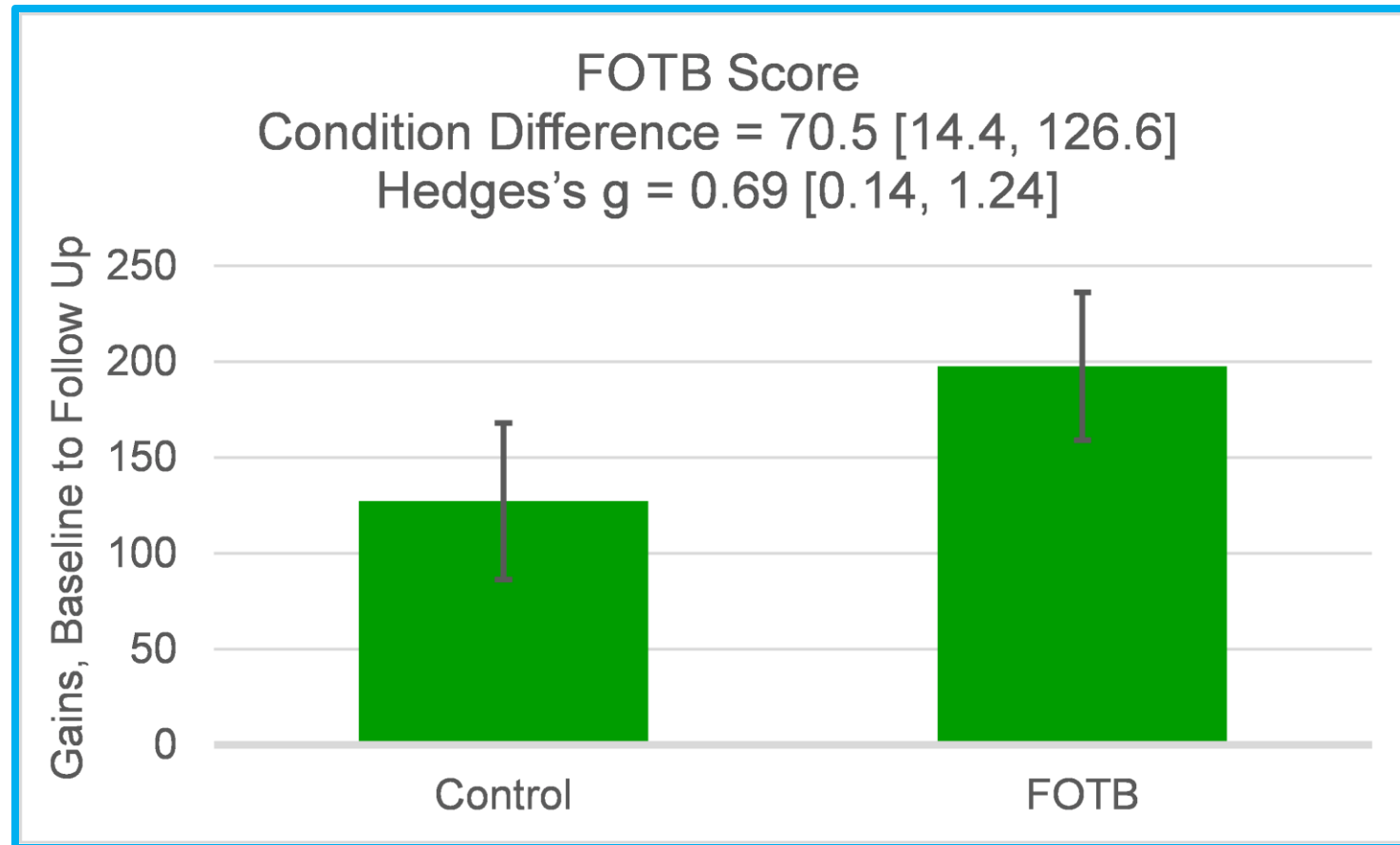
## Students Tested at Follow-Up

### Approximate Timeline

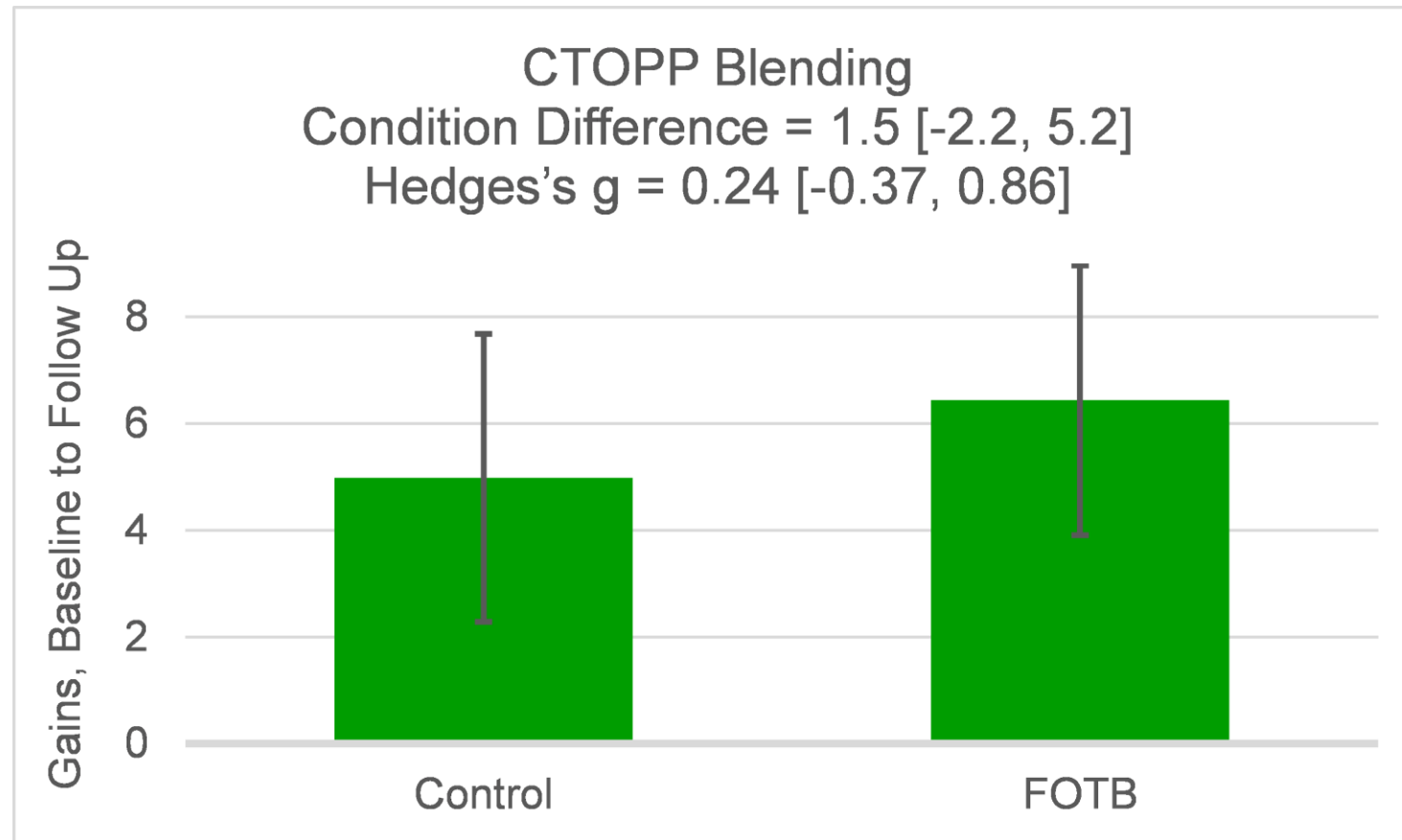
- Baseline: Fall 2021
  - Post: Spring 2023
    - End of Intervention
  - Follow-Up: Spring 2024
- N=39 (21 FOTB; 18 BAU)
  - Mean Age at Beginning of Intervention: 7.6  
(Control SD=1.5, Treatment SD=1.1)
  - Gender: 67% male, 33% female
  - Race: 64% African American, 36% White
  - Disability labels:
    - 10% Intellectual Disability
    - 54% Developmental Delay
    - 10% Autism (IQ mean=76.5; SD=11.86)
    - 15% Specific Learning Disability
    - 5% Speech/ Language Disorder
    - 5% Other Health Impairment



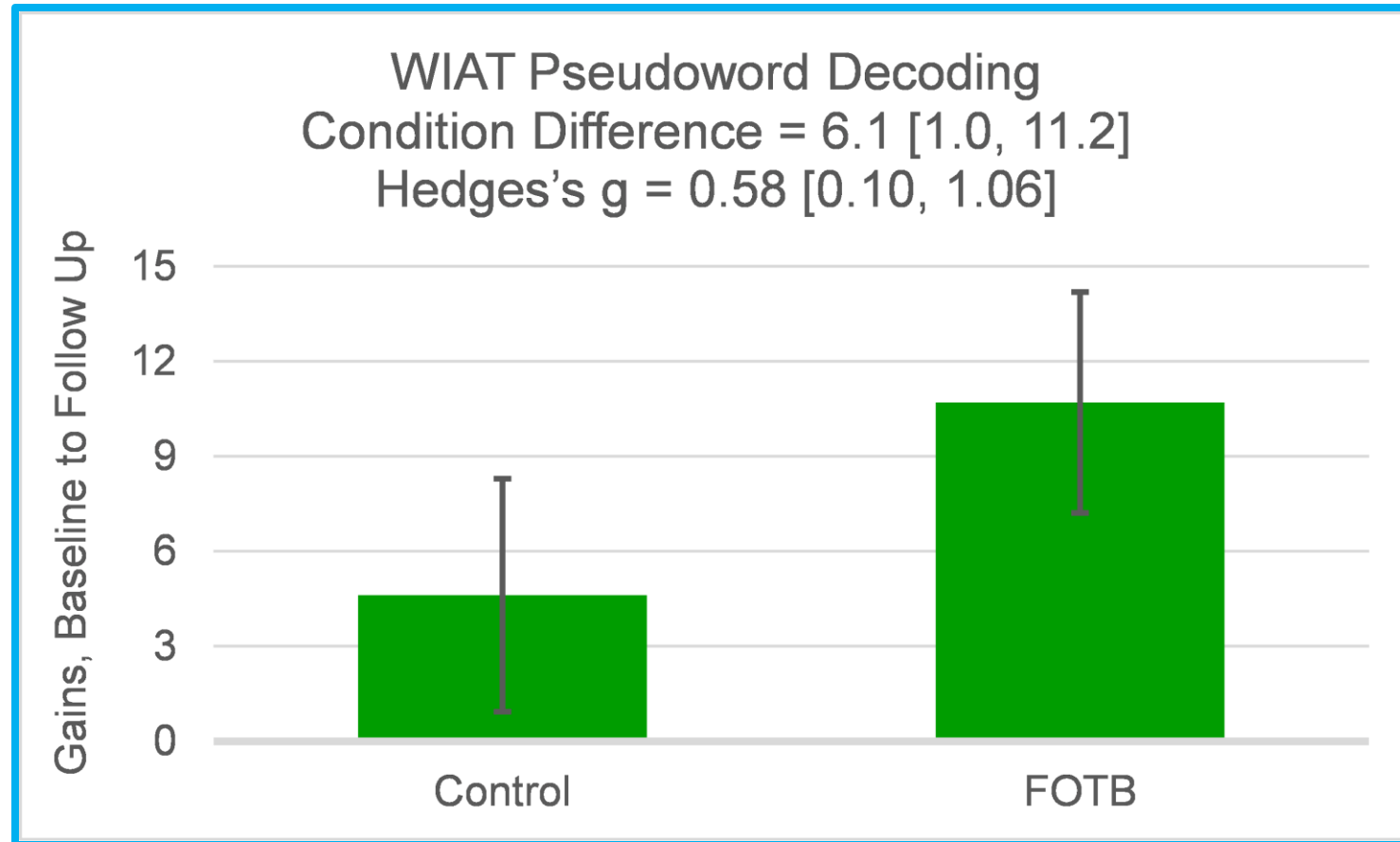
# Proximal Measure for FOTB



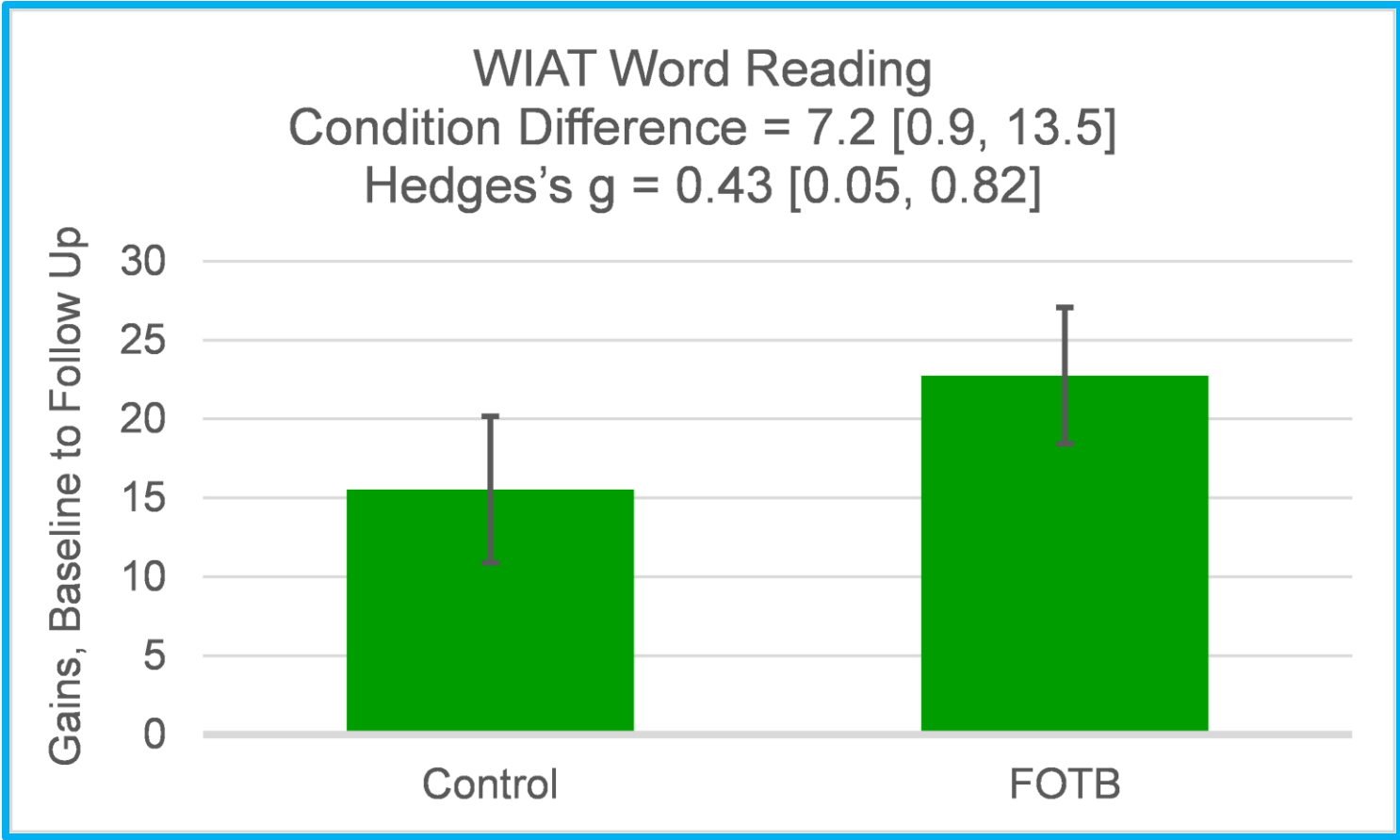
# Phonemic Awareness (Blending)



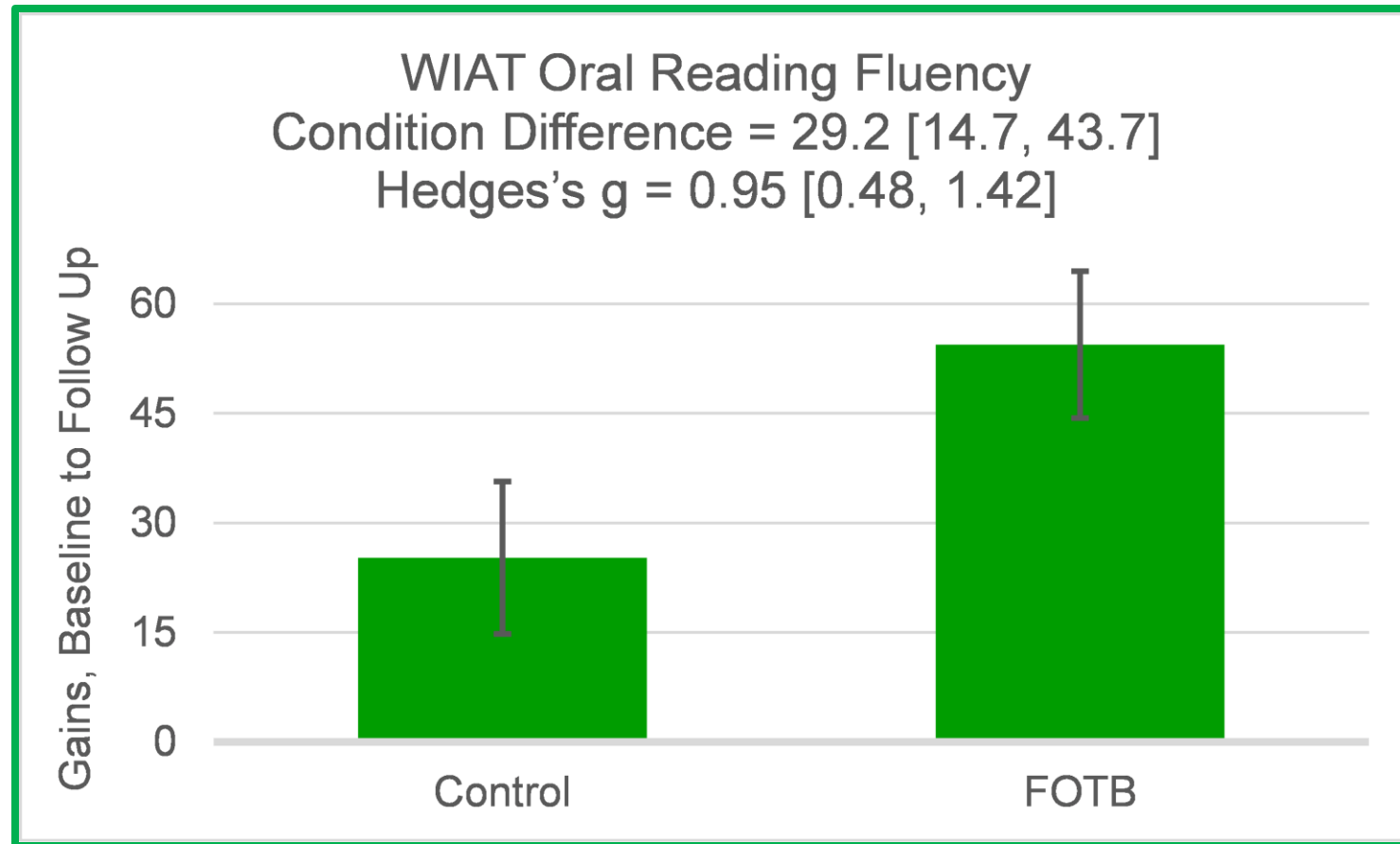
# Pseudoword Decoding



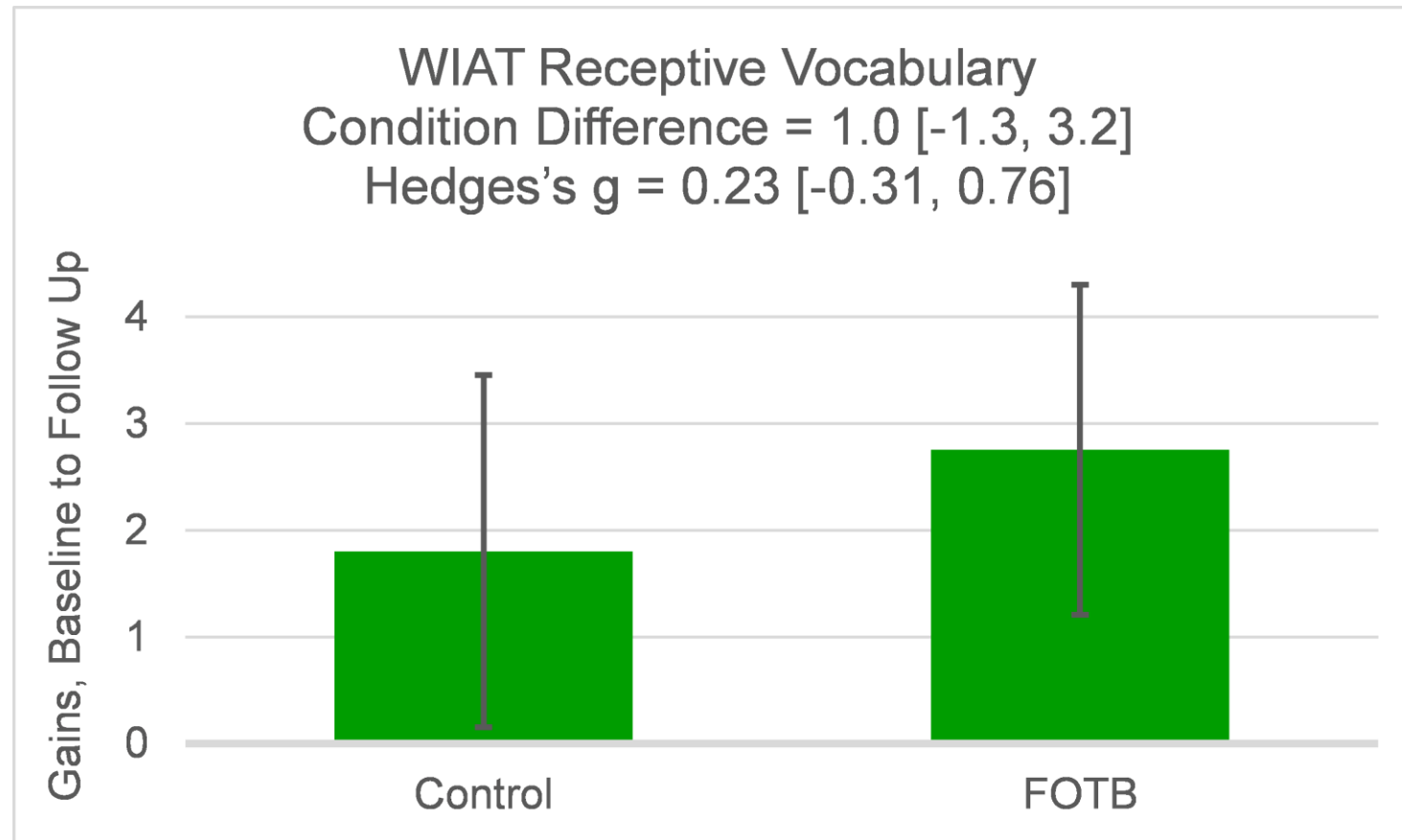
# Word Reading



# Oral Reading Fluency

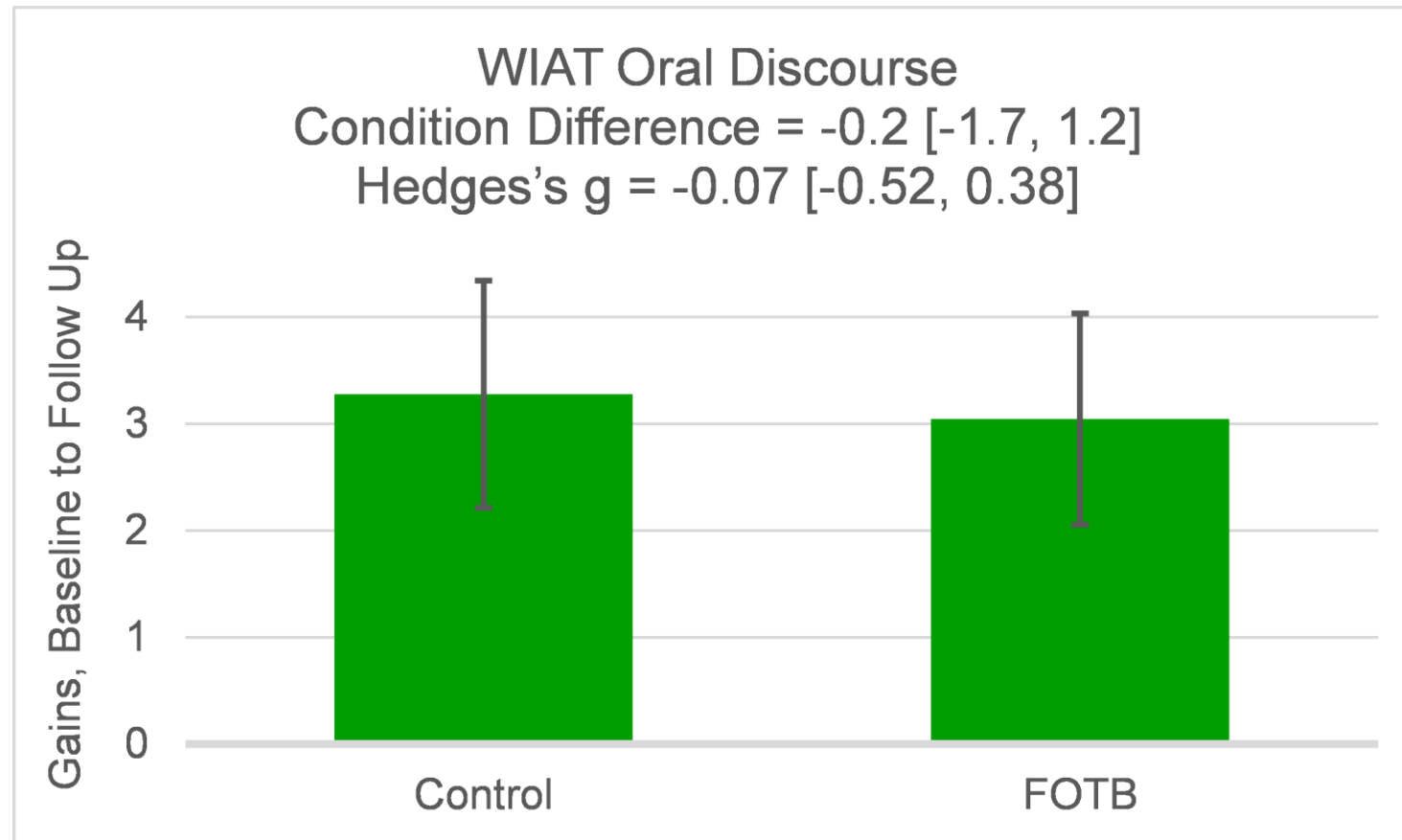


# Listening Comprehension (Receptive Vocabulary)

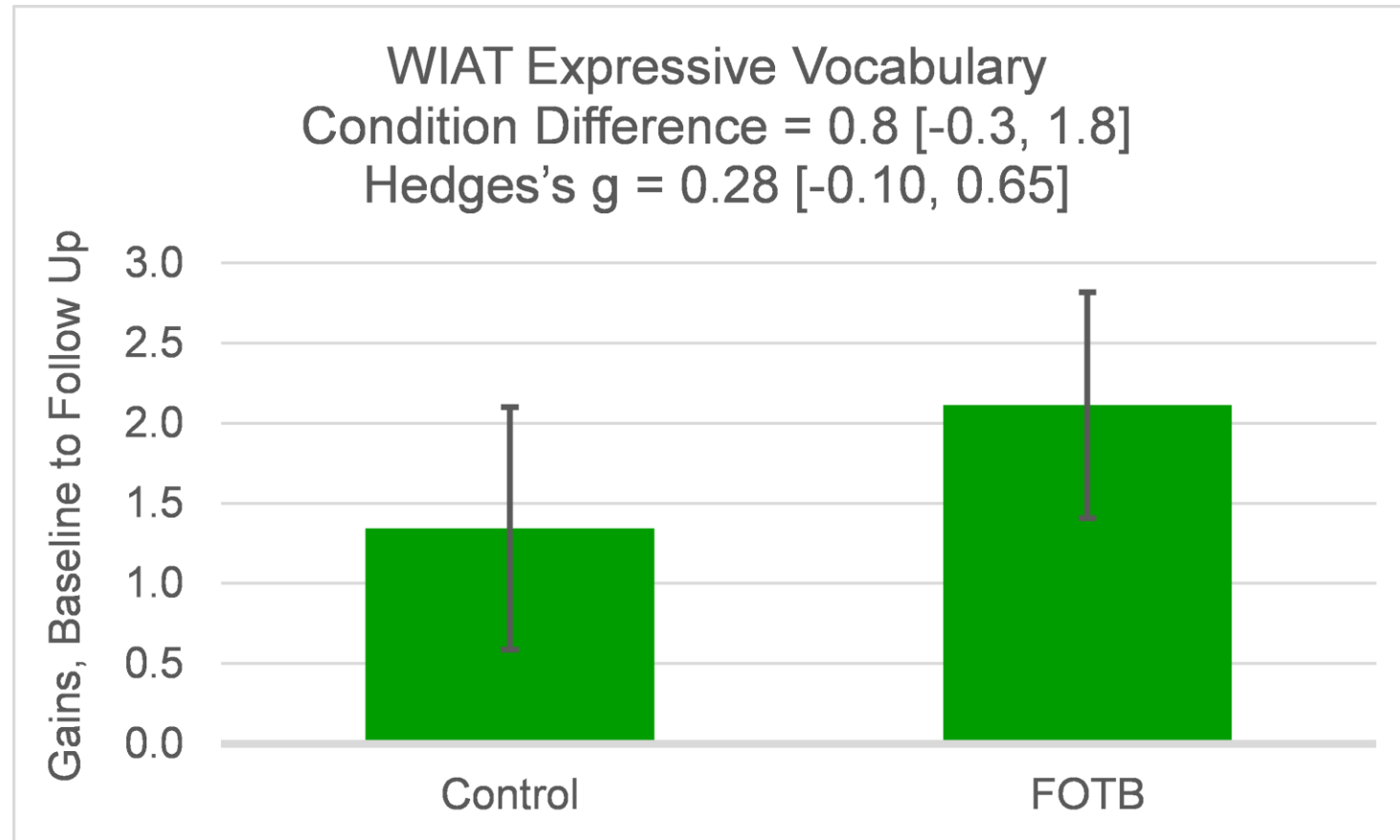




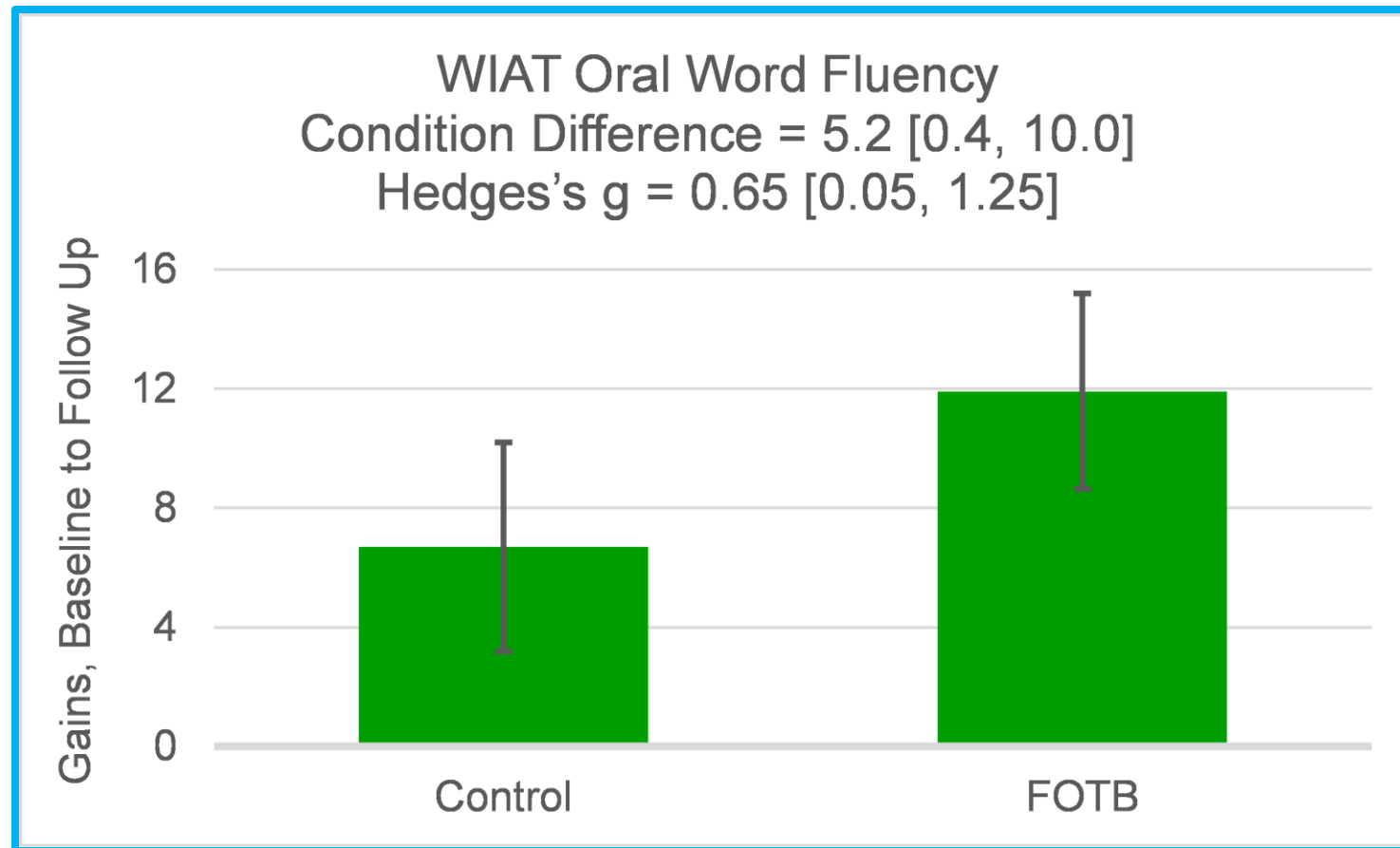
# Listening Comprehension (Oral Discourse)



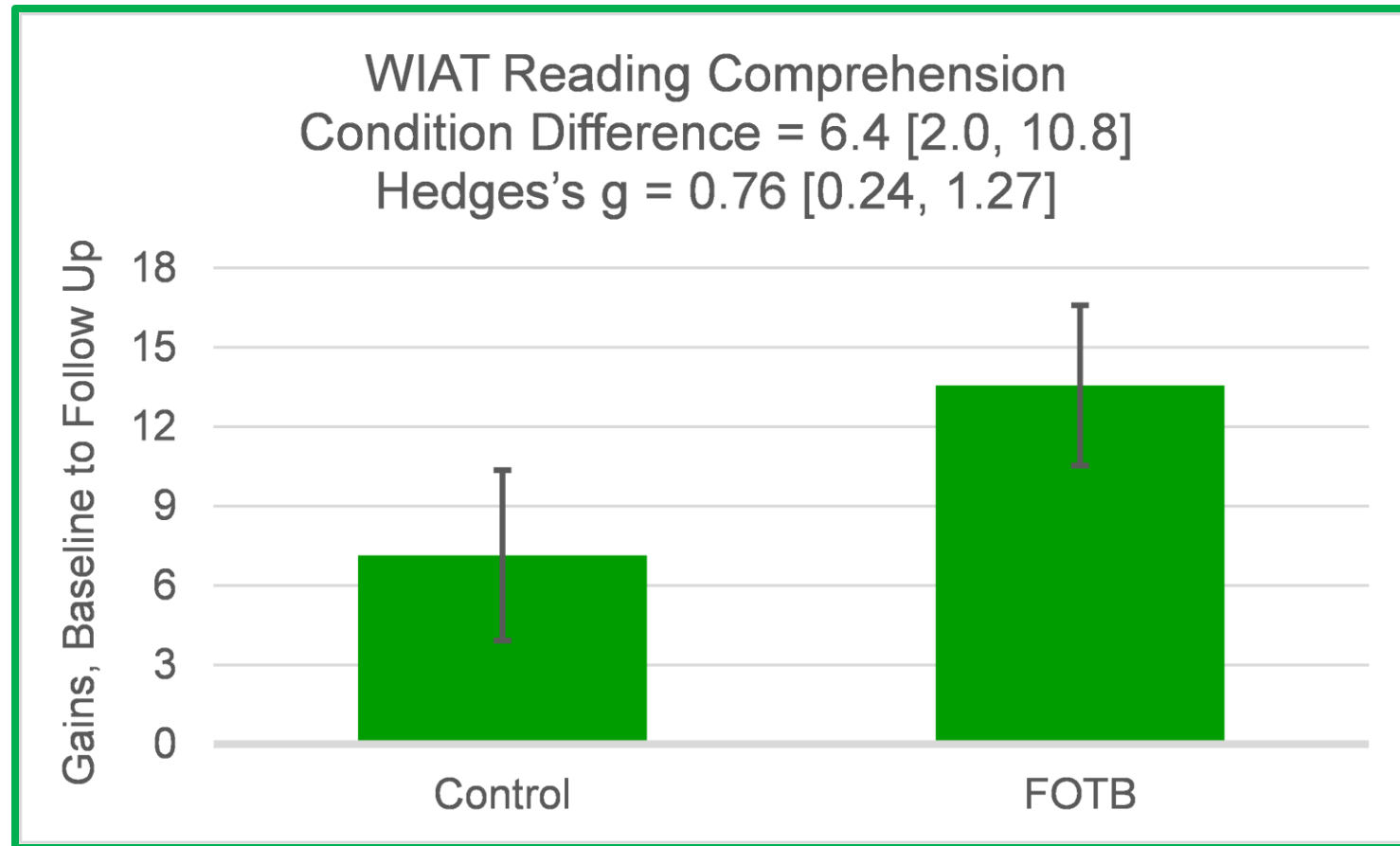
# Oral Expression (Expressive Vocabulary)



# Oral Expression (Oral Word Fluency)



# Reading Comprehension



# Discussion



# Self Teaching Hypothesis (e.g., Share, 1995)

- Share proposed students learn to use phonological, phonetic, and contextual information to decode new words and to overcome "decoding ambiguity."
- Our FOTB treatment students, who continued to read with more fluency and comprehension, may now be able to benefit from a broader range of instruction and decode more novel words

# Limitations and Directions for Future Research

- A limitation is that our interventionists provided the intervention, so additional research is needed that is delivered by classroom teachers.
- These results should be considered preliminary as we have another cohort and additional data to analyze.
- Given the limited language effects on WIAT, we will explore with additional analyses of other measures.
- Research is needed to examine longer-term effects and the effectiveness of FOTB relative to comparable programs.



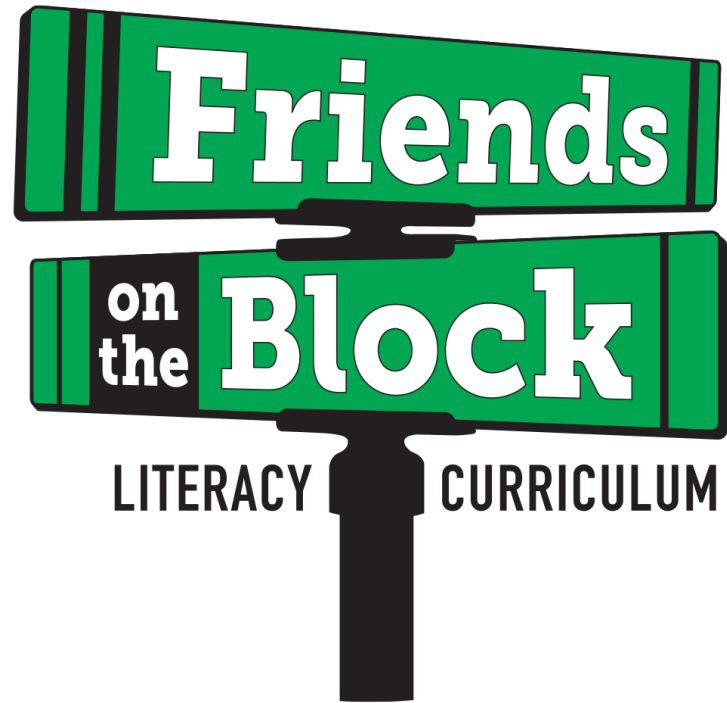
# Implications

- FOTB shows impact as intensive early literacy intervention, particularly with those most in need of such support.
- Good news: With appropriate support, students with intensive needs are not just reading words, but reading with fluency and comprehension
- It is important to customize instruction with data-based individualization
- Fidelity is key – a key part of fidelity is making data-based instructional decisions
  - In FOTB, includes pacing (how quickly to advance through intervention), providing scaffolding and corrective feedback, and selecting activities within the program to target student needs

# Questions



# For More Information on Friends on the Block



## Overview & Demonstration Videos

## FREE Materials



## OSF Registries

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Thank you!

Takeaway: FOTB is effective in boosting the early literacy skills of children with IDD.

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