

Impacts of a Computer Mediated Reading Intervention on the Behavior of Students with Emotional and Behavioral Disorders

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Agenda

Understand Reading Challenges of Students with EBD

Describe Multi-Component Computer-Assisted
Reading Intervention

Present the Study and Findings on Behavior and
Reading Outcomes

Understand Reading Challenges of Students with EBD



- Critical Foundational Skill
- Key to Success Across Content Areas
- Predictor of Education Achievement

Who Experiences Reading Difficulties?



33% of All Students

70% of Students with Disabilities

80% of Students with EBD

National Center for Special Education Research. (n.d.) Facts from the National Longitudinal Transition Study-2: School Behavior and Disciplinary Experiences of Youth with Disabilities.; Roberts, G. J., Cho, E., Garwood, J. D., Goble, G. H., Robertson, T., & Hodges, A. (2019). Reading interventions for students with reading and behavioral difficulties: A meta-analysis and evaluation of co-occurring difficulties. *Educational Psychology Review*, 32(1), 17–47.

Why is Reading so Challenging?

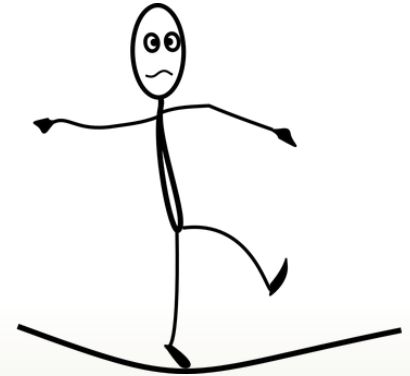
- Reading and behavior deficits remain stable or increase over time
- Often refuse to engage in difficult activities or have experienced failure
- More impulsive, uninvolved, and inattentive than peers





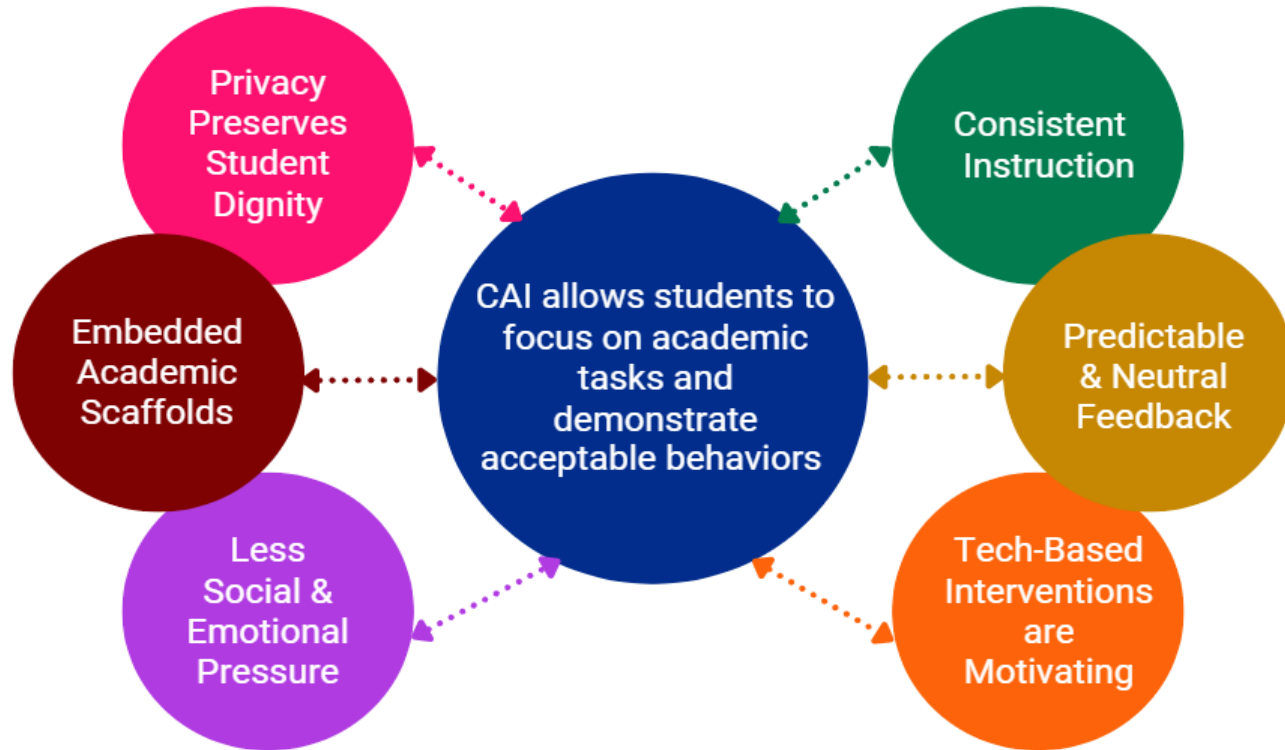
- Behavior Before Academics
- Average Only 30% of the Day on Academics
- Rarely Use Evidence-Based Interventions
- Multiple Grades, Skill Levels, and Subjects
- Un/Underprepared for Tier 2 & 3 Reading and Behavior Interventions

- Explicit, Systematic, and Predictable Instruction
- Guided Practice with Feedback
- Frequent Opportunities to Respond
- Small Group or Individualized Instruction



That is A Lot to Balance!

Computer Assisted Instruction is a Promising Option





Research Question

How does the behavior of students with EBD in an alternative educational setting vary during a dialogic teacher led group literacy lesson compared to a computer delivered literacy lesson?

Describe Multi-Component Computer-Assisted Reading Intervention

New Century – Noah Text[®] (NCNT) Description



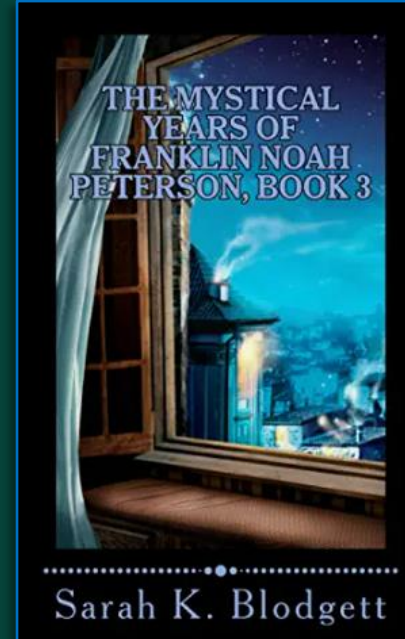
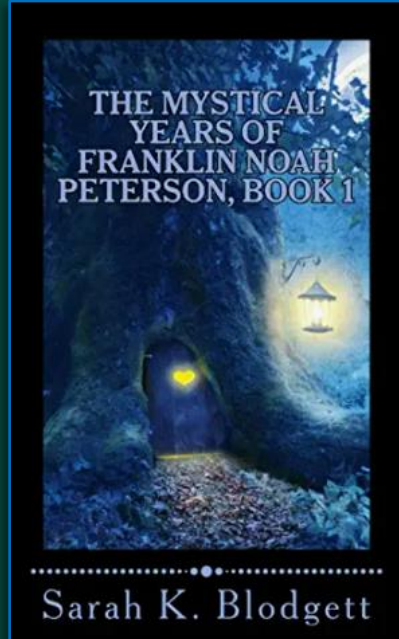
Computer-Delivered Supplemental Reading Intervention

- Intensifies and condenses instruction of word reading, vocabulary, comprehension, and fluency
- Data-based program that provides assessment and progress reports
- Engaging novels with short chapters to motivate, sustain attention, and build stamina
- Embedded scaffolds: audio, video, highlighting, immediate feedback, and Noah Text[®]

The Mystical Years of Franklin Noah Peterson

By Sarah K. Blodgett

Written at 5th grade level



Multisyllabic words alternate between regular and bold text
Long vowels are underlined

Make **Reading **E**njoyable and Fun
with **Noah** Text®!**

Enhancing **Reading **Fluency, **S**tamina,
Confidence, and **Overall Skill!******

Many secondary struggling readers are unable to read multisyllabic words and to read fluently

Word Identification

Letter Patterns
Showing Patterns in Other Words
Syllables and Blending
Spelling and Blending

The Mystical Years of Franklin Noah Peterson (Book One): Patterns & Vocabulary

Year One (Chapters 1-11)

Chapter 1: A Boy Named Frank

-ap dilapidated
 -y quirky
 -tion tradition

Chapter 2: A Morning Feast

-ump scrumptious
 -ire attire
 -ir circular

Chapter 3: Halloween Is in the Air

-im impersonal
 -an anticipation
 -en encounter

Chapter 4: A Mysterious Book

-on contemplate
 -ob obviously
 -ence residence

Chapter 5: Hidden in the Mountain Laurel

-elf self-conscious
 -ev disheveled
 -er exasperation

Year Two (Chapters 12-21)

Chapter 12: All in a Year

-lous prestigious
 -ol bolster
 -iv vivid

Chapter 13: Travel Preparations

-ay dismay
 -ent assortment
 -ep preparation

Chapter 14: The Dreaded Prank

-ute contribute
 -e appreciate
 -own unbeknown









Chapter 15: A Whole Different Era

-cy urgency
 -eth altogether
 -oy foyer

Chapter 16: Which Way to Go?

-il bewildered
 -ite recite
 -in indicate

Read the **syllables** to the left and find the words that match:

	ex-am-ple	<input type="text" value="example"/>	
	 ex-plore	<input type="text"/>	<input type="text" value="disappears"/>
	pri-vate	<input type="text"/>	<input type="text" value="private"/>
	 un-u-su-al-ly	<input type="text"/>	<input type="text" value="awaits"/>
	ad-ven-ture	<input type="text"/>	<input type="text" value="explore"/>
	 a-waits	<input type="text"/>	<input type="text" value="notices"/>
	dis-ap-pears	<input type="text"/>	<input type="text" value="residence"/>
	 no-tic-es	<input type="text"/>	<input type="text" value="adventure"/>
	res-i-dence	<input type="text"/>	<input type="text" value="unusually"/>

Syllabication
and
Blending

-fy as in **magnifying** and the word **modify**.
Practice saying these out loud. -fy. **magnifying**.
 Now look at the words **below**. Try **listening** to them
 and **saying** them out loud.
 Find words with the **pattern -fy**.

 <input type="text" value="identifying"/>	 <input type="text" value="defying"/>	 <input type="text" value="declassify"/>
 <input type="text" value="multiply"/>	 <input type="text" value="stingray"/>	 <input type="text" value="notify"/>
 <input type="text" value="happily"/>	 <input type="text" value="grumpy"/>	 <input type="text" value="horrify"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

Word
Patterns

Vocabulary

Definition

Image of Word

Audio of Key Words

Using Key Words in Sentence

Multiple Expressions of Same Word

Key Roots to Build New Vocabulary

Synonyms/Antonyms to Expand Vocabulary

Extensive Built In Vocabulary Review Lessons

Morphology: Prefixes/Suffixes to Make New Words

Vocabulary Activity Examples

Visual Image to Strengthen Word Association



dilapidated (adjective) – Fallen into ruin or decay, run-down.

The town finally tore down the **dilapidated** old school building.

di-lap-i-dat-ed

Building Vocabulary Knowledge:

- Definition
- Word in Context

Auditory Support: Syllabication—Breaking Apart and Blending Together

Enlarging is similar to magnifying. Find other words similar to magnifying.

amplifying

contracting

shortening

lessening

increasing

decreasing

expanding

enhancing

Making New Words!

Here's a sentence from today's chapter:

He **realizes** he left his **sweater** behind, and he still has the book and **pencil** that he took from the **old library** in his hand.

The base word for "realizes" is "realize". Here are some words that we can make from the base word "realize":

realize

realizing

realized


unrealized

When he enters the building, he knows for sure the old Victorian no longer houses the town library. In fact, the old Victorian looks rather new and is, certainly, someone's private residence. Again, Frank is oddly not concerned and remains unusually calm; he is almost euphoric. He has a sense he's having a magical experience and that everything will be fine. He just needs to follow the sign's instructions, he reasons: "Explore the town, your adventure awaits..." So that is what he'll do....explore the town.

Vocab Assessment and Review

Contemplate (verb) – To **seriously** think **about something** for a while.

I was **contemplating** **leaving** my friends **behind** and **starting** a new life.

 con-tem-plate



Vocabulary Post-Test

1. What does **bewildered** mean?
 alert
 puzzled
 clear
2. What does **altogether** mean?
 hardly
 overall
 few
3. What does **dismay** mean?
 calm
 discouragement
 pleasure
4. What does **unsettling** mean?
 delightful
 distressing
 good

Comprehension

Activating and Building Background Knowledge

Summary Review of Prior Chapter

Building Anticipation: Getting Ready to Read

Teaching Comprehension Strategies

Checking for Understanding: Multiple Choice

Written Response to Chapter: Discussion Question

Connecting the Story to Your Life: Discussion Prompts

Activate & Build Background Knowledge



Many large **houses** were built along the **Atlantic Ocean** by **wealthy sea captains** in the 18th **century**. Many of these **homes** had **lookout structures** built on top of their roofs. These **structures** were **often** called **widow's watches**. **Stories** were **often** told of a **captain's wife** **pacing** back and forth **inside** the **widow's watch** as she looked out to **sea** **anxiously waiting** for her **husband's** ship to **return home**. **Sadly**, **many** **sea captains** and **sailors** **became** lost at **sea** **never** to **return** to their **families**. Have you **ever** **anxiously** **waited** for **someone** to **return home**? It's an **awful** **feeling**!

Support Memory with Chapter Review & Getting Ready to Read

In the last **chapter**, we learned

- The old pick-up truck takes Frank to the **rural** region of town and stalls out near the one-room **schoolhouse**. So Frank **dec**ides to hang out and wait for school to be **dismissed**, **hop**ing one of the kids will see him.
- When the kids are let out of school, no one can see Frank; but he **happ**ens to hear a few of the boys talk about **sne**aking up on the **hob**o in the woods.
- Frank **fol**lows the boys and falls in the mud while **do**ing so.
- When Frank **catch**es up to the boys, he sees them **throw**ing **pebb**les at a make-shift tent. Then, a tall, thin, **filthy** **be**arded man **sudden**ly jumps out and scares them off!
- **How**ever, Frank just stands there and stares at the **hob**o; and sure enough, the **hob**o stares back at him!

Stories **almost** **always** have **interesting** **characters**.

The **author** in this **story** gives you **many** clues about the main **char**acter, **Franklin Noah Peterson**. As you read this first **chapter**, think **care**fully about how the **author** **de**scribes Frank.

Also, in this first **chapter**, the **author** **de**scribes **several** **important** clues about the **setting** of the **story** – where the **story** takes place. The **author** **de**scribes the sights, sounds, **objects**, pets, and **family** **members**.

So, as you read this first **chapter**, pay close **attention** to the **char**acters and the **setting** of this **story**. This is what good **reading** **de**tectives do to **understand** what they are **reading**.





Multiple Choice Questions with Audio Feedback

Check for Understanding

- Literal
- Inferential
- Vocabulary
- Text Structure
- Author's Purpose





All Questions and Answer Stems are Read Aloud

Which of the **following characteristics** might make Frank seem **quirky**?

- Loves his **family** and his pet; **very easygoing**; three close friends 
- Lives in a **coastal** town; lives in an **old** house with a **scarecrow** in the yard 
- Builds **structures** in the yard; reads **under his covers**; makes up **believe** worlds 
- Average** build; has a **sister** and two **parents**; 12 years **old** 

Frank lives with his **parents** and **nine-year-old sister, Izzy**, in a large **two-story** home built in the mid-1800s... The house is **very** big and **airy** and **even** has an **old widow's** watch perched at the top. **Although** the home is **very** old and was once **very dilapidated**, Frank's **parents, Emily** and **Noah, lovingly** restored it, such that it is **very comfortable** and **cozy**.

What does **dilapidated** mean in this passage?

- Modern, fancy** 
- Run-down, in disrepair** 
- Textured shapes, color profile** 
- Historic, old** 

Supplemental Connecting to Your Life: Discussion Prompts

Literature is a great way to explore social, emotional and life skills themes

Each lesson has a series of prompts crafted to themes such as:

- Personal Strengths
- Adolescence & Identity
- Positive & Negative Risk Taking
- Desire for Recognition
- New Experiences
- Belonging
- Handling Loss

Mar, R., Djikic, M., & Oatley, K. (2008). Effects of reading on knowledge, social abilities, and Selfhood: Theory and empirical studies. *Directions in Empirical Literary Studies*, 127–137.25; Okolo, C.M., & Ferretti, R. (2020). Technology, reading, and learning Disabilities. In A. J. Martin, R. A. Sperling, & K. J. Newton (Eds). *Handbook of Educational Psychology and Students with Special Needs*. New York: Routledge.

Comprehension Expansion

60 Building Background Knowledge Lessons

58 Chapter Review Summaries

Over 360 Comprehension Questions Across 60 Lessons

60 Written Responses to Key Questions

60 Connecting the Story to Your Life Lessons with over
300 Discussion Prompts

Vocabulary Supports: 117 New Words; 195 Synonyms

Participants and Setting:

- 7 Middle school students with dyslexia in a 2-week study during summer of 2021.
- Students completed only the first book of the series (21 lessons)

Findings:

- 100% of students:
 - Had fewer miscues when reading in Noah Text®
 - Positively rated their experience
- 87.5% of students:
 - Improved vocab knowledge and reading fluency
 - Improved or maintained reading comprehension
 - Read more words in Noah Text® than in regular text

Study & Findings

Behavior & Reading Outcomes

Day treatment program located in a center-based school

- 2 Classrooms - Elementary and Middle School
- 2 Teachers and 4 Paraprofessionals
- All Elementary and Middle School students participated in the intervention (n=8)

Comparative Case Study

- Emphasized 3 students' reading, behavior, and interactions in different literacy settings
- Privileged the lived experience of students and teachers in a real-world setting
- Multiple data sources and multiple perspectives

15-week Intervention

NCNT 3-days a week

- 45 supplemental CAI reading lessons (30-minutes)

BAU 2-days a week

- Teacher Read Aloud
- Comprehension Worksheets
- Structured Writing Activity

Data Collection

Quantitative Measures

Reading Construct	Word Reading	Vocabulary	Fluency	Comprehension
Measure	TOWRE-2 <ul style="list-style-type: none">Sight Word FluencyPhonemic Decoding Efficiency	NCNT Vocabulary Assessment	Dibels-8 Oral Reading Fluency - Mean Score of grades 3, 5, 7 Assessment	Dibels-8 MAZE Comprehension - Mean Score of grades 3, 5, 7 Assessment
	Pre/Post Intervention	Pre/Post Each Book	Pre/Post Intervention	Pre/Post Intervention

Qualitative Measures

Construct	Beliefs about Reading	Social Validity	Personal Experience	Literacy Activity Setting
Measure	Experience with Reading Survey	NCNT Social Validity Survey	Semi-Structured Interviews	Field Observation & Analytic Memos
	Pre/Post Intervention	Post Intervention	Post Intervention	During Intervention

Data Collection cont.

- Observations & Analytic Memos
 - 2 observations weekly (2 hours each)
 - 15 weeks
 - **total of 60 hours of observations**

Constant Comparative Method

- 1) Examine all data sources to broadly identify patterns and record general impressions
- 2) Examine data on micro level to code
- 3) Organize emerging patterns into clusters and triangulate

Meet Carter*

- White male 5th Grader
- SE Eligibility: Other Health Impairment (Initially speech/language)
- Comorbidity: ASD Diagnosis, Anxiety Disorder, and ADHD
- Attended Day Treatment Program since Fall 5th Grade
 - Triggered by noises and other students
 - Behaviors Include: Screaming, eloping, assault, and property destruction

Reading Measure	TOWRE-2 sight word	TOWRE-2 nonword	Dibels ORF	Dibels MAZE
Pre	8 th percentile	<1 percentile	109	13

* All names in this presentation are pseudonyms

First 10 observations (5-NCNT; 5-BAU)

Requested and used self regulation strategies 3 times during NCNT

Strategy	Excerpt from field observation notes
Noise canceling headphones	C. requests noise canceling headphones from paraprofessional. According to staff he will get upset/triggered by loud students, but rarely will wear headphones and does not <i>ever</i> request them.
Non-contingent break	Another student was pacing the room and throwing objects. C. goes into the classroom's bathroom – used as a quiet/private space students can use when they need a break.
Calming visual	Just after transitioning from a crisis situation, C. was able to request and use his CAT strategy. This is a personalized visual of his cats which he can sit and focus on rather than perseverating on the crisis.

Carter's Reading Outcomes

Reading Measure	TOWRE-2 sight word	TOWRE-2 nonword	Dibels ORF	Dibels MAZE
Pre	8 th percentile	<1 percentile	109	13
Post	3 rd percentile	<1 percentile	119	22

Comprehension – Intensive Support Needs → Core Support Needs

- White male 7th grader
- SE Eligibility: Emotional and Behavioral Disorder
- Comorbidity: Anxiety Disorder
- Attended Day Treatment Program since Fall 5th Grade
 - Triggered by difficult academic tasks and peers
 - Behaviors Include: Screaming, eloping, assault, and property destruction

Reading Measure	TOWRE-2 sight word	TOWRE-2 nonword	Dibels ORF	Dibels MAZE
Pre	19 th percentile	<1 percentile	73	16

Reading intervention was interrupted several times with continuous students' crosstalk and arguing. Garrett volunteers to answer, but another student answers before he gets a chance.

Garrett, "I'm not answering anymore."

Teacher, "Come on, I know you know the answer."

Garrett, "I do, but I'm not doing anything with him in here!" pointing at the boy who had answered. He then put his head down for the remainder of the lesson.

After lesson 6 - Garrett stopped the researcher in the hall to share his recent NCNT lesson scores (67, 74, & 81). He couldn't stop smiling and was excited they were getting better every time. He shared that his goal was to get to 90% before the end of the first book.

Teacher, "He just loves this reading program."

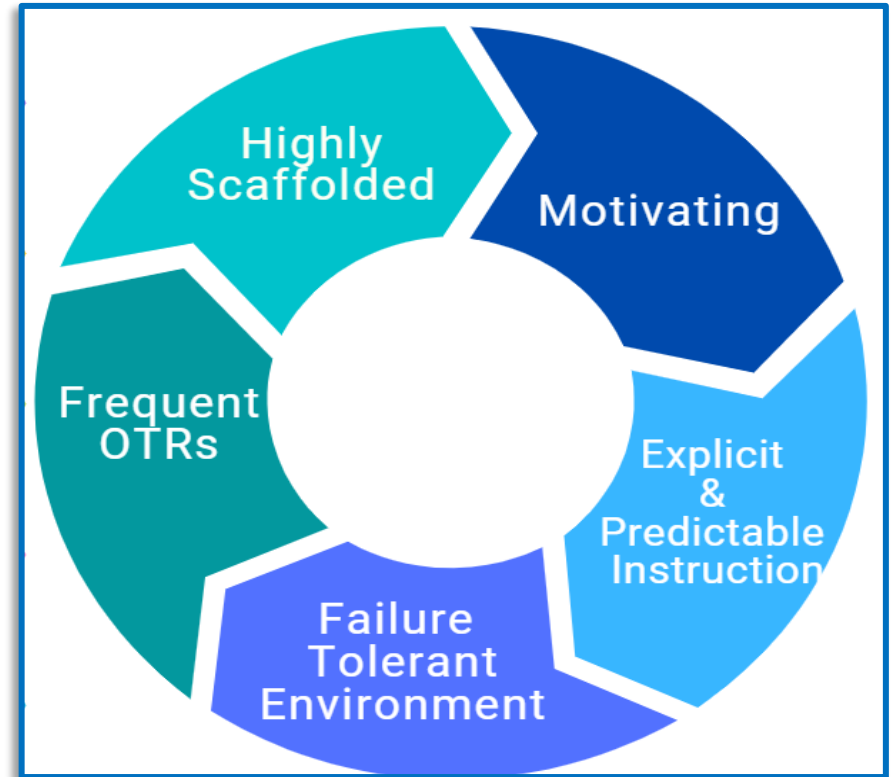
Researcher, "Is that unusual?"

Teacher, "Yes! Reading is his nemesis. He usually tries to get out of it."

Researcher, "What do you think he likes about it?"

Teacher, "I think he likes the predictability and knowing when he gets the answer right."

- Private Learning Environment
- Experience Success
- No Competition
- Builds Independence



Reading Measure	TOWRE-2 sight word	TOWRE-2 nonword	Dibels ORF	Dibels MAZE
Pre	19 th percentile	<1 percentile	73	16
Post	21 st percentile	<1 percentile	112	15

Still needs intensive support in all areas of reading

ORF - Read 50% More Words

- White male 6th Grader
- SE Eligibility: Other Health Impairment
- Comorbidity: Anxiety Disorder and ADHD
- Attended Day Treatment Program since Spring 5th Grade
 - Triggered by non-preferred activities and peers
 - Behaviors Include: Refusal, eloping, assault, and property destruction

Reading Measures	TOWRE-2 sight word	TOWRE-2 nonword	Dibels ORF	Dibels MAZE
Pre	65 th percentile	<1 percentile	111	18

Reading Measures	TOWRE-2 sight word	TOWRE-2 nonword	Dibels ORF	Dibels MAZE
Pre	65 th percentile	<1 percentile	111	18
Post	58 th percentile	<1 percentile	210	29

ORF – Intensive Support Needs → Core Support Needs

Comprehension – Strategic Support Needs → Core Support Needs

Biggest reading gains with the lowest effort and quality

- Fewest lessons completed
- Shortest average lesson duration
- Lowest average lesson scores

Attentional Issues or Something Else?

- After every academic task Evan's free choice was to socialize with the male paraprofessional
- Evan's motivated by social interaction, so how do we adapt his literacy setting?

How can teachers manipulate literacy settings to meet individual attention, motivation, social, communication, sensory, behavior, and learning needs?

- CAI may provide a neutral learning environment that allows students to focus their energy on academic tasks independently and privately rather than succumbing to the distractions and emotional pressure of dialogic learning
- As teachers of students with EBD select reading interventions, the affordances of different literacy settings (e.g. computer-mediated or teacher-mediated) is an additional layer to consider

Questions?

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