

## READING INTERVENTION FOR KINDERGARTENERS WITH PROBLEM BEHAVIORS

### FINDINGS FROM AN EXPERIMENTAL STUDY

Shanna Hagan-Burke, Ph.D.  
Texas A&M University  
[shaganburke@tamu.edu](mailto:shaganburke@tamu.edu)

*The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R324E060067 to Texas A&M University. The opinions expressed are those of the authors and do not represent views of the U.S. Department of Education.*

## The Research Team



Shanna Hagan-Burke, Oi-man Kwok, Deborah Simmons, Leslie Simmons, Yuanyuan Zou, & Caitlin Johnson



Michael Coyne, Maureen Ruby, Athena Lentini, & Yvel Crevecoeur



Mary Little & D'Ann Rawlinson

## Problem Behavior– it's a big deal!

**Problem behavior** is a consistent predictor of poor response to early reading intervention (Torgesen, 1991, Al Otaiba & Fuchs, 2006).

In fact, **problem behavior among the strongest predictors** of reading problems. In one meta analysis (Nelson et al., 2003), the three strongest predictors of poor reading outcomes were:

- (1) rapid automatized naming,
- (2) problem behavior, and
- (3) phonological awareness.

## The evidence is plentiful. Problem behavior and reading problems are related.

- Numerous studies document relationships between behavioral and reading problems.
- These relations vary to some degree by type of behavior, with **hyperactivity** and **externalizing** behaviors more commonly associated with lower academic outcomes.
- There is no consensus regarding the directionality of this linkage.
- There *is* consensus that **children at risk of reading problems often exhibit problem behaviors, and that children who exhibit problem behaviors at school are at heightened risk of reading problems.**

## Background

This study extends findings from a randomized control trial that compared the effects of two types of Tier 2 interventions on kindergarten students' reading achievement.

Simmons, D. C., Coyne, M. D., Hagan-Burke, S., Kwok, O., Simmons, L., Zou, Y., ... Crevecoeur, Y. (2011). Effects of supplemental reading interventions in authentic contexts: A comparison of kindergarteners' response. *Exceptional Children*, 77, 207-228.

## Participants

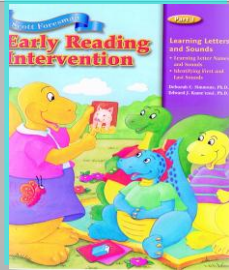
12 Schools	57 Teachers	206 Students
8 in Connecticut 4 in Texas	Intervention (n = 31) Comparison (n = 26)	Intervention (n = 112) Comparison (n = 94)
<b>SES</b> 50%-80% of school populations received free or reduced lunch	<b>Teacher certification</b> -Intervention 26 (84%) -Comparison(81%)  <b>Years of Experience Teaching K</b> Intervention 6.08 (SD = 6.92) Comparison 7.92 (SD = 8.89)	<b>Selection</b> Approx 4 per class, based screening measures of DIBELS LNF and CTOPP SM  <b>Ethnicity</b> 19% African American 42% Hispanic 37% White

## The Intervention

explicit, systematic code- focused (ESC) Program

### Components

- 4 parts
- Teacher Guides
- Student Materials
- Assessment Guide
- Manipulatives



\*Pearson/Scott Foresman. (2004). *Scott Foresman Sidewalks: Early reading intervention*. Glenview, IL: Author.

## The Intervention (ESC)

(continued)

- Taught in small groups for 30 minutes daily
- Focused on a few high-priority skills
- Used explicit methods in game-like format
- Provided extensive opportunities to learn & practice.



## ESC: Scope & Sequence

- Part 1:** Learning Letters & Sounds
- Part 2:** Segmenting, Blending, & Integrating
- Part 3:** Reading Words
- Part 4:** Reading Sentences & Storybooks

U.S. Dept. of Education-IES Grant #R324E060067A

9

## ESC Design Features

- Letter Names/Sounds = 3 day introductory cycle except for vowels (6 days)
- High priority phonemic awareness skills: 1<sup>st</sup> and last sound isolation, sequential blending and segmentation.
- Word reading and spelling
- 8 high frequency irregular sight words.

U.S. Dept. of Education-IES Grant #R324E060067A

10

## Comparison Condition

- Taught in small groups for 30 minutes daily
- Variety of teacher-made and published materials in use
  - 48% reported sustained use of a published program
  - 52% used compilation of teacher-made and commercial material
- Focus of instruction was early literacy

**School-determined intervention (or SDI)**

## SDI Condition

	% Lesson Activities		
	Fall	Spring	Combined
<b>Concepts of Print</b>	13.33	9.52	11.76
<b>Phonological Awareness:</b>	53.33	42.86	49.02
• Phoneme level	50.00	28.57	41.18
• Sound blending /segmenting	13.33	28.57	19.61
<b>Alphabetic/Reading/Decoding:</b>	96.67	80.95	90.20
• Letter-names	80.00	47.62	66.67
• Letter-sounds	73.33	47.62	62.75
• Decodable words	43.33	38.10	41.18
• Sight words	23.33	14.29	19.61
• Reading connected text	13.33	47.62	27.45
<b>Writing/Spelling</b>	46.67	28.57	39.22

## Findings from the Earlier Study

(Simmons et al., 2011)

At the end of kindergarten, children receiving the explicit, systematic, code-focused intervention (ESC) outperformed those in the comparison condition (SDI) on outcome measures of

- alphabet knowledge
- phonemic awareness (both timed and untimed tasks)
- word attack (untimed)

## from Earlier Study

(Simmons et al., 2011)

Measure	P	Effect Size
<b>Phonemic Awareness</b>		
CTOPP Sound Matching	0.01*	0.42
CTOPP Blending Words	0.01*	0.41
<b>Alphabet Knowledge</b>		
WRMT-R/NU letter <i>name</i> checklist	0.03*	0.33
WRMT-R/NU letter <i>sound</i> checklist	0.01*	0.45
<b>Word Reading</b>		
WRMT-R/NU Word Attack	0.01*	0.48
WRMT-R/NU Word ID	0.09	0.26

## Findings from Earlier Study

(Simmons et al., 2011)

(Continued)

- At posttest, high percentages of students in both conditions (ESC and SDI) performed at or above the 30<sup>th</sup> percentile on reading outcome measures.
- However, a larger percentage of students in the school-determined intervention (SDI) condition performed below the 15<sup>th</sup> percentile across all outcome measures at post-test.

## So where does problem behavior fit into this story?

We also wanted to

- (a) examine how problem behaviors influenced kindergarten response to supplementary reading intervention.
- (b) investigate whether ESC moderated the negative relations between problem behaviors and end-of-kindergarten reading outcomes.

### Supplemental Reading Intervention

Explicit, code-focused instruction targeting key phonemic & alphabetic skills

**This Study**

### Problem Behaviors

- Externalizing
- Internalizing
- Hyperactivity

### Kindergarten Reading Outcomes

- Phonemic awareness
- Alphabet knowledge
- Word reading

## More Participant Characteristics

### Academic

#### Academic criteria for inclusion:

Pre-test score at /below the 33<sup>rd</sup> percentile on LNF measure (n=142)

or

Pre-test score at/below the 37<sup>th</sup> percentile on CTOPP sound matching task. (n=200)

Note: 136 children met both criteria.

### Behavioral

#### Behavior Criteria for Inclusion:

**None.** Children were selected without regard for problem behavior, resulting in a behaviorally heterogeneous sample.

There were no differences on any behavior measure between the two groups.

Problem behavior ratings ranged from below the 16<sup>th</sup> percentile to above the 98<sup>th</sup>, with an average rating at the 50<sup>th</sup> percentile on the SSRS-T problem behavior scale.

## Variables

### Behavior Predictors

**Problem Behavior Scale**  
 SSRS-T Externalizing  
 SSRS-T Hyperactivity  
 SSRS-T Internalizing

### Reading Outcomes

**Phonemic Awareness**  
 CTOPP Sound Matching  
 CTOPP Blending Words  
**Alphabet Knowledge**  
 WRMT-R Letter-name checklist  
 WRMT-R Letter-sound checklist  
**Word Reading**  
 WRMT-R Word Attack  
 WRMT-R Word ID

Gresham, F.M., & Elliott, S.N. (1990). *Social Skills Rating System*. Circle Pines, MN: American Guidance Service.  
 Wagner, R.K., Torgesen, J.K., & Rashotte, C.A. (1999). *Comprehensive Test of Phonological Processing*. Austin, TX: Pro-Ed.  
 Woodcock, R.W. (1987, 1998). *Woodcock Reading Mastery Tests - Revised/normative update*. Bloomington, MN: Pearson Assessments.

## Data Analysis

We used multilevel modeling to (a) examine the direct influence of problem behaviors on kindergarten reading outcomes for all 206 children and (b) investigate whether an explicit, systematic, code-based reading intervention moderated the influences of problem behaviors on kindergarten reading outcomes.

➤ The models controlled for: pretest performance levels, student age, gender, ethnicity, entry-level PPVT scores, special education status, bilingual status, total hours of intervention received, and educational level of interventionist).

### First, we examined problem behaviors' influence on K reading outcomes among all 206 children.

Reading Outcome	Externalizing	Internalizing	Hyperactivity
<b>Phonemic Awareness</b>			
Sound Matching	-.08 †	-.15***	-.11**
Blending Words	-.03	-.11*	-.02
<b>Alphabet Knowledge</b>			
Letter-name checklist	-.20*	-.02	-.32***
Letter-sound checklist	-.34**	-.26†	-.58***
<b>Word Reading</b>			
Word Attack	-.46*	-.57*	-.58***
Word ID	-.11	-.11	-.11

### Next, we tested whether participating in the ESC intervention moderated any of those negative influences.

**Spoiler:** Intervention did matter for externalizing and hyperactive behaviors... but not internalizing. (Internalizing had the same pattern of negative influence across children in both conditions.)

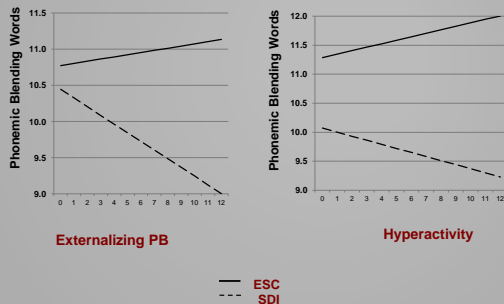
### Interaction Effects of Externalizing Problem Behavior and Type of Reading Intervention

Reading Outcome Measure	Externalizing Problem Behavior		
	$\gamma_{81}$	$\gamma_{SDI}$	$\gamma_{ESC}$
<b>Phonemic Awareness</b>			
Sound Matching	0.01	-0.10	-0.09 †
Blending Words	0.19*	-0.16*	0.03
<b>Alphabet Knowledge</b>			
Letter-name checklist	0.71***	-0.70***	0.01
Letter-sound checklist	0.81**	-0.92***	-0.11
<b>Word Reading</b>			
Word Attack	0.80 †	-1.06**	-0.26
Word ID	1.23*	-1.47***	-0.24

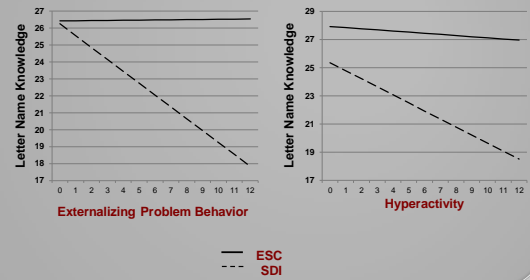
### Interaction Effects of Hyperactive PB and Type of Reading Intervention

Reading Outcome Measure	Hyperactive Problem Behaviors		
	$\gamma_{81}$	$\gamma_{SDI}$	$\gamma_{ESC}$
<b>Phonemic Awareness</b>			
Sound Matching	-0.02	-0.10 †	-0.12*
Blending Words	0.15*	-0.09 †	0.06
<b>Alphabet Knowledge</b>			
Letter-name checklist	0.48***	-0.58***	-0.10
Letter-sound checklist	0.42*	-0.81***	-0.39**
<b>Word Reading</b>			
Word Attack	0.30	-0.73**	-0.43 †
Word ID	0.39	-0.79*	-0.40 †

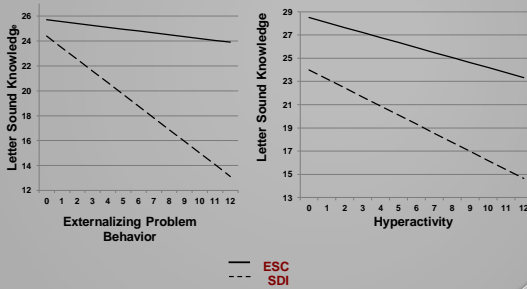
### Stated Another Way...



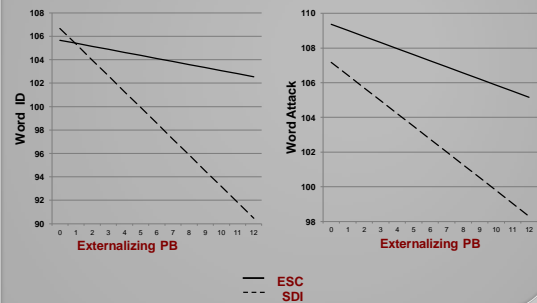
### The Influences of Problem Behavior on Letter Name Outcomes



### The Influences of Problem Behavior on Letter Sound Outcomes



### The Influences of Problem Behavior on Word Reading Outcomes



## Summary of Conclusions

### Internalizing Problem Behavior

- ESC was not sufficient to moderate negative influence of internalizing problem behaviors on kindergarten reading.
- Regardless of intervention type, higher ratings of internalizing behaviors predicted lower outcomes on all but the simplest print-based task (letter-name knowledge).
- Future studies should continue to investigate internalizing problem behaviors and their negative impact on early reading development.

continued

### Externalizing & Hyperactive PB

- This study provides preliminary evidence supporting the potential of systematic and explicit intervention that integrates phonemic awareness, alphabetic knowledge, and phonetic decoding.
- Nonetheless, more research is needed to replicate these findings and help us understand why ESC moderated the negative influences of hyperactive and externalizing behaviors on alphabet knowledge and some word reading outcomes, but had less influence on phonemic awareness.

## Limitations & Future Research Considerations

### Measurement:

Administering the entire battery of CTOPP kindergarten measures may have provided a more complete account of participants' phonemic awareness.

Additional behavior measures, particularly those that capture attention-related behaviors would likely be informative.

While issues of feasibility make rating scales appealing for larger studies, additional behavioral data employing direct observation may have enhanced our understanding of children's behaviors and the contexts in which they typically occurred.

## Limitations and Future Directions (continued)

### Analysis of Conditions:

The multiple dimensions of ECS and breadth of instructional approaches within SDI complicated efforts to compare and contrast the two.

Future studies that more thoroughly analyze the sameness and differences between intervention and comparison conditions (Denton, Kurz, Shih, & Mathes, 2008) may help discern specific features of intervention that diminish the negative influences of problem behaviors on reading development.

## Reference

Hagan-Burke, S., Kwok, O., Zou, Y., Johnson, C., Simmons, D. C., & Coyne, M. D. (in press). An examination of problem behaviors and reading outcomes in kindergarten students. *Journal of Special Education*.