

Response to Kindergarten Reading Intervention: What We Know Now and What We Need to Know?

RTI Early Childhood Summit

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We Need to Know the Conditions Under Which Practices Work

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- Schools are increasingly implementing preventive or responsive “interventions” in the primary grades to meet the academic needs of young children with early academic risk.

We Know

- In many instances, these instructional practices or programs “work” or result in substantial achievement differences over typical practices for many children.

Need to Know

- To move beyond “what works” to an examination of the instructional, contextual, and methodological factors that characterize effective interventions for young children at risk of reading difficulty (Lyon & Moats).

It Works Compared to What?

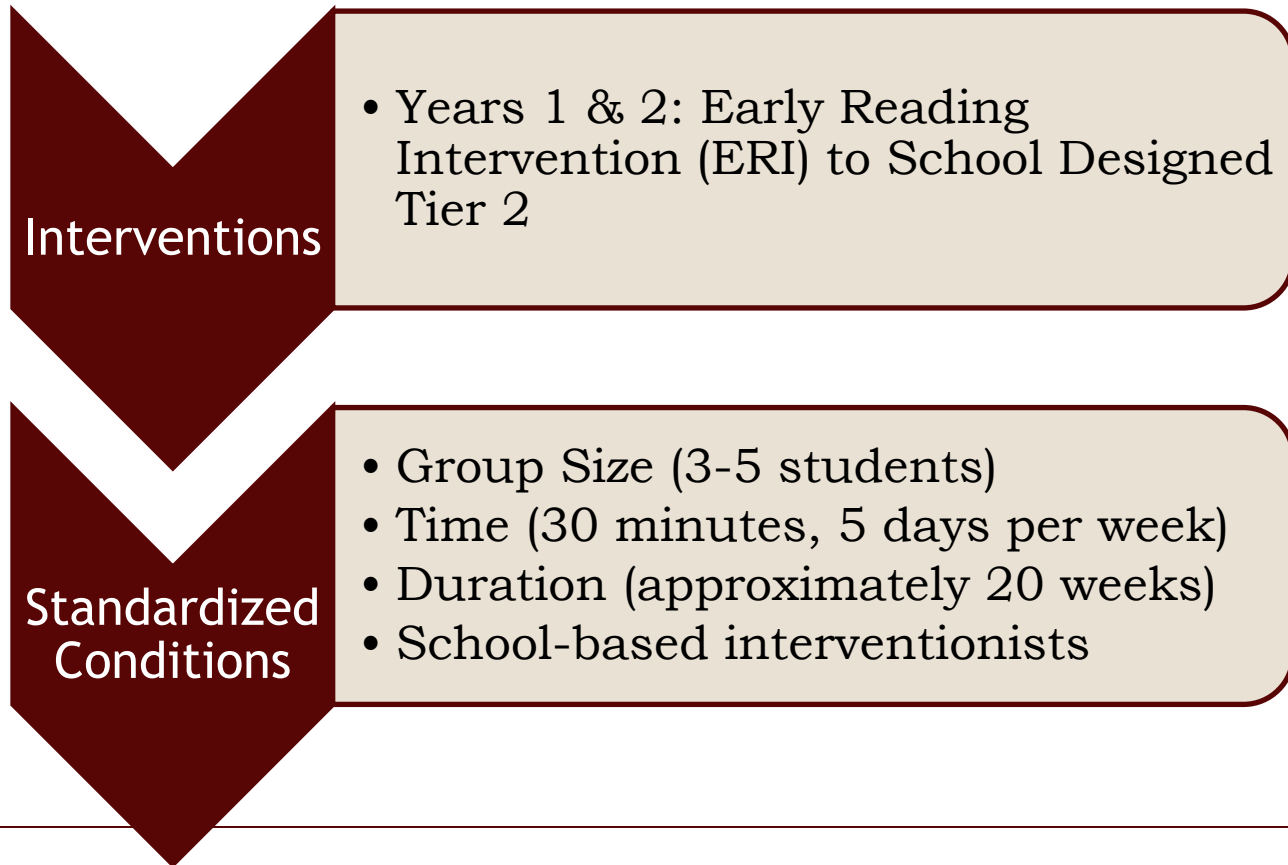
- Does an intervention work when the comparison group receives comparable amounts of a different intervention?
- Does “it” work in different settings and states?
- For whom does “it” work?
- Do “instructional adjustments” work and which ones?

A Tale of Two Studies: Replicating the Impact of a Supplemental Beginning Reading Intervention

Coyne, M. D., Little, M. E., Rawlinson, D. M., Simmons, D. C., Kwok, O., Kim, M., Simmons, L. E., Hagan-Burke, S., & Civetelli, C. (accepted for publication).

Intervention Efficacy Studies

RCTs to compare the efficacy of supplemental interventions under standardized conditions:



Compared to What?

- To determine effects of the Early Reading Intervention to a standardized comparison group
- To determine whether findings replicate across settings

The Importance of Replication Research

- The qualities that make the evidence from experimental studies trustworthy are the very same that may limit generalizability of findings from a single study (Fritz & Cleland, 2003).
- Specifically, research that emphasizes internal validity often has limited external validity.

Participants & Setting

- Kindergarteners selected from a pool of low-performing children nominated by classroom teachers
- **Phase 1 Screening (Years 01 and 02)**
 - DIBELS letter naming fluency: ≤ 36 th percentile **and** CTOPP sound matching: ≤ 37 th percentile
- Intervention primarily delivered by classroom teachers in push-in settings.

Year 01 and 02 Study Participants

| | Year 01 (<i>N</i> = 206) | | Year 02 (<i>N</i> = 162) | |
|-----------|------------------------------|-----|------------------------------|-----|
| Condition | ERI | SDI | ERI | SDI |
| Sample | 112 | 94 | 87 | 75 |
| Sites | TX/CT | | FL | |

Note. *N* = student sample size.

Standardized Program: Early Reading Intervention - ERI

Curriculum Design Features & Targets

- Published supplemental reading program for kindergarten students
- Explicit, code-based intervention
- Formative assessments at end of each curriculum part
- Includes 126 lessons taught in 30-minute, small-group sessions
- High priority alphabetic, phonemic, reading, and spelling skills



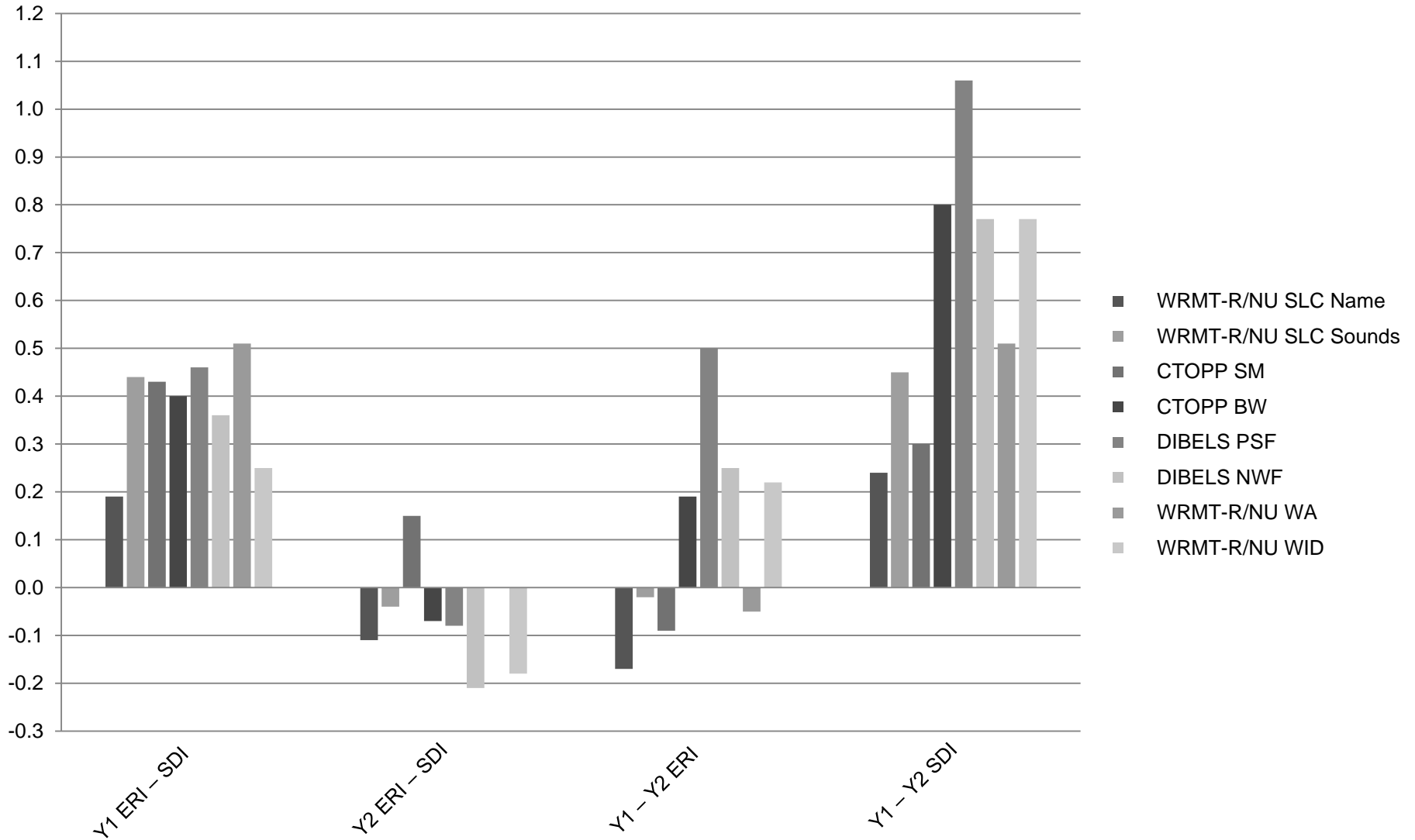
Pearson/Scott Foresman. (2004). *Scott Foresman Sidewalks: Early reading intervention*. Glenview, IL: Author.

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 a compilation of teacher-made and commercial materials
- ❖ Focus of instruction was early literacy

School- Designed Intervention (SDI)

Effects Comparison

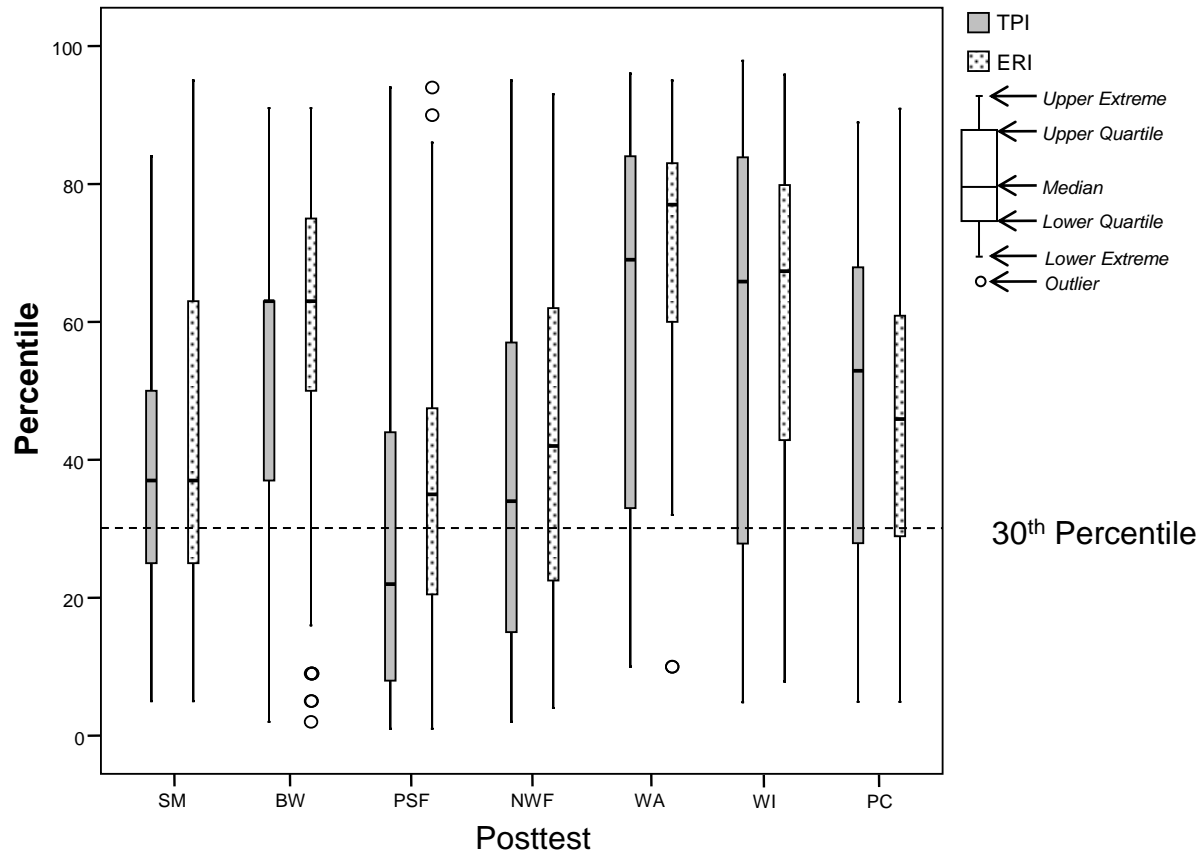


Standardized Differences (Hedge's g) for Different Models

| Measure | ERI Initial Study vs. SDI Initial Study* | ERI Replication Study vs. SDI Replication Study* | ERI Replication Study vs. ERI Initial Study* | SDI Replication Study vs. SDI Initial Study* |
|---|--|--|--|--|
| Alphabet Knowledge | | | | |
| WRMT-R/NU Supplementary Letter Checklist-Name | 0.19 | -0.11 | -0.17 | 0.24 |
| Letter Sound Knowledge | | | | |
| WRMT-R/NU Supplementary Letter Checklist-Sounds | 0.44 | -0.04 | -0.02 | 0.45 |
| Phonemic Awareness | | | | |
| CTOPP Sound Matching | 0.43 | 0.15 | -0.09 | 0.30 |
| CTOPP Blending Words | 0.40 | -0.07 | 0.19 | 0.80 |
| DIBELS Phonemic Segmentation Fluency | 0.46 | -0.08 | 0.50 | 1.06 |
| Word Attack | | | | |
| DIBELS Nonsense Word Fluency | 0.36 | -0.21 | 0.25 | 0.77 |
| WRMT-R/NU Word Attack | 0.51 | 0.00 | -0.05 | 0.51 |
| Word Identification | | | | |
| WRMT-R/NU Word ID | 0.25 | -0.18 | 0.22 | 0.77 |

Note. *reference group; **Bolded**: significant effect

Who Benefitted?



Posttest performance boxplots by measure and condition. SM = Comprehensive Test of Phonological Processing Sound Matching; BW = Comprehensive Test of Phonological Processing Blending Words; PSF = DIBELS Phonemic Segmentation Fluency; NSF = DIBELS Nonsense Word Fluency; WA = WRMT-R/NU Word Attack; WI = WRMT/NU Word Identification; PC = WRMT-R/NU Passage Comprehension.

What We Know Now

- Findings did not replicate across settings,
- BECAUSE, the strength of comparison (school-designed) interventions varied across settings!
- Effects of the standardized intervention were comparable between sites.

What We Know Now

BAU

- There is evidence that research is being translated to practice in SOME but not all sites. BAU in SOME sites produced strong effects.

Context

- Context Matters – Important to consider the conditions, experiences, and current practices.

What We Need to Know

How to Optimize Tier 2?

- Some general ed teachers have difficulty providing small group instruction daily
- When intervention occurs in pull out settings, there is limited alignment between Tier 1 and 2

When to Adopt Standardized Tier 2?

- Observations revealed considerable variability within and between schools.

Does Adjusting Intervention in Response to Learner Performance Improve Kindergarten and First Grade Outcomes

Coyne, M. D., Simmons, D. C., Hagan-Burke, S., Simmons, L. E., Kwok, O., Kim, M., Fogarty, M., Oslund, E., Taylor, A., Capozzoli-Oldham, A., Ware, S., Little, M. E., & Rawlinson, D. M. (accepted for publication). Adjusting beginning reading intervention based on student performance: An experimental evaluation. *Exceptional Children*.

Does Adjusting Instruction Matter?

- Although teachers and schools are increasingly being advised to make ongoing instructional decisions using performance data, there is little direct experimental evidence of the effects of adjusting instruction based on student response.

Year 03: RCT to Compare Effects of Adjusting Progression through ERI

Interventions

- Year 3: Early Reading Intervention (ERI) to ERI Conventional

Standardized Conditions

- Group Size (3-5 students)
- Time (30 minutes, 5 days per week)
- Duration (approximately 20 weeks)
- School-based interventionists

Year 03 Participants

- 103 students from 9 schools in TX, CT, & FL
- Selected from a pool of low-performing children nominated by classroom teachers
- WRMT-R letter identification: ≤ 9 th percentile **and/or** CTOPP rapid object naming: ≤ 16 th percentile
- Pull-out interventionists

ERI-Experimental Informed by Engelmann's Theory of Mastery & Acceleration (1996)

Engelmann outlined three conditions necessary to promote mastery and acceleration of learning:

- (a) instructional material must be appropriate,
- (b) ongoing placement of children must be appropriate, and
- (c) a clear operating plan and structure including formative assessment of student progress.

ERI-E: Adjusted Curriculum Pacing & Grouping

Formative Assessment: Curriculum Embedded Measures

- ERI-E: Every 4 weeks (midpoint and end of curriculum parts)
- ERI: Every 8 weeks (end of curriculum parts)

Appropriate Placement: Curricular Adjustments

- **Strong:** $\geq 90\%$ on 2 assessments: Accelerated lesson progression
- **Moderate:** **70-89%**: Normal lesson progression & specific skill review as needed
- **Weak:** $< 70\%$: Repeat targeted lessons then resume normal lesson progression with specific skill review

Appropriate Placement: Regrouping

- Students were regrouped (when possible) to attain greater instructional homogeneity.

Research Questions: Unpacking Effects

1. What are the distinctive patterns of ERI-E curricular adjustments across six assessments points?

2. Do outcomes of students in ERI-E latent classes differ from propensity matched students who received ERI?

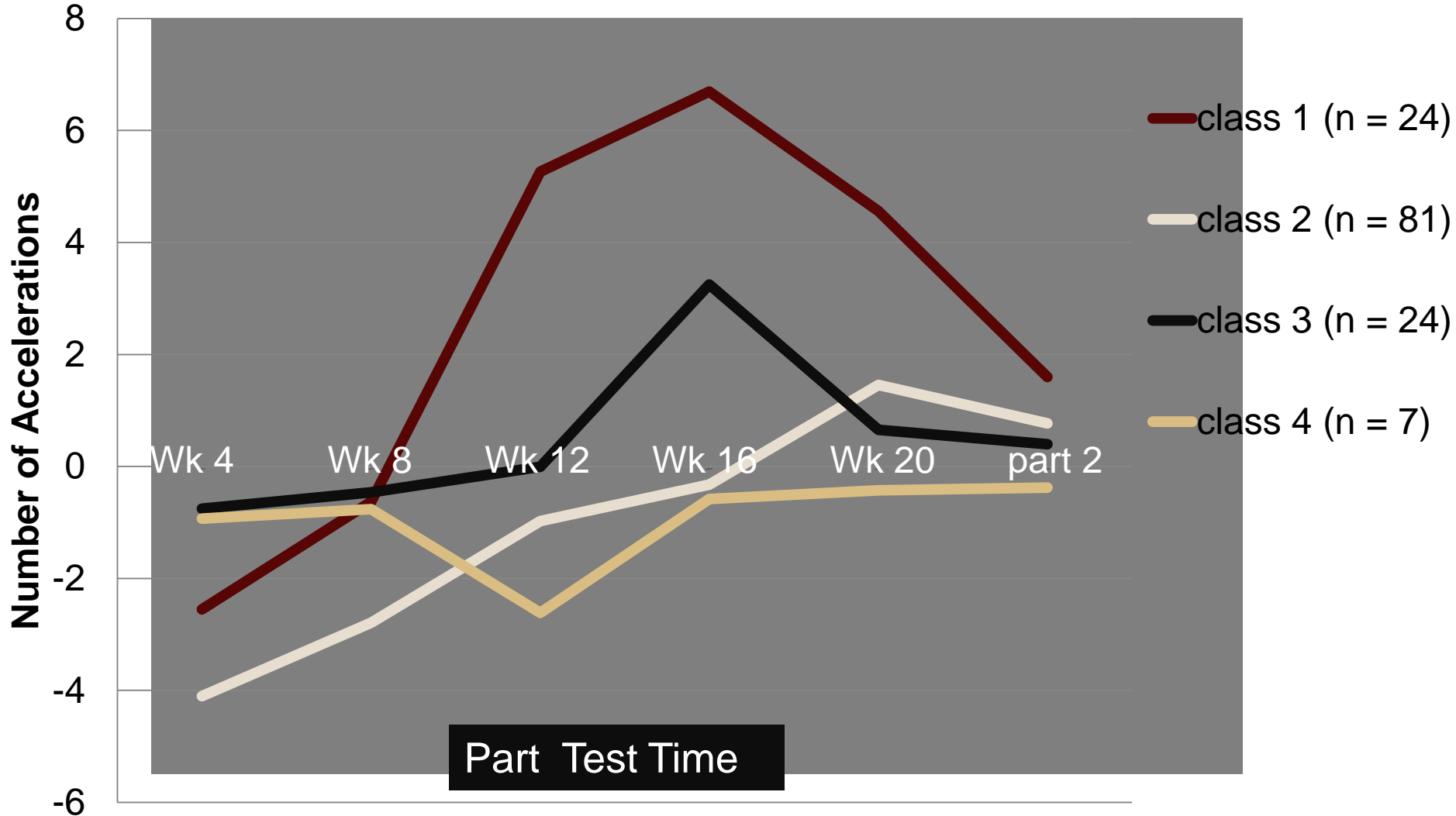
Data Analyses

- To identify types of curriculum adjustments
 - Identified latent classes of curriculum adjustments using growth mixture modeling
- To determine whether effects of curriculum adjustments
 - Used propensity matching to identify “matched peer groups”

What are the distinctive patterns of ERI-E curricular adjustments across the kindergarten year?

- Class 1: Early Acceleration
- Class 3: On Track > Later Accelerations

- Class 2: First Half Repetitions > On Track
- Class 4: Persistent 1-2 Repetitions



Research Question: Unpacking ERI-E Effects

Did curricular adjustment patterns differentially benefit students with similar entry level scores who received regular ERI?

Effect Sizes (Hedges' g) for Group Differences on Reading Outcomes

| Measure | EA | FHR>OT |
|-------------------------------|-------|--------|
| SLC-name | 0.41* | 0.20 |
| SLC-sound | 0.61* | 0.26* |
| Sound Matching | 0.60* | 0.08 |
| Blending Words | 0.63* | 0.26 |
| Phonemic Segmentation Fluency | 0.33 | 0.29* |
| Nonsense Word Fluency | 0.40 | 0.16 |
| Test of Written Spelling | 0.53 | 0.18 |
| Word Identification | 0.41 | 0.29* |
| Word Attack | 0.78* | 0.15 |
| Oral Reading Fluency | 0.57 | 0.37* |

What We Know Now

Mastery/ Acceleration Effect

- Several significant effects for advancing students who “master” content.

Mastery/ Repetition Effect

- Effects for early lesson repetition led to on track/standard progression.

Persistent 1-2 Repetitions

- No discernible advantages for prolonged repetitions & need more intensive modifications earlier

What We Need to Know

- Is there a middle ground between standard protocol and problem solving approaches to intervention?
- How do we effectively differentiate instruction? There is promise in differentiating instructional intensity in response to student performance YET, this finding was evident in a standardized curriculum.
- We need to know if findings generalize to other curricula and to school-designed interventions/BAU.

Bragging Rights!

- Tier 2 intervention – greater understanding and access
- Reduction in number of students with persistent reading problems through grade 3.
- More accurate methods of identifying children at risk of reading difficulty
- Understanding the conditions in which interventions work.

Beyond What Works: The RTI Puzzle

