2014 Update on the Center for Response to Intervention in Early Childhood (CRTIEC)

Charles Greenwood, Judith Carta, Howard Goldstein, Ruth Kaminski, and Scott McConnell

IES Project Director’s Meeting
March 6, 2014

http://www.crtieec.org
Agenda

- Introduction
- What has been Accomplished? (Handout)
- Part 1: CRTIEC Project Findings, Future Research Directions, and Recommendations for Practice
- Part 2: Feedback on R&D Structure
Funded in 2008, completing in 2014

Objectives were to:

- Conduct a focused program of research to develop and evaluate intensive interventions (Tier 2 and 3) for preschool language and early literacy skills that supplement core instruction
- Develop and validate an assessment system aligned with these interventions for universal screening and progress monitoring
- Carry out supplementary research responsive to the needs of early childhood education and special education practitioners and policy makers.
- Provide outreach and leadership
- Disseminate products and findings

Website and Resources (http://www.critec.org)
In addition to the authors, this work has been coordinated by: Drs. Gabriela Guerrero, Jane Atwater, Tracy Bradfield, Annie Hommel, Elizabeth Kelley, Trina Spencer, Naomi Schneider, Sean Noe, Lydia Kruse, Christa Haring, Alisha Wackerle-Hollman, Maura Linas, and a host of dedicated research assistants, students, and postdocs at University of Kansas, University of Minnesota, the Ohio State University, University of South Florida, and the Dynamic Measurement Group.

We want to acknowledge the partnership of the many early education programs that collaborated with us.
Part 1: CRTIEC Findings, Future Directions, and Practice Implications
Questions about Tier 2 and Tier 3 Interventions
Findings about content, timing, format, and implementation of Tier 2 and 3 curricula

- Year 1: Developing books, materials, lessons, and piloting for two curricula each at Tier 2 and Tier 3
- Year 2: Development studies with single-subject designs → refinements and additions to curricula
- Year 3: Combined single-subject and small-scale group designs
- Year 4: Mainly group designs with research staff implementing
- Year 5 and 6: Mainly cluster randomized designs with teaching staff implementing
Findings about curricular content

Tier 2 language curriculum focused on:
- Basic concepts
- Academic vocabulary
- Inferential question answering

Tier 3 language curriculum focused on:
- Core vocabulary
- Elaborated utterances

Tier 2 and 3 literacy curricula focused on:
- Phonological sensitivity (esp., phonemic awareness)
- Letter-sound correspondence (alphabetic knowledge)
Findings about timing of introducing Tier 2 and 3 curricula

- **Language**
  - Most children in low-income early childhood settings would benefit after initial screening
  - Language serves as a foundation for early literacy instruction

- **Literacy**
  - Loss of experimental control and weak group treatment results indicated the need to monitor effects of Tier 1 instruction before introducing literacy curricula
Findings about format of Tier 2 and 3 curricula

- *Story Friends* provides an acceptable and feasible context for teaching academic vocabulary in particular.
- The lack of contingent feedback seemed to interfere with the storybook context for teaching PA and alphabetic knowledge skills.
- Game-like formats with scripted interventions were acceptable and feasible vehicles for teaching Tier 3 language and Tier 2 and 3 literacy skills.
- Scripting involved more individualization for Tier 3 curricula.
Findings about implementation of Tier 2 and 3 curricula

- **Story Friends** has been implemented by a large number of teachers and aides for 2 years in FL, OH, and KS
- **PAth to Literacy** is being implemented by teachers and aides this year in FL, OH, and KS
- **Tier 3 Reading Ready Interventions** are continuing to be implemented by project staff in OR and KS
Findings about settings and results of Tier 2 and 3 curricula

- OH: $n \approx 24$ public Pre-K classrooms, 2 YMCA classrooms, and 4 Head Start classrooms
- FL: $n \approx 30$ childcare center classrooms in VPK school readiness program
- KS: $n \approx 28$ Classrooms with $\approx 50\%$ Dual language learners and 4 day weeks
- OR: $n \approx 30$ Head Start classrooms, 6 classrooms in integrated program serving children in ECSE
- MN: $n = 4$ public pre-K classrooms.
- Major challenge: Identification of children for Tier 3 development and efficacy studies
Setting effects

- **Story Friends** curriculum – no discernable effects of sites in OH and KS
- **PAth to Literacy** curriculum – do not anticipate differential effects but will know in a few months
- Tier 3 curricula are being delivered individually, which will challenge resources in many early childhood settings.
Recommendations for EC Educators: Tier 2 Language

- **Story Friends** is an effective and easy means of teaching academic vocabulary 4 days per week, 15 mins per day and does not require a teacher to design or deliver instruction.

- Practice with answering questions may be useful, but difficult to measure effects.

- Most children will know most of the basic concept words, but useful for those who do not and enhances the success for others who do.

- Minimizes the preparation burden if teachers were to teach vocabulary while reading stories.
Recommendations for EC Educators: Tier 2 Literacy

- Preliminary results with PAth to Literacy from last year predict strong effects in cluster randomized design this year.
- We have teaching staff who are using the scripted lessons with all their children and others who have taken more time and coaching to implement with fidelity.
- The final version of PAth to Literacy will have some additional refinements based on where we see decrements in children’s responding to lessons.
Findings of considerable variability in response to intervention among children who received Tier 3 support.

In general, children on IEPs made fewer and slower gains than children not identified as needing ECSE; however, children on IEPs did make gains.

It may be that intervention needs to be extended beyond 8-10 weeks for these children.
Recommendations for EC Educators: Tier 3 Language

- For children with limited vocabulary and oral language skills who need Tier 3 support, the language level of the classroom is often above their skill level; these children have difficulty accessing the core curriculum.
- The 1to1 context of Tier 3 intervention can provide children with individualized attention and opportunities to learn vocabulary and engage with language at their level.
- To be maximally effective, it is likely that the 1to1 lessons need to be supplemented with extension activities providing additional opportunities throughout the day for children to use their language skills learned in the Tier 3 intervention.
### Effect Size Results Y3 EL

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## Effect Size Results Y4 EL

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Recommendations for EC Educators: Tier 3 Literacy

- It is possible to focus on a small subset of phonological awareness skills (i.e., phonemic awareness, specifically first sounds) and achieve effects with a game-based 1to1 format.
- 5-15 mins/day across 8-12 weeks was sufficient to accelerate growth in PA for some preschool children, but is likely not enough time for all children who need intensive support to gain the skills.
- There is a need to individualize interventions for children who need this level of support.
Future R & D

- Tier 2: Explore ways to expand the effects on vocabulary; improve technology to pace instruction and provide feedback better; incorporate Story Champs to boost comprehension results
- Tier 3: Study Tier 3 in context of poor performance with Tier 2 curricula; investigate ways to expand effects on vocabulary for children with limited language skills; conduct research on teacher implementation of Tier 3 interventions
Questions about Measurement
What Have We Learned About Assessment within an RTI Model?
Year 1 – Construct specification and “Phase 1” measure development and pilot testing
  - Identify specific measures for future research and development

Year 2 – Broad-sample testing and evaluation
  - Unresolved measurement problems
  - Turn to IRT for item evaluation, development, refinement, and scaling

Year 3 – Item development and testing
  - Five measures in four domains

Year 4 – Provisional Cut Scores and Classification Accuracy Testing

Year 5 – Cut Score refinement, Progress Monitoring trials

Year 6 – Progress Monitoring trial
Findings about item characteristics

- Retooling to identify low-performing children – those appropriate for Tiers 2 and 3 – requires careful identification of item content.
- Item location/difficulty can be approximated, and engineered, to cover particular areas of an ability range.
- Variations can occur in child performance as a function of construct-irrelevant features and/or child characteristics.
  - These variations can be identified, and items eliminated.
- IRT provided a robust technology for specifying item content, testing item functioning, arraying items by location, and facilitating measure/scale development.
Findings about scale characteristics

- Reliability of seasonal scales .93 to .98
- Concurrent validity
  - Sound ID: .76 with TOPEL Print Knowledge
  - Rhyming: .45 with TOPEL PA Awareness
  - First Sounds: .52 with TOPEL PA Awareness
  - Picture Naming: .66 with PPVT-IV
  - Which One Doesn’t Belong: .67 - .71 with CELF Core Language Subtests
Item maps, displaying item locations on an implied ability scale, make selection of items for particular purposes far easier.
Findings about seasonal measure development

- Item maps, displaying item locations on an implied ability scale, make selection of items for particular purposes far easier

- Through 3 years of R&D, we developed, tested, and located ~160 items per measure – Picture Naming, Rhyming, Alphabet Knowledge, Which One Doesn’t Belong, And First Sounds

- Using provisional cut scores (next slide!), we selected three seasonal screening scales for each measure
  - 15 items, untimed, about 1-2 mins to administer

- Scale scores show growth over a year, and correlate with variety of standardized screeners and norm-referenced tests
Findings about Progress Monitoring

- **Our approach**
  - 20 items below prior season’s cut score

- **A tough nut to crack**
  - Characteristics of preschool intervention
  - Specificity of many interventions viz assessment may reduce sensitivity of assessment
  - Modeling progress requires independent documentation of progress

- **Year 5 effort**
  - Volunteer, convenience sample of ECE teachers in 4 states
  - Self-selected participants, self-selected interventions
  - Little documented growth on IGDIs

- **Year 6 effort**
  - Embedding frequent assessment in CRTIEC efficacy trials
Can we improve sensitivity and specificity of tier candidacy determination while maintaining some degree of efficiency?

- Multiple gating
- Multiple measures
- Option of teachers making “manual override” decisions

Multiple Gates

- Gate 1 – IGDIs not “above cut” – Teacher rating
- Gate 2 – Teacher rating to disconfirm Tier 2 assignment
- Gate 3 – Teacher rating to distinguish Tier 2 and Tier 3 candidacy

Initial evidence

- Tier assignments closely match proportions from standardized measures
Future R & D

- Expand item pools and range of assessment for younger/lower-performing and older/higher-performing students
  - Assess and engineer alignment with K-3 measures
- Test short- and long-term accuracy of multiple-gate decision-making framework
- Improve progress monitoring sensitivity
- Move toward computer-adaptive testing, using expanded item pools to increase sensitivity and range of assessment
- Test factors affecting implementation and data utilization in preschool classrooms
Recommendations for EC Educators: RTI Assessment

- Assess language and early literacy to screen universally at least three times each year
- Use multiple measures to select children for more intensive intervention services
- Target intervention in practical ways
  - Language and comprehension
  - Phonological Awareness and Alphabet Knowledge
- Assess child performance on both intervention-specific “mastery monitoring” skills and general outcome measures
Why the time is right for RTI in EC

- The concept has been embraced by the 3 major professional EC organizations
- Universal Pre-K is on the horizon!
- States are realizing that a key to school success is investment in the early years.
- States have begun to organize statewide infrastructures for scaling up Multi-Tiered Systems of Support aligned with their K-12 systems.
- We have some examples of programs and districts that are demonstrating the feasibility and success of RTI models in Early Childhood.
What are the “Next Steps” for RTI in Early Childhood?

- Putting models together in a single domain (such as literacy/language) that incorporate both tiered intervention components, measurement, and decision-making frameworks
- Implementing tiered models in other domains (social-emotional, math, science)
- Implementing integrated cross-domain models
- Scaling up RTI: Statewide implementation of tiered models
- Implementing RTI into the variety of EC programs and using RTI to foster a “system of early childhood programs"
- Implementing tiered models with infants/toddlers
What R & D is necessary to support those next steps?

- Goal 2—Developing and testing the integrated 3-tiered model in language/early literacy
- Goal 3—Multi-year efficacy trial of the integrated model vs. BAU
- Goal 4—Scaling up of the integrated model
Feedback on R & D Structure

- How best to structure Development, Efficacy, and Measurement activities?
  - Magnitude of accomplishments indicates the CRTIEC team made the structure work well
  - Ambitious scope of CRTIEC subsumed Goals 1, 2, 3, 5, and partially 4
  - But divide and conquer (simultaneously) presents challenges with alignment in components
  - Start with smaller, more targeted, less ambitious studies to inform the development process
  - Failure to anticipate other changes in education (e.g., Race to Top and QRISs) that could have been informed by and influenced CRTIEC
Biggest lessons learned

- Iterative development and refinement is a must
  - The rush to RCTs was informative, but too costly given lessons learned
  - E.g., took too long to abandon book context for Tier 2 PA intervention; rethinking the timing of PA intervention Tier 3 needed to lag Tier 2 development, but problem with structure difficult to overcome

- Biweekly conference calls and cross-site calls were necessary and fruitful, but:
  - Face-to-face meetings with staff didn’t happen enough (too frugal)
Part 2: Feedback on Leadership and Supplementary Studies
What quality activities/studies are realistic given the amount of time spent on the focused program of research?
Why include a leadership role for an R & D center?

- Puts researchers in touch with the broader context of their research; gives them a broader vision and forces them to be relevant and ecologically valid.
- Helps reduce the research-to-practice gap and the time to get evidence-based practices into the field.
- Increases the relevance and usefulness of the innovations for practice and policy.
We changed the landscape of RTI in Early Childhood!
Leadership—We carried out a highly successful yearly summit.

1. Important for researchers to learn what was happening in research, practice, and policy in RTI in EC—the context for their work
2. Important for programs/practitioners to find out what tools were available to support RTI in EC
3. Important for state administrators/policymakers to learn from model RTI sites and from researchers

Realistic? Carrying out the summit was a bold move—might not be something you can expect from researchers without plenty of support
Examples of Big Changes Related to RTI

- Development a joint paper on RTI in EC sponsored by DEC, NAEYC, and the National Head Start Association
- Programs and states have begun to implement and evaluate RTI/MTSS in Early Childhood
- ACF has funded a major project to develop a tool to examine the quality of progress monitoring and individualization in EC programs for use in Head Start programs
We carried out 2 supplementary studies:

- Multi-site study of Tier 1 in 65 classrooms.
- Annual survey of the state of RTI across states.

Both studies have been informative for understanding the context for this work.

What’s realistic? Depends on:

- Budget available after focused research?
- Scope of the questions/problems that need to be addressed with supplementary studies
- What you think the purpose of the supplementary studies
Leadership Activities/ Supplementary Studies

Tension between leadership/supplementary studies and focused research

- Developing new interventions iteratively to meet Goal 2 outcome standards is inherently uncertain. Some things don’t work, you need to learn from those, improve, and test again. Time needed is uncertain.

- We experienced timeline overruns and it shortened our time for Goal 3 investigations in some cases.

- Reduction in leadership and supplemental studies could add greater focus on Development to Efficacy

- There is a trade-off.
Are there ways to change the current structure to get more or different activities/studies accomplished?

- “A discipline is advanced at the rate of its experimentation”
- The current structure worked well for us because it required us to work closely to accomplish replications of intervention studies in multiple sites.
- Structures without replication requirements may produce few studies or promising interventions with weaker external validity.
- Leadership may be better supported through relations between IES and OSEP.
What activities/studies would you have liked to have done but did not have time or money for?

- Experimental work on strengthening Tier 1, universal intervention
- Iterative development work on integrating the CRTIEC RTI system (Tiers 1, 2, and 3) in a Goal 2 project
- Put the IGDIs and Interventions on tablets/other tech
- Additional studies of progress monitoring
- Development of tiered model integrating early literacy and behavioral domains
Part 2: Feedback on Dissemination Activities
What Dissemination Activities Have Worked Well? What is Planned?

- What has worked?
  - Annual Preschool RTI Summit
  - Website
  - Conference Presentation/Peer-reviewed Publication
  - Webinars
  - State Contracts/Preschool RTI Collaborations

- What do you have planned?
  - Private Publication (Brookes, MyIGDIs, DMG)
  - Integrating the Preschool Summit with the RTI Innovations Conference expanding it to P-K-12
  - Making CRTIEC a consortium of researchers and practitioners who wish to continue collaborations around Preschool RTI
What Dissemination Should IES Expect/Encourage from Grantees?

- Relevance and efficacy are at the forefront if grantees are to influence practice and improve child results.
- Ongoing communication/dissemination with researchers, practitioners, administrators, policymakers.
- Beyond peer-reviewed publication.
- NCSER should have a relationship with OSEP with respect to dissemination to practice, through OSEPs professional development and technical assistance mechanisms.
Part 2: Feedback on Effectiveness of R & D Centers for Training Future Researchers
R & D Centers as Training Sites for Researchers

- Centers provide an extraordinary context for them to learn how large-scale, multisite, longitudinal studies are organized, carried out, analyzed, and reported.
  - Outcomes have included dissertations, peer-reviewed publications, student research awards, and contributions/submissions of new research proposals.
  - Doctoral students in our experience generally have no research experiences beyond their dissertation.
Part 2: Feedback on Project Management
Kansas served as the central coordination site and the partner that supported and replicated work created primarily in the other sites.

- What worked well and didn’t work well with your management structure?
  - Cross-site multi-level teams for Science and for Implementation Coordination
  - Replication plans required close communications across sites to be on the same page
  - Replication teams were a test bed for early use and feedback was instrumental in improving the product
Would you use the same approach for future R&D Centers?

- Yes, we believed it worked well administratively and in terms of planning, conducting, and reporting research findings
What Worked Well with the Approach to R & D Management? What Could Be Improved?

What Worked Well?

- Centralized management that guided the overall organization, communication, leadership and supplementary studies
- Each site taking charge of specific components
- Replication across components
- Regular communication across sites at all levels

What could be improved for future R&D Centers?

- More face-to-face meetings (multi-level at PI and key staff, phone calls (key staff and PI)
Part 2: Suggestions for Other Funding Structures
Suggestions for Other Funding Models

- Variation of OSEP’s “3+2” funding mechanism
- Directed research in Goals 2, 3, 5 for coordinated applications from multiple sites
- Opportunities for competitive renewal of funding for Centers (like CRTIEC)
- Alternate methodologies, especially when focus is “engineering” procedures and practices
Part 2: Other Issues?
Future Directions

- Proposing Next Step Research Investigations to NCSER and NCER
- Technical Assistance – Programs are approaching us with RTI readiness and requesting help, advice, and tools
- Efforts to keep the CRTIEC brand a contributing preschool RTI asset in Early Childhood
- Extensions to Infants/Toddlers
- Publication of CRTIEC Products
Wrap-up

- Other questions?
- Future opportunities with NCSER?