Raising school-entry reading readiness through preschool-wide phonological awareness and phonics instruction

National Science Challenge – A Better Start: E Tip e Rea Literacy & Learning Symposium
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What Do We Know about PA Development and the Link to Reading?

- One of several important skills for reading development (i.e., phoneme awareness, letter-sound knowledge, fluency, vocabulary, comprehension strategies)
- In general, consists of three levels of awareness, of which phoneme-level awareness is considered to be a strong predictor of reading outcomes
- Many children identified as poor readers in the later schooling years have difficulties with phoneme awareness, phonics knowledge, and the application of these two skills to decoding printed words
- Children generally become aware of larger sound units in spoken word (e.g., syllables and rhyme) before smaller units (e.g., phonemes/sounds)
- R⠀/⠀T research evidence suggests that skill development as well as instruction, does not need to be consecutive
- It can be argued that targeting phoneme-level skills in the preschool period, including more challenging blending and segmenting tasks, may have a positive effect on overall PA knowledge and subsequent reading ability

What Do We Know about Evidence-Based PA and LSK Instruction for Preschool Children?

RF Instruction in general
- High success in clinic-based studies under high controlled research conditions with at risk population groups
- Majority of classroom wide work has focused on school-aged children
- Other researchers or professionals with specialized knowledge implementing instruction
- RF-Focused Studies Conducted in Pre-school Environments
- Few where teachers are the implementers of instruction
- RF is often not implemented among preschool-aged children
- RF is often not for early decoding ability
- RF-Risk Recipients for RF reported
- RF is not for early phoneme awareness
- RF is at risk of phoneme awareness, researchers tend to be the implementers
- Braille children with RF-related disabilities

Purpose

- Prevalence & risk for reading difficulties
- 25% of New Zealand and 25% of Australian 10-year-old children have low or very low reading ability
- 25% of Australian children in first year of school at risk in language and communication ability
- Up to 6x higher risk for reading difficulties among children with developmental language disorder
- Growing gaps (i.e., Matthew Effect) & longer term social, economic, health, and occupational outcomes
- Evidence
- Waiting and seeing is not backed by scientific research
- Systematic, explicit, multi-sensory, & integrated into existing preschool activities and routines
- Phoneme awareness and letter sound knowledge two of the best predictors in first two years at school
- We immunise widely against childhood diseases, why not against potential risk for reading difficulties
How Did We Measure Change In Ability?

Before Instruction:
- Clinical Evaluations of Language Fundamentals (CELF-P2)
- Diagnostic Evaluation of Articulation and Phonology (DEAP)
- Online Phonological Awareness Probes

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After Instruction:
- Online Phonological Awareness Probes
- Cogent Non-Word Reading Probes (10 non-words = 30 phoneme-grapheme conversions)

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How Did We Do?

Research Design: Between-Groups Experimental Design

Participants: Ninety-nine preschool children from 6 preschools plus their preschool directors and registered teaching staff

Conditions: 1 x experimental group (i.e., 2 preschools, n = 55) and 1 x control group (i.e., 2 preschools, n = 44)

Demographics: Each group containing one high SES and one mid-low SES preschool

Inclusion Criteria:
- Staff availability to implement the PA program, and children having parental consent plus nil anticipated significant absences during term 3 of 2016
- At-Risk Subgroup: 15 children in the experimental, and 11 children in the control condition presenting with DLD

SA Preschool Structure: Single intake per year; generally a focus on rhyme awareness moving to initial sound awareness: National Framework (Belonging, Being, Becoming)

What Did We Learn More About?

Developmental Language Disorder (DLD) & Typical Language Development (TD)

Before Instruction:
- Phoneme awareness sound knowledge; *

How Did We Measure Change In Ability?

Children with varying forms of Developmental Language Disorder (DLD)

Experimental condition (n = 55)
- 5 x phonological speech delay
- 5 x expressive language difficulty
- 5 x receptive language and phonological speech delay
- 5 x expressive language impairment
- 5 x receptive language impairment
- 5 x receptive and expressive language difficulties
- 6 children receiving SLT services that did not involve explicit instruction in PA and LSK

Control condition (n = 44)
- 5 x phonological speech delay
- 5 x expressive language difficulty
- 5 x expressive language impairment
- 5 x receptive language impairment
- 3 x receptive and expressive language difficulties
- 5 children receiving SLT services that did not involve explicit instruction in PA and LSK

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School Entry 2017
- All children enter formal schooling & followed up 6 months into the year.
What Did Preschool-wide, Teacher-delivered, Phoneme-focused PA and LSK Instruction Look Like?

Professional Development & Coaching:
- Program theory and structure meeting
- Manual and Resources
- Approx. 1 hr of on-site coaching per week from trainee SLTs

Contents:
- 2 phonological awareness targets per week for 10 weeks (80% focused on phoneme level)
- 4 explicit PA/Phonics activities per week (approximately 15-20 mins each)
- Small group activities for children with DLD

Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10

Rhyme Awareness
Sound Discrimination
Initial Phoneme Identity
Initial & final Phoneme Identity
Final Phoneme Identity
Phoneme Blending & Segmentation

Print Referencing Strategies To Target PA And LSK During Shared Book Reading

Week 5: Initial Sound Identification (Spot’s First Walk)

Games Used To Target PA And LSK

Week 6: Sound Sorting (Initial & Final)

Week 8: Final Sound Identity
Games Used To Target PA And LSK

Week 9: Drawing Sound Blending

First we need to give our dragon a great big ‘h-e-a-d’. Now let’s give him a round ‘b-o-d-y’. Don’t forget two long ‘l-e-g-s’. Listen carefully, give him a ‘w-i-n-g’. Time for an ‘a-r-m’. And another ‘a-r-m’. Good job, almost there, what about two ‘tai-l’? Our dragon needs a ‘s-c-a-le’. What about a great big ‘s-m-i-l(e)’. On his back he needs some ‘s-c-a-le-s’. Be sure to remember his ‘t-a-i-l’. Oh look, he needs another ‘a-r-m’.

He’s almost done, can you tell me anything else our dragon needs? Remember to stretch out your words.

Differentiation for Varying Skill Levels

Whole Preschool Level

Assessment data mapped to ‘book & activity adaptation charts’:
- Levels of PA knowledge (e.g., SA, RA, PA)
- Linguistic Complexity (e.g., CV, CVC, CCVC, CVCV)
- Cognitive Operations (e.g., categorize, blend, segment)

Modelling & video feedback provided

Small Group Level

1 x per week
- Following preschool-wide PA activities, fruit time and period of play
- Children with DLD participated in 20-30 minutes of small group activities
- Focused on PA target of the week, & then differentiated to map individual ability levels.
- 13.5 hours plus 3.5 hours of small group support

So Did Children Improve?

Phonological Awareness Scores Before and After Preschool-Wide Instruction

Differentiation for Varying Skill Levels

Whole Preschool Level

Example extract from manual

Adjusting Difficulty Levels Within Activities
- Levels of PA knowledge (e.g., SA, RA, PA)
- Linguistic Complexity (e.g., CV, CVC, CCVC, CVCV)
- Cognitive Operations (e.g., categorize, blend, segment)

Modelling & video feedback provided

So Did Children Improve?

Phonological Awareness Scores Before and After Preschool-Wide Instruction

Comparative data (e.g., control vs. experimental groups) and effect sizes are provided to assess the impact of the intervention.
Any Effect on Decoding?  
Application of PA and LSK to Single Word Reading

T-test results demonstrated that the children in the experimental group significantly outperformed those in the control group on the number of correct phoneme-grapheme conversions achieved in the context of non-words ($t(97) = 2.818, p = .006, d = 0.55$), whereby the experimental children correctly identified 2.5 times more phoneme-grapheme conversions, on average. This represented a medium effect size.

What About Children with DLD?
Phonological Awareness Scores Before and After Preschool-Wide Instruction for Children with DLD

Following 10 weeks of preschool-wide PA instruction and small-group support, children with DLD in the experimental condition significantly outperformed those in the control condition on all PA measures: RO ($t(24) = 9.376, p = .001, d = 0.16$), IPI ($t(24) = 7.979, p = .001, d = 0.62$), FPI ($t(24) = 4.596, p = .006, d = 0.41$), PB ($t(24) = 4.713, p = .003, d = 1.24$), PS ($t(24) = 3.483, p = .018, d = 0.82$) and LSK ($t(24) = 7.833, p = .001, d = 0.32$), with effect sizes ranging from the small to medium range to large, with the exception of RO.

Take Home Points
What does this add?

- Burst of phoneme-focused PA and LSK instruction over 10 weeks and within the 6-month period leading up to school-entry was effective in generating significant improvements in phonemic awareness, LSK, and the early application of this knowledge to print at a group level.
- Children with DLD showed significant improvements in phonemic awareness and LSK; however, no significant differences were observed in the application of this knowledge to early decoding attempts. … this needs to be investigated further.
- It is possible to raise knowledge in skills predictive of early reading success in a systematic and explicit way aimed at all children, through preventative preschool exposure to PA and LSK instruction in the months leading up to school-entry.

Next Step:

- Children have been followed up in August-September of 2017 and data will be evaluated to see if gains have been sustained.
Selected References & Acknowledgements


MULLIS, V.S., MARTIN, M. O., FOY, P., and DRUCKER, K.T. (Eds.), 2012, PIRLS 2011 International Results in Reading (Chestnut Hill, MA: TIMSS & PIRLS International Study Center, Boston College).


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Preschool Directors, Teachers, Parents, & Children

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