

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

National Science Challenge – A Better Start: E Tipu e Rea  
Literacy & Learning Symposium  
26th-27th October 2017  
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## Purpose



- **Prevalence & risk for reading difficulties**
  - 25% of New Zealand and 24% of Australian 10-year-old children have low or very low reading ability (FRAS, MAHL, et al., 2012)
  - 24% of Australian children in first year of school 'at-risk' in language and communication ability (ALSC, 2015)
  - Up to 6x higher risk for reading difficulties among children with Developmental Language Disorder (DLD) (DPA, 2017)
- **Priority**
  - First 3 years at school is critical
  - Growing gaps (i.e., Matthew Effect) & longer-term social, economic, health, and vocational outcomes (Dunn, Kay, & Swanson, 2012)
- **Evidence**
  - Waiting and seeing is not backed by scientific research
  - International data and reviews supporting key skills shown to support reading success (e.g., NRP Meta-analysis, Australian National Inquiry into the Teaching of Reading, UK Independent Review into the Teaching of Early Reading)
- **Prevention**
  - What children bring to beginning classroom literacy instruction makes a difference (e.g., FRAS, 2012)
  - 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 (Dunn et al., 2002)
  - We immunise widely against childhood diseases, why not against potential risk for reading difficulties?

## 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) (Dunn, et al., 2002)
- PA generally consists of three levels of awareness, of which phoneme-level awareness is considered to be a strong predictor of reading outcomes (Fletcher, 2006)
- Many children identified as poor readers in the later schooling years have difficulties with phoneme awareness, phonic knowledge, and the application of these two skills to decoding printed words (Skarrh & Carls, 2012)
- Children generally become aware of larger sound units in spoken word (e.g., syllables and onset-rimes) before smaller units (e.g., phonemes/sounds) (Fletcher, 2006)
- BUT, research evidence suggests that skill development as well as instruction, does not need to be consecutive (e.g., Anthony et al., 2005; Gilon, 2005; Ukkari et al., 2010)
- 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?

### PA Instruction in general:

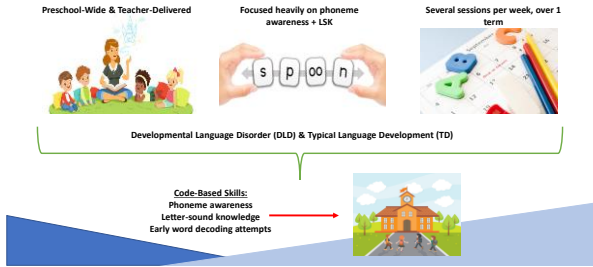
- High success in clinic-based studies under high-controlled research conditions with at-risk population groups (e.g., Atkinson et al., 2009)
- Majority of 'class/cohort-wide' work has focused on school-aged children (e.g., Shapiro & Solity 2008; Fuchs et al. 2002; van Kleeck et al. 1998; Carson et al., 2017)
- Often researchers or professionals with specialised knowledge implementing instruction (e.g., Long et al., 2010)

### PA-Focused Studies Conducted in Pre-school-Environments:

- Few where **teachers** are the implementers of instruction (e.g., Mombouli et al., 2007; Tyler et al., 2016)
- A focus on **pair or small group** instruction (e.g., Goffredo et al. 2016; Ukkari et al., 2010)
- More attention or time spent on **syllable and rhyme awareness** (e.g., Goffredo et al., 2016; Mombouli et al., 2007)
- Where the focus is phoneme awareness, researchers tend to be the **implementers** (e.g., Ukkari et al., 2010; Ukkari et al., 2000; exception, Tyler et al., 2016)
- Immediate outcomes for PA reported (e.g., Goffredo et al., 2016), **but not for early decoding ability** (exception: Mombouli et al., 2007 & O'Connor et al., 2008)
- Limited is known about a preschool-wide approach inclusive of small group work for **children with DLD** (often varied outcomes).



## What Could We Learn More About?



## What Did We Do?

**Research Design:** Between-Groups Experimental Design  
**Participants:** Ninety-nine preschool children from 4 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)

**Term 3, 2016**

- 2 experimental kindergartens receiving PA program; 2 control kindergartens continuing as usual

**School-Entry 2017**

- All children enter formal schooling & followed up 6-months into the year.

## How Did We Measure Change In Ability?

- Before Instruction:**
- Clinical Evaluations of Language Fundamentals – Preschool (2<sup>nd</sup> Edition, Australian and New Zealand Version) (CELF-P2)
  - Diagnostic Evaluation of Articulation and Phonology (DEAP)
  - Online Phonological Awareness Probes

Table 2. Baseline Language, PA, and LSK for All Children

	Language CELF-P2		Speech DEAP		Phonological awareness Online Probes						
	Receptive	Expressive	PCC	RO	IPI	FPI	PB	PS	LS		
Experimental (n=55)	97.1	100.9	96.44%	4.05	4.29	1.56	3.27	1.18	5.07		
Control (n=44)	98.9	101.8	96.79%	5.82	6.34	3.02	5.87	1.67	7.44		
Significance	<i>p</i> = .729	<i>p</i> = .863	<i>p</i> = 0.86	<i>p</i> = .017	<i>p</i> = .01	<i>p</i> = .028	<i>p</i> = .017	<i>p</i> = .26	<i>p</i> = .02		

Abbreviations: CELF-P2, Clinical Evaluations of Language Fundamentals – Preschool (2<sup>nd</sup> Edition, Australian and New Zealand Version); DEAP, Diagnostic Evaluation of Articulation and Phonology; PCC, Phonological Consciousness; RO, Rhyme Oddity; IPI, Initial Phoneme Identity; FPI, Final Phoneme Identity; PB, Phoneme Blending; PS, Phoneme Segmentation; LS, Letter-sound knowledge. \* *p* < .05.



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



## How Did We Measure Change In Ability?

Children with varying forms of Developmental Language Disorder (DLD)

Experimental condition (n = 15)	Control condition (n = 11)
<ul style="list-style-type: none"> <li>6 x phonological speech delay</li> <li>3 x expressive language delay and phonological speech delay</li> <li>3 x receptive language and phonological speech delay</li> <li>1 x expressive language impairment</li> <li>1 x receptive language impairment</li> <li>1 x receptive and expressive language difficulties</li> <li>6 children receiving SLP services that did not involve explicit instruction in PA and LSK</li> </ul>	<ul style="list-style-type: none"> <li>5 x phonological speech delay</li> <li>3 x receptive language impairment</li> <li>2 x expressive language impairment</li> <li>1 x receptive language and phonological speech delays</li> <li>5 children receiving SLP services that did not involve explicit instruction in PA and LSK</li> </ul>

Table 3. Baseline Language, PA, and LSK for Children with DLD

	Language CELF-P2		Speech DEAP		Phonological awareness Online Probes						
	Receptive	Expressive	PCC	RO	IPI	FPI	PB	PS	LS		
Experimental	80.0	80.0	83.27	2.47	2.07	1.53	2.40	1.33	2.60		
Control	76.4	82.7	93.30	2.18	3.19	1.55	3.00	1.03	3.36		
Significance	<i>p</i> = .80	<i>p</i> = .26	<i>p</i> = .10	<i>p</i> = .43	<i>p</i> = .68	<i>p</i> = .50	<i>p</i> = .69	<i>p</i> = .26	<i>p</i> = .53		

Abbreviations: CELF-P2, Clinical Evaluations of Language Fundamentals – Preschool (2<sup>nd</sup> Edition, Australian and New Zealand Version); DEAP, Diagnostic Evaluation of Articulation and Phonology; PCC, Phonological Consciousness; RO, Rhyme Oddity; IPI, Initial Phoneme Identity; FPI, Final Phoneme Identity; PB, Phoneme Blending; PS, Phoneme Segmentation; LS, Letter-sound knowledge. \* *p* < .05.

## 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 SUTs

### Content:

- 1 x phonological awareness target per week for 10 weeks (80% focused on phoneme-level)
- 4 x explicit PA/Phonics activities per week (approximately 15-20 mins each)
  - \* 2 shared story book readings per week & 2 large group PA activities
- 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	Rhyme Awareness	Sound Discrimination	Initial Phoneme Identity	Initial Phoneme Identity	Initial & final Phoneme Identity	Final Phoneme Identity	Final Phoneme Identity	Phoneme Blending & Segmentation	Phoneme Blending & Segmentation



## Week-by-week

### Preschool-wide PA content

PA target	Book	Activities
1 Rhyme awareness Identify words that rhyme	Emma, Emma Red Pajamas	Rhyme-matching strips Reverse the rhyme order
2 Rhyme awareness Identify words that do and do not rhyme	Charlie Charlie Brown Brown	Rhyme-matching post-it/collyer cards Class the rhyme order
3 Sound discrimination Identify speech sounds that are the same and different in isolation and in words	Patchwork A to Z	Sound puppets Makart tree
4 Initial phoneme identification Identify the first sound in words and final in LSK	Did you take the 'H' from my sound card program?	Initial and final phoneme Initial sound letter matching
4 Initial phoneme identification Identify the first sound in words and final in LSK	Spot's First Walk	Sound and final phoneme Initial sound letter matching
4 Initial and final phoneme identification Identify the first and final sound in words and final in LSK	Spot Goes on Holiday	Sound and final phoneme Final sound letter matching
7 Final phoneme identification Identify the final sound in words and final in LSK	What's my Lanchon?	Final sound letter matching Final sound strips
7 Final phoneme identification Identify the final sound in words and final in LSK	Brown Bear, Brown Bear, What do you see?	Final sound matching and final soundability
8 Phoneme blending and segmentation Blend apart and join together individual sounds in simple words and final in LSK	Big Mac Donald's Whopper Go	Donkey sound/Blending Blending sound/Blending and segmentation
10 Phoneme blending and segmentation Blend apart and join together individual sounds in simple words and final in LSK	Whore's Spot?	Shaping sound/Blending and segmentation Sound segmentation chart



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

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



Sound-to-Print Referencing Strategies	
<b>Book:</b> Spot's First Walk	
<b>Focus Strategy:</b> Drawing children's attention to the first sound in words	
<b>Examples:</b> You can see any words in the story to draw children's attention to the first sound in different words. The following are a list of examples.	
<b>Print Commenting</b>	This word says 'walk', it starts with a /w/ sound, the letter 'w' makes a /w/ sound.
<b>Initial Sound Questioning</b>	This is the sound 'spot'. What is the first sound you hear in the word 'spot'?
<b>Initial Sound Requesting</b>	Show me the first letter in the word 'ball'. What sound does this letter make? What other words start with the /b/ sound?

(Print Referencing Justice & Fuchs, 2004)



## Games Used To Target PA And LSK

### Week 6: Sound Sorting (Initial & Final)

soap	parrot
sun	pot
land	pond
sing	pot
swim	pie
star	pencil
spoon	pizza
socks	peacock
stair	parachute
scissors	

s

p

### 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 'I-e-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 'ar-m'. And another 'w-i-n-g'. Good job, almost there, what about two 'eye-s'. Our dragon needs a 'm-ou-th'. What about a great big 's-m-I-l(e)'. On his back he needs some 's-c-a-l-e-s'. Be sure to remember his 't-ai-l'. Oh look, he needs another 'ar-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, CCVC)
- Cognitive Operations (e.g., identify, categorize, blend, segment)

Modelling & video feedback provided

Example extract from manual

### Adjusting Difficulty Levels Within Activities

Preschool children are likely to have varying abilities of PA and as such it is important to adjust the level of task difficulty within an activity to meet individual needs. The table below illustrates how a target word in any activity can be adjusted to meet different abilities.

Target	Simplest Adaptation	Initial Target Adaptation	Final Target Adaptation	Simplest Blending	Simplest Segmenting
Example: <b>cat</b>	What word rhymes with 'cat'?	What is the first sound in 'cat'?	What is the last sound in 'cat'?	Can you hear the word 'cat'?	How many sounds are in the word 'cat'?
<b>cat</b>	Can you hear the word 'cat'?	What is the first sound you hear in the word 'cat'?	Tell me the last sound in the word 'cat'.	I am going to say a word, you need to guess what I am saying. Is it 'cat'?	Tell me how many sounds you hear in the word 'cat'.
<b>cat</b>	Can you hear the word 'cat'?	Tell me the first sound in the word 'cat'.	What is the last sound in the word 'cat'?	Can you hear the word 'cat'?	How many sounds are in the word 'cat'?



## Differentiation for Varying Skill Levels

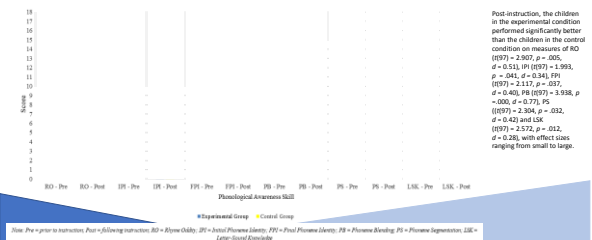
Small Group Level



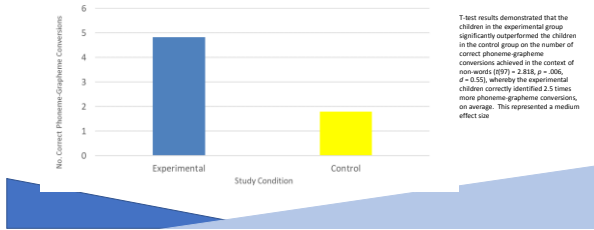
- 1 x per week
- Following preschool-wide PA activities, fruit time and period of play
- Children with DLD participated in 20-30 minutes of small-group activities
- Focused on PA target of the week, & then differentiated to map individual ability levels.
- 13.5 hours plus 3.5 hours of small-group support

## So Did Children Improve?

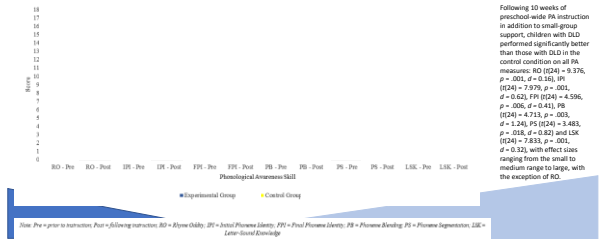
Phonological Awareness Scores Before and After Preschool-Wide Instruction



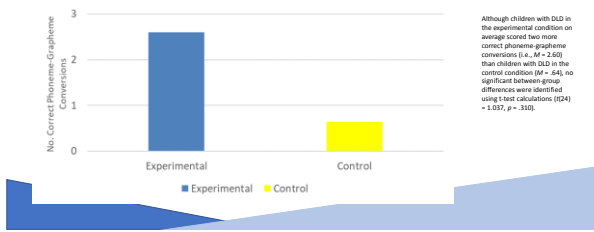
### Any Effect on Decoding? Application of PA and LSK to Single Word Reading



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



### Any Effect on Decoding for Children with DLD? Application of PA and LSK to Single Word Reading for Children with DLD



### 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.

