Evaluating a Reading Comprehension Curriculum and Factors Predicting Reading Comprehension Performance

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Introduction

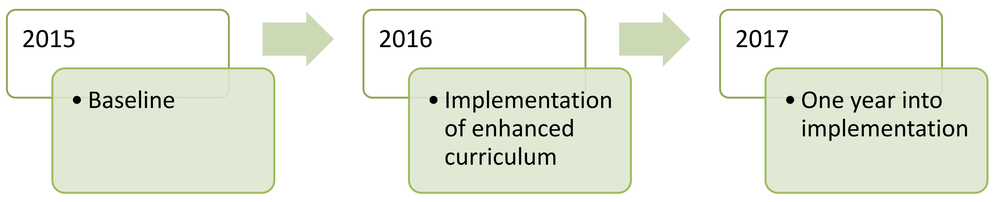
An Enhanced Reading Comprehension Curriculum: The MOE-Aided Literacy Programme (MAP) at the DAS is an intervention programme for students with dyslexia that targets phonemic awareness and phonics, reading fluency, reading comprehension, vocabulary and writing. The reading comprehension curriculum of the MAP was recently enhanced to better align the curriculum with the mainstream curriculum that students encounter in school, as well as to equip educational therapists at the DAS with specific strategies that they can rely on to teach reading comprehension.

Factors Predicting Reading Comprehension Performance: According to the Simple View of Reading (SVR; Gough & Tunmer, 1986), reading comprehension is the product of linguistic comprehension and decoding abilities. While support can be found for this framework in studies that demonstrate the ability of verbal ability and phonological awareness in predicting reading comprehension, researchers have also explored the possibility that other cognitive factors can do so as well. Specifically, naming speed, non-verbal cognitive ability and working memory have been shown to play a role in predicting reading comprehension (Adlof, Catts & Lee, 2010; Cain, Oakhill, & Bryant, 2004; Georgiou, Das, & Hayward, 2008).

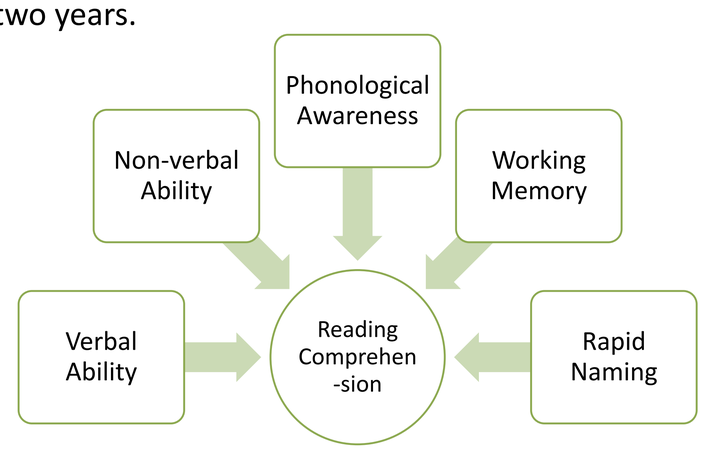
Aims

This study examined reading comprehension in the context of dyslexia with two objectives:

1. To monitor the reading comprehension performance of primary school students with dyslexia who received literacy intervention at DAS before and after implementation of an enhanced reading comprehension curriculum.



2. To explore the ability of five cognitive factors, namely verbal ability, non-verbal ability, phonological awareness, working memory and rapid naming ability, to predict concurrent and future reading comprehension performance at the end of one and two years.



Method

• 55 DAS MAP students (41 male; 7-12 years old, M_{age} = 10.69) were recruited for the study. However, 13 participants withdrew from the study, leaving 42 participants (32 male; 7-12 years old, M_{age} = 10.70).

• Measures of reading comprehension and the five cognitive factors were obtained through administration of selected subtests of the following test batteries:

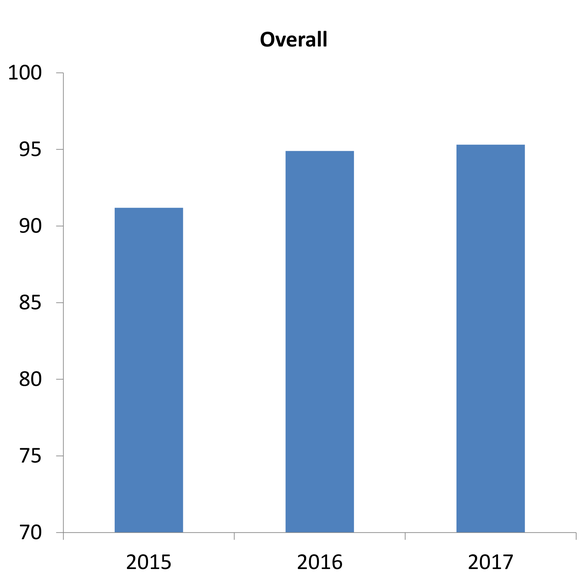
- •Wechsler Individual Achievement Test, 2nd Edition (WIAT-II)
- •Differential Ability Scales, 2nd Edition (DAS-II)
- • Wechsler Intelligence Scale for Children, 4th Edition (WISC-IV)
- •Wechsler Intelligence Scale for Children, 5th Edition (WISC-V)
- • Comprehensive Test of Phonological Processing, 2nd Edition (CTOPP-2)

• One-way repeated measures ANOVA was conducted to compare participants' (n = 42) reading comprehension performance at three time points over two years.

• Regression analyses was conducted to explore the ability of the five cognitive factors (measured in 2015) to predict concurrent (2015; n = 31) and future reading comprehension performance in 2016 (n = 48) and 2017 (n = 44).

•All analyses were conducted using the IBM SPSS statistics software, version 20. An alpha value of .05 was used for all statistical tests.

Results: Reading Comprehension Performance



Significant effect was found for time of testing, Wilk's Lambda = .82, $F(2, 40) = 4.38$, p = .02

Pairwise comparisons revealed:

• Significant increase from 2015 to 2016 (p = .01), in the time period before the enhanced reading comprehension curriculum was implemented.

• Significant increase from 2015 to 2017 (p = .03)

• No significant difference from 2016 to 2017, when the enhanced reading comprehension curriculum was implemented.

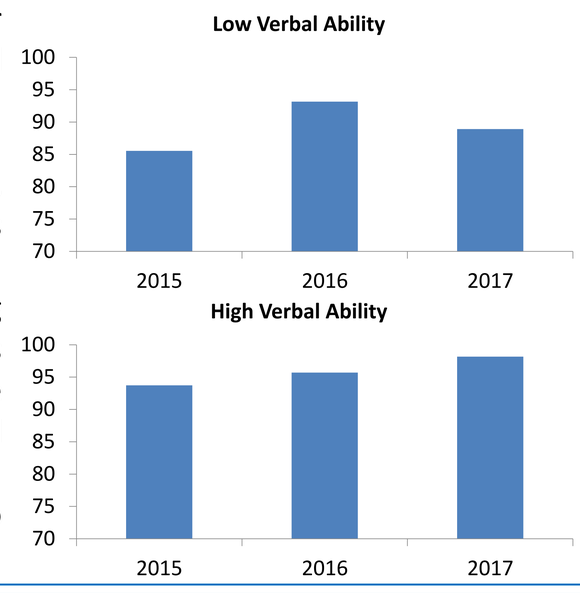
Results: Reading Comprehension Performance (cont.)

Separate ANOVA was conducted for students with "Low" and "High" verbal ability:

• For students with Low verbal ability, significant effect of time was found Wilk's Lambda = .28, $F(2, 11) = 14.10$, p = .001.

- • Significant increase in reading comprehension performance was noted from 2015 to 2016, before implementation of the enhanced curriculum

• For students with High verbal ability, no significant effects of time were found.



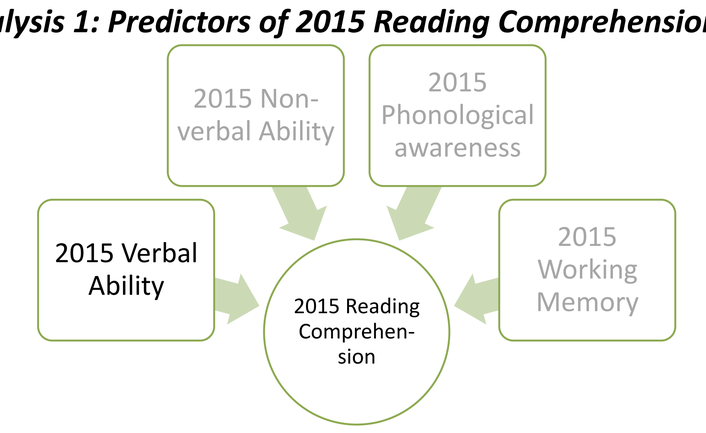
Results: Factors Predicting Reading Comprehension

Preliminary correlation analyses of reading comprehension performances measured in 2015, 2016 and 2017 were correlated with measures of verbal ability, non-verbal ability, phonological awareness, working memory and rapid naming ability was conducted:

• Rapid naming ability did not show significant linear relationship with any of the reading comprehension scores, and was omitted from subsequent analyses.

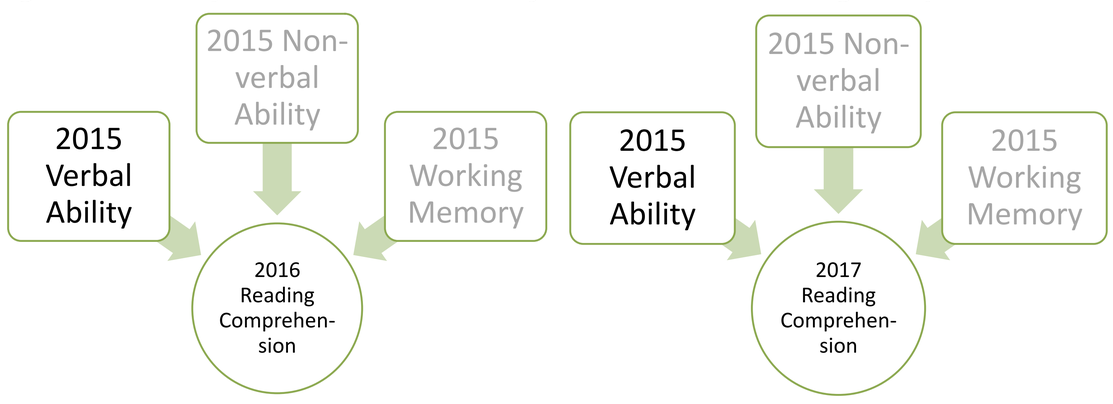
• Phonological awareness did not show significant linear relationship with 2016 and 2017 reading comprehension performance, and as such was omitted from the 2016 and 2017 regression analyses.

Regression Analysis 1: Predictors of 2015 Reading Comprehension



Total variance in reading comprehension that was explained by the model was 50% (4, 26) = 6.49, p = .001. Only verbal ability was found to be a statistically significant predictor, (β = .33), p = .044.

Regression Analysis 2 & 3: Predictors of 2016 & 2017 Reading Comprehension



Total variance in 2016 reading comprehension that was explained by the model was 40.1%, $F(3, 44) = 9.82$, p <.001. Only verbal ability was found to be a statistically significant predictor, (β = .40), p = .004.

Total variance in 2017 reading comprehension that was explained by the model was 49.1%, $F(3, 40) = 12.87$, p <.001. Only verbal ability was found to be a statistically significant predictor, (β = .54), p < .001.

Discussion & Future Directions

• There was no significant change in reading comprehension performance following the implementation of the enhanced curriculum:

- • Lack of improvement could be due to educational therapists' limited familiarity with curriculum material, low frequency of reading comprehension instruction, and misalignment between the curriculum and reading comprehension measurement tool (WIAT-III Reading Comprehension subtest).
- • Future studies should account for possible confounding factors.

• Improvement was significant only for lower verbal ability students:

- • There is a focus on building listening comprehension skills within MAP intervention. Hence, student with weaker verbal ability may show more improvements in comprehension for text comprehension.

• Verbal ability can predict concurrent and future reading comprehension performance, and therefore is important in the identification of children who may have weak reading comprehension skills and their remediation.

• Phonological awareness may not be a good indicator of the prognosis of reading comprehension ability.

• In terms of the SVR, listening comprehension and decoding skills may not fully account for the variance in reading comprehension. Further studies should explore other factors that could be important in reading comprehension.

References

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