

Cognitive Profiles of Reading Disabilities: Three Distinct Cases.

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Abstract

The cognitive profiles of a group of Year 1 beginning readers were compared and contrasted based upon qualitative analysis of their performances on a battery of reading and reading-related cognitive tasks. Through relative comparisons with typical cases and through internal contrasts of performances on the multiple tasks, the relative strength and weaknesses of these children were highlighted. Analysis of results highlighted three distinct cases of reading disabilities. One case typifies a diagnostic profile of dyslexia. In contrast, the second case showed a profile that is best described in literature as those of garden-variety poor readers. The third case exemplifies the effects of intervention on the cognitive profile of a child with reading disability. The results of this study showed the importance of diagnostic profiling in order to identify the relative strength and weaknesses of children with reading disabilities for the purpose of individualised instruction.

1. Introduction

It has been an accepted fact that unlike learning to speak, learning to read is not a natural process, which is picked up naturally by children. Some formal instruction is usually a prerequisite for the acquisition of reading skills. However, even with formal instruction, some children still fail to read. A nationwide research based upon teachers' perception conducted by Khadijah Rohani Mohd. Yunus and Zalizan Mohd. Jelas (1994) found that 30% of Level 1 children still fail to read despite formal instructions in school. When a reading disability is detected, the logical conclusion is to provide for a more individualised instruction to fulfil the needs of the child with a reading disability. Through examination of the child's reading and cognitive profile, the strength and needs of the child can be identified and this would form the basis for intervention.

2. Cognitive profiles of reading disabilities

According to the simple theory of reading, reading is a function of two broad factors, decoding and comprehension (Hoover and Gough, 1990 in Padget, Knight & Sawyer, 1996). Shankweiler et. al (2000) defines decoding as the ability to exploit regularities in the mapping between words and their alphabetic representations and comprehension as the ability to bear on the reading process knowledge of the language that the new reader has gained from experience with the spoken language. There is evidence from a variety of sources to indicate that poor readers are deficient in comprehension skills (Shankweiler et. al., 1999). There is also evidence that indicate that reading problems especially among beginning readers are due to a deficiency in the decoding aspect of reading (Pressley, 2002). Poor decoding skills generally lead to secondary problems in comprehension skills.

Individual differences in reading patterns have been found among poor readers (Shankweiler et. al, 1999). Most poor readers exhibit weaknesses in both these factors. However, some poor readers might show a discrepancy between the two factors. Some poor readers might exhibit good decoding skills but deficiency in language comprehension skills. In contrast, some poor readers exhibit deficiency in decoding skills but not in language comprehension. These individual differences in reading pattern are however not much studied yet in the Malay language.

The purpose of this paper is to examine and describe qualitatively the reading and reading-related cognitive profiles of three distinct cases of reading disabilities in Malay language learning that were found among a group of 46 children tested in Year 1 from two schools in Penang.

3. Cases

The three cases described will be known as Fitri, Farah and Zaiton. Another child, Ani who exhibits typical reading development for Year 1 will be part of the discussion for comparative purposes. According to his teacher, Fitri appears to be a bright child but he does not perform well in his academic subjects. Farah on the other hand exhibited general cognitive delay and was recommended for remedial instruction early in the year. Her remedial teacher has instructed her for 10 months before being tested for this study. Zaiton is another child who shows weakness in her studies.

4. Measures

The children were tested using a battery of reading and reading-related cognitive tasks. Academic reading skills of word recognition, non-word reading, reading comprehension, oral comprehension, spelling and non-word spelling were tested. Cognitive processing skills related to reading which were tested were skills in syllable and phoneme deletion, visual and auditory sequential memory and nonverbal logical thinking skills. All the tests were administered on an individual basis. The scores of all the measures were converted to percentages and presented graphically.

5. Results

Reading profile

The test scores of the four children are summarised in Table 1 and the scores are presented graphically in Figure 1.

Table 1. Reading tests scores

Tests	Fitri	Farah	Zaiton	Ani
Non-word reading (%)	26.32	68.42	0.00	94.74
Non-word spelling (%)	20.00	30.00	0.00	90.00
Word recognition (%)	58.09	88.97	36.76	100.00
Spelling (%)	85.00	75.00	5.00	100.00
Reading comprehension (%)	42.86	0.00	14.29	85.71
Oral comprehension (%)	100.00	0.00	0.00	100.00

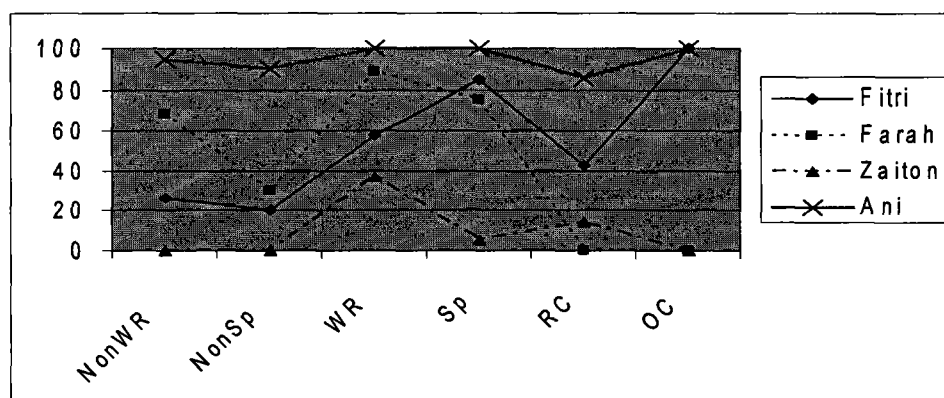


Figure 1. Graph of reading tests scores

As can be seen, Ani's performances on all six reading tests were consistent throughout, ranging from 85 to 100%. Through relative comparison with this typical case, all the other three cases showed a more inconsistent reading profile. All three cases showed distinct poor performances in at least three of the six skills tested. Generally, their reading profiles showed strengths in some areas and weaknesses in others. However, their areas of strength and weaknesses differ somewhat. Of the six skills, all three cases showed the most weakness in non-word spelling skill.

Among the three cases illustrated here, Zaiton had a more consistently poor reading profile. She showed poor performances in all six of the reading skills tested. Her highest score was 36.76% for word recognition. She could not decode any of the non-words, nor could she spell the non-words. She also scored zero in oral comprehension. Farah on the other hand showed strength in word recognition having a score of 88.9%. She also did better than the other two cases in non-word reading and non-word spelling. However, she could not answer any of the comprehension questions either reading or oral comprehension. Fitri's reading profile also showed disparity among the scores but is in relative contrast to Farah's profile. Fitri showed poor performances in non-word spelling and non-word reading. He fared better in word recognition and reading comprehension but he was strongest in his oral comprehension having a maximum score of 100%.

Cognitive processing profile

The test scores of the four children are summarised in Table 2 and the scores are presented graphically in Figure 2.

Table 2. Cognitive processing tests scores

Tests	Fitri	Farah	Zaiton	Ani
Syllable deletion (%)	28.57	57.14	28.57	85.71
Phoneme deletion (%)	0.00	10.00	0.00	100.00
Visual sequential memory (%)	86.67	33.33	20.00	86.67
Auditory sequential memory (%)	100.00	40.00	50.00	80.00
Non-verbal logical thinking skills (%)	75.00	0.00	25.00	62.50

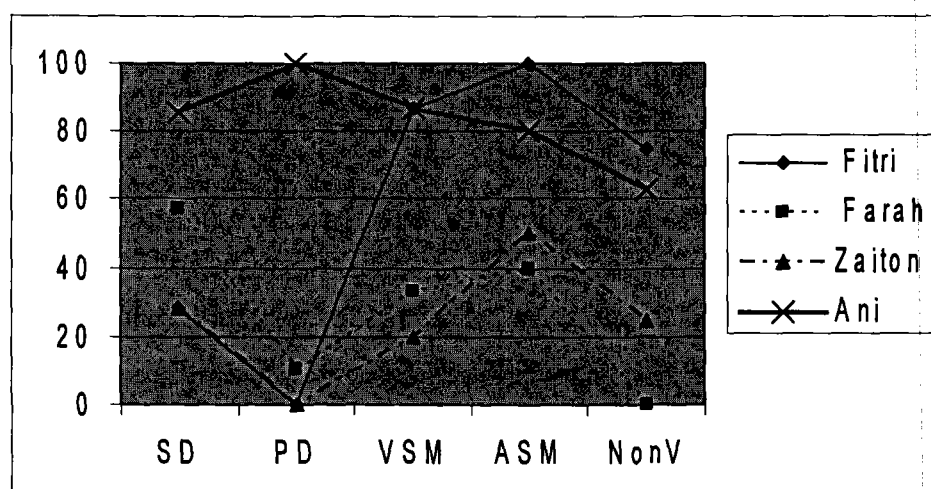


Figure 2. Graph of cognitive processing tests scores

In the cognitive processing skills category, Ani was also quite consistent throughout. Her lowest score was in nonverbal logical thinking skills and her highest score was in phoneme deletion. In contrasts, the poor readers fared most poorly in phoneme deletion skill.

Zaiton's performances on all the cognitive processing tasks were below 50%. She was weakest in phoneme deletion and in nonverbal thinking skills. She fared slightly better in visual and auditory memory skills. Farah's cognitive processing profile was quite similar to Zaiton's profile. As can be seen from their graphs, the peaks and the low points corresponds to one another (refer to Graph 2). However, Farah did better than Zaiton in the deletion tasks, but fared worse than Zaiton in the non-verbal logical thinking tasks. In Fitri's case however, even though he performed poorly like Zaiton in syllable deletion and in phoneme deletion, he did very well in the memory tasks and in nonverbal logical thinking tasks. His scores for the memory tasks and the nonverbal logical thinking tasks were higher than even than Ani's scores.

6. Discussion

All three cases showed impairment in their reading skills. However, there were marked individual differences in their reading and cognitive processing profiles. In all the three cases studied, each of them has different strengths and weaknesses. The results of this research is consistent with the results of past research which suggests clearly that children with reading impairment showed individual differences in reading patterns and should not be lumped and studied as under one category.

Zaitun showed weaknesses across all areas tested in reading and in cognitive processing. Her profile suggests impairment in both components of reading, decoding and language comprehension. Her poor performance in non-word reading and word recognition suggests a weakness in decoding skills. According to literature on reading, one of the underlying causes for poor decoding skills could be due to deficiency in phonological awareness skills (Frith, 1985). Zaiton showed corresponding weaknesses in both the phonological awareness tasks. She was also weak in both the comprehension tasks. Stanovich (1991 in Reason & Frederickson 1996) have suggested that intellectual ability can be measured by oral comprehension tasks. A weakness in oral comprehension can indicate weakness in general cognitive ability. Zaiton obtained low scores in both comprehension and nonverbal logical thinking skills suggesting poor cognitive ability. In conclusion, her reading profile is typical of children classified as garden-variety poor readers (Stanovich, 1988).

Farah's profile showed appreciable disparity between the two components of reading. She scored highest among the three cases in non-word reading and in word recognition skills. Her word recognition skills were on par to Ani's. The results indicate that she is skilled in decoding. However, her ability to comprehend is the weakest among the three cases. She could not answer any of the reading and oral comprehension questions and she scored zero in nonverbal logical thinking skills. Her cognitive delay as observed by her teacher is reflected in these test results. A reading profile such as Farah's with appreciable disparity shown in weakness in comprehension and strength in decoding is not commonly found (Shankweiler et al, 1999) among children with reading impairment. Her profile needs to be interpreted in the context of the remedial instruction she had received. An interview with her remedial teacher revealed that she had undergone systematic and structured phonics instruction for ten months, which had benefited her. This was reflected in her good decoding scores. However, she is still very weak in the comprehension component, which corresponds highly to cognitive ability. Farah's case provides evidence that the acquisition of decoding skills component does not necessarily translate into good comprehension skills in reading.

Fitri, on the other hand showed disparity that is in contrast to Farah's profile. He performed poorly in the decoding tasks of non-word reading and in non-word spelling. He was also weak in phonological awareness tasks. However, he was skilled in oral comprehension and in nonverbal logical thinking. He scored higher than Ani in the nonverbal logical thinking skills. This profile suggests impairment in the decoding component of reading with the higher order process of reading, that of comprehension remaining intact. This discrepancy profile typifies a diagnostic profile of dyslexia (Beaton, 2004; Shaywitz, 2003).

7. Conclusion

The results of this study indicated the importance of diagnostic profiling in order to identify the relative strengths and weaknesses of children with reading disabilities. The three cases presented in this paper showed that not all reading disabilities are the same and that there are meaningful individual differences among children with reading disabilities who are learning the Malay language. As each child might differ in their reading profile, it is imperative that their cognitive profiles be identified in order to develop a more precise individualised instruction to suit the needs of each child with reading disability.

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