CHAPTER FOUR

FINDINGS OF THE STUDY

4.0 Introduction

This chapter presents the findings and the discussion of the subjects. First the profiles of the subjects are described. There are altogether five subjects under study. Subjects A and B are 12 year olds while C, D and E are 11 years old . All are males and are of Chinese descent, except for Subject E who is an Ibanese. All the five subjects have been carefully observed in terms of behavior, response to interviews and questionnaires. The subjects are also made to do a few reading tests from single word tests to word phrases and finally reading of sentences. The mistakes made by the subjects are carefully recorded.

4.1 Background and Profiles of the Subjects

Subject A

He is the eldest in the family. He is twelve years old and currently in Primary Six. In terms of socio-economic status, his family is considered above average. His parents are managers and he has two younger brothers aged 8 and 5 respectively. His eight year old brother is doing quite well academically but the younger boy who is in kindergarten is a bit slow and not as articulate as the eight year old boy.

Based on the interview with the mother, it was quite obvious that there were incidences of dyslexic conditions noted in the family of the maternal side. Two uncles of the subject had exhibited academic problems in their early schooling days. They left school at a very young age and they never managed to complete their secondary school education. However, there was no case of dyslexia on the paternal side.

Subject B

He is a twelve year old boy. He is currently in the last of the Year Six classes. At present, he is staying in the orphanage because his parents are divorced and his mother is too busy to look after him. He seldom gets to see his mother, maybe, once in every three or four months. Most of the time, he is left with his caretakers in the orphanage. He mingles with the other orphans and he takes the orphanage as his home now.

Subject C

He is an eleven year old boy and is currently in Primary Five. He has a father, mother, a stepfather and a stepbrother. All of them are staying together in the same house. His mother is a housewife while his father is a coffee shop attendant in Singapore. Most of the time is spent with his mother.

Subject D

He is an eleven year old boy and is currently in Primary Five. He has a sister who is in Form One this year. Both his parents are working in Singapore and will come back only once during the weekends. He is currently staying with his grandmother.

Subject E

He is an eleven year old Iban boy. His father is an Iban while his mother is a Chinese. His father is a police officer while his mother works as a clerk in an office. He has a younger brother who is six years old. He had been in the kindergarten for three years before he went into primary one.

4.1.1 Physical History

Following the questionnaires given to the mothers of Subject A, B, C, D and E, it has been found that all these subjects do not have any physical abnormalities. They also did not suffer from any critical or chronic illnesses or extremely high fever during their infant years. At present, all these subjects do not have any physical disabilities to hamper the learning process.

However, Subjects A and E do develop allergic reactions to certain fruits like strawberries which will cause swellings on the lips. Weather and seasonal changes sometimes give them some allergic reactions like hay fever and running nose. Subjects B, C and D do not suffer any allergies. The hearing of all the subjects is fine. They are also not on prolonged medication.

4.1.2 Behavioral Observations

Based on the data collected from the questionnaires, it is learnt that these subjects displayed certain behavioral characteristics typical of dyslexics. They are:

- The mothers as well as the teachers often had to repeat instructions to the subjects.
- All the subjects involved had difficulties in following directions.
- All of them spent more time on their homework than normal children did and they never seemed to complete them.
- The subjects needed more help with language-based subjects like Bahasa Malaysia, English and Chinese.
- The subjects had more difficulties in reading, writing and spelling. However, they faired better in Mathematics.

- The subjects' grades in reading, writing and spelling were low compared to their ability to understand.
- Although, the mother or teachers spent time reading to them, they did not enjoy the reading sessions. These subjects also refused to read aloud, hesitated or avoided reading sessions.
- All the subjects under study had very short attention span. They could not concentrate for long periods and would be fidgety after a short while.
- Out of the five subjects under study, only Subject A was able to give a full score for his weekly spelling exercise while the rest seldom made it to the 50% mark.

All the subjects involved do like to attend school. Socially, they are doing fine. They do not alienate themselves from their peers.

4.1.3 Speech and Language Abilities

Subject A

He lacked accuracy when speaking. He is less articulate than normal children. He would mix up certain words or words in sentences when speaking. He would also mix up the prepositional words. Words like 'of ' would be mistaken for 'for ' and vice versa. Although, he had the tendency to reverse certain letters like b/d, p/q, m/n, he did not have any difficulty learning the alphabets in order.

Subject B

He could speak a moderate amount of English although not fluently. He had a heavy accent of Mandarin while speaking. He was not able to pronounce the /bl/ and /pl/, /kl/ and /gl/ , /fl/ and /sl/ syllables accurately. His reading was choppy spoke but he would make an effort to do his best. Though he was from the orphanage, he worked hard to seek improvement.

Subjects C, D and E

These three subjects were not able to speak in English. They hesitated to speak and it was observed they were under a great deal of pressure when given asked to speak. They had limited vocabulary and could not pronounce most single words well.

4.2 Academic Development

Based on the questionnaire given to the subjects' class teachers, data about the subjects' academic achievements and behavioral details could be obtained.

Subject A

He had some difficulty with phonological awareness and phonological processing skills (processing the sounds of speech), including segmenting or breaking spoken words into individual sounds. Examples of such words are 'character', 'opportunity', 'ambition' and 'chameleon'. These weaknesses were discovered during the school based oral assessment test.

He had difficulties in reading single words in isolation, inaccurate reading, lack of reading fluency, varying degrees of difficulty in reading a sentence and a comprehension passage and producing the letters of the alphabets in the correct sequence.

Subject: B

He had difficulty in development of phonological processing skills including segmenting and breaking down of words into their individual sounds. This subject had difficulty reading single words in isolation. His reading was labored. He also had varying degrees of difficulties in reading sentences and comprehension passages.

He also had difficulty in sequencing letters in the alphabet especially in the reversed order.

The subject's performance in academic tasks was inconsistent.

In reading, this subject lacked the intellectual ability to develop reading skills at a level equal to his peers.

Subject C

This subject had acute difficulty in phonological processing skills as well as phonological awareness. He was not able to break down the words into their individual sounds. The subject also could not read single words in isolation. Recognizing words was a major difficulty that this subject faced. He was not able to read sentences or comprehension passages. His performance in academic tasks was poor.

Subject D

He had acute difficulty in phonological processing skills. He lacked the intellectual ability to develop reading skills at a level equal to his peers. He was unable to read satisfactorily be it at word or sentence level. Even a mere utterance was a chore to him. He also had difficulty in sequencing the letters in the alphabet.

Subject E

This subject also had acute difficulty in phonological processing skills.

He had difficulty in reading single words in isolation. He was not able to comprehend reading at his grade level. His academic performance in languages was poor.

4.3 Findings from Dyslexia Checklist

Based on the checklist:

Subject A

This subject showed difficulty in spelling of words. There was some reversal of the sequence of words or forms. He would read ‘from’ as ‘form’ and ‘of’ as ‘for’.

He had short attention span and was easily distracted during lessons. He had short memory for printed words and instructions. There was omission of letters when asked to copy sentences from the board. His reading was choppy and word by word. Sometimes, there were long pauses and repetition of words. He would lose place and do not know what he was reading. He seemed to fair better with impromptu than a memorized speech text.

Subject B

This subject had difficulty with spelling as well as direction. He could not really differentiate left from his right. He also had problems with sequencing and word forms. He could be easily distracted and had poor concentration. He would make quite a number of mistakes if made to copy work from the board. He would read word-by-word in a choppy manner. He would repeat words and phrases in his oral reading. He had difficulty with rhythm and rhymes and his tone was monotonous throughout.

Subject C

This subject had difficulties in differentiating left and right, top and bottom. He also had difficulties with sequencing of words or forms. Easily distracted, he also had difficulties with words that looked alike. He mixed upper case letters with lower case letters and all his words were stringed. He showed great difficulty in remembering whole word patterns and could not learn much by ‘The Sight Method’. He could not concentrate for

long periods and he had difficulty with board copying. He also had difficulties in following instructions. He could not read single words and he would refuse to read eventhough the word was read out to him. He could not spell words given to him.

Subject D

He had difficulty with sequencing of word forms. He would get confuse with words that looked alike. He showed poor concentration ability and was easily distracted. When copying words from the board he would miss out certain letters. He had short memory for printed words or instructions. His reading had long pauses and he could not recognize the words fast. Sometimes, he could not understand what he was reading. He would not do his homework. He was not able to hand up his work on time.

Subject E

He had a poor sense of time. He had difficulties in getting things done in the correct order. He had confusion with left and right, above and below. He had difficulty with words sequence and the reversal with the sequence of words. His concentration was poor and he had short memory for printed words or instructions. He was easily distracted and showed early fatigue in reading. He showed some difficulty when copying words from the board. His would mix up ‘b’ for ‘d’ and vise versa. Somehow, he showed signs of stress when was asked to read.

4.4 Hearing Skills

The Syllable Identification Test is part of the 10-item Diagnostic Test for screening of dyslexia. This test serves as a diagnostic test because phonological recoding contributes to reading development. According to Elbro, Borstrom & Peterson (1998),

phonological recoding refers to the use of systematic relationships between letters and phonemes.

a) Syllable Identification Test

Procedure:

1) The subject was presented with a single syllable spoken by the tester, while being shown 4 pictures.
2) The subject was then asked to choose the word beginning with that syllable (pointing or saying the correct responses).
3) The individual subjects were asked to name all the pictures before starting the procedure. There were 2 practice items and 8 test items.

Scoring

The number of errors was recorded. Each error was given 1 point with the total maximum score of 8 points.

Results

The results of the tests are tabulated below:

Table 4.1 Syllable Identification Test Results

TESTS Subjects	T1 E	T2 E	T3 E	T4 E	T5 E	T6 E	T7 E	T8 E	TOTAL ERRORS	MAX. ERRORS
A	0	0	0	1	1	1	0	1	4/8	8/8
B	0	1	0	1	1	1	0	1	5/8	8/8
C	1	1	1	1	1	1	1	1	8/8	8/8
D	0	1	0	1	1	1	1	1	6/8	8/8
E	1	1	0	1	1	1	0	1	6/8	8/8

Subject A had a score of 4 out of 8. He could only identify 4 pictures correctly.
He could identify the single syllable 'l' , 'c', 'y' and 'gl'. He was unable to identify words that begins with 'n', 'br', 'pr' and 'fr'. He made 4 errors in this section

Subject B had a score of 5 out of 8. He could correctly identify 3 pictures.
He could identify syllables 'l', 'y' and 'gl'. However, he was unable to identify syllables 'c', 'n', 'br','pr' and 'fr'. He made a total of 5 errors

Subject C was not able to identify any of the pictures. He seemed to be confused and refused to speak. He would point to the wrong pictures throughout the 8 tests.

Subject D scored 6 out of 8. He could identify the syllables 'l', and 'y'. However, he was not able to identify the syllables 'c', 'n', 'br', 'pr', 'gl' and 'fr'.
He made a total of six errors altogether.

Subject E had a scored of 6 out of 8. He could identify 2 out of 8 pictures correctly.
He could correctly identify syllables 'y' and 'gl' but was not able to identify syllables 'l', 'c', 'n', 'br', 'pr' and 'fr'. He made 6 errors altogether.

b) Phoneme Identification Test

The subjects were presented with a single initial phoneme spoken by the tester, while being shown 4 pictures. The subjects were then asked to choose the word beginning with that phoneme. The subjects could point or say the correct response. The number of errors were recorded

The results of the phoneme identification test are tabulated as follows:

Table 4.2 Phoneme Identification Test Results

TESTS Subjects	T1	T2	T3	T4	T5	T6	T7	T8	Total Errors	Max. Errors
A	0	0	1	1	1	1	1	1	6/8	8/8
B	1	0	1	1	1	1	1	1	7/8	8/8
C	1	1	1	1	1	1	1	1	8/8	8/8
D	1	0	1	1	1	1	1	1	7/8	8/8
E	1	1	1	1	1	1	1	1	8/8	8/8

In the phoneme identification test, Subject A scored 6 out of 8. He could choose the words beginning with the following phonemes /p/ and /m/. However, he was not able to recognize the phonemes / b, n, g, e, i, j /. He made 6 errors altogether.

Subject B scored 7out of 8 points. He could only identify the phoneme / m /. He could not identify the phonemes / p, b, n, g, e, i / and / j /. He made 7 errors altogether.

Subject C could not identify any of the phonemes. There was confusion even with the pictures shown. His attention span was short and he could not remember the words read out by the tester. Therefore, he was not able to give a favorable response.

Subject D scored 7 out of 8. Like Subject B he was only able to identify the phoneme /m /. He could not identify the phonemes / p, b, n, g, e, i / and /j /. He made 7 errors altogether.

Subject E made errors in all the pictures. He was not able to identify any of the phonemes even though the pictures were shown to him. He looked confused and could not remember the names of the pictures. He asked the words to be repeated and finally he would point to the wrong picture.

4.5 Phoneme Segmentation

Ten words were read out to the pupils and they were asked to break down the words into their constituent sounds. The results of the tests are as follows:

Table 4.3 Phoneme Segmentation Test Results

TESTS Subjects	T1 E	T2 E	T3 E	T4 E	T5 E	T6 E	T7 E	T8 E	T9 E	T10	Total Errors
A	0	1	0	0	1	1	1	0	1	1	6/10
B	0	1	0	0	1	1	1	1	1	1	7/10
C	1	1	1	1	1	1	1	1	1	1	10/10
D	0	1	0	1	1	1	1	1	1	1	8/10
E	1	1	1	1	1	1	1	1	1	1	10/10

In the phoneme segmentation tests, Subject A made 6 errors out of the ten tests given. He was able to segment out the word ‘marbles’, ‘turtle’, ‘lemon’ and ‘cupboard’. He could not segment out ‘tapioca’, ‘lizard’, ‘bottle’, ‘crocodile’, ‘lantern’ and ‘mosquito’.

Subject B had a score of 7 out of 10. He was able to segment out the words ‘marbles’, ‘turtle’ and ‘lemon’. He was not able to segment out ‘tapioca’, ‘lizard’, ‘bottle’, ‘crocodile’, ‘cupboard’, ‘lantern’ and ‘mosquito’. He made a total of 7 errors altogether.

Subject C was had scored the maximum number of errors for all the 10 tests because he was not able to segment out all the ten words given.

Subject D had a score of 8 out of 10. He was able to segment out the words ‘marbles’ and ‘turtle’ but was unable to segment out ‘tapioca’, ‘lemon’, ‘lizard’, ‘bottle’, ‘crocodile’, ‘cupboard’, ‘lantern’ and ‘mosquito’. He made 8 errors altogether.

Subject E scored a maximum number of errors for all the tests because he was not able to segment out all the words given in the 10 tests.

4.6 Decoding Tests

Subjects A, B, C, D and E could read the letters of the alphabet following the forward and backward sequence but they were not able to recite the speech sounds of each letter.
Subject A could recite the speech sounds for ‘a’ and ‘m’ only.
Subject B, Subject C and Subject E refused to recite the speech sounds for all the letters of the alphabet.

Subject D refused to recite any of the speech sounds except for ‘C’ which he recited as ‘sa’ , ‘M’ as ‘ne’ and ‘V’ as ‘x’.

The single word decoding test was divided into 4 levels. Level 1 consisted of 10 words from CV formation. Level 2 – 10 words from the CVC formation.
Level 3 – 10 words from the CVVC formation and Level 4 consisted of 10 words from the CVCC formation.

Subjects A, B,C, D and E were tested using these 4 levels and the results were tabulated below.

Table 4.4 Decoding Test Results Level 1 (CV)

Target Word	Subject A Word Produced	Subject B Word Produced	Subject C Word Produced	Subject D Word Produced	Subject E Word Produced
Level 1 (CV)					
1. be	de	de	refusal	/	/
2. do	bo	bo	refusal	bo	doe
3. go	/	/	refusal	/	/
4. he	/	/	refusal	/	her
5. ma	/	/	refusal	mer	mer
6. me	/	/	refusal	/	/
7. no	/	/	refusal	/	on
8. pa	/	/	refusal	/	pear
9. to	/	/	refusal	/	/
10. we	/	/	refusal	/	
Total Errors	2/10	2/10	10/10	2/10	6/10

For Level 1, words with the CV formation, Subject A , B and D scored 2 out of 10.

Subject C refused to read any of the words. He had the total maximum error score.

Subject E could not read 6 out of the 10 words.

He made 6 errors altogether.

The next table shows the results of the decoding test for Level 2 (CVC) formation of the decoding test.

Subject A and Subject E scored 5 out of 10 for the Level 2 decoding test.

Subject B had a score of 7 out of 10 while Subject D scored 4 out of 10.

Subject C could not read any of the words with the CVC formation.

The results for the Level 2 Decoding Test are tabulated as follows:

Table 4.5 Decoding Test Results Level 2 (CVC)

TARGET WORD	SUBJECT A Word Produced	SUBJECT B Word Produced	SUBJECT C Word Produced	SUBJECT D Word Produced	SUBJECT E Word Produced
Level 2 (CVC)					
1. bed	deb	refusal	refusal	be	be
2. bat	dat	refusal	refusal	refusal	refusal
3. cat	/	/	refusal	cart	/
4. day	bay	refusal	refusal	/	/
5. jam	jum	refusal	refusal	jan	/
6. ten	/	/	refusal	/	/
7. hot	/	refusal	refusal	/	/
8. pig	peg	refusal	refusal	/	pin
9. hen	/	/	refusal	/	he
10. fun	/	foon	refusal	/	foon
Total Errors	5/10	7/10	10/10	4/10	5/10

The results of the decoding test for level 3 (CVVC) are as follows:

Table 4.6 Decoding Test Results Level 3(CVVC)

TARGET WORD	SUBJECT A Word Produced	SUBJECT B Word Produced	SUBJECT C Word Produced	SUBJECT D Word Produced	SUBJECT E Word Produced
Level 3 (CVVC)					
1. nail	nil	refusal	refusal	refusal	refusal
2. meat	met	nit	refusal	mat	mal
3. feed	/	/	refusal	/	/
4. goat	/	got	refusal	/	refusal
5. sail	sal	sell	refusal	sell	refusal
6. neat	net	met	refusal	nat	meat
7. seal	sil	refusal	refusal	sell	sail
8. paid	pad	refusal	refusal	pay	refusal
9. seat	sit	sat	refusal	/	sat
10. read	/	/	refusal	/	refusal
Total Errors	7/10	8/10	10/10	6/10	9/10

Subject A could read 3 words correctly out of the 10 words given. He made 7 errors altogether.

Subject B could read 2 words correctly. He made 8 errors altogether.

Subject C refused to read any of the words. He was given a maximum error score.

Subject D scored 6 out of 10. he made 6 errors. Subject E scored 9 out of 10. He made a total of 9 errors.

The results for the decoding test on Level 4 (CVCC) were recorded below in Table 4.7.

Table **4.7** **Decoding Test Results Level 4 (CVCC)**

TARGET WORD	SUBJECT A Word Produced	SUBJECT B Word Produced	SUBJECT C Word Produced	SUBJECT D Word Produced	SUBJECT E Word Produced
Level 4 (CVCC)					
1. belt	refusal	refusal	refusal	bel	be
2. cord	refusal	refusal	refusal	/	refusal
3. cold	refusal	refusal	refusal	core	refusal
4. dell	refusal	bell	refusal	dill	they
5. felt	refusal	fell	refusal	faut	fe
6. gold	refusal	/	refusal	/	/
7. help	refusal	hel	refusal	held	hel
8. sack	refusal	/	refusal	/	/
9. kick	refusal	/	refusal	/	/
10. lamp	refusal	/	refusal	Land	/
TOTAL	10/10	6/10	10/10	6/10	6/10

Subject A and Subject C refused to read the 10 given words in Level 4. They were given a maximum error score.

Subjects B, D and E could not read 6 out of the 10 words given. They made a total of 6 errors each.

4.7 Single Word Reading Tests

In the single word reading tests, the words are graded according to their level of difficulty.

Altogether, there were10 levels and in each level 10 words were given for the subjects to read. The results were then recorded in Table 4.8.

Table 4.8 Results of the Single Word Reading Test

LEVELS	Max. Err. Score.	Subject A Errors	Subject B Errors	Subject C Errors	Subject D Errors	Sub. E Errors
1. (VC)	10	4	4	10	1	3
2. (CVC)	10	4	5	10	1	5
3. (CVVC)	10	7	9	10	3	8
4. (CCVC)	10	6	8	10	8	7
5. (CCVV)	10	7	7	10	5	8
6.(CCVCC)	10	7	6	10	4	10
7.(CVCCC)	10	10	7	10	4	8
8.(CCVVC)	10	10	10	10	8	10
9.(CVCCVC)	10	7	3	10	0	6
10.(CVVCCVCC)	10	8	7	10	6	10
TOTAL ERRORS	100	70	66	100	40	75

The results above showed that Subject A scored 70 out of 100.

Subject B had 66% errors. Subject C showed refusal to read all the words in the single word reading tests. Therefore, he had the maximum error score. Subject D had 40% errors while Subject E had 75% errors on the single word reading tests.

Generally, Subjects A, B,C and E made more than 50% error in their single word reading tests. Subject D made the least error in these tests.

4.8 Reading Test at Phrase Level (Word Doubles)

The subjects were given a test on 10 sets of phrasal words. Each phrase had 3 words and each word that was correctly read was given 1 mark. The word 'and' was repeated in every phrase. The marks were recorded and tabulated in Table 4.9.

Table 4.9 Results of Reading Test at Phrase Level

PHRASE	Max. Error Score	Subject A Error	Subject B Error	Subject C Error	Subject D Error	Subject E Error
1.bread and butter	3	2	2	3	2	2
2. fork and spoon	3	0	1	3	1	1
3. fish and chips	3	1	1	3	0	1
4.milk and honey	3	1	1	3	1	1
5.cups and saucers	3	1	1	3	2	2
6. touch and go	3	1	1	3	1	1
7. cash and carry	3	2	1	3	1	2
8. neat and Tidy	3	2	2	3	2	2
9. spick and span	3	2	2	3	1	1
10. pick and choose	3	2	2	3	1	2
Total Errors	30	14	14	30	12	16

For the Reading Test at Phrase Level, Subject A and B scored 14 out of 30.

Subject C made a maximum of 30 errors. Subject D made 12 errors while Subject E scored 16 errors.

4.9 Reading Test at Sentence Level

Four sentences were given to the subjects concerned and they were asked to read the sentences. The number of words wrongly read was recorded in Table 4.10.

Table 4.10 Results of the Reading Test at Sentence Level

SENTENCES	Max. Err. Score	Subject A Error	Subject B Error	Subject C Error	Subject D Error	Subject E Error
Sentence 1	7	4	3	7	3	4
Sentence 2	5	2	2	5	3	2
Sentence 3	5	3	3	5	1	4
Sentence 4	10	3	4	10	6	5
Total Errors	27	12	12	27	13	15

Subject A and B could not read 12 out of the 27 words present at sentence level.

Subject C scored the maximum errors because he refused to read.

Subject D scored 13 errors while Subject E scored 15 errors.

4.10 Results of the Reading Test at Paragraph Level

In the reading test at paragraph level, the subjects were given common words found in the Year 5 and Year 6 comprehension passages. There were 60 words altogether in this comprehension passage.

The number of words read correctly was recorded and tabulated in Table 4.11.

Table 4.11 Results of the Reading Test at Paragraph Level

PARAGRAPH 1	Max. Err. Score	Subject A Errors	Subject B Errors	Subject C Errors	Subject D Errors	Subject E Errors
60 words	60	27/60	32/60	60/60	26/60	33/60
Total Error %	100	45	53,3	100	43.3	55

Subject A and E could not read 45% of the words in the reading tests at paragraph level. Subject B made 53.3% errors while Subject D could not read 43.3% of the words. Subject C could not read showed refusal to read any of the words at paragraph level. He had a maximum error score.

4.11 Analysis and Discussion

4.11.1 Analysis of the findings from The Federal Dyslexia Association's Checklist

In relation to the first research question, based on the results and observation of the subjects, questionnaires given to the parents and class teacher and the checklist from the Federal Territory Dyslexia association, these subjects do exhibit a range of dyslexic symptoms related to language which contributed to the reading difficulties of these children.

With reference to the checklist, the 5 subjects showed weakness in language processing skills, had poor concentration with short attention span and were unable to follow instructions.

All the five subjects had difficulties combining letters whether consonant or vocal and also had difficulties differentiating sounds of words. They were unsure of their words

while reading which contributed to the repetition of words. They would read without expression and full stop.

4.11.2 Analysis for the Syllable Identification Test

The syllable identification test is part of the 10-item DST test for hearing skills.

Based on the results and findings, all the subjects concerned do have a problem with hearing. According to Bradley & Bryant 1978, children who lack phonological awareness have difficulty with auditory tasks that require them to analyze spoken words. This will put children at a disadvantage while learning to read.

Subject A would point to the wrong picture when he was asked to locate words with the syllable ‘n’, ‘br’, ‘pr’ and ‘fr’. He would take a while to point at the picture and would point to the wrong picture for the syllables just mentioned. Looking at the responses made by Subject A he not only had hearing difficulties but he also had difficulties with his memory.

Subject B found difficulties in locating pictures with syllables ‘c’, ‘n’, ‘br’, ‘pr’ and ‘fr’. He looked confused and liked Subject A, he seemed to have a hearing problem and poor memory.

Subject C could not point to the correct pictures when the word was read out. This could be due to his inability to hear and follow instructions. Through general observations, he is an active and talkative boy but he couldn’t identify the syllables when the words were read to him and he would point to the wrong pictures. The syllables he couldn’t identify were ‘m’, ‘n’, ‘c’, ‘br’, ‘pr’, ‘fr’, ‘gl’ and ‘bl’.

Subject D was slow when he was asked to identify the pictures when the words were read to him. He looked untidy and shoddy. He was not able to identify the syllables ‘c’, ‘n’, ‘br’, ‘pr’, ‘gl’ and ‘fr’. He would hesitate and think for quite some time before he could point to the pictures.

Subject E could not locate the pictures when words with syllables ‘c’, ‘n’, ‘br’, ‘pr’, ‘fr’ and ‘l’ .

Generally, these five subjects have common weaknesses. Subjects B, C, D and E had difficulty identifying words beginning with syllable ‘c’ like the word ‘cot’. The word ‘net’ with syllable ‘n’ , the word ‘break’ with syllable ‘br’, the word ‘prawn’ with syllable ‘pr’ and the word ‘fridge’ with syllable ‘fr’.
Subject E could not identify the syllable ‘gl’ like the word ‘glass’.
Subject A was could not identify words beginning with ‘n’, ‘br’, ‘pr’, ‘fr’ but he could identify the word ‘cot’ starting with the syllable ‘c’.

4.11.3 Analysis for the Phoneme Identification Test

This test was the extension of the syllable identification test. Instead of identifying the syllables or the letters, the subjects were required to identify the letter sounds while the words were read out.

Subject A was not able to identify the sounds of [b], [n], [g], [e], [i] and [j]. He would give or point to a picture where word where it had no bearing with phonemic sound.

Subject B was not able to name the pictures starting with the phonemes /p, b, n, g, e, i / and /j /. His letter sound knowledge was poor.

He would was slow when responding and he was not able to point to the correct pictures when he was required to do so.

Subject C and Subject E showed very poor letter sound knowledge. They were not able to identify the pictures when the targeted words were read out.

Subject D was not able to identify the phonemes /p, b, n, g, e, i / and /j /.
He would give the wrong answer when was required to point to the picture starting with that phoneme that was read out by the tester.

As phoneme identification is very important in the reading process, all the subjects above showed weakness in identifying phonemic sounds.
They had very poor letter sound knowledge which could be one of the major problem that would hamper their reading development in the future.

4.11.4 Analysis for Phonemic Segmentation Tasks

Segmentation refers to the ability to break up words into its components.
The subjects' poor performance in phoneme segmentation tests demonstrated the weakness in segmenting out words which is necessary when dealing with alphabetic languages. Here, the results shown would also indicate these children would have difficulty carrying out complex sound segmentation tasks in future such as reading. This is also in consistent with Snowling's theory (2000) that children with written and verbal language problems exhibited difficulties in phonemic segmentation. According to Stackhose(1990), a relationship between segmentation skills and reading development has long been established.

4.11.5 Analysis for Decoding Skills

All the five subjects concerned were able to read the letters of the alphabet forward and in reverse order except for Subject D.

Subject D read ‘C’ as ‘sa’ , ‘M’ as ‘N’ and ‘V’ as ‘X’.

All these subjects could not recite the speech sounds given to them.

Words used to test decoding skills were divided into 4 different levels or categories.

Level 1 - (CV) combinations

Level 2 – (CVC) combinations

Level 3 – (CVVC) combinations

Level 4 – (CVCC) combinations

Subject A

In the first level , Subject A made 2 mistakes when he read out the words. He read ‘be’ as ‘de’ and ‘do’ as ‘bo’.

In level 2, he made 5 mistakes. He read ‘bed’ as ‘deb’, ‘bat’ as ‘dat’, ‘day’ as ‘bay’, ‘jam’ as ‘jum’ and ‘pig’ as ‘peg’. He read the rest of the words correctly.

In level 3, he misread 7 words. The mistakes were ‘nail’ as ‘nil’, ‘meat’ as ‘met’, ‘sail’ as ‘sal’, ‘neat’ as ‘net’, ‘seal’ as ‘sil’, ‘paid’ as ‘pad’ and ‘seat’ as ‘sit’.

In level 4, he refused to read all the words. He looked confused and tired.

He shook his head at every word given to him.

Subject B

In level 1, Subject B made 2 mistakes. He read ‘be’ as ‘de’ and ‘do’ as ‘bo’.

He read the rest of the words in this level correctly. In level 2, he read ‘cat’, ‘hen’ and ‘ten’ correctly. He refused to read the rest of the words.

He misread the word ‘fun’ as ‘foon’.

Subject C

Subject C refused to read all the words in all the respective levels. He looked confused as he looked at all the words. He seemed lost in the sea of words. Finally, he told the tester , in his mother tongue, that he could not read anything.

Subject D

In level 1, Subject D made 2 mistakes. He read ‘do’ as ‘bo’ and ‘ma’ as ‘mer’.

He read the rest of the words correctly.

In level 2, he misread three words. He read ‘bed’ as ‘be’, ‘cat’ as ‘cart’ and ‘jam’ as ‘jan’.

He refused to read the word ‘bat’.

He read the rest of the words correctly.

In level 3, he misread six words. They were ‘meat’ as ‘mat’, ‘sail’ as ‘sell’, ‘neat’ as ‘nat’, ‘seal’ as ‘sell’ and ‘paid’ as ‘pay’.

In level 4, he made six mistakes. He read ‘belt’ as ‘bel’, ‘cold’ as ‘core’, ‘dell’ as ‘dill’, ‘felt’ as ‘faut’, ‘help’ as ‘held’ and ‘lamp’ as ‘land’.

Subject E

In level 1, he misread five words. He read ‘do’ as ‘doe’, ‘he’ as ‘her’, ‘ma’ as ‘mer’, ‘no’ as ‘on’ and ‘pa’ as ‘pear’.

In level 2, he misread four words and refused one. He read ‘bed’ as ‘be’, refused to read the word ‘bat’, ‘pig’ as ‘pin’, ‘hen’ as ‘he’ and ‘fun’ as ‘foon’.

In level 3, he read one word correct which was ‘feed’. He refused to read five of the words given. He made four mistakes. He read ‘meat’ for ‘mal’, ‘neat’ for ‘meat’, ‘paid’ for ‘sail’ and ‘seat’ for ‘sat’.

In level 4, he read four words correctly. He refused to read two words. He misread four words. They were ‘belt’ as ‘be’, ‘dell’ as ‘they’, ‘felt’ as ‘fe’ and ‘help’ as ‘hel’

With reference to the results of the decoding tests, they were found to have good letter knowledge but they lacked letter-sound mapping ability. The weakness in letter-sound knowledge and skills may have contributed to their poor performance in the decoding tests.

However, these subjects do have some common weaknesses. They showed very low scores in the CVVC word combination. They would either omit one vowel in the middle of the word or take away the consonant at the end of the word.
If the mistakes made were not similar to those above, they would utter the word with the wrong letter sound.

4.11.6 Analysis for the Single Word Reading Tests

The five subjects were given 10 sets with 10 words each with varying length and complexity to read. In all, the five subjects each read 100 single words. The levels were graded as follow:

Level 1 – VC	Level 5 – CCVV	Level 9 - CVCCVC
Level 2 – CVC	Level 6 – CCVCC	Level 10 - CVVCCVCC
Level 3 – CVVC	Level 7 – CVCCC	
Level 4 – CCVC	Level 8 - CCVVC	

In level 1-(VC) combination the subjects did not do too badly except for Subject C who refused to read any of the words given to him. As the words became longer and more complex in varying degrees at their respective levels, the subjects made more and more mistakes.

Subject A

Subject A made 4 mistakes each at Levels 1 and 2. He made 7 mistakes each at Levels 3, 5, 6 and 9.

He made 6 mistakes at Level 4 and 8 mistakes for Level 10.

For Levels 7 and 8 he made a maximum of 10 mistakes.

His total percentage error for the single word reading tests was 70 %

Subject B

Subject B made 4 mistakes at Levels 1, 5 mistakes at Level 2, 9 mistakes at Level 3, 8 mistakes at Level 4, 7 mistakes each at Levels 5, 7 and 10, 6 mistakes at Level 6 and 3 mistakes at Level 9. He made a maximum of 10 mistakes at Level 8.

Adding up all the errors that he made, his total percentage error was 66 %

Subject C

Subject C failed to response for all the 10 tests given. Therefore, we could assume that his percentage error score was 100 %.

Subject D

Subject D made 1 mistake each at Levels 1 and 2, 3 mistakes at Level 3, 8 mistakes each at Levels 4 and 8, 5 mistakes at Level 5, 4 mistakes at Levels 6 and 7 and 6 mistakes at Level 10. However, he did not make any mistakes for Level 9.

His percentage error for the 10 tests was 40 %.

Subject E

Subject E made 3 mistakes at Level 1, 5 mistakes at Level 2, 8 mistakes at Levels 3, 5 and 7 respectively. He made 7 mistakes at Level 4 and 6 mistakes at Level 9.

Subject E made a maximum number of 10 mistakes at Levels 6, 8 and 10.

His percentage error for the 10 tests was 75 %.

The percentage error for Subjects A, B, C and E was above 50%. This shows that they definitely have a reading problem which does not exist in normal children.

Subject D's percentage error was 40 %. Though his score was below the 50 % mark, his reading was inconsistent. He could be considered as a borderline dyslexic.

Like in the decoding tests, these subjects were found to make omission on letters or phonemes of certain words.

The findings also revealed there were word reversals among the subjects concerned that are a common pattern in dyslexic children. The subjects would make an assortment of reversals ranging from reversals of vowels, consonants as well as syllable reversals.

Another common mistake of these subjects was the substitution of vowels/consonants in the words they read.

The analysis also showed the subjects made visual errors of some words, that the words were misread because they have similar visual appearance regardless of its meanings. Words like 'neat' may be read as 'meat' and vice versa and 'glass' as 'grass'.

Another type of error pattern commonly made was bizarre errors. These subjects would make wild guesses at the words regardless of their meanings. Examples were world/wal, flee/fall, bleed/bed, wear/will.

Overall, Subjects A, B, C, D and E were found to have poor word recognition skills. The ability to recognize words quickly and accurately, also known as lexical processing is a hallmark of skilled reading (Stackhouse, 1990).

The predominance of refusals, like in Subject C, suggested the subject had limited sight vocabulary and immature word attack skills.

The findings suggested that these subjects attempted to recognize words on sight but still could not produce the correct answers. They would sometimes try to sound out the word but their decoding skills were unreliable because they do not have a strong letter-sound knowledge and phonological awareness.

Based on the reading tests and analysis, these subjects were found to have from moderate to severe reading difficulties compared to their ages.

4.11.7 Analysis for Reading Word Doubles

There were 10 sets of word doubles presented to the subjects for reading. The findings and results of all the five subjects were discussed and analyzed.

Subject A

Subject A could read 16 words correctly out of the total of 30 words. Out of the 16 words read correctly, 10 words were repeated words ‘and’. He made 14 mistakes altogether.

Subject B

Subject B could read 16 words correctly out of the 30 words. The word ‘and’ is a repeated word found in all the sets. He made 14 mistakes altogether.

Subject B hesitated and took quite a lot of time trying to figure out the letter-sound of the words. Except for the word ‘and’, other words seemed bizarre to him.

‘bread and butter’ was read as ‘beard and buter’. The word ‘spoon’ was read as ‘spun’. ‘chip’ read as ‘cip’, ‘honey as ‘horney, ‘saucers’ as ‘sucers’, ‘touch’ as ‘tuch’, ‘cash’ as ‘cas’, ‘neat and tidy’ became ‘nat and teedy’. ‘Spick and span’ was read as ‘spis and spun’.

The word ‘choose was read as ‘chose’.

He was unsure of the words read and fumbled while reading.

Subject C

Subject C was not able to read all the 10 sets of word phrases. He had very poor letter-sound and word recognition skills.

Subject D

Subject D made 12 mistakes out of the total 30 words. He could not read the word with the ‘br’ sound like ‘bread’ and the ‘u’ sound like in the word ‘cup’. He read the ‘oo’ sound as ‘u’ and the ‘ti’ sound as ‘tee’. He would delete the extra ‘o’ in the word ‘choose’.

Subject E

Subject E read 14 words correctly out of the 30 words. He made 16 mistakes.

He was not able to read the word ‘bread’ beginning with ‘br’. He would read ‘oo’ for ‘u’ and ‘a’ for ‘u’.

Through observations and the findings, these subjects do not like to read. The reading lesson, instead of being an enjoyable activity gave them an added level of stress. This may be due to the fact that they have an underutilized left hemisphere of the brain. Furthermore, their reading performance is hampered by their poor word recognition, decoding and word segmentation skills.

4.11.8 Analysis for Sentence Reading

The subjects were made to read four sentences with common words.

There were altogether 27 words in the 4 sentences.

Subject A made 12 mistakes. Subject B also made 12 mistakes.

Subject C could not read any of the words in the sentences.

Subject D had 13 mistakes out of the 27 words while Subject E made 15 mistakes.

Generally, the subjects above were slow in recognizing the words given to them.

They would hesitate and fumble because they were not able to recognize the words in the sentences.

4.11.9 Analysis for the Reading of Sentences in a Paragraph

The subjects were asked to read the sentences in a paragraph. There were altogether 60 words in this paragraph and all the words are common words found in Year 5 and Year 6 vocabulary.

Subject A

Subject A made 27 mistakes out of the 60 words. He could not read the sentences fluently due to the fact that he had to try out the letter- sound for the words he was about to read. The words read out were choppy and not in a continuous flow. He read

the passage laboriously. Some words were read at least two or three times but the word produce was not the correct word.

Subject B

Subject B could read 28 words correctly out of the 60 words. He made 32 mistakes in the paragraph reading.

Subject B's reading was heavily accent. He had to read certain words a few times before he could produce the word but finally the words were incorrectly read.

He could not recognize the words fast enough so his reading lacked expression. In his eagerness to read the words correctly, he would forget his commas and full stops in the sentence.

Subject C

Subject C was not able to read all the words in the paragraph. He looked lost when he was asked to read.

Subject D

Subject D could read 34 words correctly. He was not able to read 26 words.

Subject D exhibited a lot of inconsistencies in his reading. He did not have the reading stability of a normal child. The same word he could read in the single word reading test and later when the same word was given to him in other test, he would not be able to read it.

Subject E

Subject E could read 27 out of 60 words correctly. He made 33 mistakes in his paragraph reading. He was slow to produce the letter-sound of the words and it took him quite some time to read one word. His reading of the paragraph lacked fluency and it became laborious and inexpressive.

4.12 Conclusion

With reference to research question 1, it can be summarized that dyslexia is a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding and phonological processing. The causes of this condition could be as a result of brain trauma or present from birth . According to findings documented by Albert Galaburda (1979) of Harvard Medical School, there were microscopic flaws known as ectopias and microgyria in a dyslexic brain and these flaws affected the connectivity and functionality of the brain related to auditory and visual processing

With reference to research question 2, the findings also showed that these children had an underlying phonological deficit indicating that they had problems processing speech sounds in reading. This was evident in the failure to perform in a range of tasks that required phonological processing such as phoneme segmentation task. They were not able to identify syllables of words in the syllable identification test. These subjects also had difficulties in identifying letter sounds as shown in the results of the phoneme identification tests which led to poor word recognition skills. As a result, the subjects showed a serious defect in their reading abilities.

With reference to research question 3, it can be conclusively ascertained that these subjects, due to their dyslexic condition had a phonological deficit at the syllabic or

onset/rime levels prior to acquiring literacy. This led to consequent problems in acquiring letter-sound relationship. Results from the reading of word phrases, sentences and paragraph showed that these subjects were slow in word recognition. Their reading was monotonous and choppy. They did not enjoy their reading lessons and it took them a lot of effort just to read a word from the sentences and paragraph.

Overall, based on the findings and analysis it can be concluded that the three research questions of this study were answered.

However, for reading to be productive with dyslexic children, a structured programme has to be drawn up so that these children can overcome their reading difficulties in time to come.