



AN ANALYSIS INTO PATTERN IDENTIFICATION AND LINGUISTIC TREATMENTS FOR DYSLEXIC STUDENTS



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1. INTRODUCTION

Learning is a vital part of a human being's life. As they grow older, they will start to slowly learn more and more things, leading them to understand the world around them even more, that is for normal people. However, we have to also recognise those who are not as fortunate. By this, it means those who have learning disabilities. Many known learning disabilities include Audio Processing Disorder (APD), Language Processing Disorder, and Visual Motor Deficit. For this research, I will be focused on what is most likely the most well-known learning disability, that being dyslexia syndrome.

Dyslexia syndrome is a relatively common learning disability that hinders a person's ability to gather, comprehend and interpret written information. This learning disability stems from several parts of an individual's brain, mainly concerning regions in the frontal, temporal and parietal lobes as these particular regions are where the brain formulates the words we want to say. This learning disability impedes these regions of the brain, resulting in a difference in how the brain processes the written information, making it harder for individuals with dyslexia syndrome to recognise, spell and decipher words.

In this research paper, the aim is to see if it is possible to identify a dyslexic student based on their actions and linguistic proficiency while also finding a treatment that can help these students with their disability.

2. RESEARCH METHODOLOGY

For the linguistic proficiency test, we broke it down into 3 smaller activities:

Activity 1 is a card matching game. Each student is given 10 pairs of playing cards (for a total of 20 playing cards), each and every one of them facing downward and placed in a 4 by 5 grid pattern. The student then has to match the cards of same number together while only being allowed to open 2 cards at a time. When the student starts, a timer is started as well. This timer will end as soon as the student has match all 10 pairs of cards.

The passing score for this test is below 1 minute 45 seconds

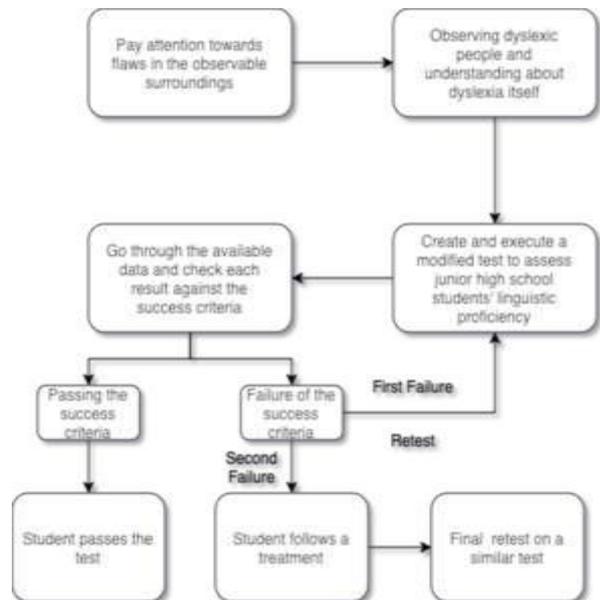


Figure 1: Flowchart of the experiment

Activity 2 is a quick time reading activity. The student is presented with 2 sets of words with each set containing 10 words. They will be timed when the first word is shown and ends when they say the last word of the set. The first set of words are words that are from the dictionary while the second set of words are made up words, making sure to keep the reading and spelling difficulty equal or at least similar between both sets of words. The

student must express all of the words presented to them in each set.

The passing score for set 1 is 8 and above correct and a time below 20 seconds while the passing score for set 2 is 7 and above correct and a time below 25 seconds.

Sets of words we used:

Test 1		Test 2		Test 3	
Set 1	Set 2	Set 1	Set 2	Set 1	Set 2
The	Hurs	Eel	Jir	Wok	Que
Aim	Leng	Ask	Vek	Nigh	Wub
Vow	Plov	Lair	Proy	Volt	Vilor
Meal	Yook	Knot	Mrlit	Crest	Mest
Reap	Orque	Gene	Knoure	Quill	Thrix
Quest	Dwirf	Mouth	Mophic	Knee	Sphig
Phone	Knove	Goose	Worsh	Thyme	Clype
Doom	Ambriv	Queue	Splime	Sphere	Elward
Invent	Zayded	Pharaoh	Eliverate	Maestro	Norplar
Tainted	Rophelar		Talidasimo	Epilepsy	Knistels

Activity 3 is a Multiple Choice Test. The student will be given a short story and 4 multiple choice questions each with 3 possible answers to go along with it. They need to finish it in under 3 minutes.

The passing score for this test is a perfect score of 4 out of 4 and the test must be completed in under 3 minutes.

An example of reading comprehension:

The Voice of Nature
 An Aboriginal myth from southern Australia relates how, in the beginning, the voice of the Ancestor spoke each day from a great gum tree, and the tribe gathered around to listen. But as time went by the people grew weary of hearing his words of wisdom. One by one they turned their backs on the voice to pursue their own pleasures, and a vast silence settled over the whole of the land and the sea. There was no wind and the tides were still, no bird sang, and the Earth seemed to be dying.

The tribe soon wearied of the pleasures of their own making and began to be afraid and lonely. They returned to the great tree again and again, hoping to hear the words that would ease their misery. And one day the voice of their Ancestor spoke again.

He told them it was the last time his voice would be heard, but that he would give them a sign. The great tree split open, a huge tongue of light came down into its trunk, and then it closed up again.

Since that time the Aboriginals have known that the voice of their Ancestor exists in all things, and speaks to them through every part of nature.

1. Where does the myth come from?
 A. Northern Australia
 B. Southern Australia
 C. Eastern Australia

2. From what tree did the Ancestor speak from each day?
 A. Pine Tree
 B. Apple Tree
 C. Gum Tree

3. What did the tribe feel then they wearied of the pleasures of their own making?
 A. Happy and Excited
 B. Jealous and Proud
 C. Afraid and Lonely

4. What came down onto the Great Gum Tree's split trunk?
 A. Huge tongue of light
 B. Rainwater
 C. Fast winds

Figure 2: Reading comprehension from Set 1

3. RESULTS AND ANALYSIS

Table 1: Data collected from Test 1

G.7	T1	T2	T3	T4	T5	T6	Overall
1	x	✓	✓	✓	x	x	✓
2	x	✓	✓	✓	x	x	✓
3	✓	✓	x	✓	x	✓	✓
4	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	x	x	✓	✓
6	✓	✓	✓	✓	✓	✓	✓
7	✓	✓	✓	x	✓	✓	✓
8	x	✓	✓	x	✓	✓	✓
9	✓	✓	x	✓	✓	✓	✓
10	✓	✓	✓	✓	✓	x	✓
11	x	✓	✓	x	x	✓	✓
12	✓	✓	✓	✓	✓	✓	✓
13	x	x	x	x	x	✓	x
14	x	✓	✓	✓	✓	✓	✓
15	✓	✓	✓	✓	✓	✓	✓
16	✓	✓	✓	✓	✓	✓	✓
17	x	✓	✓	✓	✓	x	✓
18	✓	✓	✓	✓	✓	✓	✓
19	✓	✓	✓	✓	✓	✓	✓
20	x	✓	✓	✓	✓	✓	✓
21	✓	✓	✓	✓	✓	✓	✓
22	✓	✓	✓	✓	✓	✓	✓
23	✓	✓	✓	✓	✓	✓	✓
24	✓	✓	✓	✓	✓	✓	✓
25	✓	✓	✓	x	✓	✓	✓
26	✓	✓	✓	✓	✓	x	✓
27	✓	✓	✓	x	✓	x	✓
28	✓	✓	✓	x	x	✓	✓
G.8	T1	T2	T3	T4	T5	T6	Overall
1	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	x	✓
3	x	✓	✓	x	✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓	✓
6	x	✓	✓	✓	✓	✓	✓
7	x	✓	✓	✓	x	✓	✓
8	x	✓	✓	x	x	x	✓
9	x	✓	✓	✓	✓	✓	✓
10	✓	✓	✓	x	x	✓	✓
11	x	✓	✓	✓	✓	✓	✓
12	✓	✓	✓	✓	✓	✓	✓
13	✓	✓	✓	✓	✓	✓	✓
14	✓	✓	✓	✓	✓	✓	✓
15	✓	✓	✓	✓	x	✓	✓
16	✓	✓	✓	✓	✓	x	✓
17	x	✓	✓	✓	✓	✓	✓
18	✓	✓	✓	x	x	x	✓
19	✓	✓	✓	x	✓	✓	✓
20	✓	✓	✓	✓	✓	✓	✓
21	✓	✓	✓	✓	✓	✓	✓
22	✓	✓	✓	✓	✓	✓	✓
23	✓	✓	✓	✓	✓	✓	✓
24	✓	✓	✓	✓	✓	✓	✓
25	✓	✓	✓	✓	✓	✓	✓
26	✓	✓	✓	✓	✓	✓	✓
27	x	✓	✓	✓	✓	x	✓
28	✓	✓	✓	✓	✓	x	✓
29	✓	✓	✓	x	x	✓	✓
30	✓	✓	✓	✓	✓	✓	✓
31	✓	✓	✓	x	x	✓	✓
32	✓	✓	✓	x	x	✓	✓
33	x	✓	✓	x	x	x	x
34	x	✓	✓	x	x	✓	✓
35	✓	✓	✓	x	✓	✓	✓
36	✓	✓	✓	✓	✓	✓	✓
G.9	T1	T2	T3	T4	T5	T6	Overall
1	✓	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	x	x	✓	✓
3	✓	✓	✓	✓	✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓
5	x	✓	✓	✓	✓	x	✓
6	x	✓	✓	x	x	x	x
7	✓	✓	✓	✓	✓	✓	✓
8	✓	✓	✓	x	x	✓	✓
Unk	T1	T2	T3	T4	T5	T6	Overall
1	x	✓	✓	✓	✓	✓	✓
2	✓	✓	✓	✓	✓	x	✓
3	✓	✓	✓	x	✓	x	✓
4	x	✓	✓	✓	✓	✓	✓
5	✓	x	✓	x	x	x	x
6	✓	✓	✓	x	x	✓	✓
7	x	✓	✓	✓	✓	✓	✓
8	✓	✓	✓	x	x	✓	✓
Rate of	22/80	2/80	4/80	24/80	22/80	17/80	4/80
Failure	28%	3%	5%	30%	28%	21%	5%

After analysing the data from the first linguistic proficiency test, a total of 4 out of the 80 students (or 5%) failed.

Student (Grade 7 / 13) failed in T1, T2, T3, T4, T5

Student (Grade 8 / 33) failed in T1, T4, T5, T6

Student (Grade 9 / 6) failed in T1, T3, T4, T5, T6

Student (Unknown / 5) failed in T2, T4, T5, T6

The first activity (T1) tests the student's memory. A dyslexic person has been shown to have a bad short term memory and this test rewards memory over guesswork. However, this test's true potential was not utilised by many students as they still prefer to use guesswork over the provenly superior method of memory.

The second activity (T2, T3, T4, T5) tests the student's subconscious linguistic ability. This activity is where most students fail, especially in the time aspect of activity 2 where they lag behind the required time. This is most likely due to their inability to read words quickly, especially unfamiliar words. This leads them to take their time to read the words presented to them. They also often get tripped up by phonic tricks such as ph, kn, and que, leading to the misreading of several words.

The third activity (T6) tests the student's understanding of the written information through the use of a reading comprehension. The students might not have understood the written information and thus, made mistakes in their answers. These questions are supposedly easy as they were made for 6 to 7 graders.

The students who failed the first test were given another chance to take another test with similar questions and sets. Before executing the tests to the students, we have validated the tests beforehand. The second test proved a suspicion that some students did not

do their best and just had low motivations throughout the testing. However, those who had dyslexia still had a similar performance to their first test, with their scores hovering around 5 out of 6 of the criteria not being met.

Therefore, those two students, 2 out of 80 (2.5%) diagnosed as Dyslexic students. After consulting with the counsellor in the school, the counsellor confirmed that those two names are the one with dyslexic behaviour according to the psychological tests before they entered the junior high school. The treatments are given to those two students. The treatments included: Linguistic, phonic spelling, and conversation using syllable. The treatments are meant to make the students fully aware of the mistake in their own reading. The treatments is given around a week (five days) with the duration of one hour per day.

After the treatments, the students are given a final test in order to see whether the treatments can help them to overcome their weaknesses. The results from the treatments was remarkable with 2 or 3 out of 6 in terms of spelling time that still have trouble with. (T2, T3, T4, T5).

4. CONCLUSION AND EVALUATION

To sum things up, the data from the experiment and from the experience of conducting the experiment showed that there were some patterns that revealed itself. The main indicator was their difficulty in saying longer words, words with a string of three or more consonants, and words containing phonic tricks like kn, ae and ph. They would occasionally give up on sight of a long word. These students would also show signs of a weak short-term memory like how they forget the location of cards, even if they have just saw it a few seconds ago.

Another finding was the fact that, for junior high school students at least, only a short-time treatment is required to be used as a refresher for the student in his daily life provides a decent starting spot for them to increase their linguistic capability. This was seen as the dyslexic student pass the final test. While the student scored a 5 out of 6 on his

first and second test, he scored a 2 out of 6 on the final test. While the student was doing the test, he was correcting himself and being much more self-conscious to get the right answer.

One aspect of the experiment that was not anticipated at first was the grey areas in psychology that had to either be dealt with or avoided entirely while conducting this experiment. These grey areas include the willingness of the student to participate in our experiment and the current emotions the student is feeling. These grey areas also limit the findings and thus, it would be difficult to go in-depth in the treatment for dyslexic students.

A possible suggestion that schools can take is to introduce a pre-test to the one used in this experiment. This experiment could be a shorter version of the test or a refined version of one of the subtests. One example would be a memorisation game of reordering cards. The point of this pre-test is to identify suspicious students who did poorly so they will be tested more in-depth with the complete test.

As a final addition to this extended abstract, unusual materials were used for the research, such as a deck of cards, to show that any item, with proper handling, can be used as a learning device.

For the next improvement, the instruments used for the tests will be apply to the other students in the same age group. It is hoped that the school will get a closer identification of those students and try to help them cope up with the linguistic problems.

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