Science Fair Log Book 2025-26

Project Title: Walking in My Words: Understanding the Dyslexic Brain

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1. Project Information

- Title: Walking in My Words: Understanding the Dyslexic Brain
- Division: Life and Health Sciences
- Purpose: This project explores how a dyslexia simulation affects reading and connects to how dyslexia impacts the brain.is about how dyslexia affects the brain.
- Significance: This project is important to me because I have dyslexia, which causes misunderstandings with teachers, peers, and sometimes even family. I dread reading and writing, it's like climbing a mountain every time I am handed an assignment.

  Instructions: Dyslexia Simulation Instructions

  Google form: Dyslexia Simulation Data Form

  Consent Form: Science Fair 2025-26_ Consent Form (1).docx

  Passage 1 (use level 5): Dyslexia Simulator

  Passage 2: Passage 2

In this experiment participants will read two short paragraphs: one written normally and one modified to stimulate dyslexia. The stimulated paragraph will include mixed up letters, letter reversals and uneven spacing to mimic how reading can feel.
Each participant will be timed while reading the paragraphs, how many reading errors were made, and how difficult each text felt on a scale from 1-5. All participants will be tested individually in a quiet area, and no names will be recorded.
These results will show how the stimulated dyslexic text changes reading speed, accuracy, and difficulty. This helps demonstrate how dyslexia affects the brain's language and proccesing pathways, making reading slower and more challenging.
The purpose of the project is to show people how dyslexia affects reading as well as brain processing. As someone with dyslexia, I want to help others understand what I go through as well as the challenges it creates.

2. Research

What is Dyslexia?

Dyslexia is a learning difference that affects reading, language processing, reading speed, spelling and decoding words. People with dyslexia often have normal or above average intelligence. Dyslexia is neurological, meaning that it is related to how the brain works, not how much effort or motivation the individual puts in.

How Does Dyslexia Affect the Brain?

Reading requires multiple parts of the brain to work together, especially areas in the left side of the brain which handle language and word recognition. In people without dyslexia, these areas work in sync to recognize letters, match sounds to words, and read fluently. In people with dyslexia these areas in the brain are less active and communicate differently, which makes reading slower and more effortful.

Brain imaging studies (like MRI scans) show that individuals with dyslexia often rely on different neural pathways when reading. This can cause letters to appear jumbled, reversed or harder to process quickly, because of this reading can take longer and lead to many mistakes or misunderstandings, especially when the text is long and dense.

How Does Dyslexia Affect Reading Speed?

Reading speed depends on how efficiently the brain recognizes words and connects words and letters to sounds. Typically the brain can quickly identify whole words by using specialized language paths, allowing reading to become fast and automatic. In individuals with dyslexia, these neurological pathways process written language differently, often requiring words to be decoded letter by letter which slows reading speed.

Since reading speed is less automatic, people with dyslexia must use more mental effort while reading.

Dyslexia simulations attempt to recreate this experience by disrupting visual and language processing, which can cause non-dyslexic readers to experience slower reading times.

How Does Dyslexia Affect Reading Accuracy?

Reading accuracy refers to the ability to correctly read words without skipping, mispronouncing, or repeating them. Dyslexia affects the brain's phonological processing system, which is responsible for connecting written letters to spoken sounds. When this system functions differently, reading errors become more common.

Neuro-imaging studies show that individuals with dyslexia may rely on alternative neural pathways during reading. This can increase the likelihood of mistakes such as skipped words, misread letters, or repeated phrases.

Why Use A Dyslexia Simulation?

A dyslexia simulation alters text to visually represent some of the challenges that people with dyslexia experience, such as letter movement or spacing issues. While a simulation cannot completely recreate dyslexia, it helps people without dyslexia understand how reading can feel confusing or difficult. Using a simulation allows researchers to compare reading performance under normal and simulated conditions.

What Is The Connection To This Experiment?

In this experiment, participants read normal text and dyslexia simulated text so that their reading time, number of mistakes, and difficulty ranking can be compared. If the dyslexia simulation increases reading time, errors, and difficulty ratings, then this experiment supports existing research showing that dyslexia affects how the brain processes written language. This project helps increase awareness and empathy by demonstrating these challenges in a controlled way.

3. Hypothesis

Question: What effect does dyslexia simulated text have on reading speed and accuracy?

Answer: If students read a dyslexia simulated text, then their reading time will increase and they will make more errors because the simulation disrupts normal visual and phonological processing similar to what occurs in dyslexia.

Manipulated: Type of text being read (Normal vs. Simulated text)
Responding: Reading time, Number of errors, and the difficulty level (1-5)
Controlled: Same length and difficulty of paragraph, same font size, same instructions given to all participants, and all participants ranging from grade 9-12.

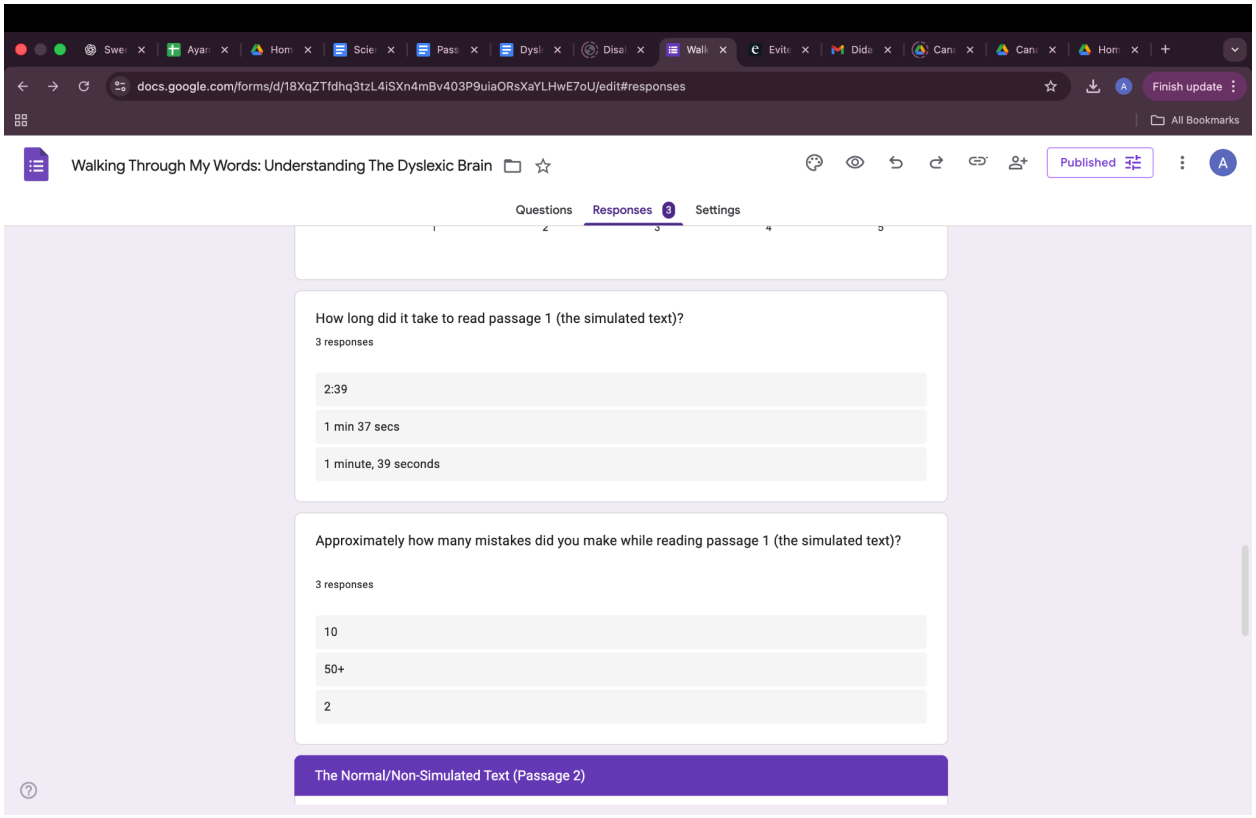
4. Materials

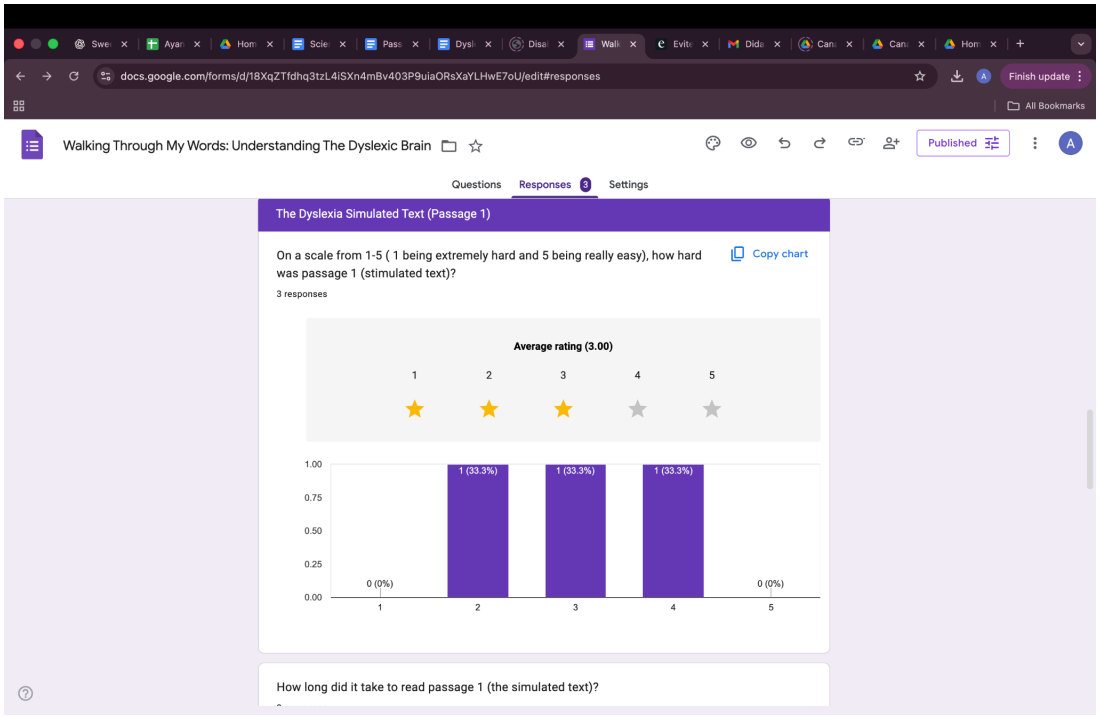
- Computer, tablet or laptop
- Dyslexia simulator website
- Normal text website
- Stopwatch (phone or browser)
- Data collection google form
- Quiet room
- Consent forms/participant information
- Intructions

5. Procedure

1. Prepare the dyslexia simulator website so the same text and simulation settings are used for all participants.
2. Test participants individually in a quiet place
3. Use the same device whenever possible, if different devices are used ensure that the device is around the same size and has the paragraphs saved in the same way (pdf of website).
4. Before starting, ensure that a parent/gardian consent form has been signed.
5. Explain the experiment to the participant and remind them that participation is voluntary and that they can stop at any time.
6. Assign each participant an id number and do not record names.
7. Display the normal (non-simulated) text from the website onto the screen.
8. Start the stopwatch when the participant begins reading and stop it when they finish.
9. Record the reading time and number of errors.
10. Ask the participant to rate the difficulty of the text on a scale of 1-5 (1 being very easy and 5 being very difficult) and record their rating.
11. Allow the participant to have a 30-60 second break.
12. Display the dyslexia simulated text on the same screen.
13. Have the participant read the simulated text.
14. Time the reading again and record the reading time, number of errors and difficulty rating.
15. Thank the participant for their time and repeat steps 5-14 for each participant.
16. After all the trials are completed, calculate the average reading time, number of errors, and difficulty rating for both the normal and simulated texts.
17. Graph the results and analyze how the dyslexia simulation affected reading performance.

6. Data Collection





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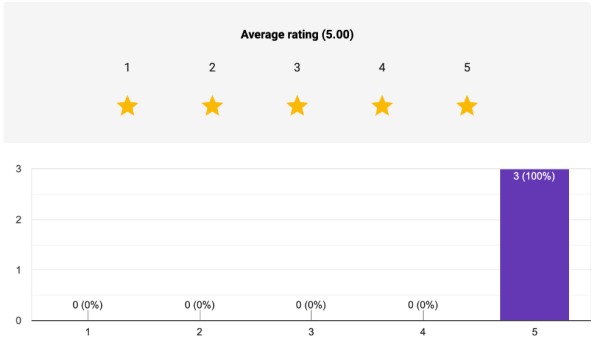
Questions Responses 3 Settings

The Normal/Non-Simulated Text (Passage 2)

On a scale from 1-5 (1 being extremely hard and 5 being really easy), how hard was passage 2 (the non-stimulated text)?

Copy chart

3 responses



How long did it take to read passage 2 (the non-simulated text)?

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Questions Responses 3 Settings

How long did it take to read passage 2 (the non-simulated text)?

3 responses

- 1:37
- 47 secs
- 44 seconds

Approximately how many mistakes did you make while reading passage 2 (the non-simulated text)?

3 responses

- 2
- 1
- 0

7. Analysis

The data showed that average reading time and reading errors increased when participants read the dyslexia simulated text compared to the normal text, as well as most participants rated the simulated text as more difficult on the difficulty scale.

These results suggest that disrupting visual text patterns increases cognitive effort, which aligns with research showing that dyslexia affects how the brain processes written language. The increase of reading time, errors, and perceived difficulty supports the hypothesis that dyslexia-like visual challenges negatively impact reading performance.

8. Conclusion

The results from the experiment support the hypothesis that dyslexia simulated text increases reading time, reading errors, and perceived difficulty compared to normal text. This suggests that when the brain needs to work harder to process written language, reading becomes slower and more effortful. The experiment demonstrates how dyslexia can impact reading performance and highlights the importance of awareness and understanding.

9. Ackgnowlagement

I want to thank my teacher for all of her guidance and support throughout this project. I also want to thank the participants and their parents for volunteering their time. Finally, I appreciate the researchers and organizations whose studies on dyslexia helped me to complete this project.

10. Reflection

This project was personally meaningful to me because I have dyslexia and growing up, I felt that reading required a lot more effort for me than for others, but it was always hard for me to explain exactlyn why. Through this experiment, I was able to scientificlaly explore demonstrate how reading challenges can affect speed, accuracy, and perceived difficulty.

One of the most powerful parts of this project was observing participants react to the dyslexia simulation. Many expressed frustration, confusion, anger or mental fatigue after only one short passage. This helped me realize that the experiences I have had for years can only be partially understood by others. This project reinforced that dyslexia is not related to intelligence, but rather to differences in the way our brains process written language.

This project has also helped me grow as a researcher. I learned how to design an experiment, controll variables, collect data ethically, and review the results with an analytical perspective even when the topic was personal to me. It has taught me that science can be used to discover information and also be used to build empathy and awareness. Overall, this experience has increased my confidence and strengthened my understanding of both neuroscience and myself.

11. Bibliography

"Disability Simulator." *Disabilitysimulator.com*, 2026, www.disabilitysimulator.com/dyslexia?utm. Accessed 3 Mar. 2026.

"Dyslexia." *Understood*, 6 June 2022, www.understood.org/en/topics/dyslexia.

"Dyslexia Canada | Official Website." *Dyslexia Canada*, 19 Jan. 2024, dyslexiacanada.org/.

"Home." *Dyslexie Font*, dyslexiefont.com/en/.

International Dyslexia Association. "International Dyslexia Association – …until Everyone Can Read!" *Dyslexiaida.org*, 2017, dyslexiaida.org/.

Marshall, Abigail. "Brain Scans Show Dyslexics Read Better with Alternative Strategies." *Dyslexia the Gift*, 30 June 2019, www.dyslexia.com/research/articles/alternative-brain-pathways/.

Mayo Clinic. "Mayo Clinic." *Mayoclinic.org*, Mayo Foundation for Medical Education and Research, 2025, www.mayoclinic.org/.

McDonough, Molly. "Dyslexia and the Developing Brain | Harvard Medicine Magazine." *Magazine.hms.harvard.edu*, Dec. 2023, magazine.hms.harvard.edu/articles/dyslexia-and-developing-brain.

NIH. "Homepage | NICHD - Eunice Kennedy Shriver National Institute of Child Health and Human Development." *Nih.gov*, 2019, www.nichd.nih.gov/.

Terada, Youki. "Do Dyslexia Fonts Actually Work?" *Edutopia*, 24 June 2022, www.edutopia.org/article/do-dyslexia-fonts-actually-work/.

"Yale Dyslexia." *Yale Dyslexia*, 2017, dyslexia.yale.edu/.

Zettler-Greeley, Cynthia. “Understanding Dyslexia (for Teens) - KidsHealth.” *Kidshealth.org*, May 2022, kidshealth.org/en/teens/dyslexia.html.

Wilkinson, Freddie. “The History of Space Exploration | National Geographic Society.” *Education.nationalgeographic.org*, National Geographic, 24 Oct. 2022, education.nationalgeographic.org/resource/history-space-exploration/.

12. Daily Logs

Date	Time Spent	Worked On
December, 12, 2025	15 min	Met with Ms. Fan and finalized my idea for the project.
December, 15, 2025	30 min	Came up with my research question and hypothesis.
December, 16, 2025	1hr	Started research and found a good dyslexia simulator.
December, 17, 2025	1hr & 30 min	Continued research and found an un-simulated passage.
December, 18, 2025	1hr	Completed research.
January, 5, 2026	1hr	Figured out and wrote down the procedure.
January, 12, 2026	1hr	Created a google form and edited the consent form,
January, 13, 2026	1hr	Attatched all the links to the resources and created intructions for the experiment.
January, 14, 2026	20 min	Sent the google doc with instructions to all my friends.
February, 12, 2026	1hr	Anylized my data and created a table.
February, 18, 2026	1hr	Wrote my observations, and analysis.
February, 19, 2026	1hr	Wrote my conclusion, and application.
February, 23, 2026	1hr	Wrote down the sources of error and the ackgnowlagements.
February, 25, 2026	45 min	Created my bibliography.
March, 2, 2026	1hr & 30 min	Finished uploading everything to the portal.