Teen academic proficiency and later adult economic outcomes for Dyslexic individuals

Sorielis Paulino Polanco, Quantitative Analysis Center, Wesleyan University

Introduction

- Dyslexia affects 17-21% of students, impacting reading, math, and processing abilities (Herrera-Arajo, 2017). Dyslexia is also a genetic and lifelong condition that affects brain development and processing information, which connects to mental disorders like anxiety, depression, and ADHD (Moll,2022)
- Students with dyslexia who come from lower-income families are often unable to access the same resources that higher-income families can, which creates a significant socioeconomic barrier(Romeo,2022)
- Students who have reading disabilities are 74% less likely to have a higher level of education, and 56% are less likely to have a higher level of economic success (McLaughlin, 2014).
- For instance, adults with dyslexia are estimated to earn 15% less per year, about $8,000 less than people without it (Herrera, 2017).
- However, these studies rarely address the fact that a lot of individuals with dyslexia are also capable of achieving high-level professional success, including becoming CEOs.

Methods

Sample

- Respondents (n=20,745) were drawn from the National Longitudinal Study of Adolescent to Adult Health, with Wave 1 including adolescents in grades 7-12 during 1994-95. While Wave 5 was also conducted during 2016-2018.

Measures

- **Reading proficiency** was measured in Wave 1 using participants' self-reported grades in English, ranging from A to D. **Math proficiency** was measured using self-reported grades in math, also ranging from A to D. **Dyslexia** was determined by participants' self-reported having a specific learning disability, including difficulties with reading, writing, or math (0 = no, 1 = yes).
- **School grade** at Wave 1 was recorded from 7th to 12th grade, **Adult income** was measured in Wave 5 based on self-reported personal earnings before taxes, with responses categorized into 13 levels from less than $5,00 to $200,000 or more. Analyses also controlled for **education level, gender, race, and Job.**

Research Questions

- Identifying the relationship between reading and math proficiency and the adult income of individuals with dyslexia or without
- Determine whether early reading and math proficiency in adolescence predict adult income.
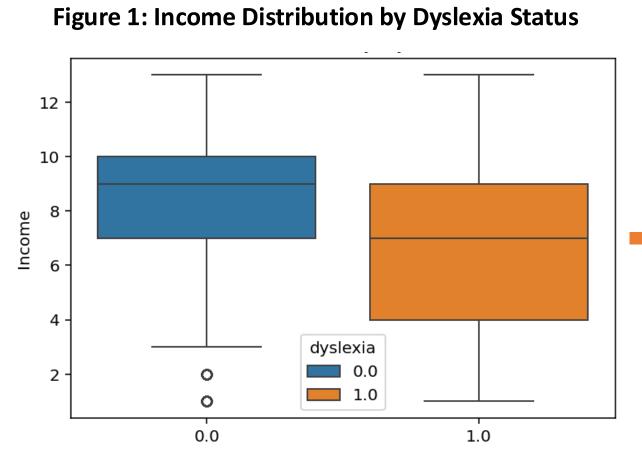
Results

Univariate

- 737 out of the 5,767 sampled students are dyslexic.
- In the dataset, 1,552 students received a math grade of A, 1,899 received B, 1,521 received a grade of C, and 950 received a D or lower.
- In the dataset, 1,712 students received an English grade of A, 2,389 received a B, 1,435 received a C, and 647 received a D or lower.
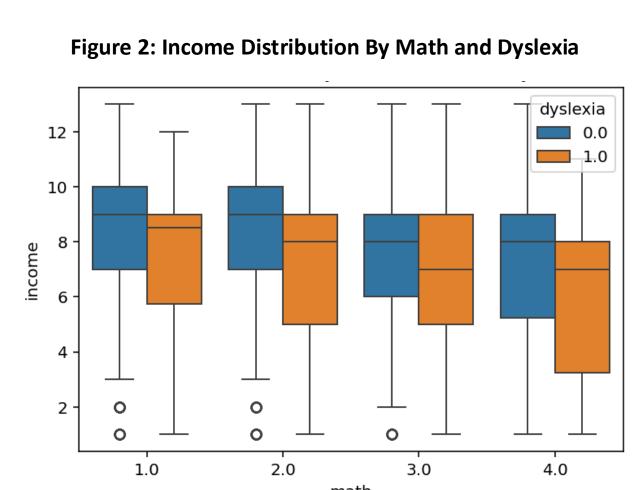
Bivariate

- ANOVA: People with dyslexia have, on average, almost the same job score as those without dyslexia. Which means that it is not significant (B = -0.0219 , p = 0.869). Meaning there is no evidence that dyslexia changes the job outcome.
- ANOVA: People with dyslexia have earned significantly less income than those without dyslexia (B = -1.2374, p< 0.001). Which means that people with dyslexia will have less amount of income.
- Logistic Regression: Higher income is associated with lower odds of having dyslexia, with each increase in income category reducing the likelihood of dyslexia by about 12%. (Figure 1)
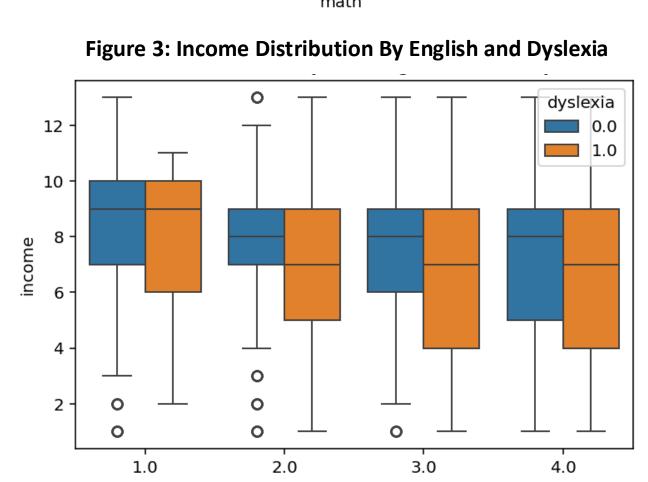
Multivariate

- The multiple linear regression was used with job scores from dyslexia, math, English proficiency, gender, and race. This regression is not statistically significant (p = 0.298). Dyslexia is not a significant predictor of job outcome (B = 0.0776, p = 0.572). Math, gender, and race were also not significantly. But, reading was significant (B = -0.0987, p = 0.037). This means that adult job outcomes are not determined by these factors.
- The multiple linear regression predicting income from dyslexia, gender, education, race and school grade and job type. The model was significant (p<0.001). Dyslexia is associated with significantly lower income (B = -0.8262 , p < 0.001), which means that individuals with dyslexia earn less than $5,000. Education (B = 0.3259 , p < 0.001) and school grade (B = 0.1114 , p < 0.002) were significant with income. Gender and race showed significant associations with income.
- In the regression predicting income from math and dyslexia, (B= -1.205, p < 0.001), which means controlling for math grade, students with dyslexia earn on average $1.205k less than those without dyslexia. (Figure 2)
- Similarly, with English and dyslexia (B = -1.175, p< 0.001) and the English levels range from -0.646 to -1.494 p <0.0001), this shows that dyslexia is consistently associated with lower income. (Figure 3)

Figure 1: Income Distribution by Dyslexia Status

Figure 2: Income Distribution By Math and Dyslexia

Figure 3: Income Distribution By English and Dyslexia

Discussion

- The purpose of this study is to examine whether dyslexia is associated with socioeconomic factors such as income, education, gender, race, and school grade level and job. With the tests, the findings showed that individuals with dyslexia face socioeconomic disadvantages.
- The multivariate regression shows that dyslexia does not significantly predict job scores even after controlling for math proficiency, English, gender, and race. Which means that dyslexia does not determine the job outcome.
- Also, dyslexia remains significant to income instead of jobs. Which means that individuals with dyslexia earn less than $5,000.
- Education and school grade are associated with income, which shows that having a higher grade level and education does connect with having a better income. This shows how important it is to have academic success, which shows higher earnings and economic stability.
- This study does have limitations since the dataset does not have any long-term math and reading proficiency. For example, college-level outcomes or ongoing education. Also, there was no data on accommodations; if we had that data, it would show a significant influence on the socioeconomic outcome.
- Even with the limitations, we see a big impact when it comes to economic inequality. This is important for future researchers to better understand the minds of these students and to provide more resources for students who do not have access to special education and more accommodations.

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