Specialized and altered fonts: A meta-analysis on reading rates for individuals with dyslexia

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Background

Designers have attempted to create fonts specific to readers with dyslexia to make it easier for them to read. These fonts typically contain bolder letters, lack serifs, and have heavier markings on the letters' bottom, making them appear weighted.

Other more common fonts have been altered to have similar characteristics to dyslexia specific fonts by adding space within and between words to reduce visual crowding between the letters and words.

A dyslexia font is appealing because if a special font does assist individuals with dyslexia, printing text using this font would be a quick and relatively low-cost accommodation to use.

Purpose

A meta-analysis is being undertaken to review all existing literature that manipulates font for readability with individuals with dyslexia to determine its efficacy.

Research Question

Do fonts modified for individuals with dyslexia result in an increased reading rate compared to standard fonts in samples of individuals with dyslexia?

Methods

The study was accomplished by searching five databases using the terms *dyslexia* and *font*, along with a second search using the terms *dyslexia* and *spacing* because added spacing was a commonality of the studies found during the initial search.

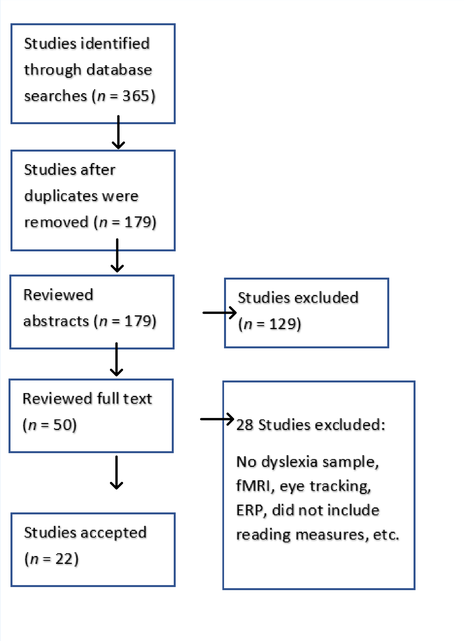
The searches yielded a total of 365 results. After duplicates and irrelevant articles (based on abstracts) were removed, 50 articles were noted for additional review to determine if they met the criteria for the meta-analysis. Criteria included a sample with dyslexia, use of dyslexia specific or altered font, and measured reading rate as the outcome. A total of 22 studies met the search criteria.

Examples of Manipulated Fonts

Many studies have altered common fonts to resemble dyslexic specific fonts and when matched for size and spacing, they appear very similar to dyslexic specific fonts.

The student reads the book.	OpenDyslexic
The student reads the book.	Arial with increased spacing
The student reads the book.	Comic Sans MS

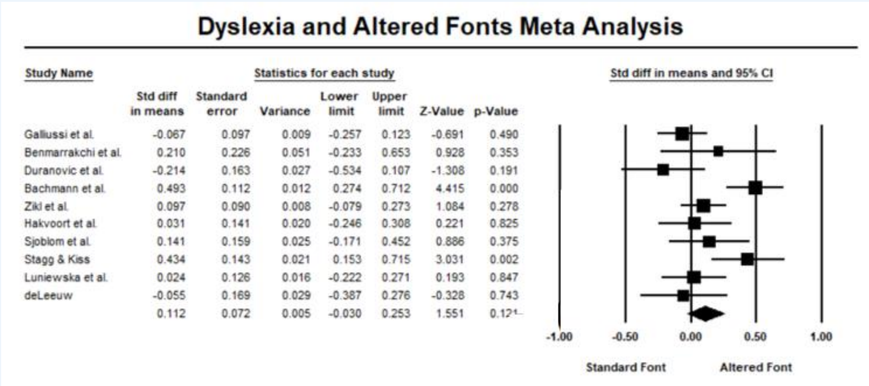
Methods Continued



Study Characteristics

Study	Font characteristics: Dyslexia Specific	Font characteristics: Added Space	Mean Age	Language	Outcome
Bachmann & Mengheri (2018)	EasyReading		9.5	Italian	Increased rate
Benmarrakchi & Kafi (2021)	Arabolexia		10.5	Arabic	No difference
Duranovic et al. (2018)	Dyslexie		10.77	Bosnian	No difference
Galliussi et al. (2020)		inter-letter and inter-word	12.4	Italian	No difference
Hakvoort et al. (2017)		Inter-letter	9.11	Dutch	No difference
(de)Leeuw (2010)	Dyslexie		21.5	Dutch	No difference
Luniewska et al. (2021)		Inter-letter	12.17	Polish	No difference
Sjoblom et al. (2016)		Inter-letter	22.58	English	No difference
Stagg & Kiss (2021)		Inter-letter	13	English	Increased rate
Zikl et al. (2015)	OpenDyslexic		10.24	Czech	No difference

Results



- Although this analysis is still in progress, the current mean effect size is 0.112 with a 95% confidence interval of -0.030 to 0.253.
- The overall effect size is not statistically different than zero.

Conclusions and Implications

- Although dyslexia specific and altered font could be an relatively inexpensive accommodation for individuals with dyslexia, the current results do not demonstrate their efficacy.
- The use of dyslexia specific fonts is not justified based on the results of these 10 studies.
- There is a need to conduct more studies in English and use word reading accuracy as an outcome measure. This is a primary characteristic of dyslexia in English.

Limitations

- Publication bias, which may be of concern given the large number of studies reporting no differences between standard and dyslexia specific fonts.
- Limited number of studies within data set.
- Limited number of studies using English.

Next Steps

- Analyze the full sample of 22 studies.
- Perform a moderation analysis with the full sample of studies to test if an effect of dyslexia specific font is moderated by participant age.

References

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