A psychophysical approach for investigating format readability online

THE READABILITY CONSORTIUM
https://thereadabilityconsortium.org

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Introduction

We introduce a scientific tool designed for online reading performance studies. This tool:

- **Determines optimum reading format** for individuals by **allowing experimenters to manipulate** various text parameters.
- Utilizes online testing via **Pavlovia and Psychopy,** enabling large-scale participant testing.

The tool's primary function is to assess reading performance across various typefaces, font parameters (e.g. weight, width, etc.), letter spacings by ranking comprehension scores and reading speed.

Methods

- The **Readability Tool was designed using Psychopy** v2.2.3 and its online counterpart Pavlovia (Peirce et al., 2019).
- This tool is an online Psychopy experiment **with multiple layers of Javascript code that run on Pavlovia.**
- This tool works in parallel with another tool "**Readability Image Converter**", which uses text input and creates images to display during the experiment.

Text Variables

Currently, this tool allows testing:

- Different fonts
- Letter spacing (i.e. text-kerning)
- Different axes of variable fonts (grade, optical size etc.).

Different Fonts

Here's how to make the best tuna fish sandwich in the neighborhood, maybe the entire galaxy!
(Times)

Here's how to make the best tuna fish sandwich in the neighborhood, maybe the entire galaxy!
(Comic Sans)

Roboto Flex Variable Font

Here's how to make the best tuna fish sandwich in the neighborhood, maybe the entire galaxy!
(font grade -50)

Here's how to make the best tuna fish sandwich in the neighborhood, maybe the entire galaxy!
(font grade 100)

Letter Spacing

Here's how to make the best tuna fish sandwich in the neighborhood, maybe the entire galaxy!
(-0.05 em)

Here's how to make the best tuna fish sandwich in the neighborhood, maybe the entire galaxy!
(0.05 em)

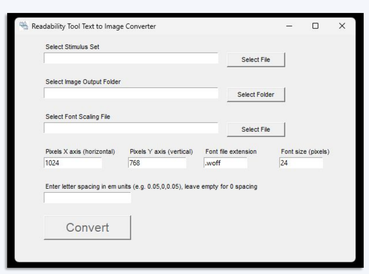
Preparing Stimuli

Tool comes with a stimulus spreadsheet that can be modified to create your text stimuli with the following steps:

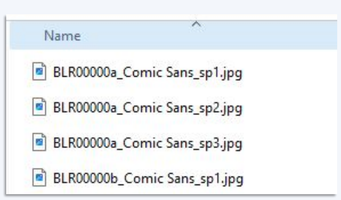
1. Modify the sheet for your text stimuli and Prepare font files for your text variables
2. Feed the files into the **Readability Image Converter**
3. Get .jpg images of your stimuli.

1

2



3



The Readability Tool

- **Stimulus images (e.g. passages, sentences, or words) and respective questions** are selected from the custom spreadsheet that the experimenter prepares.
- Order of stimuli and conditions are **randomized**
- It allows **specifying the text conditions** in your experiment (e.g. Arial, Comic Sans etc.).

Schematic Representation of the Test

Text Stimulus Display	Comprehension Questions	Feedback Questions	Ending Message/Display of Best-Worst Conditions
Here, image of the text stimulus is displayed. Font or letter spacing of this text is determined by your conditions.	*Here, multiple choice question(s) is asked to assess comprehension/memory of the preceding stimulus*	*Here, likert question(s) is displayed to assess familiarity/interest regarding the text stimuli.*	*Reading performance across conditions is assessed and best and worst performing conditions are displayed at the end.*

Loops over all stimuli

- Once test is completed, conditions with the **best and worst reading performance are displayed** on the screen.

Conclusion

The future of the readability tool holds great potential, facilitating both academic research and practical applications in various fields such as

- Providing insights into **personalized education and accessibility design**.
- Proliferating the innovative research **exploring the intersections of typography, cognitive psychology, and digital user experience** by reducing financial barriers and simplifying the experimental setup.

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