

# A Preliminary Experiment on Japanese Typefaces Designed for Readers with Dyslexia

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## Background

- Tani et al. (2016) reported that
  - Japanese typefaces have impacts on subjective readability of written materials for readers with dyslexia;
  - there is a difference between objective and subjective readability.
- We created 2 sets of Japanese typefaces for readers with dyslexia—LiS Font walnut and LiS Font cashew—and reported their features in previous research.

## Methods

### Procedures

- Rapid reading tasks**
  - duration time, number of errors, and number of self-corrections are recorded
- Interview regarding to most and least readable typefaces**

### Materials

- Eight kinds of stimuli
- Two kinds of written materials (text and random kana characters)
  - Four kinds of typefaces (LiS Font walnut, LiS Font cashew, Hiragino Maru Gothic, Hiragino Mincho)

### Participants

Six children who possess symptoms of dyslexia (mean[±SD] age, 10.17±1.47 years)

ID	1	2	3	4	5	6
Age	11	9	8	11	12	10
Gender	M	M	M	M	M	M

LiS Font walnut (walnut)

りすフォントくるみ

LiS Font cashew (cashew)

りすフォントかしう

Hiragino Maru Gothic (maru)

ヒラギノ丸ゴシック

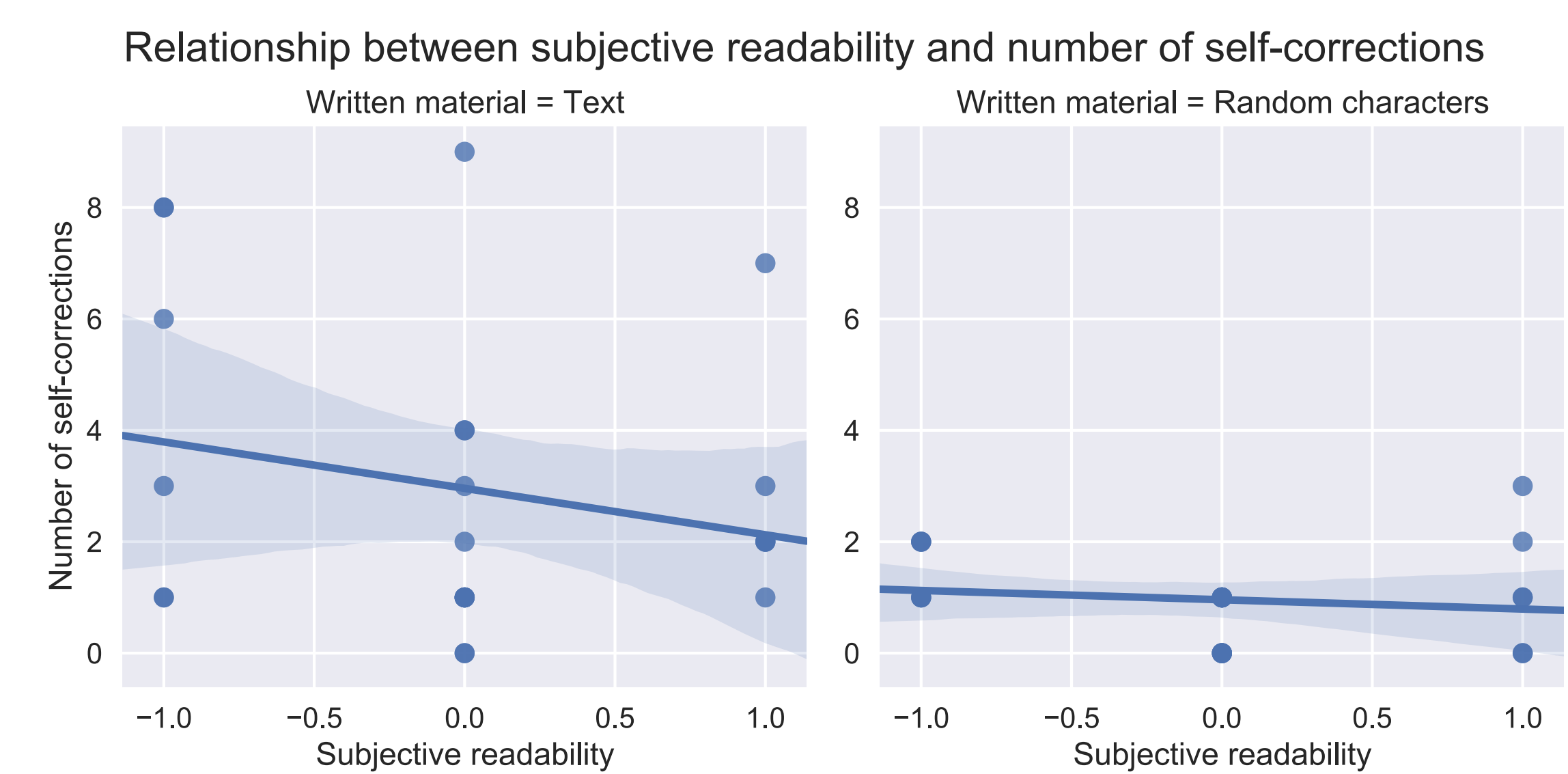
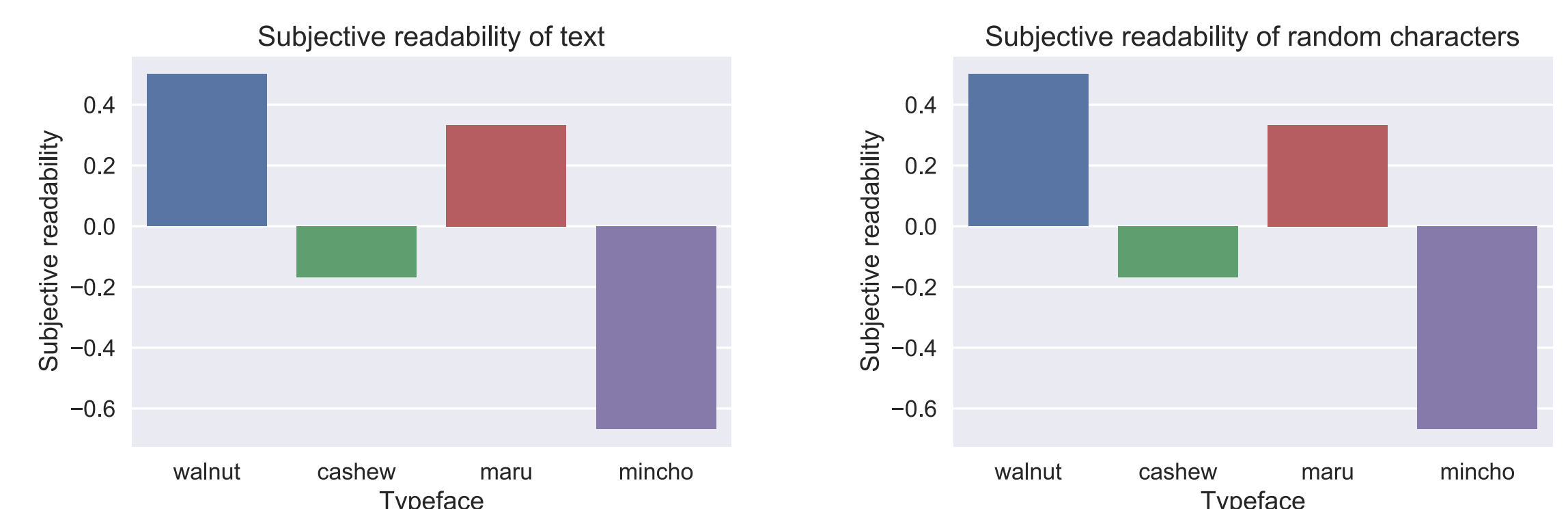
Hiragino Mincho (mincho)

ヒラギノ明朝

## Results

### Overview

			Duration time (s)	Number of errors	Number of self-corrections	Subjective readability
Text	walnut	mean	70.50	2.33	2.50	0.50
		SD	26.91	1.75	2.35	–
	cashew	mean	75.00	1.50	3.17	-0.17
		SD	41.65	0.84	3.54	–
	maru	mean	70.50	3.00	2.67	0.33
		SD	26.17	1.79	1.21	–
	mincho	mean	71.50	2.00	3.50	-0.67
		SD	31.19	0.89	3.62	–
Random characters	walnut	mean	29.50	1.17	1.17	0.50
		SD	6.77	0.75	1.17	–
	cashew	mean	28.67	0.50	0.83	-0.17
		SD	4.58	0.55	0.98	–
	maru	mean	27.17	1.00	0.83	0.33
		SD	6.01	0.89	0.41	–
	mincho	mean	28.67	0.50	1.00	-0.67
		SD	4.50	0.55	0.63	–



### Case summary

ID	Most readable typeface		Least readable typeface		Features of readable and/or preferable typefaces	Symptoms of reading difficulties
	Text	Random characters	Text	Random characters		
1	maru	walnut	mincho	cashew	Larger characters/Bolder strokes/Larger counters	Making errors when reading
2	walnut	walnut	mincho	mincho	Larger characters	Making errors when reading/Lack of reading fluency
3	walnut	cashew	mincho	mincho	Larger characters	Lack of reading fluency/Not good at reading kanji characters
4	cashew	walnut	mincho	mincho	Bolder strokes	Making errors when reading/Skipping characters and lines
5	maru	maru	cashew	mincho	Handwriting styles	Seeing non-existent shapes when reading
6	walnut	maru	cashew	cashew	Standard typefaces	No symptoms of reading difficulties

## Conclusions and Discussion

- Objective indicators**—duration time, number of errors, and number of corrections—show **no significant difference** between the four kinds of typefaces.
- Subjective indicator**—subjective readability—implies that there is a **significant difference** between four kinds of typefaces.
- We can put forward the following hypotheses from the results and they will be tested in future research:
  - A **negative correlation between subjective readability and number of self-corrections** exists;
  - Participants are aware of features of typefaces they are comfortable with;
  - Participants with similar symptoms of reading difficulties have similar preferences of typefaces.**

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**Reference** Tani, N., Goto, T., Uno, A., Uchiyama, T., & Yamanaka, T. (2016). The Effects of Font Type on Reading Aloud in Japanese-Speaking Children with Developmental Dyslexia [in Japanese]. The Japan Journal of Logopedics and Phoniatrics, 57(2), 238–245.