

Stroop Effect experiment data analysis

Project description

This project analysed a dataset from a Stroop Effect experiment.

Detailed information about this experiment:

<https://faculty.washington.edu/chudler/words.html#seffect>

The dataset from:

<https://drive.google.com/file/d/0B9Yf01UalbUgQXpYb2NhZ29yX1U/view>

Independent variable and Dependent variable

The independent variable is word condition(word congruency), either congruent or incongruent.

The dependent variable is the total time that participants used for a wordset.

Hypotheses

$$H_0: \mu_i - \mu_c = 0$$

Null hypothesis (H_0) states that there is no difference between incongruent and congruent population mean times.

μ_i denotes incongruent population mean and μ_c denotes congruent population mean.

$$H_A: \mu_i - \mu_c \neq 0$$

Null hypothesis (H_A) states that there is a significant difference between incongruent and congruent population mean times.

μ_i denotes incongruent population mean and μ_c denotes congruent population mean

Statistical test

This is a T-test because the population mean and standard deviation are unknown, also sample size is small ($n < 30$).

This is a dependent test because of the repeated measurements, participants take 2 tests with different word conditions orderly.

This is a 2-tailed test because no direction is predicted.

Descriptive statistics

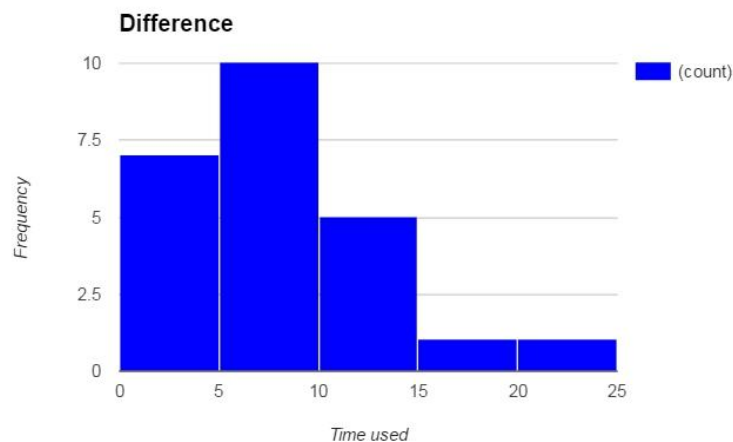
Table 1

Results of Descriptive Statistics for Stroop Effect Experiment.

Congruent			Incongruent			Difference		
\bar{x}_c	SD	n	\bar{x}_i	SD	n	$\bar{x}_i - \bar{x}_c$	SD	n
14.05	3.56	24	22.02	4.8	24	7.96	4.86	24

Figure 1

Histogram of time difference between Congruent test and Incongruent test.



This is a positive skewed distribution

T-test

Table 1

Results of T test for Stroop Effect Experiment.

Mean of Difference				
$\bar{x}_i - \bar{x}_c$	SE	t-value	t-critical	df
7.96	0.99	8.02	2.069*	23

* $p < .05$

Results of the t-test show a statistically significant mean difference between Congruent test and Incongruent test, null hypothesis rejected. We can say that the sample is different from the population. So the time took is different between those two experiments and the participants took less time to say all the congruent words than to say the incongruent ones.

Reference

1. <http://www.dummies.com/education/math/statistics/how-to-use-the-t-table-to-solve-statistics-problems/>
2. http://lap.umd.edu/psyc200/handouts/psyc200_0812.pdf
3. <http://www.differencebetween.net/miscellaneous/difference-between-z-test-and-t-test/>
4. <http://www.psychology.emory.edu/clinical/bliwise/Tutorials/TOM/meanstests/assump.htm>