

Project on testing a perceptual phenomenon

Project Background and Description

Stroop Effect is the psychological phenomenon by which it can perform various Computing descriptive statistics and perform a statistical test on a data set.

Link to Dataset: [Stroopdata.csv](#)

1. Independent Variable and Dependent Variable

Independent Variable:

- It is the condition in which a **congruent** words and **incongruent** words condition are present.

Dependent Variable:

- It is the **Performance of the participant**.

2. Set of Hypotheses and Statistical test

Set of Hypotheses:

The set of hypotheses that are considered for this dataset is **Null Hypotheses** and **Alternative Hypotheses**.

Where,

Null Hypothesis is $H_0 : \mu_C$ (that is greater than or equal to) μ_I

Mathematical Expression is $H_0: \mu_C \geq \mu_I$

Alternative Hypothesis is $H_a : \mu_C$ (lesser than) μ_I

Mathematical Expression is $H_A: \mu_C < \mu_I$

(here μ is a population mean,

the subscript "C" represents the congruent words condition, and

the subscript "I" represents the incongruent words condition.)

Statistical test:

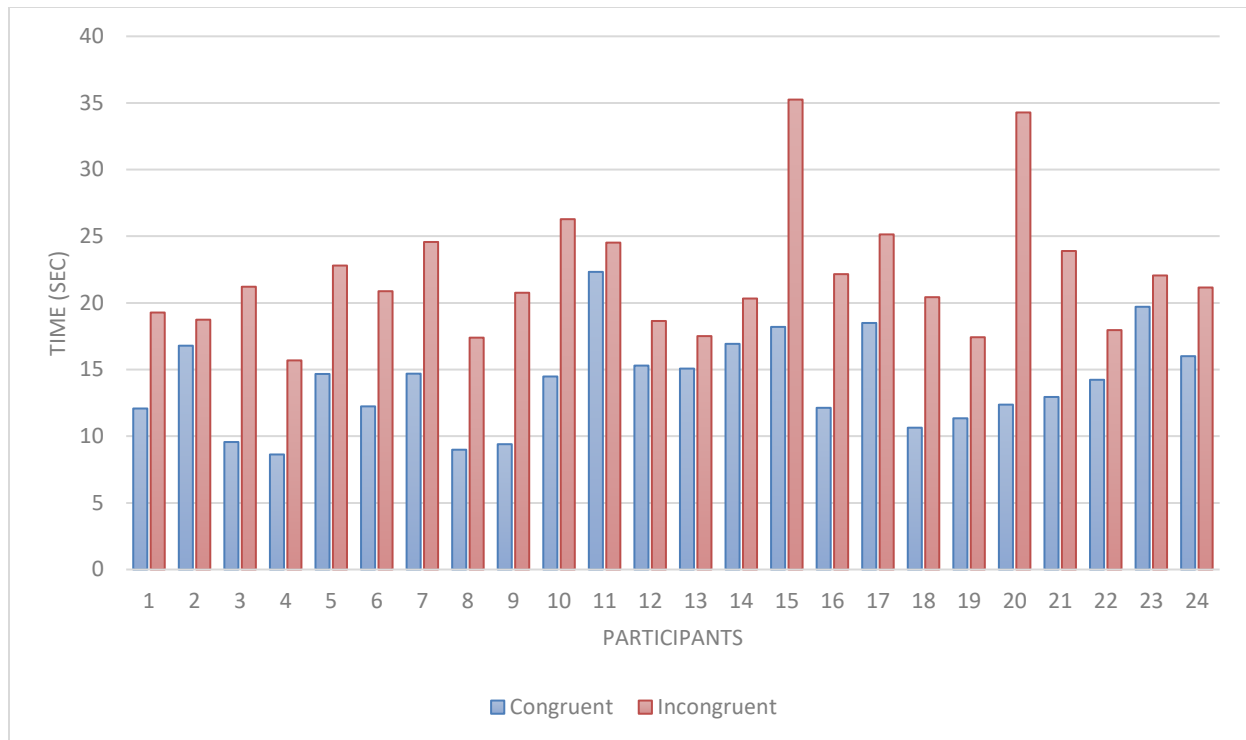
The statistical test which is considered to be performed is **Two-tailed dependent t-test**.
The reasons to opt this test is because,

- 1) The sample size was below 30
- 2) The population's standard deviation is unknown.
- 3) To know the difference between the two paired samples.

3. Measure of Central Tendency

	Congruent	Incongruent
Mode	22.328	35.255
Mean	14.051	22.0159
Median	14.356	21.017
N	24	24
Sample Standard Deviation	3.56	4.80

4. Distribution of the Sample Data



Each participant's congruent time Vs their incongruent time.

5. Statistical Test

- The Confidence Level on the mean difference is 95%; where CI = (-18.03, 2.10)
- The Critical Statistic value is given by -2.069, 2.069
- The value for $d = -1.64$
- The value of $r^2 = .74$

Reasons to reject the null hypothesis or fail to reject

$t(23) = -8.02, p < 0.05$, two-tailed

Null Hypothesis should be **rejected**. As the p value falls into the critical region of 0.05.

Did the results match up with your expectations?

Yes, This result I found matched up with my expectation.

References and Dataset

https://en.wikipedia.org/wiki/Stroop_effect
[Stroopdata.csv](#)

