

# PROJECT ON TESTING A PERCEPTUAL PHENOMENON

## Project Background and Description

Computing descriptive statistics and perform a statistical test on a data set based on a psychological phenomenon [Stroop Effect](#).

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

## 1. Independent Variable and Dependent Variable

### *Independent Variable:*

- The condition – a **congruent** words and **incongruent** words condition.

### *Dependent Variable:*

- The **Performance of the participant**.

## 2. Set of Hypotheses and Statistical test

### *Set of Hypotheses:*

The set of hypotheses that, I prefer for this dataset is **Null Hypotheses** and **Alternative Hypotheses**.

Where,

#### **Null Hypothesis:**

There will not a difference in the population means reaction time between congruent and incongruent conditions. (  $H_0: \mu_C$  equals to  $\mu_I$  ).

**Mathematical Expression is  $H_0: \mu_C = \mu_I$**

#### **Alternative Hypothesis:**

The population mean reaction time in incongruent condition will take longer than congruent condition. (  $H_1: \mu_C$  Lesser than  $\mu_I$  )

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

(where  $\mu$  is a population mean, the subscript "C" represents the congruent words condition, and the subscript "I" represents the incongruent words condition.)

### Statistical test:

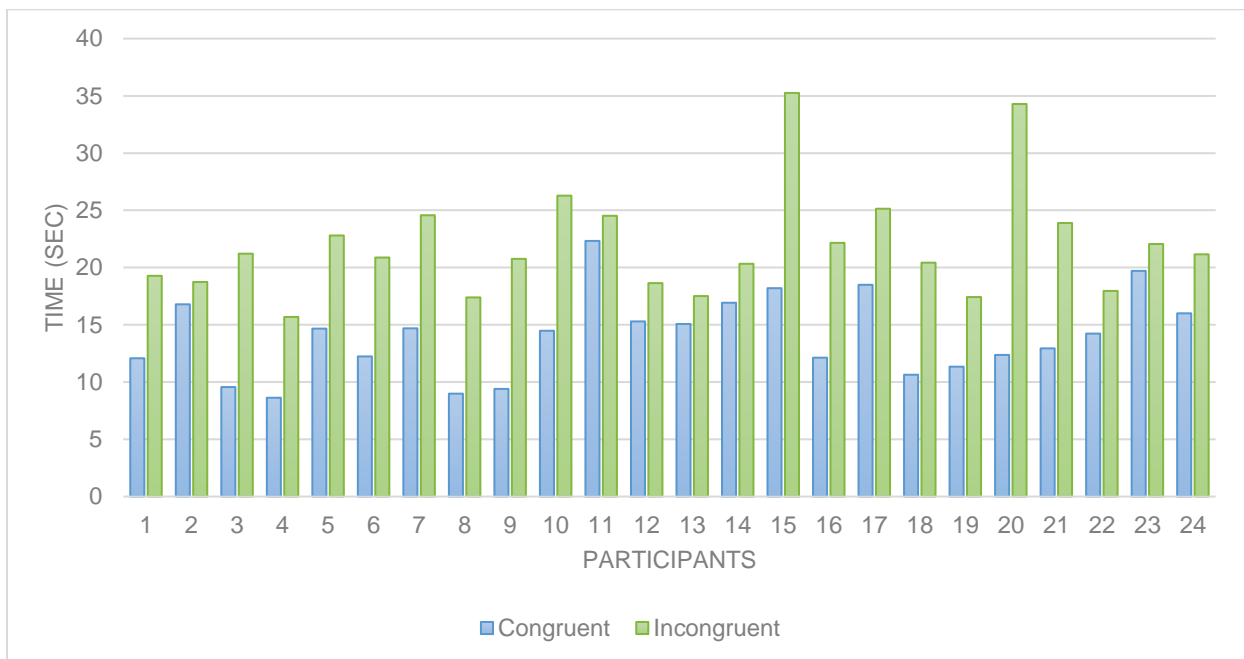
The statistical test that, I prefer to perform is **Two-tailed dependent t-test**.  
Because,

- 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

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

**Do you reject the null hypothesis or fail to reject it?**

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

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

**Did the results match up with your expectations?**

Yes, This result match up with my expectation.

## References and Dataset

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