

Project 1: Test a perceptual phenomenon

Stroop Effect Experiment

1. Independent variable:

The congruency condition, i.e. whether the words are congruent to the color in which they are written or not.

Dependent variable:

The time taken to name the color in which the words are written.

2. $H_0 : \mu(i) = \mu(c)$

$\mu(i)$ = The population mean of the time taken to read the incongruent words.

$\mu(c)$ = The population mean of the time taken to read the congruent words.

$H_A : \mu(i) > \mu(c)$

We expect to perform a one tailed two- sample independent t-test.

This is because the two samples come from two different populations. The two samples are relatively independent of each other.

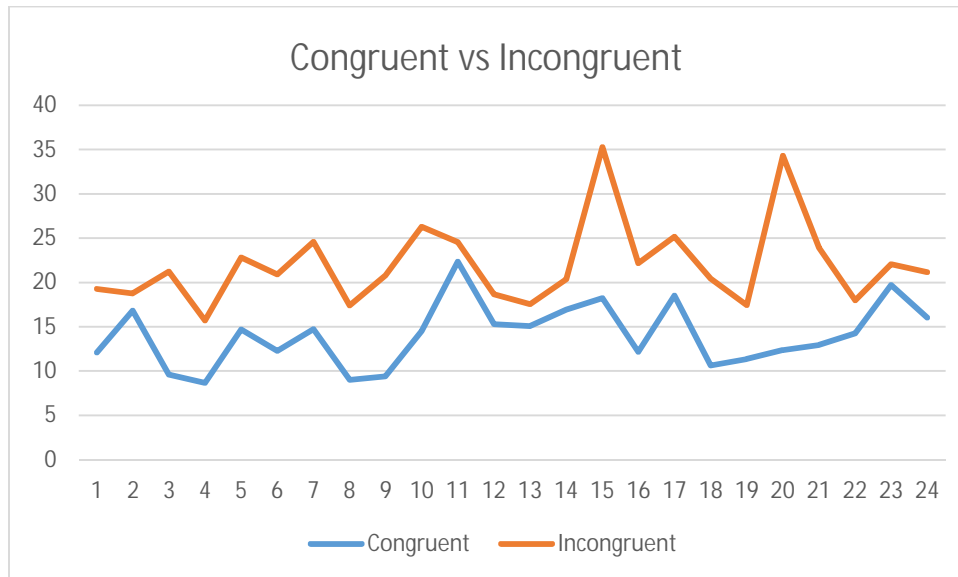
3. Sample mean of congruent time = 14.05113

Sample mean of incongruent time = 22.01592

Sample standard deviation of congruent time = 3.559358

Sample standard deviation of incongruent time = 4.797057

4.



We observe that the time taken for reading incongruent words is more than the time taken for reading congruent words but the graphs have similar shape and show similar variability.

5.

t-statistic = 13.0645

Alpha = 0.05

degrees of freedom = 46

t(critical) = 1.676

We reject the null hypothesis. We conclude that the time taken to read the incongruent words is significantly more than the time taken to read the congruent words.

Yes. The results matched up to our expectations because after visualizing the graphs of the two samples, one can clearly see that the

values of congruent word times are very much less than the values of incongruent times.

6.

The effects occur because the human mind tends to read the word first without considering the color of the word. It requires extra effort on the individual's part to determine the color besides what is written as the text, which additionally diverts attention from the color itself. The individual is confused because of the incongruence of the two.

Similar Effect:

The spatial Stroop effect demonstrates interference between the stimulus location with the location information in the stimuli. In one version of the spatial Stroop task, an up or down-pointing arrow appears randomly above or below a central point. Despite being asked to discriminate the direction of the arrow while ignoring its location, individuals typically make faster and more accurate responses to congruent stimuli (i.e., an down-pointing arrow located below the fixation sign) than to incongruent ones (i.e., a up-pointing arrow located below the fixation sign).

Link: https://en.wikipedia.org/wiki/Stroop_effect