PROJECT ON TESTING A PERCEPTUAL PHENOMENON BETWEEN CONGRUENT AND INCONGRUENT DATASET DATASET LINK

1. Dependent and Independent variable

- Here the color and the words given are independent variable.
- In the given congruent and incongruent dataset time is the dependent variable.
- we have two different conditions in the same experiment as words displayed are color words whose names do or do not match the colors in which they are printed.

2. Set of Hypotheses and Statistical test

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

Where,

Null Hypotheses is Ho : μ (equal to) μi

Alternative Hypotheses is Ha : μ (greater than) μi, μ (lesser than) μi, μ (not equal to) μi

The Statistical test that, I prefer to use is one tailed t-test . since we have a dependent and independent variable.

Here C is the congruent variable and I is the Incongruent variable.

It is a population mean as it gives only the sample scenarios.

A t-test is appropriate because the population variance is unknown and the sample size is less than 30. When the sample size is less than 30, the sample data no longer approximate a normal distribution, which makes the use of a Z-value inappropriate

3. Measure of Central tendency

For **congruent** values

N= 24

S = 3.5

S^2=12.7

SE=0.72

Mode = 22.33

Mean = 14.05

Median= 14.35

For **incongruent** values,

N=24

S=4.8

S^2=23

SE=0.73

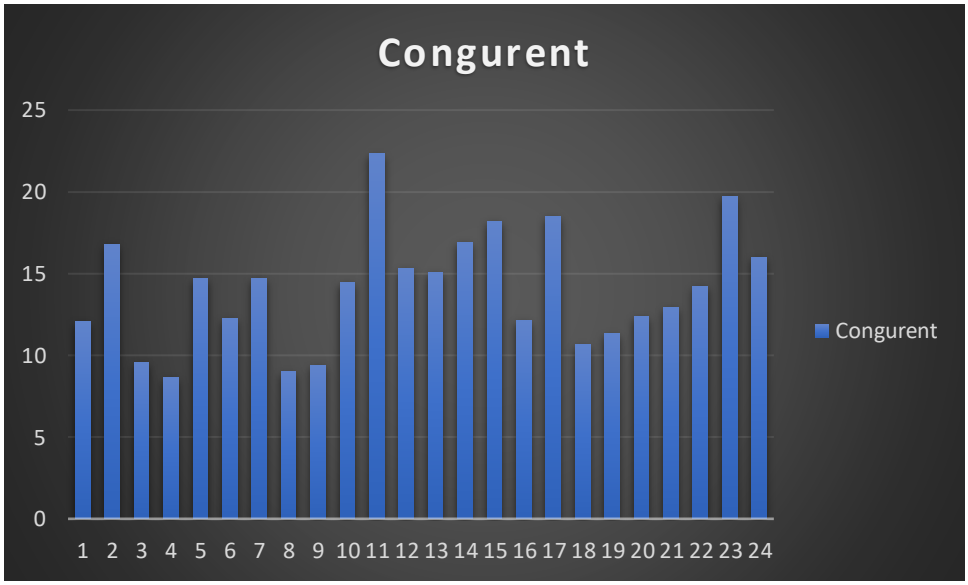
Mean =22.016

Median = 21.017

Mode = 35.26

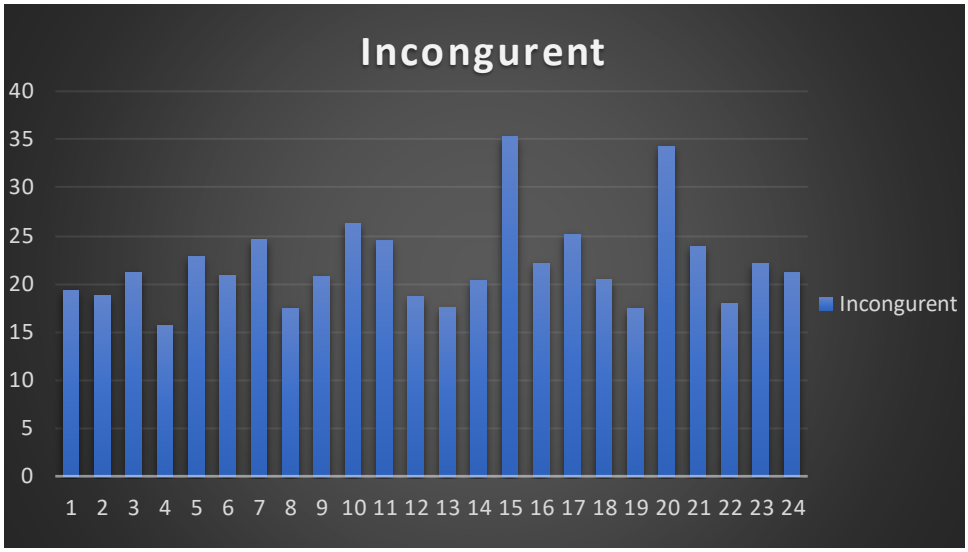
4. Visualization of Dataset

Congruent Visualization



From the above visualization, It is clear that this is a Normal Distribution

Incongruent Visualization



From the above visualization, It is clear that this is also a Normal Distribution .

Normal Distribution: A normal distribution, sometimes called the bell curve, is a distribution that occurs naturally in many situations. For example, the bell curve is seen in tests like the SAT and GRE. The bulk of students will score the average (C), while smaller numbers of students will score a B or D. An even smaller percentage of students score an F or an A. This creates a distribution that resembles a bell (hence the nickname). The bell curve is symmetrical. Half of the data will fall to the left of the mean; half will fall to the right.
Many groups follow this type of pattern. That's why it's widely used in business, statistics and in government bodies like the FDA:

- Heights of people.
- Measurement errors.
- Blood pressure.
- Points on a test.
- IQ scores.
- Salaries.

5.Statistical Test

α = .01

diff = 23

critical statistic value = -2.50

difference in colour recognition time = -8.02

p-value = < .0001

With the data presented, it is very unlikely that the 7.96 second difference in mean time for colour recognition for the congruent data vs. the incongruent data is obtained if the two means are actually the same (or if $\mu_C > \mu_I$). By conventional criteria, this difference is considered to be extremely statistically significant.

There is sufficient evidence at the $\alpha = .01$ level of significance to support the claim that it takes less time to recognize the colour of words with the congruent condition compared to words with the incongruent condition.Here the null hypothesis is rejected.

● Conclusion and Decision

Thus from the above Statistical test we can conclude that Null Hypotheses (Ho) should be rejected, Since the T-Statistics lies in the Critical region and Alternate Hypotheses(Ha) is accepted.