Stroop Effect

My results:

Congruent words – 14.564

Incongruent words – 29.061

1. What is our independent variable? What is our dependent variable?

Independent variable is the color congruency to words.

Dependent variable is the recognition time taken by the participants.

2. What is an appropriate set of hypotheses for this task? What kind of statistical test do you expect to perform? Justify your choices.

Mean of Congruent test = μ_{cong}

Mean of Incongruent test = μ_{incong}

The appropriate set of hypotheses are :

Null Hypothesis:

$H_0 : \mu_{cong} = \mu_{incong}$

It means difference between time taken between population means of congruent and incongruent test conditions is null.

Alternative Hypothesis:

$H_a : \mu_{cong} \neq \mu_{incong}$

It means difference between time taken between population means of congruent and incongruent test conditions is unequal.

Justification:

The dependant t-test is used in testing above hypothesis. Sample size is less than 30 and standard deviation is also not known. And if sample size was more than 30 , we would use z-test to calculate number of standard deviations away the mean is.

3. Report some descriptive statistics regarding this dataset. Include at least one measure of central tendency and at least one measure of variability.

Central Tendency Measures of the following data:

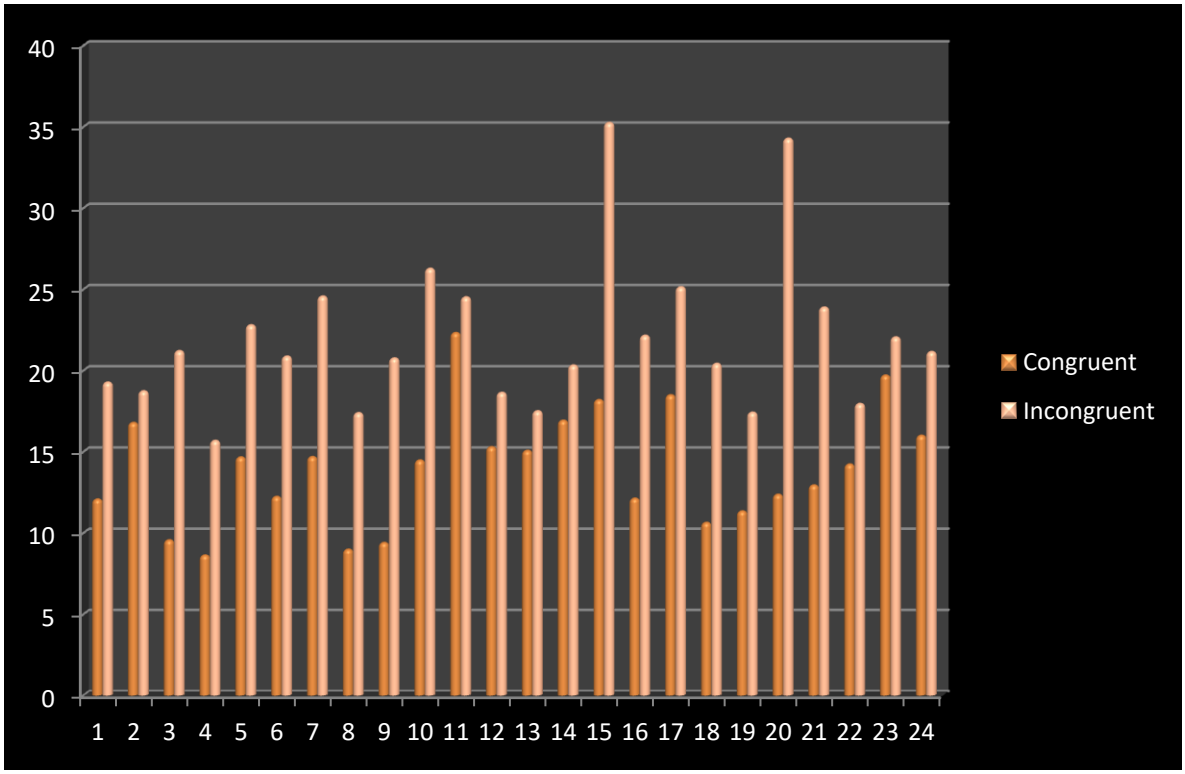
	Congruent	**Incongruent**
Mean	14.05	22.015

	Congruent	**Incongruent**
Mode	14.36	21.02

Variability Measures of the following data:

	Congruent	**Incongruent**
Standard Deviation	3.56	4.80

4. Provide one or two visualizations that show the distribution of the sample data. Write one or two sentences noting what you observe about the plot or plots.



The data plotted above shows that the time taken to complete the congruent test by users is less than time taken to complete incongurent test. It takes around 15-20 seconds less for participants to complete congruent test. Hence it proves that STROOP EFFECT really effects our reaction time.

5. Now, perform the statistical test and report your results. What is your confidence level and your critical statistic value? Do you reject the null hypothesis or fail to reject it? Come to a conclusion in terms of the experiment task. Did the results match up with your expectations?

t statistics:

$(\mu_{incong} - \mu_{cong})/(sd/\sqrt{n}) = 8.02$

At an alpha level of 5%,

t critical value = 2.069

Since the t-statistic lies in the critical region, we can say that the time taken to complete incongruent test is far greater. Hence, we reject the null hypothesis.

Yes the result match with my expectations , that the time taken by people to complete incongruent test is greater than the congruent test.