Stroop Effect

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

Independent variable - congruent vs incongruent list of words
Dependent variable - time it takes to name the ink colors

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

Hypothesis - I would hypothesize that the incongruent list of words would take a longer time than the congruent one. I would have a one-tailed t-test.

Null hypothesis - the times between the two data sets is the same.

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

measured in seconds

Congruent:

mean
median
mode
std

| |
| --- |
| 14.051125 |
| 14.3565 |
| #N/A |
| 3.559357958 |

Incongruent

22.01591667
21.0175
#N/A
4.797057122

(As feedback, what other measures could I have included that may have been of interest? Cohen's D? mean difference?)

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.

Just from the visualization of the data, it seems that as expected, the incongruent tests are taking much longer. What I find interesting is that most of them take twice as long (or more)as the congruent tests.
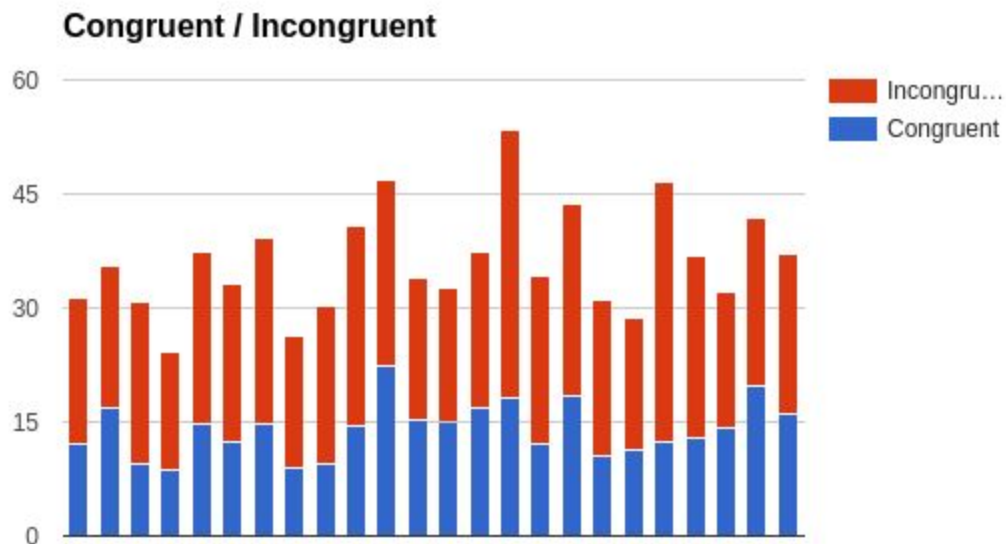
5. Now, perform the statistical test and report your results. What is your confidence level and your critical statistic value? Do you reject the null hypothesis or fail to reject it? Come to a conclusion in terms of the experiment task. Did the results match up with your expectations?

I expect to reject the null hypothesis. Since this is a dependent test
with 95% confidence level and an alpha level of .05 the t-critical value for a one tailed t-test is
1.714. The t-statistic value that I got is 8.020706944 which is well above the t-critical value, so we can
assume that this was not by chance. This is consistent with my expectations.

6. Optional: What do you think is responsible for the effects observed? Can you think of an alternative or similar task that would result in a similar effect? Some research about the problem will be helpful for thinking about these two questions!
I think that habit is responsible for the effects. By nature and nurture, we are trained to associate the words with the color, so our brain messes up when it is not in our expected pattern. An interesting thought would be to see how this would affect color blind people since it would presumably have less of an effect.

Alternative tasks with similar effect would be to say the words written backwards.