

Project 1

1. The independent variable of the project is the color they are shown and the word that is spelled out in whatever color is used. The dependent variables is the amount of time it takes for the person to name the all of the words, due to it being dependent on how fast the participant completes this task

2. An appropriate hypothesis for this project is that the incongruent colors will directly affect the amount of time people need in order to finish the test.

Hence, our null and alternate hypothesis are $H_0 : \mu_C = \mu_i$ and $H_A : \mu_C \neq \mu_i$

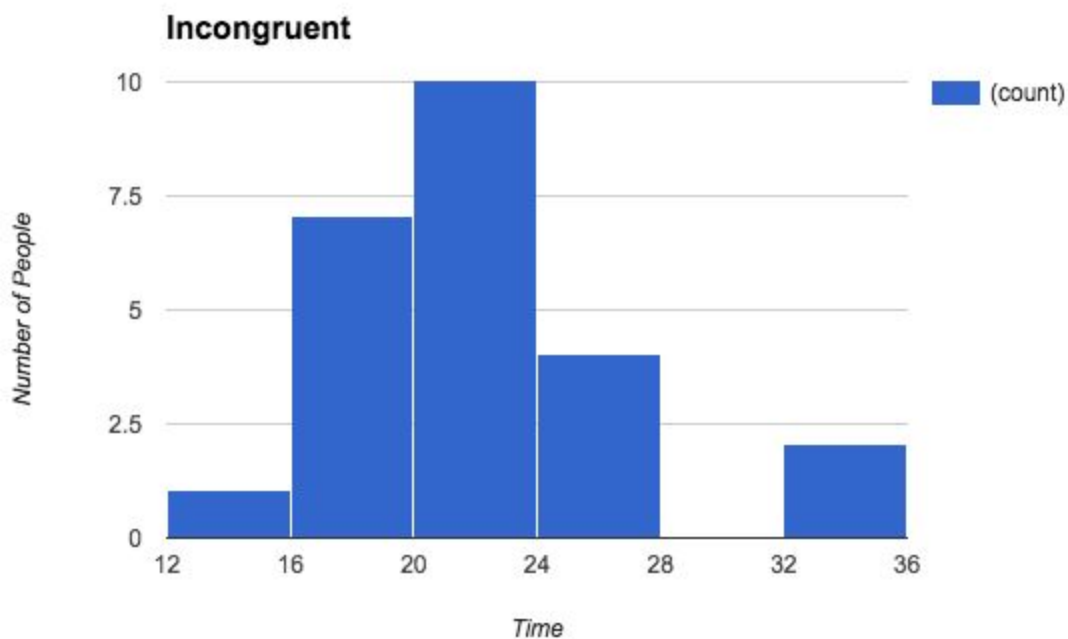
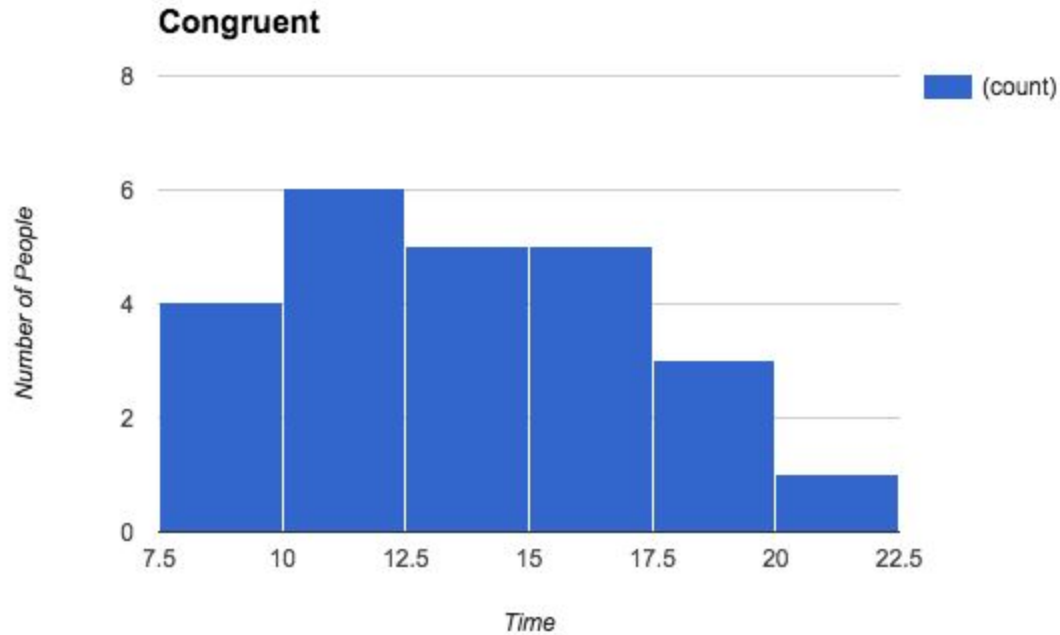
These μ 's are the population means as we determine that these samples are accurate representations of the population mean could be, by definition of the hypothesis test.

We would expect the alternate hypothesis to occur, which would mean that μ_c is inherently different from μ_i due to changing the independent variable between the two different test.

A test that we could use for this assignment is the t-test. This would be effective if we do not have the population mean and instead only have the sample data given to us by the test. The project is dependent due to the fact that in this instance the two samples will be directly correlated in order to determine whether or not there is a difference between the two sample means.

3. Due to the nature of the experiment we are not aware of the population mean. This means that we can only determine the two sample means. The sample mean for the Congruent Test Sample is 14.05 and the sample mean for the Incongruent Test Sample is 22.02. Through using the point estimates (the difference between the sample means) we can determine that the standard deviation of difference are 4.86.

4.



These two histograms show the number of people that took a specific set of time for each experiment. What is interesting about the Congruent graph is that it takes a uniform distribution, thus displaying that the time it took people to complete the task was relatively spread out amongst participants. However, the incongruent histogram displays a normal distribution that we would normally expect from a test like this.

5. In order to comprehend this set of data, the best method to use in order to either accept or reject the null hypothesis that the differences in the independent variables in the two tests is a two tailed t-test, due to the fact that we do not have the population standard deviation.

Through the equation $(u_c - u_i) \div (s/\sqrt{n})$ we get the t-statistic -8.02. This correlates with the t-critical value that we will use for this test which will be 2.069 and -2.069. Due to the fact that -8.02 is less than -2.069 we can get reject the null hypothesis. This means the incongruent colors most likely have an affect on changing the amount of time that people finish the test in.

We are able to find an accurate estimation of how much the incongruent colors affect the test subjects through finding the confidence interval. We find the confidence interval to be {-10.02, -7.96}. Which means that on average people took somewhere between 10.02 and 7.96 seconds longer to finish the incongruent test when compared to the congruent colored test.

These results matched up with my expectations that the incongruent test would in fact affect the dependent variable.

6. I believe that this outcome was a result of human beings associating color with a word subconsciously. When you see a color you automatically think that color, so you would need more time to comprehend that the word does not say the color that you are envisioning in your head. This creates the delay and makes it so that you take longer to complete the incongruent color test. I think a similar task could be trying to read a word while someone yells another word at the sametime. This would most likely result in an increase in time that it took to comprehend the word, due to two sense conflicting with one another.