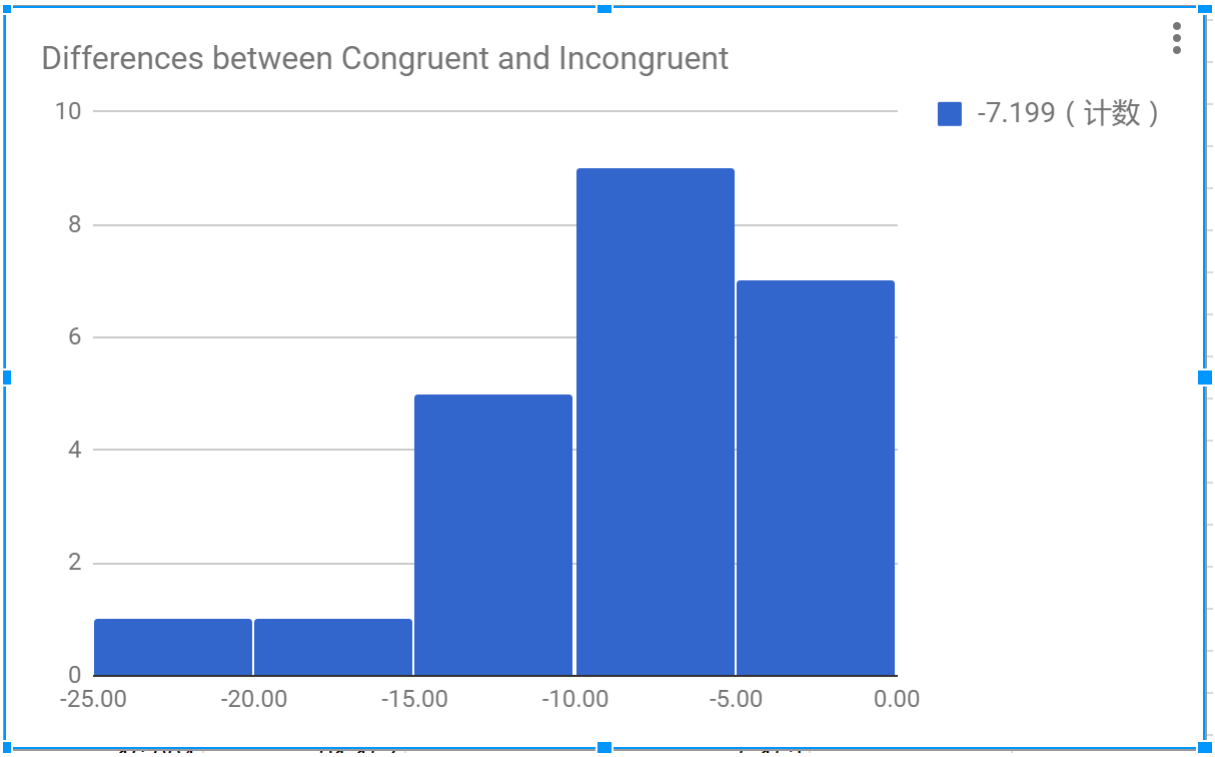
- Udacity-Machine-Learning-Statistics Project

1. Independent Variable: Congruency of the words Dependent Variable: Reaction time to name the color
2. Null Hypothesis: There is no significant statistical difference between the reaction time to naming color of the congruent words and the reaction time to naming color of the incongruent words. Alternative Hypothesis: There is significant statistical difference between the reaction time to naming color of the congruent words and the reaction time to naming color of the incongruent words.
   HA: u(t(congruent))-u(t(incongruent)) =0 H0: u(t(congruent))-u(t(incongruent)) !=0 (u is the population mean response time)
   I say it serves the best interest to conduct a two-tailed dependent samples t-test with an alpha level of 0.05.
   The reasons for using the test are the following:
   1. the sample size is small(less than 30).
   2. the data is gathered from pretest and posttest, therefore dependent.
   3. Using two-tailed test let us capture extreme statistical significance of both negative and positive difference.
   4. Given that the sample size is small and the distribution is slightly skewed, we can assume the sample is normal.
3. Mean Difference:-7.96 Degree of Freedom: 23 Standard Deviation: 4.865 Standard Error:0.99
4. Visualization:



Observations: 1. In general the time to name the incongruent is longer than that to name the congruent.

2. The distribution of difference between the congruent and the incongruent is slightly negatively skewed.

5. T-statistics:8.04 T-critical value: 2.069 95%Confidence Level: (-10.05, -5.87) p-value<0.025
   Result: Reject the null.
   Conclusion: There is significant statistical difference between the reaction time to naming color of the congruent words and the reaction time to naming color of the incongruent words.
   And yes, it meets my expectation that it will definitely take longer to name color of the incongruent words.
6. Optional:
   1. I think it's because humans process words faster than color. Therefore, if there is a conflict between words and color, humans tend to choose the words. As a result, it takes more time for humans to adjust to and name the correct color.
   2. A similar test would be naming the right animal given a photo and word below it from two conditions. One condition is that the name of the animal and the picture of the animal are congruent. The other condition is not.

7. Reference: I used Google Spreadsheet as my tool.