Inferential Statistics Project

Dataset:

Participant	Congruent	Incongruent
1	12.079	19.278
2	16.791	18.741
3	9.564	21.214
4	8.63	15.687
5	14.669	22.803
6	12.238	20.878
7	14.692	24.572
8	8.987	17.394
9	9.401	20.762
10	14.48	26.282
11	22.328	24.524
12	15.298	18.644
13	15.073	17.51
14	16.929	20.33
15	18.2	35.255
16	12.13	22.158
17	18.495	25.139
18	10.639	20.429
19	11.344	17.425
20	12.369	34.288
21	12.944	23.894
22	14.233	17.96
23	19.71	22.058
24	16.004	21.157
25	14.375	33.306

Variable Types:

Independent Variable: Type of Word (Congruent or Incongruent)
Dependent Variable: Time Required

Hypotheses and Test:

Ho – Null Hypothesis: There is no significant difference in the average response time of the population between viewing congruent words and incongruent words.

Ha – Alternate Hypothesis: There is a significant difference in the average response time of the population between viewing congruent words and incongruent words.

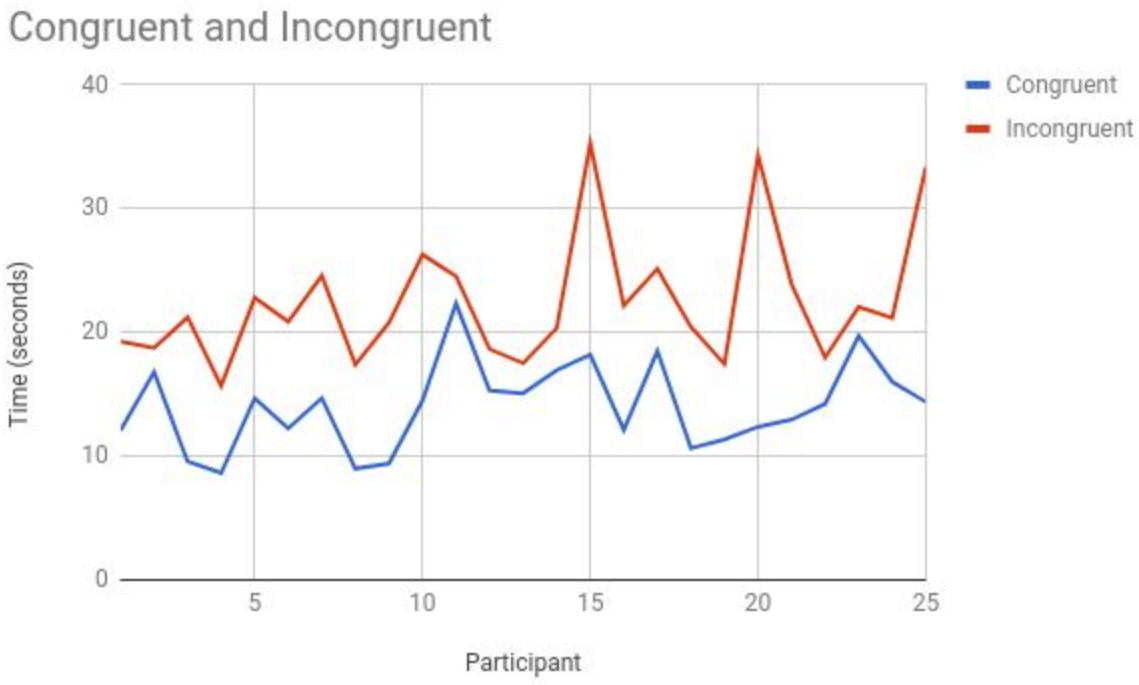
Since we do not any parameters regarding the population, it is better to use the t-test instead of a z-test, in this case.

Descriptive Statistics:

Mean:
Mean time for reading Congruent words: 14.064
Mean time for reading Incongruent words: 22.468

Standard Deviation:
Standard deviation for reading Congruent words: 3.485
Standard deviation for reading Incongruent words: 5.211

Visualizations:



From the above graph we can see that the time taken for incongruent words is consistently greater than the time taken for congruent words. The range of time taken for congruent words is

between 8 to 23 seconds whereas the time taken for incongruent words is between 15 to 34 seconds.

Statistical Tests:

Confidence: 95%
Alpha: 0.05
df: 24
t-critical: -2.064, 2.064
P value: 3.923e-8
t-statistic: 8.0636

We reject the null hypothesis because the time required to name the incongruent colors is consistently higher than the time required to name the congruent colors. The results are same as what I expected because I took considerably more time to complete the second test as compared to the first one.

References:

https://docs.google.com/document/d/1-OkpZLjG_kX9J6LIQ5IltsqMzVWjh36QpnP2RYpVdPU/pub?embedded=True
http://www.statisticshowto.com/t-score-formula/
https://s3.amazonaws.com/udacity-hosted-downloads/t-table.jpg