Stroop Effect

Paired Data Worksheet

The famous "Stroop Effect" is named after J. Ridley Stroop who discovered this strange phenomenon in the 1930s. The words themselves have a strong influence over your ability to say the color. For example, if the word "BLUE" is printed in a red color, you should say "RED".

Twelve (12) Participants received two versions of a graphic (similar to that seen above) in a random order. In the first version, the words were the color the word read. In the second version, the words were a different color than the word read. The time taken to them to read the Colors was recorded (in seconds) for both versions.

Subject	1	2	3	4	5	6	7	8	9	10	11	12
Words	9.4	13.5	9.4	17.6	19.8	10.4	12.6	23.0	11.0	16.9	23.8	28.9
Colors	10.3	9.2	15.9	21.4	33.7	17.0	11.8	23.6	15.4	25.5	21.6	34.3

Hypotheses

H_o : _____ H_A : _____

μ_1 : The mean time in seconds to read the Colors from the graphic 1.
μ_2 : The mean time in seconds to read the Colors from the graphic 2.

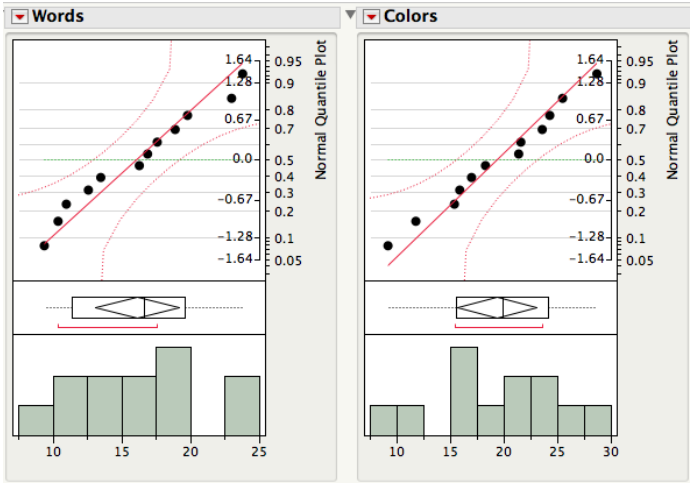
Conditions

Do the data values form "roughly" a straight, diagonal line in the QQ-plots?
☐ Yes ☐ No

Are the Nearly Normal Conditions Satisfied?
☐ Yes ☐ No

Are different subjects used for both groups?
☐ Yes ☐ No

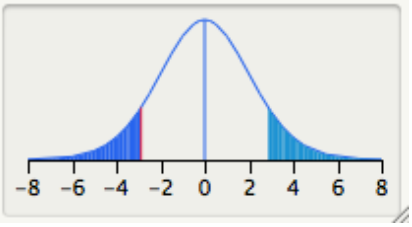
Independent Group Condition Satisfied?
☐ Yes ☐ No



t Test

Words-Colors
Assuming unequal variances

Difference	-2.8750	t Ratio	-1.40235
Std Err Dif	2.0501	DF	21.84136
Upper CL Dif	1.3785	Prob > |t|	0.1749
Lower CL Dif	-7.1285	Prob > t	0.9126
Confidence	0.95	Prob < t	0.0874



What is the Test-Statistic? _____
What is the P-value? _____
Make a decision using $\alpha = 0.05$. ☐ Reject H_o ☐ Fail to Reject H_o
Make a conclusion:

Paired Data: T-test on Differences

Since two times were measured from each person we do not have independent groups. Each person is acting as a block because we repeated the entire experiment on each person. By taking the differences in each person's times, we allow the Blocks to account for some of the variation in the data.

Subject	1	2	3	4	5	6	7	8	9	10	11	12
Difference	0.9	-4.3	6.5	3.9	13.8	6.6	-0.8	0.6	4.4	8.6	-2.2	5.5

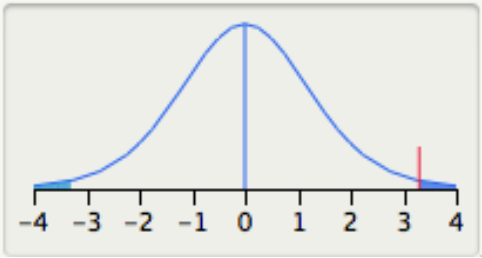
Conditions are satisfied as long as difference are Nearly Normal (they are)

Test Mean=value

Hypothesized Value	0
Actual Estimate	3.3
DF	11
Std Dev	4.2606

t Test

Test Statistic	2.6831
Prob > |t|	0.0213*
Prob > t	0.0106*
Prob < t	0.9894



μ_D : The mean difference, for each individual subject, in the time reading the colors of the words from the two graphics.

H_o : _____ H_A : _____

What is the Test-Statistic? _____
What is the P-value? _____

Make a decision using $\alpha = 0.05$.
☐ Reject H_o ☐ Fail to Reject H_o

Make a conclusion: