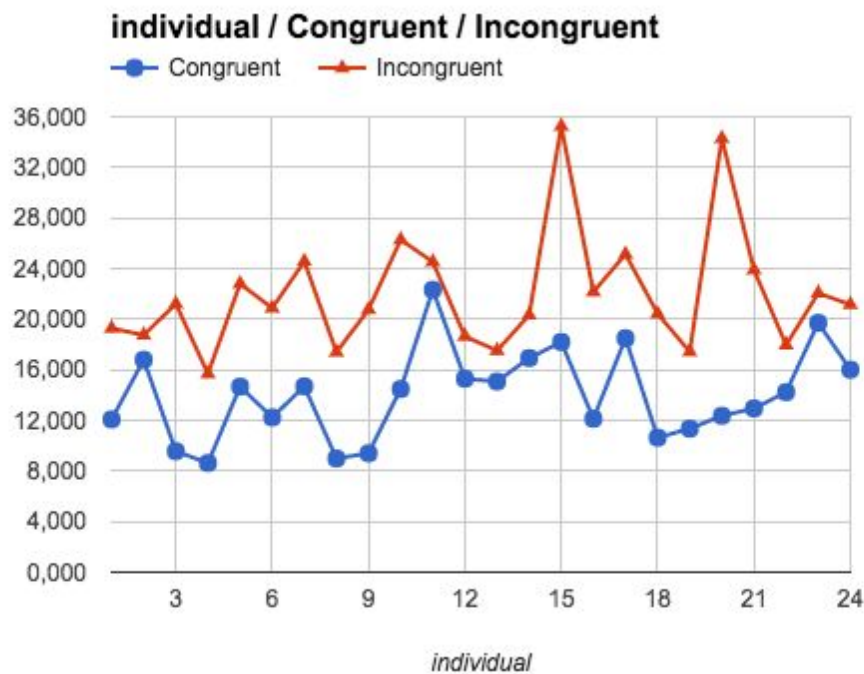


Answers for P1: Test a perceptual phenomenon

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1. The independent variable is either the congruent or the incongruent test, because it is the one that is changed by the scientists to see if it has any effect on the dependent variable. The dependent variable is the time executing the test measured in seconds.
2. The case here is a two-tailed dependent t-test for paired samples. The null hypothesis is that there is no difference in completion time between incongruent and congruent conditions compared to the whole population(the two populations are different by chance), while the alternative hypothesis is that the incongruent condition will take (significantly) longer(or shorter) than the congruent condition compared to the population(the two populations are different):
 1. $H_0: \mu_1 = \mu_2$
 $H_a: \mu_1 \neq \mu_2$
3. See stroopdata_Angelos file.
4. The above plot shows that every individual has taken more time to execute the incongruent test in comparison to the congruent test. There is a tendency though, that the individuals take more time to execute the incongruent test then the congruent test.



5. See stroopdata_Angelos file. Supposing that our alpha level is equal to 0.05($\alpha=0.05$), and by observing the t-table, the t-critical value for 23 degrees of freedom(24 individuals -1) seems to be ± 2.069 (two-tailed). By calculating the standard deviation after measuring the difference of means between the two experiments, we managed

to calculate the standard error and then the t-statistic (t-statistic = -8,0207) and later the p-value (p-value < 0.0001). By taking into consideration that this difference is considered to be extremely statistically significant and that the t-statistic is much lower than -2.069, we end up at the conclusion that we reject the null hypothesis, which means that our dependent variable (time executing the test) will change after the treatment (pretest - posttest). And these were my expectations as well. It is obvious that someone performing the first experiment would take more time to perform the second. It is a lot more difficult to distinguish the color from the word and say out loud the correct one.

6. As mentioned before, it is obvious that someone who speaks English would end up at the same result. Let's suppose that we have a sample of x individuals who know how to read the English dictionary but doesn't speak the English means that they do not understand what they read. In this case we will have similar time measurement for the congruent and the incongruent test which will cause to fail to reject the null because the means would be similar.

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