12.4: Non-Parametric RM ANOVA

Refresher on Non-Parametric Statistical Analyses

Remember when we talked about circumstances when we can't calculate these parametric analyses?

If not, non-parametric statistics are analyses that don't require the population data to be normally distributed. If the data are not normally distributed, then we can't compare means. Because there is no center!

Note

When might non-normally distributed data happen? If you're not sure, look back at the non-parametric analyses section of the chapter on independent t-tests…

If the data are not normally distributed, then our formulas don't provide a description of the center of the distribution. Instead, we analyze the ranks of the scores, not the scores themselves. This applies to all of the following analyses:

- Mean
- Standard deviation
- t-test
- *ANOVAs*
- Pearson's correlation

Alternatives

So far, we've talked about non-parametric analyses for t-tests and Between Groups ANOVAs.

Example 12.4.1

What were the non-parametric alternatives for:

- Independent t-test?
- Dependent t-test?
- BG ANOVA?

Solution

- Independent t-test: Mann-Whitney U
- Dependent t-test: Wilcoxon Matched-Pairs Signed-Rank
- BG ANOVA: Kruskal-Wallis H

What is the non-parametric alternative to a Repeated Measures ANOVA, you might ask in this page on non-parametric alternatives to RM ANOVAs? The answer is Friedman's test. The Friedman test is a non-parametric statistical test developed by Milton Friedman that used to detect differences in treatments across multiple test attempts. The procedure involves ranking each row (or block) together, then considering the values of ranks by columns.

Because you will probably never have to do this without statistical software, we aren't going to go over the formula here. But if you are interested, the Wikipedia page includes the formula and some other interesting information.

Contributors and Attributions

- Dr. MO (Taft College)
- Wikipedia: https://en.Wikipedia.org/wiki/Friedman_test