

7.1: ANOVA is Analysis of Variance

ANOVA stands for Analysis Of Variance. It is a widely used technique for assessing the likelihood that differences found between means in sample data could be produced by chance. You might be thinking, well don't we have t -tests for that? Why do we need the ANOVA, what do we get that's new that we didn't have before?

What's new with the ANOVA, is the ability to test a wider range of means beyond just two. In all of the t -test examples we were always comparing two things. For example, we might ask whether the difference between two sample means could have been produced by chance. What if our experiment had more than two conditions or groups? We would have more than 2 means. We would have one mean for each group or condition. That could be a lot depending on the experiment. How would we compare all of those means? What should we do, run a lot of t -tests, comparing every possible combination of means? Actually, you could do that. Or, you could do an ANOVA.

In practice, we will combine both the ANOVA test and t -tests when analyzing data with many sample means (from more than two groups or conditions). Just like the t -test, there are different kinds of ANOVAs for different research designs. There is one for between-subjects designs, and a slightly different one for repeated measures designs. We talk about both, beginning with the ANOVA for between-subjects designs.

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