

9.9: Factorial summary

We have introduced you to factorial designs, which are simply designs with more than one IV. The special property of factorial designs is that all of the levels of each IV need to be crossed with the other IVs.

We showed you how to analyse a repeated measures 2x2 design with paired samples-tests, and what an ANOVA table would look like if you did this in R. We also went through, by hand, the task of calculating an ANOVA table for a 2x2 between subjects design.

The main point we want you take away is that factorial designs are extremely useful for determining things that cause effects to change. Generally a researcher measures an effect of interest (their IV 1). Then, they want to know what makes that effect get bigger or smaller. They want to exert experimental control over their effect. For example, they might have a theory that says doing X should make the effect bigger, but doing Y should make it smaller. They can test these theories using factorial designs, and manipulating X or Y as a second independent variable.

In a factorial design each IV will have it's own main effect. Sometimes the main effect themselves are what the researcher is interested in measures. But more often, it is the interaction effect that is most relevant. The interaction can test whether the effect of IV1 changes between the levels of IV2. When it does, researchers can infer that their second manipulation (IV2) causes change in their effect of interest. These changes are then documented and used to test underlying causal theories about the effects of interest.

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