

CHAPTER OVERVIEW

16: Factorial ANOVA

Over the course of the last few chapters you can probably detect a general trend. We started out looking at tools that you can use to compare two groups to one another, most notably the t-test (Chapter 13). Then, we introduced analysis of variance (ANOVA) as a method for comparing more than two groups (Chapter 14). The chapter on regression (Chapter 15) covered a somewhat different topic, but in doing so it introduced a powerful new idea: building statistical models that have *multiple* predictor variables used to explain a single outcome variable. For instance, a regression model could be used to predict the number of errors a student makes in a reading comprehension test based on the number of hours they studied for the test, and their score on a standardised IQ test. The goal in this chapter is to import this idea into the ANOVA framework. For instance, suppose we were interested in using the reading comprehension test to measure student achievements in three different schools, and we suspect that girls and boys are developing at different rates (and so would be expected to have different performance on average). Each student is classified in two different ways: on the basis of their gender, and on the basis of their school. What we'd like to do is analyse the reading comprehension scores in terms of *both* of these grouping variables. The tool for doing so is generically referred to as **factorial ANOVA**. However, since we have two grouping variables, we sometimes refer to the analysis as a two-way ANOVA, in contrast to the one-way ANOVAs that we ran in Chapter 14.

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