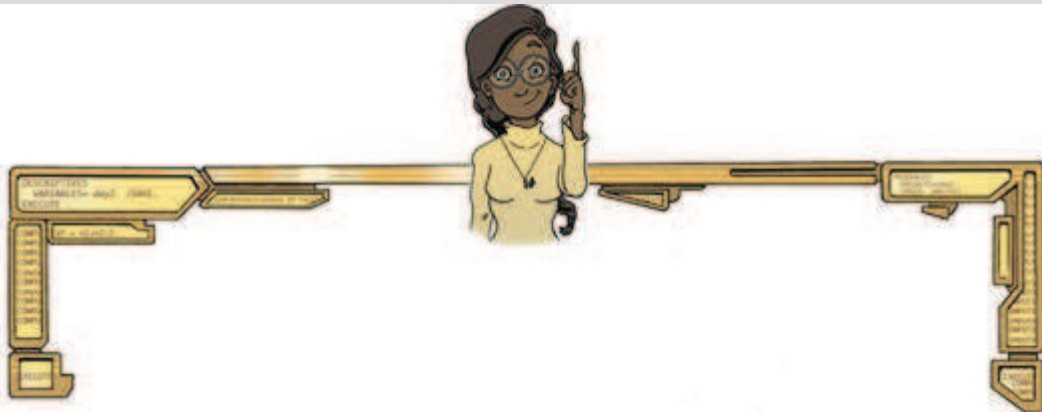


Deviation contrast
 Difference contrast (reverse Helmert contrast)
 Eta squared, η^2
 General linear model
 Grand variance
 Harmonic mean
 Helmert contrast
 Independent ANOVA
 Omega squared
 Orthogonal
 Pairwise comparisons
 Planned contrasts
 Polynomial contrast
Post hoc tests
 Quadratic trend
 Quartic trend
 Repeated contrast
 Simple contrast
 Weights
 Welch's *F*

Smart Alex's tasks



- Task 1: To test how different teaching methods affected students' knowledge I took three statistics modules where I taught the same material. For one module I wandered around with a large cane and beat anyone who asked daft questions or got questions wrong (punish). In the second I encouraged students to discuss things that they found difficult and gave anyone working hard a nice sweet (reward). In the final course I neither punished nor rewarded students' efforts (indifferent). I measured the students' exam marks (percentage). The data are in the file Teach.sav. Fit a model with planned contrasts to test the hypotheses that: (1) reward results in better exam results than either punishment or indifference; and (2) indifference will lead to significantly better exam

results than punishment.



- Task 2: Compute the effect sizes for Task 1
- Task 3: Children wearing superhero costumes are more likely to harm themselves because of the unrealistic impression of invincibility that these costumes could create. For example, children have reported to hospital with severe injuries because of trying 'to initiate flight without having planned for landing strategies' (Davies, Surridge, Hole, & Munro-Davies, 2007). I can relate to the imagined power that a costume bestows upon you; indeed, I have been known to dress up as Fisher by donning a beard and glasses and trailing a goat around on a lead in the hope that it might make me more knowledgeable about statistics. Imagine we had data (Superhero.sav) about the severity of injury (on a scale from 0, no injury, to 100, death) for children reporting to the accident and emergency department at hospitals, and information on which superhero costume they were wearing (hero): Spiderman, Superman, the Hulk or a teenage mutant ninja turtle. Fit a model with planned contrasts to test

the hypothesis that different costumes give rise to more severe injuries.

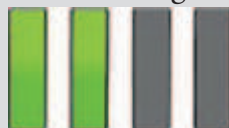


- Task 4: In [Chapter 7](#) (Section 7.6) there are some data looking at whether eating soya meals reduces your sperm count. Analyse these data with a linear model (ANOVA). What's the difference between what you find and what was found in [Section 7.6.5](#)? Why do you think this



difference has arisen?

- Task 5: Mobile phones emit microwaves, and so holding one next to your brain for large parts of the day is a bit like sticking your brain in a microwave oven and pushing the 'cook until well done' button. If we wanted to test this experimentally, we could get six groups of people and strap a mobile phone on their heads, then by remote control turn the phones on for a certain amount of time each day. After six months, we measure the size of any tumour (in mm^3) close to the site of the phone antenna (just behind the ear). The six groups experienced 0, 1, 2, 3, 4 or 5 hours per day of phone microwaves for six months. Do tumours significantly increase with greater daily exposure? The data are in



Tumour.sav.

- Task 6: Using the Glastonbury data from [Chapter 6](#) (GlastonburyFestival.sav), fit a model to see if the change in hygiene (change) is significant across people with different musical tastes (music). Do a simple contrast to compare each group against the no affiliation group. Compare the results to those described in [Section 11.5](#).



- Task 7: [Labcoat Leni's Real Research 7.2](#) describes an experiment (Çetinkaya & Domjan, 2006) on quails with fetishes for terrycloth objects. There were two outcome variables (time spent near the terrycloth object and copulatory efficiency) that we didn't analyse. Read [Labcoat Leni's Real Research 7.2](#) to get the full story, then fit a model with Bonferroni *post hoc* tests on the time spent near the terrycloth object.



- Task 8: Repeat the analysis in Task 7 but using copulatory efficiency as



the outcome.

- Task 9: A sociologist wanted to compare murder rates (Murder) each month in a year at three high-profile locations in London (Street). Fit a model with bootstrapping on the *post hoc* tests to see in which streets the



most murders happened. The data are in Murder.sav.

Answers & additional resources are available on the book's website at

<https://edge.sagepub.com/field5e>

