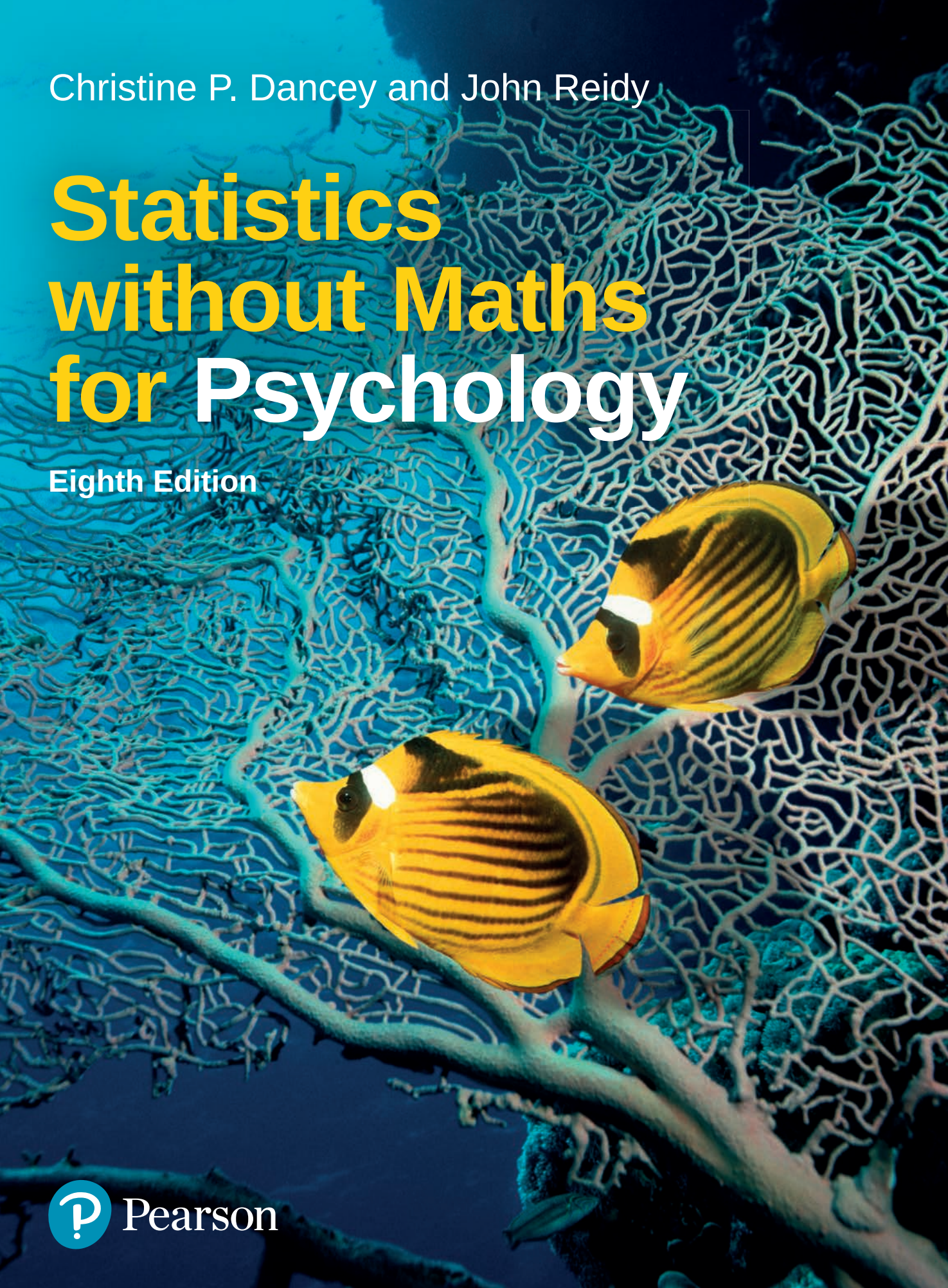
Christine P. Dancey and John Reidy

Statistics without Maths for Psychology

Eighth Edition

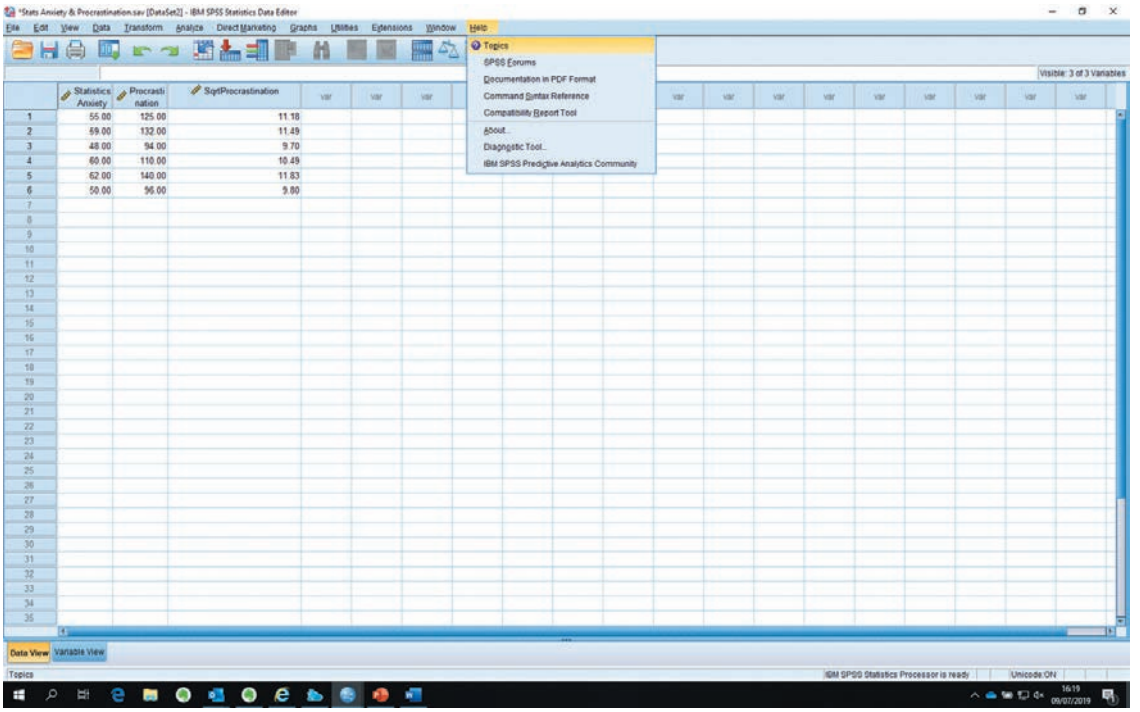


Pearson

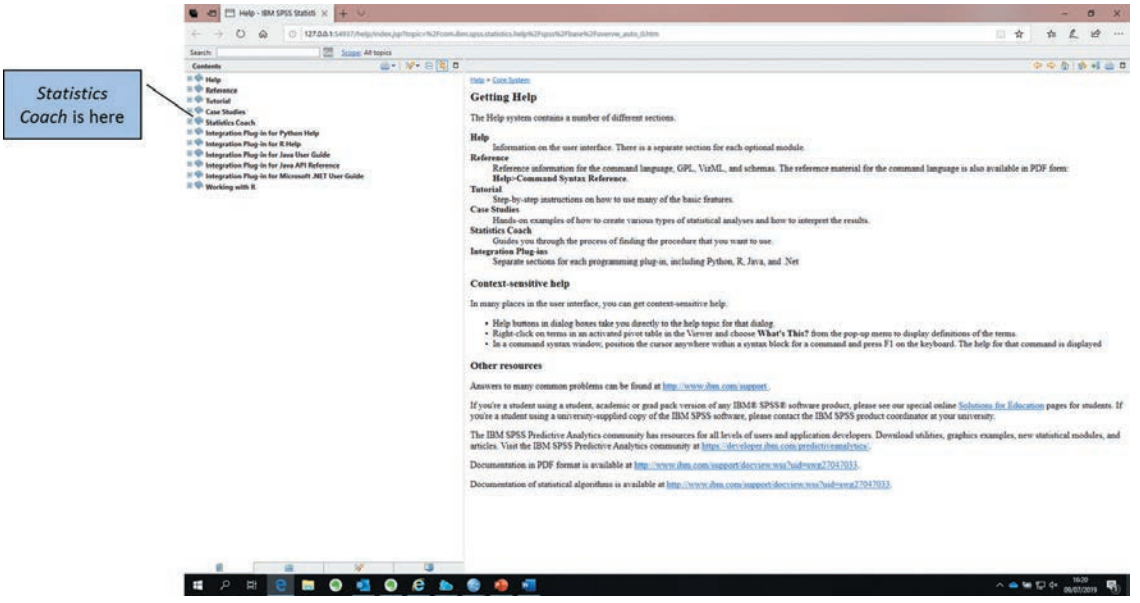
Statistics without Maths for Psychology

SPSS: Statistics Coach

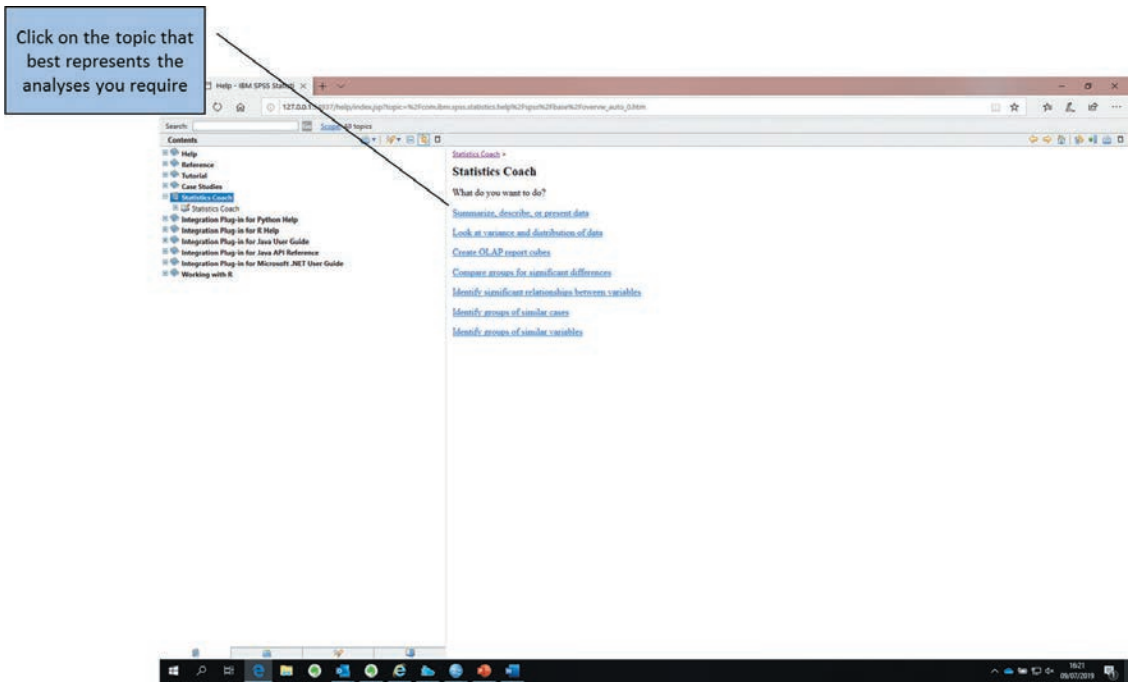
Another useful feature of SPSS is the *Statistics Coach.* You can use the Statistics Coach (in place of the decision chart on page 163 to find out which sorts of analysis you should be doing on your data. You start the Statistics Coach through the *Help* menu:



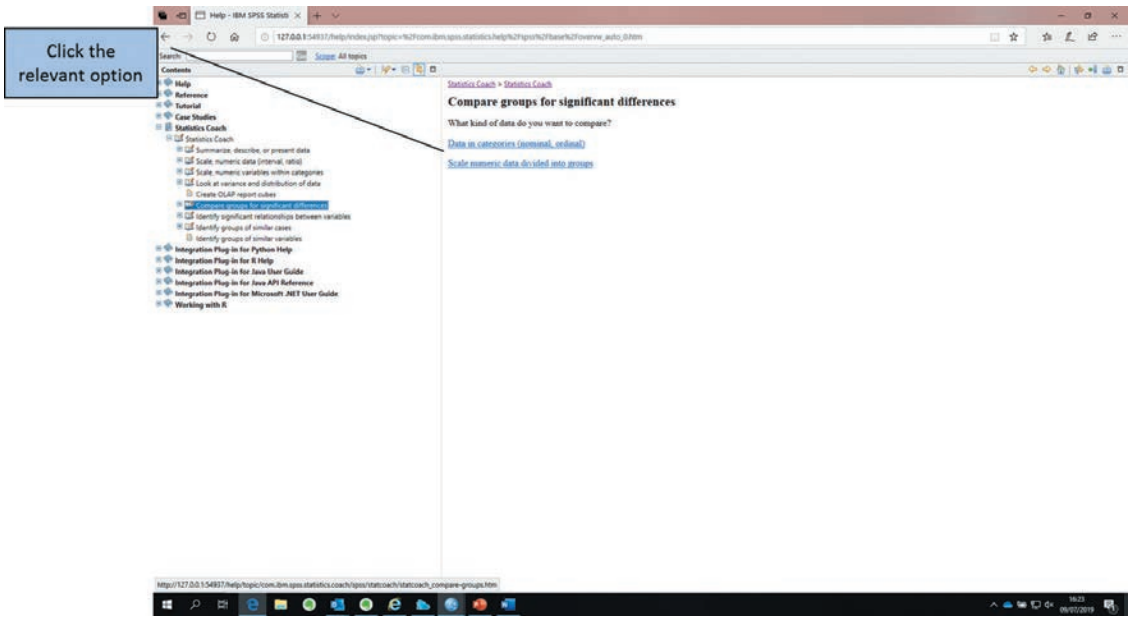
And then select the *Topics* option. This will open your web browser and take you to the SPSS help pages. We showed you this in Chapter 2 when we covered how to use the SPSS tutorials. When the help pages are opened the *Help* topics will be expanded. To see the Statistics Coach you need to condense the Help topics. You will then see the Statistics Coach listed.



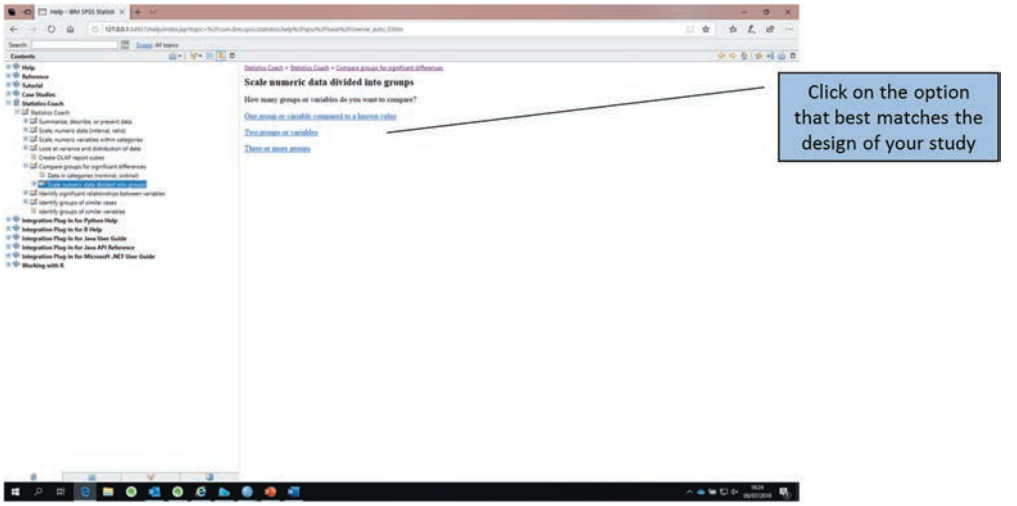
When you click on the *Statistics Coach* topic it will you will be presented with a screen that asks you what you want to do. You are given a number of options to choose from, such as *Summarize, describe, or present data,* and *Compare groups for significant differences.*

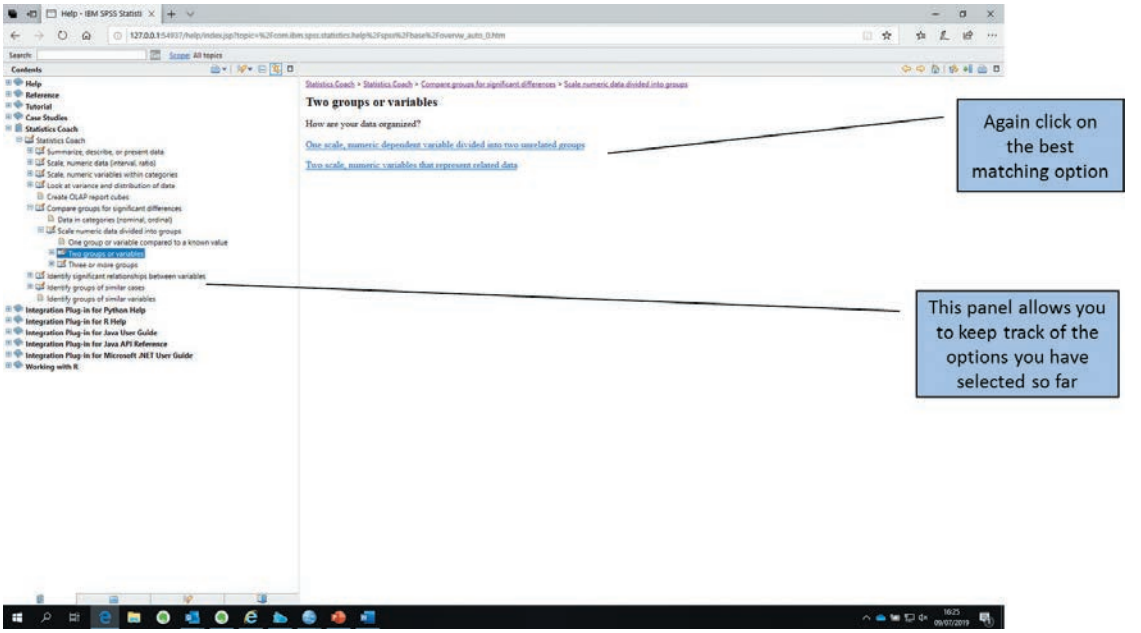


On the left-hand side of the screen you will be presented with the contents of the Statistics Coach. You can navigate through the coach by topic if you wish, or you can simply click on the option in the right-hand pane. Towards the top right-hand part of the screen are buttons to navigate your way through the Statistics Coach. Be careful with these buttons, as they can throw you out of the sequence of questions you are answering to find out which analysis you need to carry out. To query the coach, you simply click on one of the options in the right-hand pane. As an example, we have selected the *Compare groups for significant differences* option.

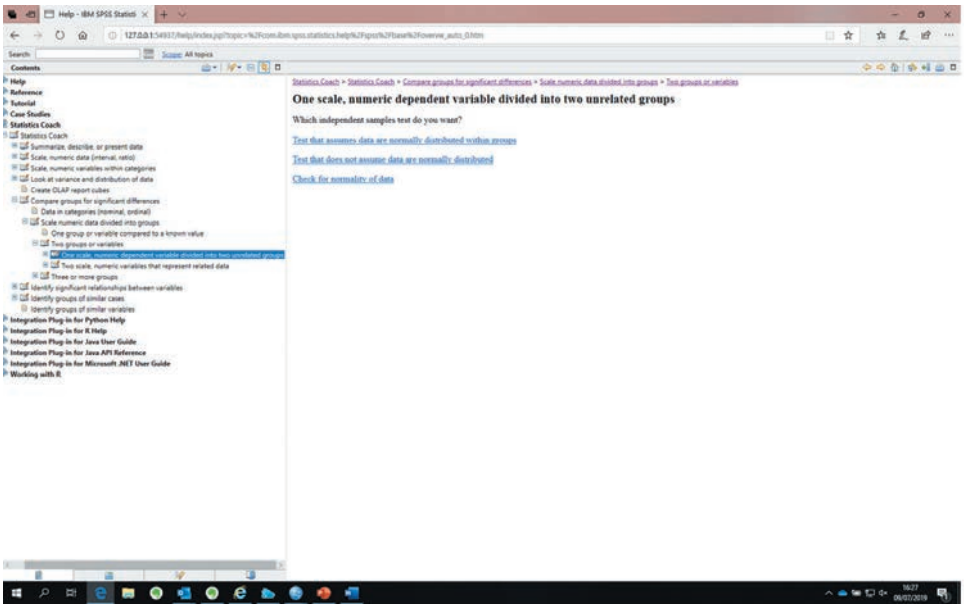


You should then answer the relevant questions presented on the screens. You do this simply by clicking on the relevant option in the right-hand pane and this will take you to the next question.

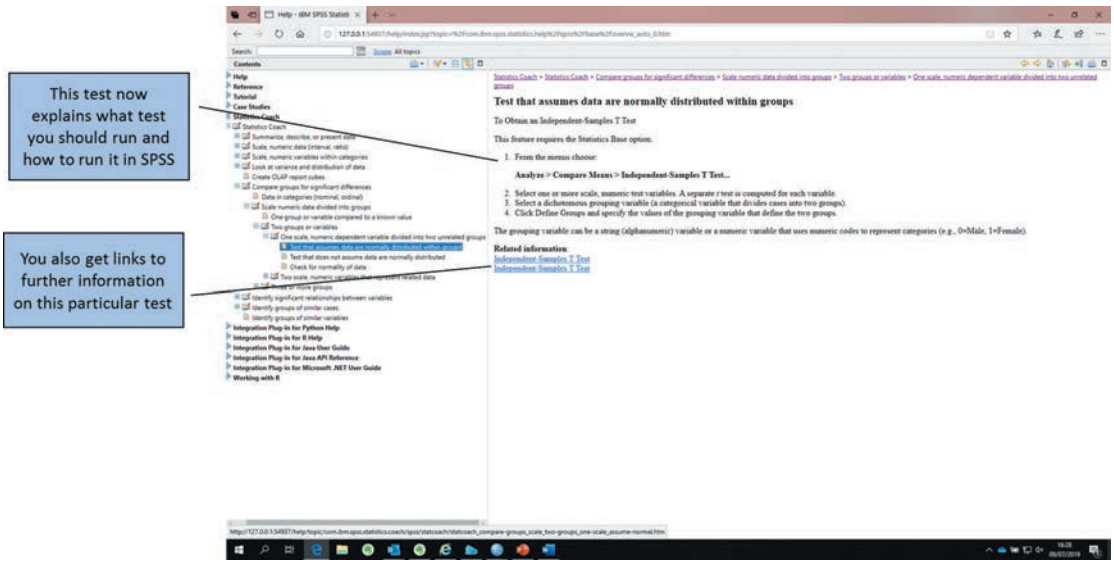




There will be a series of such screens for each type of analysis that you might want to carry out. Keep answering the questions presented to you.



Once you have answered the final question for a particular test, the coach will present a screen which tells you which test you need and how to run the test. It will also tell you whether there are any particular assumptions underlying the use of the test, such as having normally distributed data.



Summary

In this chapter we have gone further into the realms of inferential statistics and have laid the final foundations for you to tackle the most frequently used inferential statistical techniques in psychology today. You have learnt the following:

- The logic behind hypothesis testing and statistical significance.
- The null hypothesis represents no effect and as such represents the converse of the experimental hypothesis.
- How we can use probability distributions to work out the probability that the effects in our research are due to sampling error if the null hypothesis were true.
- Although hypothesis testing is the major research method in psychology there is growing concern over its inability to establish meaningful conclusions from our data.
- As a result of this we have suggested several ways of supplementing the results of your hypothesis testing with more meaningful statistics, for example effects sizes and confidence intervals.
- In hypothesis testing there are two general sorts of errors (Type I and Type II errors) that you could make when drawing conclusions from your analyses:
  - Type I errors are when you reject the null hypothesis when it is, in fact, true.
  - Type II errors are when you fail to reject the null hypothesis when it is false.
- What it means to make directional (one-tailed) and non-directional (two-tailed) predictions and how these are related to probability distributions.
  - Two-tailed predictions are those where we predict a difference between two conditions (or a relationship between two variables) but do not specify the direction of the difference (or relationship).
  - One-tailed predictions are those where we specify the direction of a predicted difference (or relationship).

We hope that by this stage you have a good conceptual understanding of descriptive and inferential statistical approaches to analysing your data. In the remaining chapters, with the exception of Chapter 8, we will describe specific statistical tests in much more detail. However, you should always bear in mind when reading these chapters that these tests are based upon the concepts we have introduced to you in these opening chapters.

Discover the website at **go.pearson.com/uk/he/resources** where you can test your knowledge with multiple choice questions and activities, discover more about topics using the links to relevant websites, and explore the interactive flowchart designed to help you find the right method of analysis.

SPSS exercises

Exercise 1

Professor Yob is interested in crowd violence during football matches. She thinks that crowd violence is the result of uncomfortable seating in stadia. She therefore modifies two different stadia in England. In one stadium she puts in seating that is tightly packed and generally uncomfortable. In the other stadium she installs seating that is very comfortable, with lots of leg room and plenty of space between adjacent seats. She organises it so that one football club plays half of its games at one stadium and half of its games at the other stadium. She follows a group of 12 yobs who support the club and records the number of

times each one gets arrested or thrown out of each stadium. She predicts that there will be more arrests and ejections from the stadium with uncomfortable seating and obtains the data shown in Table 5.2.

Table 5.2 Number of arrests for each yob at the comfortable and uncomfortable stadia

Yob	Uncomfortable seating	Comfortable seating
1	8	3
2	5	2
3	4	4
4	6	6
5	4	2
6	8	1
7	9	6
8	10	3
9	7	4
10	8	1
11	6	4
12	7	3

1. Is this a between-participants or a within-participants design?
2. What sort of variable has Professor Yob measured: discrete or continuous?

   (a) What is the IV?
   (b) What is the DV?

3. Is the prediction one-tailed or two-tailed?
4. What is the null hypothesis?
5. Input the data into SPSS and generate the following for each condition:

   - error bar charts
   - the mean
   - the standard deviation
   - the standard error
   - 95% confidence intervals.

6. Convert the first score from each condition into a z-score.

Exercise 2

Dr Pedantic has a passion for language and his particular dislike is the use of split infinitives (e.g. 'to *boldly go* where no man has gone before' contains a split infinitive, whereas 'to go boldly where no man has gone before' does not). He blames the popularity of *Star Trek* in the 1970s for the proliferation of split infinitives in journals reporting research. He therefore selects 12 researchers in psychology who have published research in journals before and after the *Star Trek* series was first televised. He goes through the last 20 publications of each researcher before *Star Trek* was televised and the first 20 publications after *Star Trek* was televised and counts the number of split infinitives used. He predicts that the number of split infinitives will be greatest in the journals published after *Star Trek* was televised and obtains the data shown in Table 5.3.