

FAQ 36: What are some good approaches to analysing quantitative data?

What's the issue?

The same general principles apply to the analysis of quantitative data in all studies, no matter whether they include children or adults. Basically the aim of any data analysis is to discover patterns and themes in the data and when the data is of a quantitative nature, certain skills are required. With the development of computer programs for statistical analysis it has become quite easy to perform very complicated analysis which has opened up many opportunities for researchers. This, however, creates at least two potential problems. The first is that computers do not question whether it is sensible at all to perform the calculations that they are used for – researchers simply get results. The second potential problem is that not many people understand complicated statistical analysis. Based on this it is possible to give the following crude but simple advice. First, make sure you know what you are doing and second, aim for analysis which that audience will understand.

Common practice

Based on the discussion from Newton and Rudestam (1999), it is possible to set the following 10 rules for the successful analysis of quantitative data:

- Get comfortable with your data. As the data is the raw material on which the results are to be built, the data files must be handled with care.
- Thoroughly explore your data, twice. It is easy to make errors when handling the data (recoding or computing) and doing the analysis.
- Use graphics to display your results. A visual representation of data can reveal the meaning and implications of your study in a way that abstract numbers might conceal.
- Replicate research with new samples and in new settings to ensure the validity of the results.
- Remember the distinction between statistical and substantive significance.
- Remember the distinction between statistical significance and effect size.
- Do not expect statistics to speak for themselves. It is not enough to fill endless pages with tables and graphs. The goal of data analysis is to present an organized argument that supports or does not support a particular position.
- Keep it simple when possible. Complex statistics can lead to confusion.
- Consult with other researchers. No one is an expert in all areas, and discussing your findings with colleagues is likely to sharpen your arguments and help you in detecting errors.
- Do not expect your research to be perfect. Research is often more complicated and more difficult than expected. The effects (if they are detected) are weaker and the results more controversial.

Questions to consider

As with qualitative data some of the most important questions to consider regarding the data analysis have to be dealt with when designing the study. A focused data collection will usually make life much easier when it comes to the data analysis stage.

Pitfalls to avoid

- Do not conduct analysis under time pressure as this is one of the worst enemies of good data analysis. Handling quantitative data requires care and attention.
- Resist the temptation to present too much raw data; try to make a focused analysis rather than presenting all questions from a survey
- Do not ignore the concept of statistical power when analysing quantitative data.
- Do not speak above the level of your audience. If percentages and cross-tabulation is what the audience is looking for, it is perhaps better if logistic regression models can be avoided.

- Do not oversimplify things.
- Do not make claims that are outside the scope of your data.

A researcher's experience

Sometimes research is conducted under time pressure and that increases significantly the possibility of errors in the findings. One example of how time pressure and undue caution can lead to mistakes is when I was working on a database which included amongst other things, information on children's leisure activities. When making a variable which was supposed to classify the kids into two groups those active in sports and those who were not active I failed to remember that many children engage in more than one sport, and thus classified those who participated in two or three sports activities as being not active instead of active. This error was then discovered two years later when the data was looked at again in another study. (Kjartan Olafsson, Iceland)

References and further resources

- Hartwig, F. & Dearing, B. E. (1979). *Exploratory data analysis*. Sage University Paper Series on Quantitative Applications in the Social Sciences, Series no. 07-016. London: Sage Publications.
- Newton, R. & Rudestam, K. (1999). *Your statistical consultant: Answers to your data analysis questions*. Thousand Oaks, CA: Sage Publications.
- Pallant, J. (2005) *SPSS survival manual*. Maidenhead: Open University Press.